AECOM

July 25, 2020

Pennsylvania Department of Environmental Protection
Regional Permit Coordination Office
Rachel Carson State Office Building
400 Market Street
Harrisburg, PA 17101

Attention: Kevin S. White, P.E.

Re: Conemaugh River Crossing Project
Application Number: WQ6583220-001
APS ID Number: 1017991; AUTH ID Number 1317321
Incompleteness Review Response

Dear Mr. White:

On behalf of Texas Eastern Transmission, LP (Texas Eastern), AECOM is hereby submitting this response to your Incompleteness Review of the Section 401 Water Quality Certification Application referenced above on July 10, 2020. An electronic copy of the requested information discussed below has been provided.

The **comments**/*responses* are as follows:

1. **Please ensure that the Environmental Assessment (E.A.) is consistent with the E.A. that was submitted with the Chapter 105 application. For example, the E.A. submitted for the SWQC did not include/discuss the following elements:**
    - **a. E.A. Form**
    - **b. Statement of water dependency**
    - **c. Permanent/Temporary Direct/Indirect impact table**
    - **d. Module S2.A.1**
    - **e. Module S2.A.5. i, iv, v, vi**
    - **f. Module S2.B**
    - **g. Module S2.D**
    - **h. Module S3 (all)**
    - **i. Module S4**

    Also ensure that these revisions are consistent with and correspond to any and all changes made to the 105 Joint Permit Application for this project.

A revised Section 401 Water Quality Certification Application is enclosed which includes the following elements:

a) E.A.Form

AECOM
715 Washington Boulevard
Williamsport, PA 17701
Tel: 570.505.1674
Fax: 570.505.1682

b) *Statement of water dependency – see Section 1.1.2*
c) *Permanent/Temporary Direct/Indirect impact table – See Appendix H*
d) *Module S2.A.1 – See Section 2.2*
e) *Module S2.A.5. i, iv, v, vi – See Section 2.7*
f) *Module S2.B – See Section 2.1 and 2.2*
g) *Module S2.D – See Section 2.3*
h) *Module S3 (all) – See Section 3.0, Appendix H, and Appendix I*
i) *Module S4 – See Section 4.0*

Please replace your existing electronic copy with the enclosed revised copy. If you have any questions or require additional information regarding the Section 401 Water Quality Certification Application, please do not hesitate to contact me at (860) 888-2249 or email eileen.banach@aecom.com.

Sincerely,

AECOM

Eileen Banach
Scientist

cc: Mr. William Brett, Texas Eastern Transmission, LP

Clean Water Act Section 401 Water Quality Certification

Environmental Assessment

Conemaugh River Crossing Project
Westmoreland and Indiana Counties, Pennsylvania

Revised July 2021

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATERWAYS ENGINEERING AND WETLANDS

CHAPTER 105 ENVIRONMENTAL ASSESSMENT FORM

			Included	Item Location
Note: The Department may waive a specific information requirement in writing, at the request of the Applicant, during the pre-application review process if the Department determines the information is not necessary to complete the review.				
Module S1: Project Summary				
This module is intended to organize information in order to present an overall summary of the project scope, certain key information requirements and when applicable, a comprehensive view of the overall project and related projects.				
A. Provide an overall project description and If the answer to the question below is **YES**, address CEA requirements; otherwise proceed to **S1.B** Comprehensive Environmental Assessment (CEA) when applicable. Answer the following question:			☒	1.0
Does the "overall" project require more than one Ch. 105 permit in more than one county or will the project be completed in more than one phase?	☐ Yes	☒ No		
B. Provide information related to the project purpose, need, water dependency and summarize the amount and type of resources present and the temporary and permanent impacts proposed to those resources.			☒	1.1, 2.0, 3.0, App H
Module S2: Resource Identification and Characterization				
This module is intended to organize information related to the identification of the resources present on the project site and to characterize those resources that may be affected by the proposed project.				
A. Provide the standard resource identification information, location map, wetland determination or delineation reports; watercourse reports; identification and qualifications of preparers; location map, and answer the related questions.			☒	2.0, App B, E
Is the site located within or adjacent to any of the following; or within 100 feet of items vii or viii?				
i. National, state or local park, forest or recreation area	☐ Yes	☒ No		2.7
ii. National natural landmark	☐ Yes	☒ No		2.7
iii. National wildlife refuge, or Federal, state, local or private wildlife or plant sanctuaries	☐ Yes	☒ No		2.7
iv. State Game Lands	☒ Yes	☐ No		2.7
v. Areas identified as prime farmland	☒ Yes	☐ No		Tbl 2.6-1
vi. Source for a public water supply	☐ Yes	☒ No		2.7
vii. A National Wild or Scenic River or the Commonwealth's Scenic Rivers System	☐ Yes	☒ No		2.7
viii. Designated Federal wilderness area	☐ Yes	☒ No		2.7
B. Identify all aquatic resources present on the project site and provide an identifier, the resource type; size of the resource(s); fishery designations, Ch. 93 uses and special protection status; and Exceptional Value (EV) wetland analysis.			☒	2.1, 2.2
C. Provide the following information related to habitat for Federal threatened and endangered (T&E) plant and animal species or State T&E species or species of special concern - copies of search forms or search receipts; identification of avoidance and minimization efforts taken to resolve identified conflicts.			☒	2.6
Did the PNDI search or agency coordination identify any potential conflicts?	☐ Yes	☒ No		2.6
If the above is answered **YES**; answer the following two questions related to PNDI Coordination:				
a. ***Is the applicant utilizing a sequential review of the PNDI coordination?***	☐ Yes	☐ No		
b. ***Is the applicant utilizing a concurrent review of the PNDI coordination?***	☐ Yes	☐ No		
D. Characterize the aquatic resources: riverine, wetland and lacustrine present on the project site that are proposed to be directly or indirectly affected by the project. Including but not limited to the following, resource classification information, Level 2 rapid condition assessment results, discussion of resource functions, characterization of riparian properties and any other relevant information or studies conducted.			☒	2.1, 2.2, 2.3, App H
Module S3: Identification and Description of Potential Project Impacts				
*This module is intended to organize and present information concerning the potential impacts or effects of the proposed project **in this** application. Impacts related to the "over all" project that are proposed under related but separate application(s) should be addressed as part of the CEA Policy response under **S1.A**.*				
A. Provide a summary table of the proposed temporary and permanent direct and indirect impacts for each effected resource category (e.g. riverine, wetlands and lacustrine resources).			☒	App H
B. If any questions from **S2.A** Standard Information Response questions were answered YES, discuss in detail any potential impacts to those resource(s).			☒	3.7
IMPORTANT NOTE: If either item vii or viii from S2.A is answered YES, the project is not eligible as a "Small Project Application" type. Complete all applicable sections of the EA form for the standard application type unless an item was otherwise waived by the Department in writing (see previous Note on waiving of information requirements).				

	Included	Item Location
C. Provide a table(s) of all proposed water obstruction(s), encroachment activities and dams (e.g. subfacility codes) and provide an identifier, the subfacility code and description, resource identifier from **S2.B**, latitude and longitude, the proposed temporary and permanent direct and indirect impacts and subfacility details.	☒	App H
D. Provide a discussion of how the proposed subfacility(ies) individually and in combination directly and/or indirectly impact the identified resource(s) and the effects on the applicable resource functions: hydrologic, biogeochemical, habitat, recreation, any other environmental impacts and the effects on the property or riparian rights of owners upstream, downstream or adjacent to the project.	☒	3.8
E. **Antidegradation Analysis** - The applicant should demonstrate consistency with State antidegradation requirements as described in the Water Quality Antidegradation Implementation Guidance Policy Document Number 391-0300-002. Project application information provided below in **S3.F, G and H** may be cross-referenced.	☒	3.9
F. **Alternatives Analysis** - The scope and extent of this analysis should be commensurate with the size and scope of the proposed project impacts *in this* application, information provided in **S4.A** below, related to avoidance and minimization efforts, may be cross-referenced.	☒	App I
G. **Potential Secondary Impact Evaluation** - Identify and describe environmental impacts on adjacent land and water resources associated with but not that direct result of the project.	☒	3.10
H. Identify and evaluate the potential cumulative environmental impacts of this project and other potential or existing projects like it, and the impacts that may result through numerous piecemeal changes to the wetland resource.	☒	3.11
Module S4: Mitigation Plan		
*This module is intended to organize and present information concerning actions undertaken in accordance with the definition of **Mitigation** in Title 25 Pa. Code Chapter 105 - §105.1, 105.16, 105.18a(a)(3), 105.18a(b)(7), 105.20a, and 105.21 as related to the potential impacts or effects of the proposed project **in this** application.*		
A. Identify and discuss any measures taken that resulted in avoiding or minimizing unavoidable resource impacts, provide detailed responses for individual proposed impact area(s) **and** the project as a whole.	☒	4.1
B. Identify and discuss any repair, rehabilitation or restorative actions taken to rectify an impacted resource, provide detailed responses for individual proposed impact area(s) and the project as a whole. Identify and discuss any proposed preservation and maintenance operations that will be taken to reduce or eliminate an impact during the life of the project.	☒	4.2
C. Identify and discuss any actions undertaken to provide compensatory mitigation including the purchase of credits from an approved provider, a detailed discussion of proposed compensation actions and how they will offset the lost resource functions. Provide detailed plans including performance standards and success criteria.	☒	4.3
Answer the following question. If the answer to the question is **YES**, provide the information regarding the mitigation credit provider; otherwise provide a detailed mitigation plan. If the application proposes to utilize both mitigation bank credits and conduct permittee responsible mitigation; both the credit provider and mitigation plan information shall be submitted.	☒	
Does the applicant propose to utilize an approved mitigation bank to provide all or a portion of the compensation? ☒ Yes ☐ No		4.3
D. When applicable, provide a plan to monitor the identified actions proposed in **S4.B** and/or **S4.C** compensatory mitigation area. Applicants should utilize the Department's Design Criteria and the USACE's RGL 08-03 -(http://www.usace.army.mil/Portals/2/docs/civilworks/RGLS/rgl08_03.pdf) to develop monitoring plans for compensatory mitigation proposals. The plan should include performance standards/success criteria, duration and timeframes of monitoring, monitoring report template, and template remedial action or adaptive management plan.	☒	4.4
Note: All or portions of this Module may apply to "Small Project" type applications under case specific circumstances and should be discussed during any pre-application meetings or prior to application submittal.		
CERTIFICATION		
I certify that the above statements, attachments including those labeled and identified as Enclosures, and all conclusions are true, correct, and based upon current environmental principles and science, to the best of my knowledge and belief.		
Signature: Erik Berka — Date: 7/23/2020		

TABLE OF CONTENTS

TABLES

APPENDICES

ACRONYMS AND ABBREVIATIONS

AUX	Auxiliary
CFR	Code of Federal Regulations
CWA	Clean Water Act
DCNR	Pennsylvania Department of Conservation and Natural Resources
EA	Environmental Assessment
eFACTS	Environment, Facility, Application, Compliance Tracking System
Enbridge	Enbridge Energy Company, Inc.
EPA	U.S. Environmental Protection Agency
E&SCP	Erosion and Sediment Control Plan
ESCGP-3	Erosion and Sediment Control General Permit
FEMA	Federal Emergency Management Agency
FERC	Federal Energy Regulatory Commission
GIS	geographic information system
HDD	horizontal directional drill
HUC	Hydrologic Unit Codes
LOD	limits of disturbance
MLV	mainline valve
O&M	operations and maintenance
PA	Pennsylvania
PADEP	Pennsylvania Department of Environmental Protection
PEM	palustrine emergent marsh
PFBC	Pennsylvania Fish and Boat Commission
PFO	palustrine forested
PGC	Pennsylvania Game Commission
PHMSA	Pipeline and Hazardous Materials Safety Administration
Plan	FERC's Upland Erosion Control, Revegetation, and Maintenance Plan
PNHP	Pennsylvania Natural Heritage Program
PPC	Preparedness, Prevention, and Contingency Plan
Procedures	FERC's Wetland and Waterbody Construction and Mitigation Procedures
Project	Conemaugh River Crossing Project
PSS	palustrine scrub-shrub
ROW	right-of-way
SPCC	Spill Prevention, Control, and Countermeasure
SSA	Sole-Source Aquifers
Texas Eastern	Texas Eastern Transmission, LP
TWS	temporary workspace
USACE	United States Army Corps of Engineers

USDOT	U.S. Department of Transportation
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
WHPA	wellhead protection area
WQC	Water Quality Certification
WWF	Warmwater Fishes

1.0 GENERAL PROJECT DESCRIPTION

Texas Eastern Transmission, LP (Texas Eastern), a wholly-owned subsidiary of Enbridge Energy Company, Inc. (Enbridge) proposes to replace a section of their existing Line 12 natural gas pipeline beneath the Conemaugh River in Derry Township, Westmoreland County and Blacklick Township, Indiana County, Pennsylvania (PA). Activities associated with the installation of this pipeline are referred to herein as the Conemaugh River Crossing Project (Project). The Project would entail 467 feet of in-situ replacement of Line 12 on the west side of the Conemaugh River, 1,880 feet of horizontal directional drill (HDD) bore beneath the Conemaugh River (includes 418 feet of new permanent easement), and 248 feet of conventional pipeline in new permanent easement on the east side of the Conemaugh River to connect back to the existing Line 12. Approximately 1,280 feet of the existing Line 12 will be capped, grouted, and left in place. The Line 12 mainline valve (MLV) located in the existing MLV site on the west side of the Conemaugh River will be replaced with a new MLV to support pipeline operations and the Line 12 MLV located in the existing MLV site on the east side of the Conemaugh River will be removed and replaced with a flange connection. No changes to the footprint to the existing valve sites will be required. The existing Line 12 pipe under Newport Road will remain in service to connect the new MLV site east of Newport road to the existing pipeline crossover located at the MLV site east of the Conemaugh River. The associated new aboveground facilities for the Project consist of one new permanent access road and MLV in Indiana County, where the new segment of pipeline connects to the existing Line 12.

This Water Quality Certification (WQC) Environmental Assessment (EA) is being submitted to the Pennsylvania Department of Environmental Protection (PADEP) Regional Permit Coordination Office to receive authorization under Section 401 of the Clean Water Act (CWA). This State authorization is required in concert with receipt of the United States Army Corps of Engineers (USACE) Section 404 authorization.

1.1 PROPOSED FACILITIES

1.1.1 Purpose and Need

Per the United States Department of Transportation (USDOT) regulations regarding pipeline safety (49 Code of Federal Regulations (CFR) Part 192 Subparts I and O), gas transmission pipeline operators are required to develop and implement a comprehensive corrosion control and integrity management program for pipeline segments where a failure would have the greatest impact on the public or property. The rule further requires that operators identify and characterize applicable threats to pipeline segments, conduct a baseline assessment and periodic reassessments of these segments, mitigate significant defects discovered from the assessments, and continually monitor the effectiveness of its integrity management program.

The USDOT Pipeline and Hazardous Materials Safety Administration (PHMSA), acting through the Office of Pipeline Safety, administers the national regulatory program to ensure the continued protection of the environment and public from the risks of hazardous materials transportation by establishing policy and enforcing rigorous operation and maintenance standards. Texas Eastern conducts regularly scheduled internal in line inspections (aka “tool runs”) of their natural gas pipeline transmission systems using advanced internal inspection tools commonly known as “pigs” or “smart pigs”. These internal pipeline tools are equipped with GPS tracking and sensors to measure and record pipe wall thickness as they pass through the pipe. Upon completion of a pipeline tool run, the data is analyzed by Texas Eastern’s integrity experts and given a repair classification based on the severity of the defect. Examples of these pipeline “anomalies” include pipe dents or evidence of metal loss from corrosion.

A tool run was completed in 2018 on Texas Eastern's 24-inch Line 12 pipeline system in Westmoreland County. As a result of these inspections, an anomaly was identified approximately 25 feet from the west bank of the Conemaugh River, within wetland W-CMS-016, that required investigation and repair to comply with PHMSA regulations. Under PHMSA regulations the existing Line 12 cannot operate unless the anomaly is repaired. Texas Eastern obtained a General Permit 11 (GP116518226) from PADEP to cross and excavate wetland W-CMS-016 and attempted to repair the anomaly during the construction season in 2018 and 2019. However, the Conemaugh River in this location is part of a USACE flood control area and frequently overflows its west bank into the existing pipeline right-of-way (ROW) and wetland W-CMS-016. Additionally, Line 12 is currently located approximately 30 feet below grade, likely due to silt deposits from frequent river flooding. These combined conditions made it impossible to keep the trench box dewatered sufficiently for safe anomaly repair. Texas Eastern explored several options to repair the anomaly and ultimately concluded that it would not be possible under current conditions.

With anomaly repair deemed infeasible and Line 12 inoperable Texas Eastern has been temporarily using their Line 19 Auxiliary (AUX) line to continue to meet gas service demands, however this pipeline is too small to continue use indefinitely. Based on studies conducted, Texas Eastern has determined that the existing segment of Line 12 under the Conemaugh River should be abandoned in place and a new segment installed. Texas Eastern has chosen HDD over an open-cut or conventional crossing of the Conemaugh River. HDD will require less wetland impacts by avoiding open cutting the large wetland on the west side of the river (W-CMS-016), as well as avoiding direct impacts to the Conemaugh River itself.

1.1.2 Statement of Water Dependency

Due to the nature of this project (repair of an existing natural gas pipeline), avoidance of all aquatic resources was not feasible. The Project is considered water dependent because it requires access or proximity to or siting within water to fulfill the basic purposes of this project.

1.2 LOCATION AND DESCRIPTION OF FACILITIES

1.2.1 Pipeline Facilities

The Project's pipeline facilities include a new segment of Texas Eastern's 24-inch Line 12 in Westmoreland and Indiana Counties, PA, beginning at Station 0+00 and ending at Station 26+57. The pipeline facilities are summarized in Table 1.2-1, which provides the proposed Project's pipeline installations, pipeline diameter, approximate length, Station, and county. The Project location map in Appendix B shows the regional location of the Project.

Table 1.2-1
Pipeline Facilities

Facility	Pipeline Diameter and Type	Approx. Length (feet)	Begin Station	End Station	State	County
Line 12	24-inch replacement pipeline	1,230	0+00	12+00	PA	Westmoreland

Facility	Pipeline Diameter and Type	Approx. Length (feet)	Begin Station	End Station	State	County
Line 12	24-inch replacement pipeline	1,365	12+00	26+57	PA	Indiana

1.3 ABOVEGROUND FACILITIES IN PENNSYLVANIA

The Line 12 MLV located in the existing MLV site on the west side of the Conemaugh River will be replaced with a new MLV to support pipeline operations and the Line 12 MLV located in the existing MLV site on the east side of the Conemaugh River will be removed and replaced with a flange connection. The Project requires one new MLV and associated permanent access road on the east side of the Conemaugh River in Indiana County. The new MLV is required to tie in the new segment of Line 12 to the existing Line 12.

1.4 LAND REQUIREMENTS

The construction workspace for the Project would include workspace with Texas Eastern's existing easement, temporary workspace (TWS) outside of the existing easement, new permanent right-of-way (ROW), access roads, and one MLV. Table 1.3-1 includes a summary of all land requirements for construction (temporary impacts) and operation (permanent impacts) of the Project.

A photo-based alignment sheet is included in Appendix A as "Alignment Sheet and Erosion and Sediment Control Plans" and depict the location and configuration of temporary and permanent construction workspace required for the Project. The United States Geological Survey (USGS) figure included as Appendix B depict the location of all proposed workspace. Typical construction workspace configurations have been provided in the Project-specific Erosion and Sediment Control Plan (E&SCP), which is included in Appendix C as "Erosion and Sediment Control Plan Narrative".

Table 1.3-1Land Requirements for Project Facilities in Pennsylvania

Facility	Approximate Length or size/ No. of Sites	Construction Workspace Within Existing Easement(acres)	Temporary Workspace Outside of Easement (acres)	New Permanent Easement for Construction and Operation (acres)	Total Workspace for Construction (acres)
Line 12	2,595 linear feet/1	8.48	2.75	0.76	11.99
Aboveground Facilities[1]	0.95 (ac)/3	0.00	0.00	0.00	0.00
Access Roads[2]	1759 (ft)/4	0.00	0.0	0.24	0.24
Total Project		**8.48**	**2.75**	**1.00**	**12.23**

1. Workspace for the existing and new aboveground facilities (MLVs) is included in Line 12 workspace. The new MLV is in existing easement, no temporary workspace or new easement is required. All workspace is included in Line 12 workspace.

2. Construction Workspace Within Existing Easement includes new temporary access roads, existing permanent access road acreage is not included.

All units in acres and rounded to the nearest 0.01. The totals shown in this table may not equal the sum of addends due to rounding.

1.4.1 Pipeline Facilities

The Project requires the full width of Texas Eastern's existing ROW on the west and east side of the Conemaugh River, approximately 350 feet on average, for workspace to complete the in-situ replacement of the Line 12 segment and HDD operation. This footprint would accommodate the following: trench excavation, bank sloping, topsoil segregation, safe construction and restoration activities; HDD entry/exit pits, drill rig, frac tanks, mud pump and fluid system, bentonite storage, tools and auxiliary equipment; new permanent access road and MLV. An additional area outside of the existing ROW is required for temporary workspace on the west side of the Conemaugh River to accommodate the HDD pullback strings. New permanent easement as well as temporary workspace is required in the east side of the Conemaugh River for HDD activities and installation of the new segment of pipeline.

The current workspace requirements are included on the aerial alignment sheets as "Alignment Sheet and Erosion and Sediment Control Plans". The estimated land requirements for pipeline construction and operations and maintenance (O&M) requirements are presented in Table 1.3-1.

1.4.1.1 New Pipeline Right-of-Way

Texas Eastern has utilized HDD bore to reduce impacts to wetlands and watercourses. The HDD path would be too steep an angle to accommodate an exit within the existing MLV on the east side of the Conemaugh River. The HDD pit must be located outside of the existing ROW, requiring a small segment of new pipeline ROW to connect the HDD pipe to the existing Line 12.

Typical construction and operation ROW widths for new pipeline are shown in the E&SCP ("Erosion and Sediment Control Plan Narrative"). As noted, the new ROW would consist of new 50-feet permanent easement. Workspace outside of this new easement is required for installation of the new pipeline and construction workspace for the HDD exit.

1.4.2 Access Roads

Texas Eastern will utilize an existing permanent road off of Westinghouse Road to access workspace on the west side of the Conemaugh River and an existing permanent access road off of Newport Road to access the existing MLV site on the east side of the Conemaugh River. Two temporary access roads off of Newport Road will be used to access workspace on the east side of the river. The existing roads are currently used to access Texas Eastern's existing MLV sites and will not require any upgrades or improvements for use during construction. The two temporary roads will be removed and restored after construction. One permanent access road will be installed off of Newport Road, within the existing ROW, to access the new MLV.

1.4.3 Aboveground Facilities

Facilities will be replaced at the existing MLV sites on the east and west side of the river. All facilities will be contained within the existing MLV footprints. One new MLV will be installed as part of the Project on the east side of the Conemaugh River within Texas Eastern's existing ROW. The MLV will be 100 feet by 100 feet.

1.5 CONSTRUCTION PROCEDURES

1.5.1 Standard Construction Methods

The proposed Project would be constructed in compliance with applicable specifications, Federal regulations and guidelines, and Project-specific permit conditions. Construction of the Project would commence after ROW and applicable regulatory permits and clearances have been acquired for the Project. Construction activities are expected to begin in February 2021 and be completed in July 2021.

Construction and restoration techniques to be used would be those typical for in-situ replacement, HDD operation, and new pipeline installation. The E&SCP provides detail of such techniques and mitigation measures that would be used for the Project. The Project E&SCP is consistent with the Federal Energy Regulatory Commission's (FERC) Upland Erosion Control, Revegetation, and Maintenance Plan (May 2013 version) (*Plan*) and the FERC's Wetland and Waterbody Construction and Mitigation Procedures (May 2013 version) (*Procedures*). Additional construction techniques and measures that would be employed are described in the Project's Spill Prevention, Control, and Countermeasure (SPCC) Plan and Preparedness, Prevention, and Contingency Plan (PPC) (Appendix D).

Before the start of construction, utilities will be identified, land surveys will be finalized, and the pipeline centerline and construction workspace will be surveyed and marked. Texas Eastern's contractors will contact the "PA One Call System" to verify and mark all utilities along the construction workspace to minimize the potential for damage to other buried facilities in the area. Where there is a question as to the location of utilities, they will be located by field instrumentation and test pits. The USACE will be notified at least 3 to 5 days before the start of construction.

The construction workspace will be located mostly within the cleared and maintained ROW, though temporary workspace outside of the ROW are mostly maintained as field. Texas Eastern has not maintained the full extent of their existing easement on the northern side of the ROW and to provide adequate room for the HDD operations, limited tree trimming, and clearing will be conducted. Within wetland areas a total of 26 trees that meet the regulatory classification of trees will need to be removed, these trees will be cut with the stumps left intact. Twelve of the trees that need to be removed are located in a Palustrine Forested (PFO) wetland within the limits of Texas Eastern's existing easement, which will be maintained following construction resulting in approximately 0.10 acres of permanent wetland conversion. The remainder of trees to be removed are in the HDD pullback area outside of the existing easement, this workspace is required to complete construction operations and will be restored following construction and allowed to regenerate. The trees that will be cut in the HDD pullback area are located within wetland W-BJM-011, classified as Palustrine Emergent (PEM) and Palustrine Scrub-shrub (PSS) and as such, will not constitute a conversion of forested wetland.

Prior to construction, limited clearing within the ROW will be required for construction of the Project. Initial clearing operations will include the removal of vegetation within the construction workspace either

by hand cutting or mowing. The limits of clearing will be identified and flagged in the field prior to any vegetation cutting operations. In the wetlands, brush will be hand-cut and removed from the site. Unless grading is required for safety reasons, vegetation will be cut off at ground level, leaving existing root systems intact to revegetate.

Closely following clearing, but prior to grading, erosion controls will be installed at the required locations as outlined in the E&SCP. The construction workspace will be rough graded as necessary to allow for safe passage of equipment and to prepare a work surface for construction activities. However, as stated above, the rootstock of shrubby vegetation in upland areas will be left in the construction workspace wherever possible to encourage natural revegetation and, unless grading is required for safety reasons, wetland vegetation will be cut off at ground level, leaving existing root systems intact. Typically, the grading of the construction workspace will be completed with bulldozers. Backhoes will be used in conjunction with bulldozers in areas where boulders require removal. Timber mats will be placed over wetlands within the LOD.

In-Situ Replacement of Existing Line 12 Segment and Installation of New Line 12 Segment

A trench will be excavated to expose the existing pipeline between the MLV and HDD entry/exit point on the west side of the Conemaugh River, and between the HDD entry/exit and new MLV on the east side of the River. In general, the trenches will be approximately 15 feet wide and 9 feet deep. This is necessary to provide adequate room for safe removal of the existing Line 12 segment and installation of the new pipeline. Excavated material will be placed next to the trench so as to avoid unnecessary movement of machinery across the terrain. These construction activities will not impact any wetlands or watercourses.

Should trench dewatering be necessary, it will be pumped to a stable, vegetated upland area (where practical), and filtered through a filter bag. The trench will be dug by an excavator or backhoe.

All suitable material excavated during trenching will be replaced in the trench once the pipeline has been replaced. In areas where excavated material is unsuitable for backfilling, additional clean fill will be brought from a commercial borrow area in the region. To protect the new coating, the pipe is padded with relatively rock-free material placed immediately around the pipe. Suitable padding material is typically made by mechanically screening the subsoil directly over the pipe trench using an excavator outfitted with a 'padding bucket'. If suitable padding material is unavailable, material will be brought from a commercial borrow area in the region. In no case will topsoil be used as padding material. Once the pipe is padded, the trench is then backfilled with the remainder of the excavated subsoil material. The top of the trench may be slightly crowned to compensate for settling. Topsoil is then spread across the construction workspace as needed. Upon completion of finish grading the soil is inspected for compaction and scarified as necessary.

Once backfilling is complete, restoration and revegetation of the construction workspace will immediately occur. In general, every effort will be made, weather and soil conditions permitting, to complete final cleanup (including final grading) and installation of any permanent erosion control measures within 20 days after the trench is backfilled. In conjunction with backfilling operations, any woody material and construction debris will be removed from the construction workspace. The construction workspace will be fine-graded to prepare for restoration. Permanent water bars will be reinstalled in accordance with FERC requirements for slope and spacing using compacted soil and maintained in accordance with the E&SCP at the existing locations. Permanent water bars will be installed to match existing water bars on adjacent undisturbed pipeline ROW.

Revegetation will be completed in accordance with permit requirements and in accordance with the E&SCP. The construction workspace will be seeded within six (6) working days following final grading, weather and soil conditions permitting. Alternative seed mixes specifically requested by the landowner or agencies may be used. Any soil disturbance that occurs outside the permanent seeding season or any bare soil left unstabilized by vegetation will be mulched in accordance with the E&SCP.

1.5.2 Major Waterbody Crossings

The Project will cross one major waterbody, the Conemaugh River, via HDD. Directional drilling is an advanced boring method that requires the drilling of a small diameter hole, or pilot hole, along a predetermined design path. The pilot hole is then gradually enlarged until it is sufficient to accommodate the pipeline being installed. The pipeline may or may not be installed concurrently with the hole enlargement depending upon the final diameter of the enlarged hole and the soil conditions encountered.

Excavation of the drill entry and exit locations would be necessary to contain drilling fluids during all phases of the installation. These fluids and cuttings must be disposed of in an approved manner periodically or at the completion of the crossing installation. The crossing length and cross-sectional geometry are dependent upon the pipeline design parameters, the obstacle to be crossed, and the subsurface conditions.

Although Texas Eastern has commissioned a geotechnical survey and is confident in the current HDD methods and technologies available, it is recognized that such methods contain inherent risks. Texas Eastern has developed an HDD Contingency and Unanticipated Release Plan to mitigate these risks.

1.5.3 Environmental Training for Construction

Environmental training would be required for all land agents, construction personnel and the environmental inspector; and agency personnel would also be invited to the training. This training would include an overview of the FERC *Plan* (FERC, 2013b) and *Procedures* (FERC, 2013a), and detailed sessions that describe the timing, notification and environmental permit conditions required to be implemented and adhered to during construction, restoration and mitigation.

1.5.4 Construction Workforce

There would be one construction spread employed to construct the Project with approximately 40 personnel. In addition, one Environmental Inspector would be assigned to the Project.

1.6 OPERATION AND MAINTENANCE PROCEDURES

Texas Eastern would own, operate, and maintain the pipeline and MLV associated with the Project in accordance with 49 CFR Part 192 and 199 and other applicable regulations. The proposed facilities would be operated and maintained in a manner to ensure that a safe, continuous supply of natural gas reaches each of the delivery points. Maintenance activities would include regularly scheduled ground and overflight surveys. Signs, marker posts, aerial markers, and decals would be painted or replaced to ensure that the pipeline locations would be visible from the air and ground.

The facilities would be patrolled from the air periodically. This would provide information on possible leaks, construction activities, erosion, population density, possible encroachment, and any other potential problems that may affect the safety and operation of the facility. In addition, Texas Eastern contractors

would adhere to the "Call Before You Dig" program. Under the "Call Before You Dig" program, anyone planning excavation activities may call a single number to alert all utility companies. Representatives of the utility companies that might be affected then visit the site and mark their facilities so that the excavation can proceed with relative certainty as to the location of all underground lines. Other maintenance functions would include:

- Mowing of the ROW in accordance with the timing restrictions outlined in FERC's *Plan and Procedures*;
- Periodic inspection of MLVs, water crossings and erosion control devices;
- Maintenance of a supply of emergency pipe, leak repair clamps, sleeves, and other equipment needed for repair activities;
- Periodic internal inspection with in-line inspection tools or "pigs;" and
- Calibration of equipment and transmitters.

No herbicides or pesticides would be used for the clearing or maintenance of the temporary or permanent ROW or within 100-feet of a waterbody. An existing cathodic protection system for the pipeline would be maintained.

1.6.1 Maintained ROW

Texas Eastern would continue to maintain their existing ROW. Within wetlands and riparian areas, the maintained ROW would be reduced to 30 feet. Within the 30-foot maintained ROW in wetlands, trees within 15 feet of the pipeline that could compromise the integrity of the pipeline may be selectively cut and removed from the ROW. A permanent 10-foot wide cleared corridor would be maintained as herbaceous cover through wetlands in accordance with FERC's *Plan* (FERC, 2013b) and *Procedures* (FERC, 2013a). Maintaining a cleared ROW is required for the following safety reasons:

- For pipeline patrols and corrosion surveys;
- For emergency repairs of the pipeline; and
- For visibility during aerial patrols.

1.6.2 Erosion Control

Erosion problems on the pipeline ROW would be identified and repaired as necessary.

1.6.3 Periodic Pipeline and ROW Patrols

Erosion control devices would be regularly inspected and maintained during periodic pipeline and ROW patrols, including:

- Infiltration trench;
- Water bars;
- Riverbanks;
- Other conditions that could affect operation of the pipeline.

2.0 SURFACE WATER RESOURCES

The following section details the resources identified along the proposed Project including waters of the United States (U.S)., which are regulated and protected by the CWA and require federal and state authorization for any proposed impacts, discharges, or temporary impacts to water quality. Waterbodies and wetlands were field delineated in 2016 and 2020; delineations conducted in 2016 were also field-verified during subsequent delineations in 2020. Identification of regulated wetland and waterbody boundaries occurred within the Project limits of disturbance (LOD).

Information regarding fisheries and designated and existing uses was collected through online review of digital geographic information system (GIS) data layers published by PADEP and the PA Fish and Boat Commission (PFBC).

2.1 EXISTING WATERBODIES

The Project would cross one waterbody, the Conemaugh River, classified as warmwater fisheries (WWF) (Commonwealth of Pennsylvania, 2009) via HDD, resulting in no surficial impacts to the banks or substrate. The waterbody is denoted as S-JLK-037 on plans provided in Appendix A. Warmwater streams and rivers typically are slow-moving bodies of water with soft substrates of sand and silt and are less oxygenated than coldwater streams and rivers. These waterbodies are unsuitable for the propagation of trout and are not capable of supporting a stocked trout population.

Table 2.1-1 lists common fish species for the Conemaugh River (WWF). For more details about the Conemaugh River, refer to Appendix E.

Table 2.1-1
Representative Fish Species in the Conemaugh River

Common Name	Scientific Name
Warmwater Fish	
Largemouth bass	*Micropterus salmoides*
Black crappie	*Pomoxis nigromaculatus*
Channel catfish	*Ictalurus punctatus*
Bluegill	*Lepomis macrochirus*
Pumpkinseed	*Lepomis gibbosus*
Green sunfish	*Lepomis cyanellus*
Brown bullhead	*Ameiurus nebulosus*
Yellow bullhead	*Ameiurus natalis*
Yellow perch	*Perca flavescens*
Bluntnose minnow	*Pimephales notatus*

Sources: PFBC 2020

2.2 EXISTING WETLANDS

On behalf of Texas Eastern, AECOM scientists identified, located, classified and delineated wetland resources within and adjacent to the Project area through field surveys conducted in 2016 and 2020. Jurisdictional wetlands crossed by the Project were field delineated in accordance with the USACE Wetlands Delineation Manual (Environmental Laboratory, 1987) and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont Region (USACE; 2014, 2012). During the site investigations, four (4) wetlands were delineated within the Project area. The limit of the site investigation was defined by the easement limits of Texas Eastern's existing pipeline ROW and temporary workspace outside the existing ROW. Table 2.2-1 lists the wetlands located within the Project Study Area that have the potential to be affected by the Project. The identified wetlands contain a project-specific resource identifier ("W"). The sizes of the existing resources listed in Table 2.2-1 contains information pertaining to whether any of the wetlands delineated within the Study Area are exceptional value according to PA Code, Title 25, Chapter 105 [105.17 (iii)].

Table 2.2-1
Wetland Summary

Wetland ID[1]	Classification [2]	Delineated Size (acres)	Chapter 105 Wetland Classification	Hydrogeomorphic Classification (HGM)[4]	Palustrine Community Classification[5]
W-BJM-010	PEM/PSS/ PFO	0.63[3]	-	Flat mineral soil	Mixed Forb – Graminoid Wet Meadow
W-BJM-011	PEM/PSS	1.47[3]	-	Flat mineral soil	Mixed Forb – Graminoid Wet Meadow
W-CMS-007	PEM	0.13	-	Flat mineral soil	Mixed Forb – Graminoid Wet Meadow
W-CMS-016	PEM	3.40[3]	-	Flat mineral soil	Mixed Forb – Graminoid Wet Meadow

Notes:
[1] Wetland ID is an AECOM designation for a wetland.
[2] PEM= Palustrine Emergent, PSS= Palustrine Scrub-Shrub, PFO= Palustrine Forested
[3] The wetland area is open-ended and continues outside of the Study Area. Acreage included within table represents the delineated acreage within the Project Study Area.
[4] HGM classifications were assigned from *Hydrogeomorphic Classification. HGM classification for wetlands of the Mid-Atlantic Region, USA* (Brooks).
[5] PCC classifications were assigned from *Terrestrial and Palustrine Plant Communities of Pennsylvania, 2nd Edition* (Zimmerman et al., 2012).

The *Wetland and Watercourse Delineation Report* located within Appendix E contains information pertaining to the delineation process utilized to identify and delineate the wetlands found within the Study Area. This report also contains wetland and watercourse data forms and photos of the identified resources. Figure 2 – Plan View located within the *Wetland and Watercourse Delineation Report* (Appendix E), both at a scale of 1:2,400 depict all of the wetlands and watercourses delineated within the Study Area as well as within the LOD for the Project. These features are all labeled with unique identifiers and their classifications. AECOM scientists listed in Table 2.2-2 performed the aquatic resource delineations, and prepared permit application materials.

The wetlands within the Study Area were classified as PEM, PEM/PSS/PFO, and PEM/PSS wetland type. The most common dominant herbaceous plant species observed were *Juncus effusus*, *Microstegium vimineum*, *Chamaedaphne calyculata*, *Fallopia japonica*, *Juncus tenuis*, and *Carex crinita*. The most common Sapling-Sapling/Shrub species were *Frangula alnus*, *Ulmus Americana*, *Fraxinus pennsylvanica*, *Acer rubrum*, *Cornus racemosa*, *Platanus occidentalis*. The most common tree species were *Platanus occidentalis*, *Fraxinus pennsylvanica*, and *Acer rubrum.*

The primary indicators of hydrology were Surface Water (A1), High Water Table (A2), Saturation (A3), Water-Stained Leaves (B9), Aquatic Fauna (B13), and Oxidized Rhizospheres on Living Roots (C3). Wetland soils matrix hues were 10YR, 2.5YR, and 5GY with low chroma (≤2). Soils met the criteria for hydric soil indicators Depleted Matrix (F3). The soil texture was silty loam or clay loam.

Table 2.2-2
Scientist Information

Scientist Name	AECOM Mailing Address	E-mail Address	Portions of Work Completed
Jesse Killosky	No longer at AECOM	--	Resource Delineation
Brian Miller	681 Andersen Drive Pittsburgh, PA 15220	brian.miller1@aecom.com	Resource Delineation
Charlotte Stallone	564 White Pond Drive Akron, OH 44320	Charlotte.stallone@aecom.com	Resource Delineation
Eileen Banach	10 Orms Street Providence RI 02904	eileen.banach@aecom.com	Permit Application
Mark Benfer	715 Washington Boulevard Williamsport, PA 17701	mark.benfer@aecom.com	Permit Application
Josh Singleton	715 Washington Boulevard Williamsport, PA 17701	josh.singleton@aecom.com	Delineation Report
Angela Chmiel	10 Orms Street Providence RI 02904	angela.chmiel@aecom.com	Permit Application

2.3 AQUATIC RESOURCES CHARACTERIZATION

Table 2.2-1 and Section 2.1 above contains all the resources potentially affected by the Project. The *Wetland and Watercourse Delineation Report* contained within Appendix E contains data sheets, resource mapping and photos of all delineated resources. In some instances, these resources extended outside of the Project Study Area and are depicted in the report as being open-ended.

The impacted wetlands and Conemaugh River were evaluated using the PA Wetland Condition Level 2 Rapid Assessment Protocol (L2RAP) (PADEP, 2019b). The overall score for the Conemaugh River is 0.76; the overall score for wetland W-BJM-010 is 0.90; the overall score for wetland W-BJM-011 is 0.89; and the overall score for wetland W-CMS-016 is 0.96. Mapping and data sheets related to the L2RAP are provided in Appendix G, Attachment S-3.

2.3.1 Riverine Resources

The Conemaugh River was the only riverine resource delineated within the Project area. This resource will be crossed using a HDD bore and there will be no impact to riverbanks or bed.

2.3.2 Wetland Resources

Table 2.2-1 above provides the following information for each delineated wetland: Hydrogeomorphic (HGM) classification, Cowardin vegetation class, and Palustrine Community Classification (PCC) (Brooks; Zimmerman et al., 2012).

The following section contains information pertaining to the wetland HGM types and conditions as they relate to their inherent functions including, but not limited to, those associated with hydrologic, biogeochemical and habitat attributes as well as any applicable recreational uses.

Habitat Attributes

As shown in Table 2.2-1, the wetlands within the Study Area were identified as wetland HGM code flat mineral soil. Additionally, wetlands were classified as PEM, PEM/PSS/PFO, and PEM/PSS wetland type. Wetland PCC classification identified was: Mixed Forb – Graminoid Wet Meadow. The most common dominant herbaceous plant species observed were *Juncus effusus, Microstegium vimineum, Chamaedaphne calyculata, Fallopia japonica, Juncus tenuis*, and *Carex crinita*. The most common Sapling-Sapling/Shrub species were *Frangula alnus, Ulmus Americana, Fraxinus pennsylvanica, Acer rubrum, Cornus racemosa, Platanus occidentalis*. The most common tree species were *Platanus occidentalis, Fraxinus pennsylvanica*, and *Acer rubrum*,

The primary indicators of hydrology were Surface Water (A1), High Water Table (A2), Saturation (A3), Water-Stained Leaves (B9), Aquatic Fauna (B13), and Oxidized Rhizospheres on Living Roots (C3). Wetland soils matrix hues were 10YR, 2.5YR, and 5GY with low chroma (≤2). Soils met the criteria for hydric soil indicators Depleted Matrix (F3). The soil texture was silty loam or clay loam.

Hydrologic Patterns

The landform/geomorphic setting of identified wetlands was identified as hillsides, and groundwater primarily provides hydrology to the hillside wetlands.

Biogeochemical

No obvious sources of pollution were observed within the Project area.

Recreational Uses

Hunting is a major recreational activity in the region; however, the Project area is located within privately-owned land that is bisected by two roads, which does not offer opportunities for public hunting, hiking or observation of wildlife. Game species present in the general vicinity may include wild turkey (*Meleagris gallopavo*), white-tailed deer (*Odocoileus virginianus*), gray squirrel (*Sciurus carolinensis*), eastern cottontail rabbit (*Sylvilagus floridanus*), black bear (*Ursus*

americanus), red fox (*Vulpes vulpes*), gray fox (*Urocyon cinereoargenteus*), coyote (*Canus latrans*), and ruffed grouse (*Bonasa umbellus*), amongst others. Non-game species present in the general vicinity may include red-tailed hawk (*Buteo jamaicensis*), eastern screech owl (*Otus asio*), American kestrel (*Falco sparverius*), turkey vulture (*Cathartes aura*), eastern chipmunk (*Tamias striatus*), striped skunk (*Mephitis mephitis*), and resident and neo-tropical songbirds.

2.3.3 Lacustrine Resources

There are no lacustrine resources delineated within the Project area.

2.3.4 Other Environmental Resources

Other environmental factors, special studies, macroinvertebrate studies, or substitute methods were not conducted for the proposed Project; therefore, discussion of such methods is not provided.

2.4 WATER QUANTITY AND STREAMFLOW

The following sections detail the existing water resources present within the limits of the Project as it pertains to groundwater and surface water.

2.4.1 Existing Groundwater Resources

2.4.1.1 Aquifers

Bedrock Aquifers

Groundwater resources include all waters beneath the earth's surface and storage at any given time. The proposed Project is underlain by the Paleozoic clastic and carbonate aquifers of the Pittsburgh Low Plateau Section of the Appalachian Plateaus Physiographic Province. The Appalachian Plateaus Physiographic Province consists primarily of sandstone, siltstone, and shale (DCNR, 2000).

Principal Aquifers

Principal aquifers are the regionally extensive aquifer or aquifer system with the potential to be used as a source of potable water. The Project crosses through PA aquifers (Trapp and Horn, 1997). Pennsylvanian aquifers are in Paleozoic sedimentary rocks that are flat-laying or gently folded. The rocks consist mostly of shale, sandstone, conglomerate, and carbonate rocks.

Wellhead Protection Areas

A wellhead protection area (WHPA) is defined by the U.S. Environmental Protection Agency (EPA) as the surface and subsurface area surrounding a water well or well field supplying a public water system, through which contaminants are reasonably likely to move toward and reach such water well or well field. The Project does not cross any WHPAs.

Sole Source Aquifers

Sole-Source Aquifers (SSA) are defined by the EPA as aquifers which supply at least 50 percent of the drinking water consumed in the area overlying the aquifer. The Project does not cross any SSAs (EPA, 2020).

2.4.2 Existing Surface Water Resources

The Project is located within one (1) major watershed subregion: the Allegheny River, [Hydrologic Unit Code (HUC) 0501]; one (1) major basin: Conemaugh (HUC 050100); and two (2) watersheds: Conemaugh River (HUC 0501000710) and Blacklick Creek (HUC 0501000709) (USGS, 2015, Natural Resources Conservation Service (NRCS), 2020). Each hydrologic unit has a unique HUC that is two to twelve digits long, based on six levels of classification: 2-digit HUC first-level (region), 4-digit HUC second-level (subregion), 6-digit HUC third-level (basin), 8-digit HUC fourth-level (subbasin), 10-digit HUC fifth-level (watershed), and 12-digit HUC sixth-level (subwatershed).

Surface water resources identified in the Project LOD includes one river, the Conemaugh River. The Conemaugh River would be crossed via HDD with no surficial impacts. Further information about this river is in the Wetland Delineation Report in Appendix E.

2.5 WATER QUALITY

2.5.1 Existing Groundwater Quality

Potential for contaminated groundwater areas in PA were analyzed using data from the PADEP Environment Facility Application Compliance Tracking System (eFACTS) (PADEP, 2020). The Project is located in an undeveloped area where impacts from manmade pollution are unlikely. No sites within a 300-foot survey corridor of the Project facilities were identified as having potential groundwater contamination.

Existing Surface Water Quality

2.5.1.1 Impaired Surface Waters and Waterbodies with Contaminated Sediments

According to the *2018 Final Pennsylvania Integrated Water Quality Monitoring and Assessment Report*, none of the receiving waters for the Project are listed as a siltation impaired waterbody (PADEP, 2018).

2.5.1.2 Sensitive Surface Waters

The Project is not located in or within 100 feet of a national natural landmark, national wildlife refuge, or federal or local or private wildlife or plant sanctuaries (USFWS 2020). It is also not located in or within 100 feet of a national wild or scenic river, PA's Scenic Rivers System, or any areas designated as a Federal Wilderness Area (NPS, 2020; DCNR 2020).

2.6 EXISTING HABITAT FOR THREATENED AND ENDANGERED SPECIES

A signed copy of the PA Natural Heritage Program (PNHP) Project Environmental Review Receipt is provided within Appendix F of this permit application. The PNDI review resulted in "No Known Impacts"

for threatened and/or endangered species under the jurisdiction of the PA Department of Conservation and Natural Resources (DCNR), PA Game Commission (PGC), PFBC, and United States Fish and Wildlife (USFWS).

2.7 ADDITIONAL RESOURCES IN THE PROJECT AREA

The Location Map in Appendix B shows the overall Project area with all receiving waters and political boundaries labeled on the United States Geological Survey 7.5-minute series Blairsville, PA topographical quadrangles (National Geographic Society, 2013) at a scale of 1:24,000. Based on available data, no natural areas, wildlife sanctuaries, natural landmarks and other geographical or physical features including cultural, archaeological and historical landmarks were identified within 1 mile of the Project area. Therefore, these features are not shown on the enclosed Location Map.

The Project is not located in or within 100 feet of a national or local park, forest, or recreation area. The Project is located within a USACE flood control zone and USACE-owned land on the east side of the Conemaugh River, which is leased to the PGC. The Project is not located in or within 100 feet of a national natural landmark, national wildlife refuge, or federal or local or private wildlife or plant sanctuaries. It is also not located in or within 100 feet of a national wild or scenic river, the Commonwealth's Scenic Rivers System, or any areas designated as a Federal Wilderness Area. According to the PADEP's eMapPA Internet application, the Project is not located along any private or public water supply (PADEP, 2019a).

Two prime farmland soil map units listed by the NRCS were identified within the Project area.

Table 2.6-1
Prime Farmland Soils

Map Unit Symbol	Description	Acreage within Limit-of-Disturbance
MoA	Monongahela silt loam, 0 to 3 percent slopes	3.2
MoB	Monongahela silt loam, 3 to 8 percent slopes	6.0
Total Acres		**9.2**

3.0 PROJECT IMPACTS

The proposed Project has been designed to avoid and minimize impacts to environmental resources; however, construction and operation of the pipeline would result in unavoidable impacts and temporary discharges. The following section details these impacts and the avoidance and minimization measures that have been applied to the Project to limit the discharges and temporary impacts to waters of the U.S., as currently defined by the USACE.

3.1 WATERBODIES

Texas Eastern must replace a segment of its existing Line 12 beneath the Conemaugh River in order to restore safe operation. To reduce impacts to the Conemaugh River Texas Eastern has elected to install this new segment via HDD bore, which will eliminate surficial impacts to the river's banks, bed, and riparian areas that would have been incurred with conventional construction methods. The entire Project area on the west side of the Conemaugh River and a portion of the Project area on the east side of the Conemaugh River is within Federal Emergency Management Agency (FEMA)-delineated floodplain.

The proposed Project would be constructed in compliance with applicable specifications, federal regulations and guidelines, and project specific permit conditions. Construction and restoration techniques would be typical for pipeline construction. The E&SCP provides detail of such techniques and mitigation measures that may be used for the Project. The Project E&SCP is consistent with FERC's *Plan* (FERC, 2013b) and *Procedures* (FERC, 2013a). Additional construction techniques and measures that may be employed are provided in the SPCC Plan.

3.1.1.1 Pipeline Operation Effects and Mitigation

The Project facilities would be operated and maintained in a manner to ensure that a safe, continuous supply of natural gas reaches each of the delivery points. No herbicides or pesticides would be used for the clearing or maintenance of the temporary or permanent ROW or within 100-feet of a waterbody. The existing permanent easement will continue to be maintained through periodic mowing and the new permanent easement will be maintained in a manner consistent with the landowner's uses.

3.1.1.2 Aboveground Facility Construction and Operation Effects and Mitigation

Modifications to two existing MLV sites will occur entirely within the current MLV footprints and will have no impacts to wetlands, watercourses, or natural features. The site design for the new MLV would avoid impacts to wetlands and watercourses as well as encroachment upon, disturbance of, and alteration to natural features, which are sensitive to stormwater impacts. Once the facilities are constructed, the site would be stabilized with gravel cover, as indicated in the E&SCP. The stormwater BMPs for this Project have been planned to minimize the extent of the proposed earth disturbance, maximize protection of existing drainage features and vegetation, minimize soil compaction, and employ measures and controls that minimize the generation of increased stormwater runoff. A permanent infiltration trench will be installed to manage increased stormwater runoff associated with the new MLV and its permanent access road.

3.1.2 Operations and Maintenance

O&M plans would incorporate measures to protect surface waters as applicable. No herbicides or pesticides would be used for the clearing or maintenance of the temporary or permanent ROW or within 100-feet of a waterbody. Runoff would be controlled with approved BMPs as part of the approved E&SCP.

3.2 ANTICIPATED WATER WITHDRAWAL

Texas Eastern anticipates obtaining water from the Conemaugh River at a point south of the Project crossing. Water will be necessary for hydrostatic testing of the pipeline and HDD operations. Texas Eastern has previously obtained water from the Conemaugh River at the proposed location for use in maintenance activities conducted in the vicinity of the Project.

3.2.1 Hydrostatic Test Water

In compliance with USDOT specifications, Texas Eastern would conduct hydrostatic testing on the pipeline segment prior to placing the pipeline in-service. Water would be used to conduct hydrostatic testing of the new pipeline and piping associated with aboveground facilities. No chemicals would be added to hydrostatic test waters. In accordance with FERC's *Procedures* (FERC, 2013a), Texas Eastern would notify PADEP at least 48 hours before testing activities as applicable. Texas Eastern would also conduct hydrostatic testing in accordance with the following:

- Water would be obtained from the Conemaugh River at a point south of the Project site and trucked to the Project site.
- One hundred percent radiographic inspection of all pipeline section welds would be performed, or pipeline sections would be hydrotested before installation under waterbodies or wetlands.
- Hydrostatic testing would be performed on all pipeline sections prior to installation under waterbodies or wetlands via HDD.
- The SPCC Plan would address secondary containment and refueling of pumps used for hydrostatic testing within 100 feet of any waterbody or wetland.
- Intake hoses would be screened to minimize the potential for entrainment of fish.
- Adequate flow rates would be maintained to protect aquatic life, provide for all waterbody uses, and provide for downstream withdrawals of water by existing users. The flow rates for the water withdrawals would be sufficiently small in rate and quantity that the impacts on streamflow and the ecosystems that they support are negligible.
- After hydrostatic tests are completed, the water will be trucked off-site for discharge at an appropriate facility, no water will be discharged on site.

Texas Eastern anticipates approximately 42,000 gallons of water from the Conemaugh River would be required for hydrostatic testing.

3.2.2 HDD Operations and Buoyancy Control

Texas Eastern estimates that approximately 200,000 gallons of water will be need for HDD operations and buoyancy control. To regulate cutting tool temperature and assist in the movement of drill cuttings or spoil out of the bore hole, HDD construction techniques require the use of a drilling mud or fluid constituted mainly of water and a small proportion of bentonite. Bentonite is an inert, naturally occurring, hydrophilic, non-toxic powdered clay which swells extensively when it comes in contact

with water. As the clay takes on water, it creates a viscous fluid which helps to lubricate the drilling equipment and forms an impervious coating along the walls of the bore-hole.

The drilling mud is typically mixed onsite in a large mixing tank before being pumped through the drill pipe to the terminus of the bore-hole. After being extruded at the terminus of the drill head, the drilling mud moves back up the borehole between the drill pipe and the borehole walls to either the exit or entry pit. Once the drilling mud is in the exit or entry pit, it is processed to remove cutting debris from the mixture before returning to the mixing tank to be reused in the drilling process. A portion of the drilling fluid, which will contain the cuttings from the borehole, will be allowed to dry before being removed to an approved material disposal facility such as a landfill or other similar approved disposal facility.

3.3 WETLANDS

Appendix E describes wetlands crossed by the Project area that were identified within the LOD and the plans in Appendix A depicts regulatory classifications and proposed crossing methods of those wetlands. Each wetland documented during the field delineations was assigned a unique identification (ID) that includes the surveyor initials and a three digit number (e.g., 001, 002, 003), for example, W-CMS-016.

3.3.1 Wetland Construction and Operation Impacts

The Project has been designed to avoid wetland impacts where practicable. Texas Eastern has chosen HDD over an open-cut or conventional crossing of the Conemaugh River because HDD will require less wetland impacts by avoiding open cutting the large wetland on the west side of the river (W-CMS-016), as well as avoiding direct impacts to the Conemaugh River itself.

In accordance with the construction methods outlined in the E&SCP, construction workspace would include the width of the existing ROW as well as temporary workspace outside of the ROW. Temporary workspace will be required outside of the existing ROW to provide a straight corridor for handling pipe on the west side of the Conemaugh River where the ROW changes direction, in which to prefabricate the pipeline into one continuous section in preparation for the pull-back. Construction workspace necessary for HDD operations would require temporary matting of wetlands in the construction workspace.

Construction activities that could affect wetland vegetation, soils, and hydrology include clearing, use of heavy equipment that could cause soil mixing and compaction and fuel handling. Impacts on wetlands during Project construction would include disturbance of soils and hydrology, and removal of vegetation. Texas Eastern would comply with any mitigation requirements and permit conditions in its CWA Section 404 permits and Section 401 certifications.

3.3.2 Wetland Effects and Mitigation

Texas Eastern has designed the Project to avoid wetland impacts where practicable have minimized impacts to only those necessary to safely construct the Project. One PEM/PSS and one PEM/PSS/PFO wetland will be crossed via temporary structures and used as workspace during construction operations resulting in 1.96 acres of temporary impact (1.36 acres in wetland W-BJM-011 and 0.60 acres of impact in wetland W-BJM-010). The PFO and PSS portions of wetland W-BJM-010 within Texas Eastern's existing ROW will be maintained as emergent following construction, as part of their regular maintenance program, constituting a permanent conversion. Texas Eastern intends to purchase mitigation credits to off-set this conversion.

The HDD operation will install a new segment of Line 12 beneath one PEM wetland resulting in 0.03 acres of permanent impact. Table 3.3-1 lists potential wetland disturbance acreages (by wetland type) for wetlands crossed by the pipeline facilities.

Table 3.3-1
Summary of Delineated Wetlands Affected by Construction and Operation

Cowardin Classification	Length Crossed (feet)	Wetland Area Temporarily Affected (acre)	Permanently Converted Wetlands (acre)
PEM	800	1.78	-
PFO	160	0.10	0.10
PSS	138	0.08	0.02

Note: Acres of permanently converted wetlands are included in acres of temporarily affected wetlands.

Because PEM wetlands temporarily matted for workspace would be restored to pre-construction conditions and allowed to revegetate, no long-term or permanent impacts to PEM wetlands would result from the pipeline. In previous years Texas Eastern has not maintained the extent of their ROW resulting in a small amount of PFO wetland within the existing ROW. In order to safely conduct the Project, Texas Eastern must clear the extent of their ROW for workspace and will maintain it during subsequent operation of the pipeline. This will result in 0.10 acres of PFO wetland conversion. A PSS portion of the same wetland within the existing easement will also be maintained in an emergent state following construction resulting in approximately 0.02 acres of permanent conversion. Both conversions will require compensatory mitigation. To provide this, Texas Eastern intends to purchase off-site mitigation credits at a ratio of 2:1 (0.20 acres) for the PFO wetland and a ratio of 1.5:1 (0.03 acres) for the PSS wetland. Details of the plan/agreement will be discussed and shared with PADEP prior to issuance of the permit authorization.

3.4 WATER QUANTITY AND STREAMFLOW

3.4.1 Groundwater

The Project is not anticipated to have significant impacts on groundwater supply. Texas Eastern proposes to implement BMPs designed to avoid, reduce, and/or mitigate potential impacts on groundwater during construction and operation as detailed within the Project E&SCP. Texas Eastern would adhere to practices related to groundwater protection, including specifications for trench breakers and dewatering. As engineering design progresses, potential groundwater effects would be evaluated, and mitigation measures would be implemented where appropriate.

Construction activities that could affect groundwater include clearing of vegetation, and dewatering of the trench and bore pits, soil mixing and compaction, and fuel handling. Impacts could include changes in the volume and rate of groundwater infiltration and alteration of groundwater flows. Clearing and grading of the ROW and construction workspaces would remove vegetation that could act as a filter for groundwater recharge and/or rate of recharge. In accordance with FERC's *Plan* and Texas Eastern's E&SCP, vegetation would only be cleared where necessary and would be allowed to re-vegetate once construction was complete. Excavation would typically occur at depths that are shallower than the aquifers in the Project

area; thus, excavation is not expected to affect groundwater. Any impacts from trench dewatering, including changes in the volume or rate of groundwater infiltration, would be short-term and temporary.

Soil mixing and compaction during construction could change the volume or rate of groundwater infiltration. Texas Eastern would implement measures identified in FERC's *Plan* and E&SCP, such as using equipment mats in areas of saturated soils, to minimize impacts. Texas Eastern would de-compact any soils compacted by pipeline construction activities prior to completion of restoration and revegetation. Severely compacted agricultural areas would be plowed with a paraplow or other deep tillage implement. In areas where topsoil has been segregated, the subsoil would be plowed before replacing the segregated topsoil. If subsequent construction and cleanup activities result in further compaction, additional tilling would be conducted.

3.4.2 Surface Water

Texas Eastern does not anticipate any direct impacts to surface water resources from construction or operation of the Project. Utilizing HDD will avoid surficial impacts to the Conemaugh River and the new MLV has been sited to avoid surface water resources. The stormwater BMPs for this Project have been planned to minimize the extent of the proposed earth disturbance, maximize protection of existing drainage features and vegetation, minimize soil compaction, and employ measures and controls that minimize the generation of increased stormwater runoff. An infiltration trench will be installed to manage increased stormwater runoff associated with the new MLV and its permanent access road.

3.5 WATER QUALITY

3.5.1 Groundwater Quality

Construction activities that could affect groundwater include clearing of vegetation, excavation, and dewatering of the trench and bore pits, soil mixing and compaction and fuel handling. Impacts could include changes in the volume and rate of groundwater infiltration, groundwater contamination, and alteration of groundwater flow and well yields. Clearing and grading of the ROW and construction workspaces would remove vegetation that could act as a filter for groundwater recharge. In accordance with Texas Eastern's E&SCP, vegetation would only be cleared where necessary and would be allowed to re-vegetate once construction was complete. Any impacts from trench dewatering, including changes in the volume or rate of groundwater infiltration, would be short-term and temporary. Soil mixing and compaction during construction could change the volume or rate of groundwater infiltration. Texas Eastern would implement measures identified in its E&SCP, such as using equipment mats in areas of saturated soils, to minimize impacts. Texas Eastern would de-compact any soils compacted by pipeline construction activities prior to completion of restoration and revegetation. Severely compacted agricultural areas would be plowed with a paraplow or other deep tillage implement. In areas where topsoil has been segregated, the subsoil would be plowed before replacing the segregated topsoil. If subsequent construction and cleanup activities result in further compaction, additional tilling would be conducted.

Groundwater contamination could occur from an inadvertent spill of fuel or hazardous liquids during refueling or maintenance of construction equipment, or during operation of aboveground facilities. In general, equipment refueling and lubricating would take place in upland areas that are more than 100 feet from the edges of streams and river and their associated wetlands. Texas Eastern would follow the procedures specified in the SPCC Plan to address the handling of fuel or other materials in or within 100 feet of waterbodies. During clearing, where possible, and during grading, sediment barriers would be

installed and maintained adjacent to waterbodies and within temporary construction workspaces, where needed, to minimize potential for sediment run-off.

3.5.2 Surface Water Quality

Texas Eastern would provide mitigation for impacts resulting from construction through adherence to FERC's *Plan* and *Procedures* and Texas Eastern's E&SCP (FERC 2013a, b). Texas Eastern chose the HDD construction method to replace the segment of Line 12 beneath the Conemaugh River to avoid surficial impacts to its banks, riverbed, and riparian areas, which will avoid turbidity and sedimentation thereby protecting the surface water quality. Additionally, Texas Eastern would adhere to its SPCC Plan and HDD Contingency Plan during construction, as well as to applicable regulatory permit conditions.

3.5.3 Sensitive Water Resources

The Project does not cross any waterbody defined as a sensitive water resource.

3.6 HABITAT FOR THREATENED AND ENDANGERED SPECIES

No habitat for threatened and endangered species would be impacted by construction or operation of the Project.

3.7 ADDITIONAL RESOURCES IN THE PROJECT AREA

The Project is not located in or within 100 feet of a national or local park, forest, or recreation area; nor is it located in or within 100 feet of a national natural landmark, national wildlife refuge, or federal or local or private wildlife or plant sanctuaries. It is also not located in or within 100 feet of a national wild or scenic river, the Commonwealth's Scenic Rivers System, or any areas designated as a Federal Wilderness Area. The Project is not located along any private or public water supply (PADEP, 2020a and PaGWIS, 2020).

USACE-owned land on the east side of the Conemaugh River is leased to the PGC, which maintains the leased property as active farmland. Approximately 9.2 acres within the LOD are mapped as prime farmland soils by the NRCS (NRCS, 2018). These prime farmland soils are located in active farmland which will continue to be farmed following construction of the pipeline, with the exception of the new MLV and access road. The USACE and PGC are both amenable to this project and the minor loss of farmland in the interest of safe maintenance and operation of the pipeline system.

3.8 RESOURCE FUNCTION EFFECTS

The wetland impacts proposed for the Project are summarized and tabulated on the Subfacility Details Impact Table which is attached in Appendix H. Watercourse S-JLK-037 and its associated floodway will be impacted by this Project through having a pipeline HDD bored under the watercourse and floodway. Four (4) wetlands were delineated during the watercourse and wetland investigation. Three wetlands will be impacted by the Project. W-BJM-011 and W-BJM-010 will be temporary impacted by the temporary workspace, and W-CMS-016 will be permanently impacted by the pipeline that will be bored under the wetland.

Hydrologic Impacts

The Project is not anticipated to adversely affect the natural drainage patterns, groundwater discharge, natural recharge areas, or storm and floodwater storage and control or have a significant impact to the water quality characteristics provided by the wetlands within the Project area. Impacts to the watercourse flushing characteristics, stream gradient, or sensitive waterbodies will be minimal due to HDD methodology being used to install a new section of pipeline. The E&SCP (see Appendix C) is consistent with the standard design criteria from the Pennsylvania Stormwater Best Management Practices Manual (BMP Manual) to protect water quality.

An approved E&SCP and appropriate BMPs will be implemented and utilized as necessary to reduce any temporary effect on water quality and resources during restoration efforts.

Habitat Impacts

Texas Eastern plans to restore all impacted areas to pre-construction conditions following the completion of construction activities, with the exception of the permanently converted portions of PFO and PSS wetland and the new MLV and access road. Texas Eastern intends to purchase mitigation credits to offset the wetland conversions. The mainline valve and access road will be placed within active farmland and represents minimal habitat loss.

Biogeochemical Impacts

Minimal temporary impacts to food chain production may occur during construction. No processes or communities that are important ecologically to food chain production would be impacted for longer than the duration of construction. Additionally, wetland and upland disturbed areas will be restored to original condition once construction activities are complete, with the exception of the permanently converted portions of PFO and PSS wetland and the new MLV and access road. Texas Eastern intends to purchase mitigation credits to offset the wetland conversions. The mainline valve and access road will be placed within active farmland and represents minimal loss to food chain production.

Recreation

As mentioned previously, public recreational activities such as hunting, or fishing are unlikely to occur in the Project area which is located within privately-owned land surrounded by forested land. As such, impact on recreational activates is not likely to occur.

Properties upstream and downstream of the Project area include existing roadway, forest land, and pipeline ROW. These land uses should not have any further impact on the aquatic habitat within the Project area. The areas that are to be impacted during construction will be restored as depicted on the E&SC Plans within Appendix A. The proposed construction activities will not permanently restrict the property rights of landowners upstream or downstream of the proposed Project as the area will be returned to pre-construction conditions.

Environmental impacts on other adjacent land are expected to be minimal. These impacts are anticipated to consist of increased noise levels from machinery and dusty conditions. To minimize these impacts, an approved E&SCP will be implemented and utilized during construction activities.

3.9 ANTIDEGRADATION ANALYSIS

The proposed construction activities have been evaluated for non-discharge alternatives for compliance with the PADEP's antidegradation requirements in PA Code, §102.4(b)(6). Non-discharge alternatives are defined as environmentally sound and cost effective BMPs that individually or collectively eliminate the net change in stormwater volume, rate and quality for storm events up to and including the 2-year design storm when compared to the stormwater rate, volume and quality prior to the earth disturbance activities.

Various BMPs identified as non-discharge alternatives in the Erosion and Sediment Pollution Control Program Manual (PADEP, 2012) were considered and evaluated for implementation as part of the proposed activities. These alternatives were evaluated individually, and in various combinations, for their ability to minimize accelerated erosion and sedimentation during the earth disturbance activity in order to achieve no net change from pre-development to post-development volume, rate and concentration of pollutants in stormwater runoff. The primary non-discharge alternatives/BMPs considered for construction activities are limiting the disturbed area and limiting extent and duration of the disturbance.

The LOD to be utilized for construction has been established to restrict construction activities to occur within the existing pipeline ROW. Since the Project area will be restored to pre-construction uses, there is no negative affect on land use anticipated. The Project area will only incur temporary land disturbance until vegetation is established.

Texas Eastern will limit the extent and duration of the earth disturbance during construction. The duration and extent of earth disturbances will be limited to the minimal timeframe necessary to complete activities. Temporary or permanent stabilization is to occur as soon as possible upon completion. This BMP is very effective at reducing the concentration of pollutants in stormwater runoff and reducing the impact of sediment runoff volume and rate.

As demonstrated in the previous paragraphs, due to the nature of the Project, the proposed activities are not expected to have an impact on the volume, rate and concentration of pollutants in stormwater runoff up to, and including, the 2-year/24-hour storm. Antidegradation Best Available Combination of Technologies (ABACT) BMPs are not required as the Project is not located in a high-quality or exceptional value watershed. The E&SCP contained within Appendix A of this permit application depicts the locations of all planned BMPs and details for construction.

The proposed Project will create a small amount of new impervious cover, which is of concern for stormwater management. Minimizing the LOD to the minimum area necessary to install the replacement segment and minimizing tree clearing will maintain existing vegetative cover, where feasible and maintain the infiltration capacity of undisturbed areas to the maximum extent practicable.

It is not anticipated that the cumulative effect of this construction will have a major impairment on the Commonwealth's wetland resources because reclamation involves restoring the temporarily impacted wetland area. Furthermore, the wetlands impacted and surrounding upland areas will be restored to original contours and conditions following the completion of all construction activities.

3.10 POTENTIAL SECONDARY IMPACT EVALUATION

In addition to the resources impacted during original pipeline construction, there are adjacent wetlands that will be avoided during construction. Wetlands W-BJM-011 and W-BJM-010 extend outside the LOD and

a secondary impact is possible to the off-site portions of these wetlands. Wetland W-CMS-016 and the Conemaugh River (S-JLK-037) will not be impacted by construction workspace but the HDD bore path will travel below both resources. Wetland W-CMS-007 is proposed to be avoided but is located adjacent to construction workspace. These resources are described in Table 3.10-1 and additional information pertaining to these resources are located within the *Wetland and Watercourse Delineation Report* within Appendix E.

Table 3.10-1
Potential Secondary Impacted Resources

Resource Type	Resource ID[1]	Classification[2]	Chapter 93 Designation[3]	Stocked Trout Waters	Wild Trout Waters	Special Protection Status
Wetland	W-BJM-011	PEM/PSS	-	-	-	-
Wetland	W-BJM-010	PEM/PSS/PFO	-	-	-	-
Wetland	W-CMS-016	PEM	-	-	-	-
River	S-JLK-037	PER	WWF	-	-	-
Wetland	W-CMS-007	PEM	-	-	-	-

Notes:
[1] Resource ID is an AECOM designation
[2] PEM= Palustrine Emergent , PSS=Palustrine Scrub/shrub, PFO=Palustrine Forested, PER=Perennial
[3] PA Code, Title 25, Chapter 93 Designated Use or Existing Use Designation, whichever is more protective

The nature of this Project is not anticipated to cause any direct or indirect secondary impacts on adjacent land or resources. The Project will not permanently restrict the property rights of landowners upstream or downstream. There are no dams, water obstructions, or encroachments necessary to fulfill this Project purpose.

3.11 CUMULATIVE IMPACTS

The CEA Policy states that when a temporary wetland impact is proposed to be properly restored, the applicant does not need to identify the temporary impact as an adverse cumulative impact. Texas Eastern intends to restore the temporarily impacted wetlands immediately following construction with the exception of the permanently converted portions of PFO and PSS wetland. Texas Eastern intends to purchase mitigation credits to offset the wetland conversions. It is anticipated that this Project will have 0.05 acres of permanent wetland and stream impact due to the pipeline bored under wetland W-CMS-016 and watercourse S-JLK-037 along with its associated floodway. The pipeline will be installed via HDD bore and is unlikely will have any adverse effects on the local watershed. The wetland surface and watercourse riverbanks and bed will not be disturbed during construction activities, so all vegetation will remain intact and minimal impact to underground hydrology will not occur.

Texas Eastern will continue to evaluate the integrity of its pipelines using in-line inspection tools in accordance with the mandates and guidance of United States Department of Transportation (USDOT) Pipeline and Hazardous Materials Safety Administration's (PHMSA) 49 CFR 192 Subpart O, and future inspections may indicate the need for additional anomaly repairs to the pipelines in the Project area. However, if future anomaly repair is required, and impacts to wetlands within the Project area are required

to address the anomaly, those impacts would similarly be temporary and restored to pre-construction conditions immediately following construction activities.

To address the Chapter 105 cumulative impacts requirements, PADEP recommends that the applicant identify and consider other existing and potential project permanent impacts for each wetland resource. The Project area was reviewed using the PADEP eMapPa interactive mapper, eFacts websites, and existing utilities surveyed during AECOM investigations to identify additional and/or cumulative wetland impacts that would occur as a result of existing or new potential projects. No current or future projects other than the anomaly investigations were identified within or adjacent to the Project area; however, an anomaly identified and repaired in 2020 was identified in eFacts. That anomaly was located was located outside of the Project area.

4.0 MITIGATION PLAN

4.1 AVOIDANCE AND MINIMIZATION MEASURES

As described in the Alternatives Analysis (see Appendix I), the Project purpose and need cannot be accomplished without temporary impacts to wetlands and floodway and permanent impacts to wetlands, a river, and floodway; Texas Eastern will implement appropriate construction measures to minimize these unavoidable impacts. Construction workspace requirements are a function of pipe diameter, equipment size, topography, and geological rock formations. All construction activities are restricted to the LOD on the E&SCP drawings. The construction workspace includes the bore entry and exit pit, temporary workspace to stage and weld the replacement pipeline, areas for soil stockpiling, and areas that construction equipment will utilize to complete the required repairs. Texas Eastern must provide sufficient workspace to permit the safe operation of construction equipment at the Project site.

The E&SCP BMPs for this earth disturbance activity have been planned to minimize the extent and duration of the proposed earth disturbance, maximize protection of existing drainage features and vegetation, reduce soil compaction, and employ measures and controls that reduce the generation of increased runoff. Specific BMPs have been selected for this site in order to achieve these broad goals. The location of proposed BMPs are shown on the E&SCP drawings.

Timber mats and equipment will not contain free-standing soil and vegetative materials prior to arrival on-site. This minimizes potential impacts from invasive plants, contaminants, biological diseases, etc.

4.2 IMPACT REPAIR, REHABILITATION, RESTORATION, PRESERVATION AND MAINTENANCE

Restoration and revegetation of the construction workspace will immediately occur upon completion of construction activities. In conjunction with restoration operations, any woody material and construction debris will be removed from the construction workspace. Permanent water bars will be reinstalled using compacted soil and maintained in accordance with the E&SCP at the existing locations. Permanent water bars will be installed to match pre-existing water bars on pipeline ROW.

Revegetation will be completed in accordance with permit requirements and written recommendations on seeding mixes, rates, and dates obtained from the local soil conservation authority or other duly authorized agency and in accordance with the E&SCP. Alternative seed mixes specifically requested by the landowner or agencies may be used. Any soil disturbance that occurs outside the permanent seeding season or any bare soil left unstabilized by vegetation will be mulched in accordance with the E&SCP.

Regarding preservation and maintenance, no vehicular traffic will be permitted across wetlands without the aid of temporary timber matting, or approved equal, at any time during construction in an effort to reduce the impact across resources.

4.3 COMPENSATORY MITIGATION

As described in the Alternatives Analysis (see Appendix I), Texas Eastern has incorporated all practicable measures to avoid and minimize environmental impacts associated with the Project. Texas Eastern's construction procedures have also been developed to minimize unavoidable impacts to wetlands. During Project construction, a PEM wetland and the Conemaugh River will be crossed via HDD. Two additional

wetlands, one PEM/PSS and one PEM/PSS/PFO, will be crossed via temporary matting. Construction of the Project will result in a total of approximately 4,472 square feet (0.10 acres) of permanent/conversion impact to the PFO portion and 976 square feet (0.02 acres) to the PSS portion of one wetland. To mitigate for the wetland conversion, Texas Eastern intends to purchase off-site mitigation credits. Construction will be in accordance with the methods described in this application and Texas Eastern's E&SCP to minimize the potential for adverse effects to wetlands and floodway.

The construction procedures used to cross unsaturated wetlands are similar to those used on dry land. Stable temporary work surfaces may be required in wetlands where soils are saturated and unstable. Installing construction mats in the equipment travel lane is a typical method of site stabilization that Texas Eastern will employ, as necessary. During site preparation activities, vegetation will be cut to ground level within the wetland. Original topographic conditions and contours will be restored as close to pre-construction as possible after completion of the repair work.

4.4 MONITORING PLANS

Texas Eastern will complete vegetation and site monitoring through final stabilization of the impacted areas as defined in the E&SCP and as required by state or federal agencies.

5.0 COMPLIANCE WITH REGULATORY STANDARDS

Construction, operation, and maintenance of the Project would be conducted in accordance with Texas Eastern's specifications and applicable federal and state permit requirements. Texas Eastern is committed to complying with the resource protection measures set forth in the environmental conditions and requirements as specified within federal and state permits.

5.1 FEDERAL

Interstate natural gas transmission pipeline projects are subject to exclusive federal jurisdiction under the Natural Gas Act [U.S. Code Sections 717-717w]). The FERC is the regulatory agency with authorization to approve or deny construction and operation of proposed natural gas projects under the Natural Gas Act Sections 3 and 7. The FERC has responsibilities to assess the environmental impacts of proposed interstate natural gas transmission line projects pursuant to the National Environmental Policy Act (NEPA) under its regulatory standards outlined in 18 CFR 380. The Project is authorized under a Blanket Certificate pursuant to Section 7(c) of the Natural Gas Act.

However, other agencies maintain statutory jurisdiction over certain regulated activities associated with interstate natural gas transmission projects. Specifically, the USACE maintains jurisdiction over regulated activities proposed within waters of the U.S. under Section 10 of the Rivers and Harbors Act of 1899 (33 U.S. Code 403), and Section 404 of the CWA (33 U.S. Code 1344). The Project's compliance with the regulatory standards for issuance of an authorization under Section 404 of the CWA is discussed below.

5.1.1 Section 404 Clean Water Act

The Project would impact waters of the U.S. as defined under Section 404 of the CWA (33 U.S. Code 1344), including wetlands, and therefore requires authorization from the USACE.

5.1.2 Section 401 Water Quality Certification

The Project and proposed impacts are consistent with federal and state laws and regulations related to public health and welfare. Under Section 401 of the CWA and the water quality standards (33 CFR Part 1341), an applicant for a Section 404 permit to discharge dredged or fill material into waters of the U.S. must first satisfy the requirements for obtaining a certification from the appropriate state agency that the proposed activity would comply with the state's water quality standards and criteria. In PA, the authority for WQC is delegated to PADEP.

5.2 PENNSYLVANIA STATE

The Project is subject to exclusive federal jurisdiction under the Natural Gas Act, and that the operations, maintenance, and safety of Texas Eastern's facilities are also subject to exclusive federal jurisdiction under the re-codified Pipeline Safety Act (49 U.S. Code 60, 101 et seq.). The FERC encourages interstate pipelines to cooperate with the appropriate state and local entities whose interests and programs are related to the proposed Project.

For the purposes of review and coordination of PA State regulations, various state permits and approvals are related to this Project: Chapter 105 Water Obstruction and Encroachment Permit, Section 401 of the

CWA for a State WQC, and Chapter 102 Erosion and Sediment Control General Permit (ESCGP-3). Texas Eastern would submit applications for these required approvals in support of the Section 401 WQC.

6.0 REFERENCES

Brooks, Robert P. Pennsylvania State University. Riparia, Department of Geography. *Hydrogeomorphic Wetland Classification. HGM classification for wetlands of the Mid-Atlantic Region, USA.*

Collins, H.H. Jr. 1981. The Complete Field Guide to North American Wildlife. Eastern Edition. Harper & Row Publishers, NY.

Commonwealth of Pennsylvania. 2009. The Pennsylvania Code, Title 25: Environmental Protection. Chapter 93: Water Quality Standards, Section 93.9, Designated Water Uses and Water Quality Criteria.

Cowardin, L.M., Charter, V., Golet, F.C., LaRoe, E.T., 1979, Classification of Wetlands And Deepwater Habitats of the United States, Report No. FWS/OBL-97/31, U. S. Department of the Interior, Fish and Wildlife Service, Washington District of Columbia.

Environmental Laboratory. 1987. Corps of Engineers Wetlands Delineation Manual, Technical Report Y-87-1, U.S. Army Engineer Waterways Experiment Station, Vicksburg, Mississippi.
Environmental Data Resources, Inc. (EDR). 2015. EDR DataMap Environmental Atlas Project Reports.

Federal Energy Regulatory Commission (FERC). 2002. Office of Energy Projects. Guidance Manual for Environmental Report Preparation. August 2002. http://www.ferc.gov/industries/gas/enviro/erpman.pdf. Accessed April 28, 2020.

Federal Energy Regulatory Commission (FERC). 2013a. Office of Energy Projects. Wetland and Waterbody Construction and Mitigation Procedures. May 2013. http://www.ferc.gov/industries/gas/enviro/procedures.pdf. Accessed April 28, 2020.

Federal Energy Regulatory Commission (FERC). 2013b. Upland Erosion Control, Revegetation, and Maintenance Plan. May 2013 Version. www.ferc.gov/industries/gas/enviro/plan.pdf. Accessed on April 28, 2020.

Fike, J. 1999. Terrestrial and Palustrine Plant Communities of Pennsylvania. Pennsylvania Natural Diversity Inventory. June 1999.

Natural Resources Conservation Service (NRCS). 2018. Soil Survey Geographic (SSURGO) Database for Westmoreland and Indiana Counties, PA. Accessed at https://websoilsurvey.sc.egov.usda.gov/app/HomePage.htm on April 10, 2020.

Natural Resources Conservation Service (NRCS). 2020. The Watershed Boundary Dataset (WBD). http://datagateway.nrcs.usda.gov/GDGOrder.aspx. Accessed May 5, 2020.

National Geographic Society. 2013. Seamless Layer 2013 (Topo Source: Seamless Digital Raster Graphic-N.P.S. Natural Physical Map & U.S.G.S. Topographic Map i-cubed USGS Quadrangles: Blairsville, PA).

National Park Service (NPS). 2020. Nationwide Rivers Inventory. Pennsylvania Segments. http://www.nps.gov/ncrc/programs/rtca/nri/states/pa.html. Accessed May 20, 2020)

Pennsylvania Department of Conservation and Natural Resources (DCNR). 2000. Physiographic Provinces of Pennsylvania. Available at: http://www.dcnr.state.pa.us/cs/groups/public/documents/document/dcnr_016202.pdf. Accessed on May 8, 2020.

Pennsylvania Department of Conservation and Natural Resources (DCNR). 2020. Scenic Rivers. http://www.dcnr.state.pa.us/brc/conservation/rivers/scenicrivers/index.htm. Accessed May 20, 2020.

PADEP. 2012. *Erosion and Sediment Pollution Control Program Manual.* Technical Guidance Number 363-2134-008. March 2012.

Pennsylvania Department of Environmental Protection (PADEP). 2016. *Pennsylvania Wetland Condition Level 2 Rapid Assessment Protocol*, Document No. 310-2137-002. Bureau of Waterways Engineering and Wetlands, Division of Wetlands, Encroachments and Training, Harrisburg, PA.

Pennsylvania Department of Environmental Protection (PADEP). 2018. https://www.dep.pa.gov/Business/Water/CleanWater/WaterQuality/IntegratedWatersReport/Pages/2018-Integrated-Water-Quality-Report.aspx. Accessed May 9, 2020.

Pennsylvania Department of Environmental Protection (PADEP). 2020. Environmental Facility Application Compliance Tracking System. Available at: https://www.ahs.dep.pa.gov/eFACTSWeb/default.aspx. Accessed on May 7, 2020.

PADEP. 2020a. eMapPA. Accessed at http://www.depgis.state.pa.us/emappa April 10, 2020.

Pennsylvania Fish and Boat Commission (PFBC). 2020. Pennsylvania Fishes. https://www.fishandboat.com/Fish/PennsylvaniaFishes/Pages/default.aspx. Accessed on May 11, 2020.

Pennsylvania Groundwater Information System (PaGWIS). 2020. PaGWIS Multiple Criteria Search. Accessed at https://www.dcnr.pa.gov/Conservation/Water/Groundwater/PAGroundwaterInformationSystem/Pages/default.aspx on April 10, 2020.

Trapp, H. and M.A. Horn. 1997. Groundwater Atlas of the United States, Delaware, Maryland, New Jersey, North Carolina, Pennsylvania, Virginia and West Virginia. United States Geological Survey, Reston, VA. Available at: http://pubs.usgs.gov/ha/730l/report.pdf. Accessed on February 1, 2015.

US Army Corps of Engineers (USACE). 2011. Pennsylvania State Programmatic General Permit-4 (PASPGP-4). US Army Corps of Engineers. Accessed at: https://www.nab.usace.army.mil/Portals/63/docs/Regulatory/Permits/PASPGP-4_2-Year_Final_Monitoring_Report.pdf.

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

United States Environmental Protection Agency (EPA) 2020. Sole Source Aquifer Locations. Available at: https://www.epa.gov/dwssa. Accessed on May 11, 2020.

United States Fish and Wildlife (USFWS). 2020. National Wildlife Refuge. Available at: https://www.fws.gov/refuges/profiles/bystate.cfm. Accessed on May 20, 2020.

United States Geological Survey (USGS). 2015 National Hydrography Dataset. U.S. Geological Survey, Washington D.C. Available at http://nhd.usgs.gov/data.html. Accessed on May 11, 2020.

Zimmerman, E., T. Davis, G. Podniesinski, M. Furedi, J. McPherson, S. Seymour, B. Eichelberger, N. Dewar, J. Wagner, and J. Fike (editors). 2012. *Terrestrial and Palustrine Plant Communities of Pennsylvania, 2nd Edition.* Pennsylvania Natural Heritage Program, Pennsylvania Department of Conservation and Natural Resources, Harrisburg, Pennsylvania.

Appendix A
Alignment Sheet, Site Plan and Erosion and Sediment Control Plans

RIGHT-OF-WAY		
TRACT NUMBERS	48	1
OWNERSHIP/AGENCY	UNITED STATES OF AMERICA	UNITED STATES OF AMERICA
	1,261'	1,376'

SURVEY DATA

SURVEY COMPANY:
FIELD BOOK:
PAGES:

STA. 0+00 EQUATION, 815+49 BEGIN CONSTRUCTION CENTERLINE MLV (REF. DWG. DELM-D-1200)
STA. 0+25 FENCE X-ING
STA. 4+23 P.I. – 11°17'09" LT.
STA. 4+67 HDD EXIT
STA. 4+95 10 DEG. OVERBEND (3 DIA. RADIUS ELL)
STA. 5+43 ENTER WETLANDS
STA. 8+31 24" LINE 12
STA. 11+79 EXIT WETLANDS
STA. 12+81 ℄ OF CONEMAUGH RIVER
STA. 16+81 FENCE X-ING
STA. 17+06 FENCE X-ING
STA. 17+84 EDGE OF ROAD
STA. 18+05 EDGE OF ROAD
STA. 18+09 OVERHEAD WIRE X-ING
STA. 23+03 12 DEG. OVERBEND (3 DIA. RADIUS ELL)
STA. 23+26 HDD ENTRY
STA. 25+71 BEGIN FABRICATION (REF. DWG. DELM-D-1220)
STA. 26+69 END FABRICATION/MAINLINE TIE IN (REF. DWG. DELM-D-1211)

CLASS LOCATION

CLASS 1

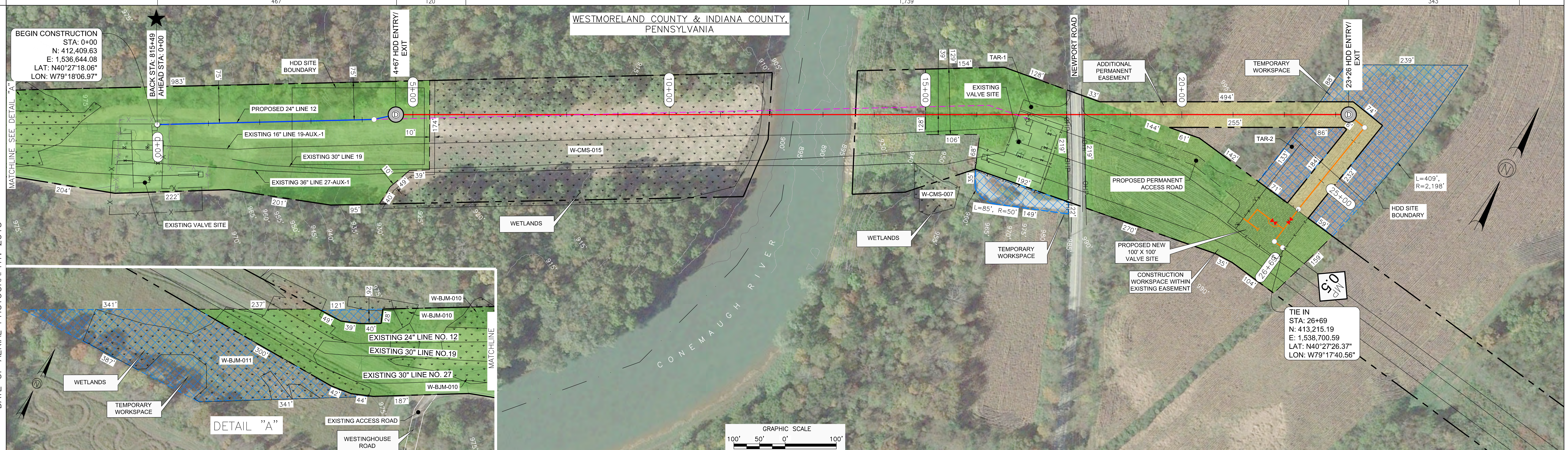
PIPE MATERIAL

815+49 BACK / 0+00 AHEAD — 1-A 467' — 4+67 — 2, 1-C 120' — 5+87 — 1-B 1,739' — 23+26 — 3, 4, 5 — 1-A 343' — 26+69

ALIGNMENT LEGEND

PROPOSED IN-SITU REPLACEMENT
HDD DRILL
CONVENTIONAL LAY
CAPPED & GROUTED PIPELINE
TEXAS EASTERN PIPELINE
PIPELINE MILEPOST
EXISTING EASEMENT
CONTOURS
PROPERTY LINE
COUNTY LINE CENTERLINE
FENCE
FOREIGN PIPELINE
OVERHEAD WIRES
ADDITIONAL PERMANENT EASEMENT
CONSTRUCTION WORKSPACE WITHIN EXISTING EASEMENT
TEMPORARY WORKSPACE
DELINEATED WETLAND BOUNDARY
PROPOSED PERMANENT ACCESS ROAD
EXISTING ACCESS ROAD
DRILL TARGET
VALVE

DATE OF AERIAL PHOTOGRAPHY: 2015



ENVIRONMENTAL DATA

FOR ENVIRONMENTALLY SENSITIVE AREAS (ESA). CONSULT WITH ENVIRONMENTAL INSPECTOR PRIOR TO CONSTRUCTION ACTIVITIES. FOR REFERENCE ENVIRONMENTAL SENSITIVE AREA DEFINITION.

STA. 5+43 BEGIN W 001
STA. 11+79 END W 001

E & S TYPICALS

E&S TYPICALS WILL BE USED AS A PLAN AND WILL FURTHER INPUT FROM ENVIRONMENTAL INSPECTORS, FOR REFERENCED E&S TYPICAL.

ES-0022 | ES-0022 | ES-0026 | ES-0011 | ES-0011

PROFILE

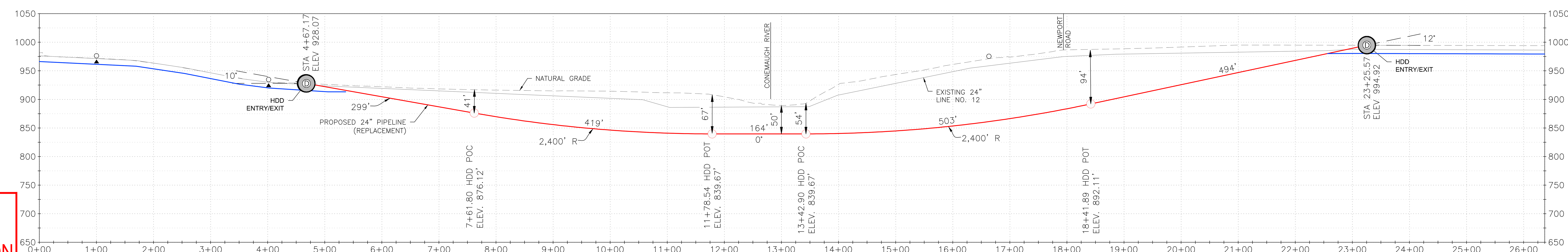
THE LOCATION OF TRENCH BREAKERS AND SLOPE BREAKERS ARE INTENDED TO BE USED AS A GUIDELINE ONLY. EXACT LOCATION TO BE DETERMINED IN THE FIELD AS DIRECTED BY THE ENVIRONMENTAL INSPECTOR.

SLOPE BREAKER ○
TRENCH BREAKER ▲

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
BRANDON MICHAEL WALKER
ENGINEER
PE077056

05/28/2020

ISSUED FOR 05/28/20 CONSTRUCTION



LAND USE:	PA		OW	PA	ROW	PA	PA
% SLOPE:	< 5%	5-15%	> 30%	0%	> 30%	< 5%	5-15%	< 5%

PROJECT DATA	
NOM. DIA.	24"
MOP	1050 PSIG
DESIGN SPEC.	DOT 192 / ASME B31.8
PIPE SPEC.	API-5L
MIN. TEST PRESSURE	1.5X MOP

LAND USE CLASSIFICATION					
AG	AGRICULTURE	PA	PASTURE	ROW	EXISTING RIGHT-OF-WAY
F/W	FOREST/WOODLAND	R	RESIDENTIAL	OW	OPEN WATER

PERMANENT SLOPE BREAKER & TRENCH BREAKER SPACING			
% SLOPE	SLOPE BREAKER SPACING (FT)	% SLOPE	TRENCH BREAKER SPACING (FT)
5-15%	300 FT	5-15%	300 FT
15-30%	200 FT	15-30%	200 FT
>30%	100 FT	>30%	100 FT

DWG. NO.	DESCRIPTION
DELM-D-1200	PIPING PLAN WEST SIDE
DELM-D-1211	PIPING SECTIONS
DELM-D-1220	PIPING PLAN MAINLINE VALVE
DELM-G-1211	PROPOSED SITE PLAN EAST SIDE

REFERENCE DRAWINGS

REV	DSN	CK	DESCRIPTION
0	LGF	RG	ISSUED FOR CONSTRUCTION (05/28/2020)

REVISIONS

ITEM NO.	MATERIALS	QTY
1	PIPE, 24" X 0.500, X-60,	2669'
2	3R ELL, 10 DEG. SEGMENTABLE	1
3	3R ELL, 12 DEG. SEGMENTABLE	1
4	3R ELL, 39 DEG. SEGMENTABLE	1
5	3R ELL, 90 DEG.	1
A	FBE COATING	810'
B	FBE W/ ARO COATING	1739'
C	FBE W/ ARO + SP-2888	120'

audubon Field Solutions
10205 WESTHEIMER ROAD
SUITE 100
HOUSTON, TX 77042
PHONE: (281) 669-0590

TITLE	ENGINEERING APPROVALS			
	BID		CONSTRUCTION	
DRAWN BY	SIGNATURE	DATE	SIGNATURE	DATE
JBS		4/14/20		

CONEMAUGH RIVER CROSSING PROJECT
DELMONT TO ARMAGH
PROPOSED 24-INCH LINE 12 HDD INSTALLATION
CONSTRUCTION ALIGNMENT
LOC. WESTMORELAND & INDIANA COUNTY, PA

ENBRIDGE
Texas Eastern Transmission, LP
5400 Westheimer Ct. Houston, Tx 77056-5310 713 / 627-5400

YEAR: 2020	W.B.S.	SCALE: 1 = 100'	DWG.DELM-DW-P1100	REV. 0

S:\AFS\Projects\Enbridge\Conemaugh_River_Xing\190913 – Conemaugh River Xing\801_Mapping\001_Alignment\DELM-DW-P1100_ALIGNMENT SHEET.dwg – PLOT TIME: 5/28/2020 8:29 AM

IG.#

WESTMORELAND COUNTY

INDIANA COUNTY

FEMA 100-YR FLOODPLAIN (ZONE A)

PAGE 1

PAGE 2

PAGE 3

CONEMAUGH RIVER

FEMA 100-YR FLOODPLAIN (ZONE A)

FEMA 100-YR FLOODPLAIN (ZONE A)

BASE MAP SOURCES:
AERIAL IMAGERY: SOURCE: ESRI, DIGITALGLOBE, GEOEYE, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, USDA, USGS, AEROGRID, IGN, AND THE GIS USER COMMUNITY

NWI WETLAND: USFWS, NATIONAL WETLANDS INVENTORY FOR PA, POLYGON, 10/15/2018

SOIL MAP UNIT: USDA-NRCS, SOIL SURVEY GEOGRAPHIC DATABASE FOR WESTMORELAND AND INDIANA COUNTIES, PA, 9/2018

LEGEND

- PROPOSED LOD
- PROPOSED TEMP. WORK SPACE
- STUDY AREA
- PROPOSED HDD
- PEM WETLAND
- PSS WETLAND
- PFO WETLAND
- OPEN-ENDED WETLAND
- WATERCOURSE
- ASSUMED 50-FT FLOODWAY
- FEMA 100-YR FLOODPLAIN
- PAGE BOUNDARY
- COUNTY BOUNDARY

0 250 500 1,000 1,500 2,000 Feet

ENBRIDGE

FIGURE 2
SITE PLAN

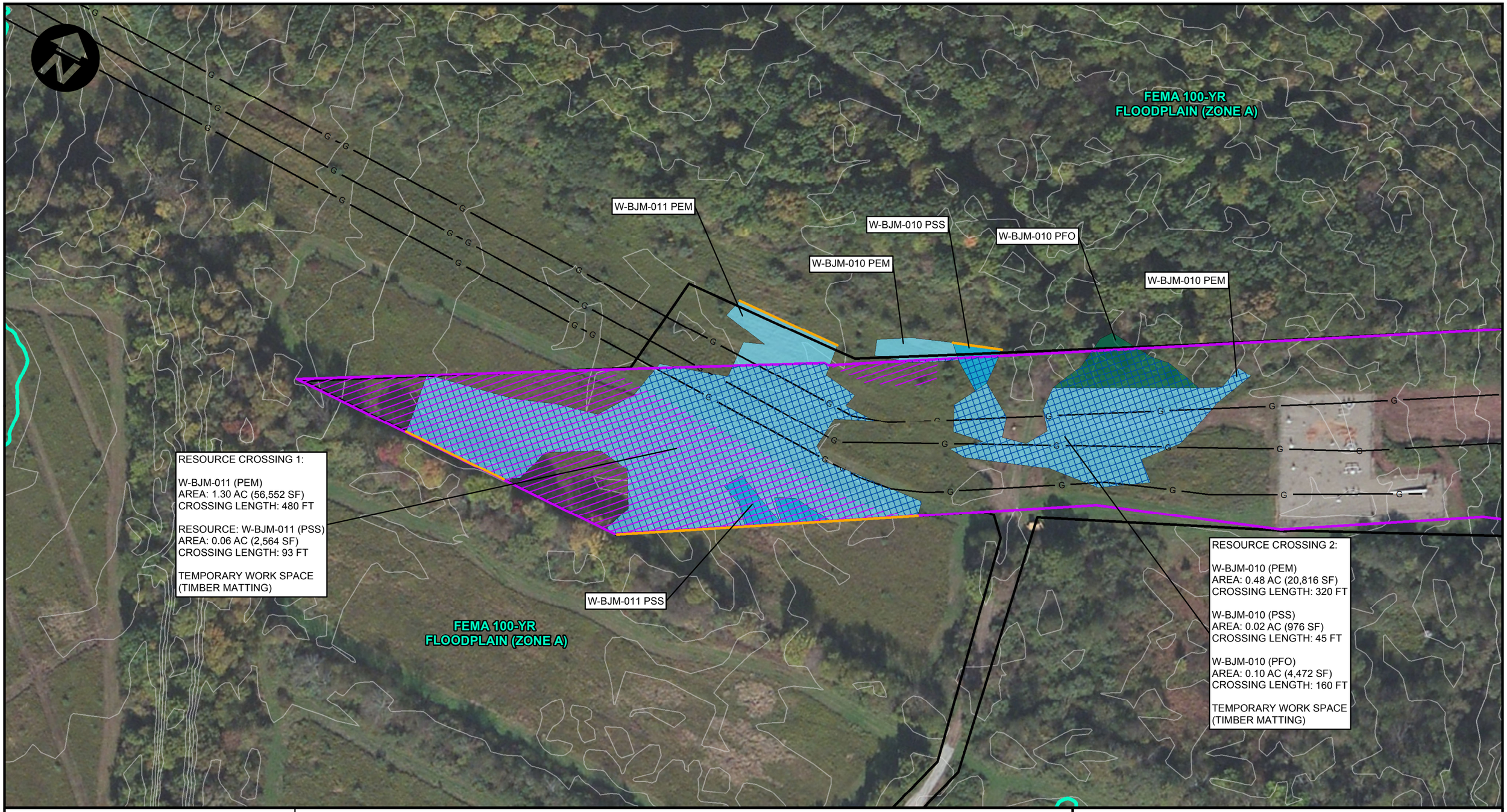
AECOM

CONEMAUGH RIVER PROJECT

40° 27' 21.15" N AND 79° 17' 57.81" W

BLACKLICK TOWNSHIP, INDIANA COUNTY
AND DERRY TOWNSHIP, WESTMORELAND COUNTY, PA

Prepared by: MLN	CHECKED BY: SLH	DATE: 7/22/2020	PAGE INDEX



BASE MAP SOURCES:
AERIAL IMAGERY: ESRI, HERE, GARMIN, (C) OPENSTREETMAP CONTRIBUTORS
SOURCE: ESRI, DIGITALGLOBE, GEOEYE, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, USDA, USGS, AEROGRID, IGN, AND THE GIS USER COMMUNITY

NWI WETLAND: USFWS, NATIONAL WETLANDS INVENTORY FOR PA, POLYGON, 10/15/2018

SOIL MAP UNIT: USDA-NRCS, SOIL SURVEY GEOGRAPHIC DATABASE FOR WESTMORELAND AND INDIANA COUNTIES, PA, 9/2018

LEGEND

- PROPOSED LOD
- PROPOSED TEMP. WORK SPACE
- STUDY AREA
- PROPOSED HDD
- EXISTING TETLP PIPELINE
- PEM WETLAND
- PSS WETLAND
- PFO WETLAND
- OPEN-ENDED WETLAND
- WATERCOURSE
- WETLAND IMPACT (ROW)
- WETLAND IMPACT (HDD)
- STREAM IMPACT (HDD)
- FLOODWAY IMPACT (HDD)
- COUNTY BOUNDARY
- FEMA 100-YR FLOODPLAIN
- ASSUMED 50-FT FLOODWAY

0 50 100 200 Feet

ENBRIDGE

FIGURE 2
SITE PLAN

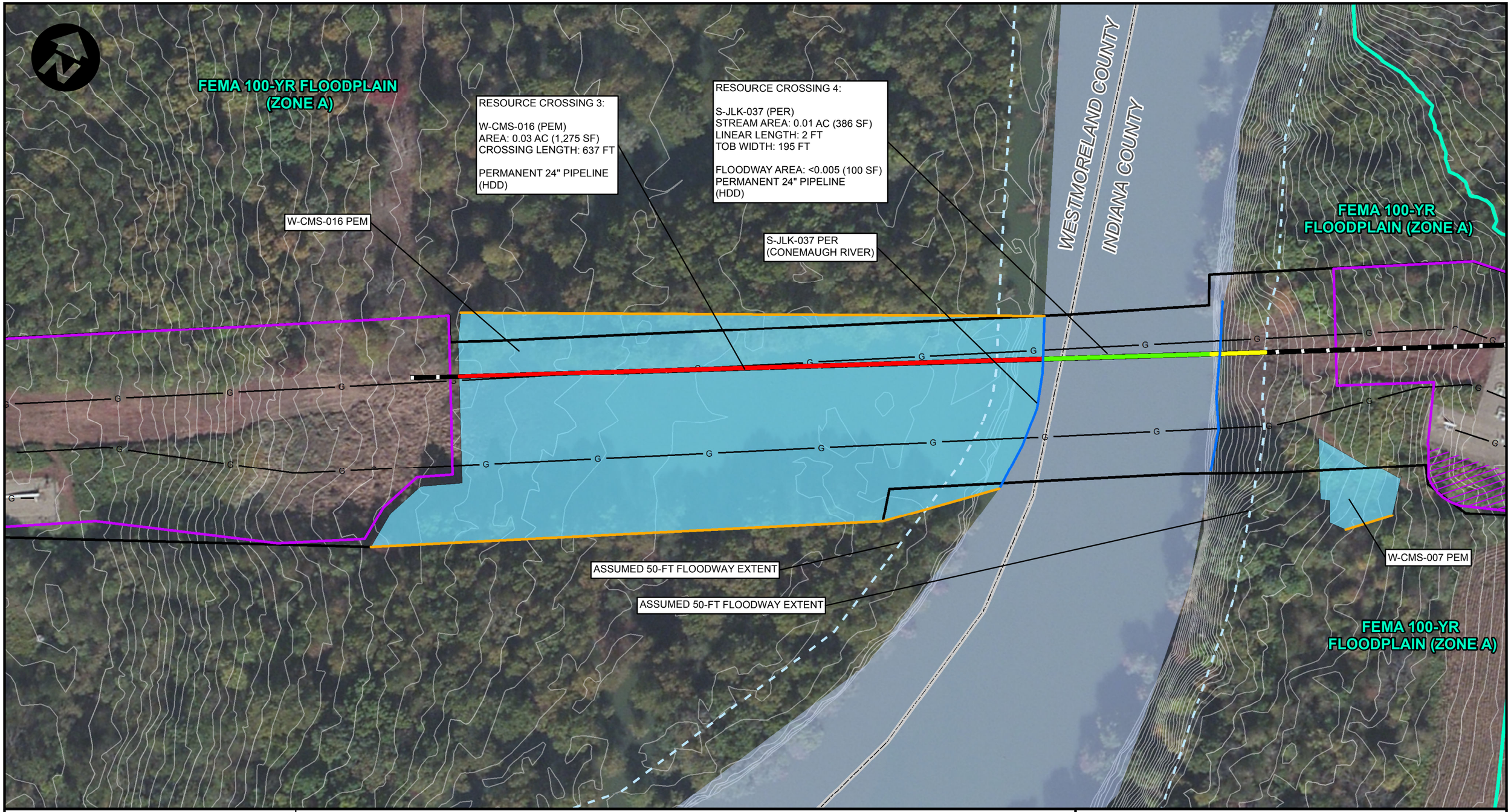
AECOM

CONEMAUGH RIVER PROJECT

40° 27' 21.15" N AND 79° 17' 57.81" W

BLACKLICK TOWNSHIP, INDIANA COUNTY
AND DERRY TOWNSHIP, WESTMORELAND COUNTY, PA

Prepared by: MLN	CHECKED BY: SLH	DATE: 7/14/2020	PAGE 1 OF 3



BASE MAP SOURCES:
AERIAL IMAGERY: ESRI, HERE, GARMIN, (C) OPENSTREETMAP CONTRIBUTORS
SOURCE: ESRI, DIGITALGLOBE, GEOEYE, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, USDA, USGS, AEROGRID, IGN, AND THE GIS USER COMMUNITY

NWI WETLAND: USFWS, NATIONAL WETLANDS INVENTORY FOR PA, POLYGON, 10/15/2018

SOIL MAP UNIT: USDA-NRCS, SOIL SURVEY GEOGRAPHIC DATABASE FOR WESTMORELAND AND INDIANA COUNTIES, PA, 9/2018

LEGEND

- PROPOSED LOD
- PROPOSED TEMP. WORK SPACE
- STUDY AREA
- PROPOSED HDD
- EXISTING TETLP PIPELINE
- PEM WETLAND
- PSS WETLAND
- PFO WETLAND
- OPEN-ENDED WETLAND
- WATERCOURSE
- WETLAND IMPACT (ROW)
- WETLAND IMPACT (HDD)
- STREAM IMPACT (HDD)
- FLOODWAY IMPACT (HDD)
- COUNTY BOUNDARY
- FEMA 100-YR FLOODPLAIN
- ASSUMED 50-FT FLOODWAY

0 50 100 200 Feet

ENBRIDGE

FIGURE 2
SITE PLAN

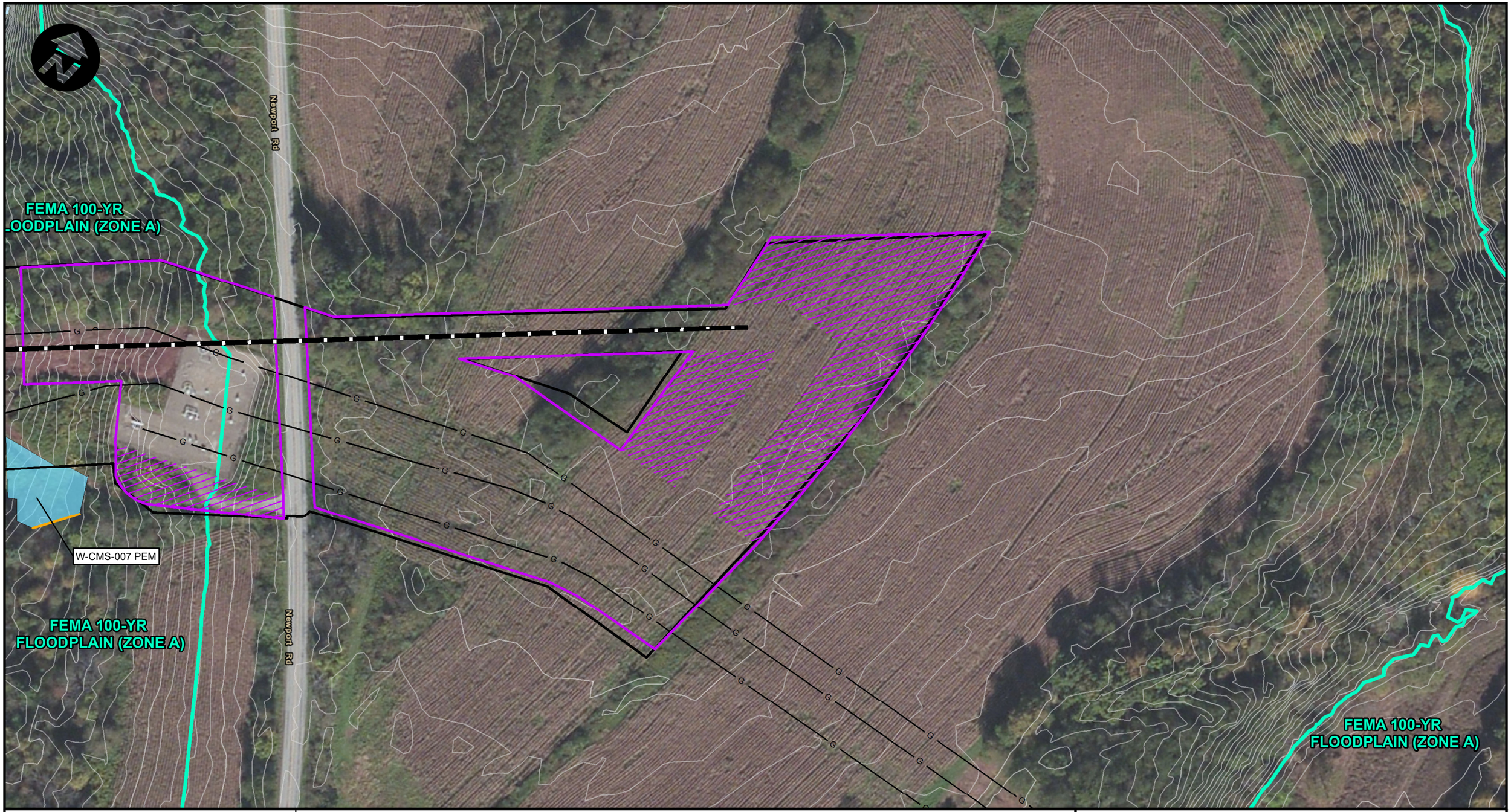
AECOM

CONEMAUGH RIVER PROJECT

40° 27' 21.15" N AND 79° 17' 57.81" W

BLACKLICK TOWNSHIP, INDIANA COUNTY
AND DERRY TOWNSHIP, WESTMORELAND COUNTY, PA

Prepared by: MLN	CHECKED BY: SLH	DATE: 7/14/2020	PAGE 2 OF 3



BASE MAP SOURCES:
AERIAL IMAGERY: ESRI, HERE, GARMIN, (C) OPENSTREETMAP CONTRIBUTORS
SOURCE: ESRI, DIGITALGLOBE, GEOEYE, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, USDA, USGS, AEROGRID, IGN, AND THE GIS USER COMMUNITY

NWI WETLAND: USFWS, NATIONAL WETLANDS INVENTORY FOR PA, POLYGON, 10/15/2018

SOIL MAP UNIT: USDA-NRCS, SOIL SURVEY GEOGRAPHIC DATABASE FOR WESTMORELAND AND INDIANA COUNTIES, PA, 9/2018

LEGEND

- PROPOSED LOD
- PROPOSED TEMP. WORK SPACE
- STUDY AREA
- PROPOSED HDD
- EXISTING TETLP PIPELINE
- PEM WETLAND
- PSS WETLAND
- PFO WETLAND
- OPEN-ENDED WETLAND
- WATERCOURSE
- WETLAND IMPACT (ROW)
- WETLAND IMPACT (HDD)
- STREAM IMPACT (HDD)
- FLOODWAY IMPACT (HDD)
- COUNTY BOUNDARY
- FEMA 100-YR FLOODPLAIN
- ASSUMED 50-FT FLOODWAY

0 50 100 200 Feet

ENBRIDGE

FIGURE 2
SITE PLAN

AECOM

CONEMAUGH RIVER PROJECT

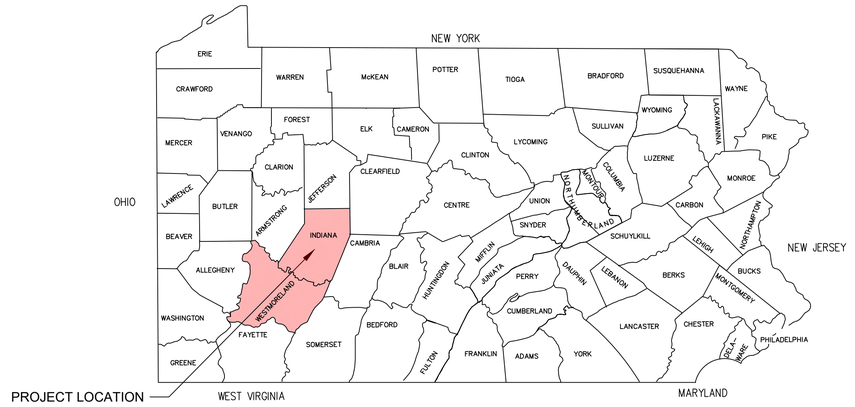
40° 27' 21.15" N AND 79° 17' 57.81" W

BLACKLICK TOWNSHIP, INDIANA COUNTY
AND DERRY TOWNSHIP, WESTMORELAND COUNTY, PA

Prepared by: MLN	CHECKED BY: SLH	DATE: 7/14/2020	PAGE 3 OF 3

CONEMAUGH RIVER CROSSING PROJECT
DELMONT TO ARMAGH
PROPOSED 24-INCH LINE 12 HDD INSTALLATION
DERRY TOWNSHIP, WESTMORELAND COUNTY, PENNSYLVANIA
BLACKLICK TOWNSHIP, INDIANA COUNTY, PENNSYLVANIA
MAY 2020
EROSION AND SEDIMENT CONTROL PLAN
REVISION 1 07/23/2020

EROSION AND SEDIMENT CONTROL PLAN			
SHEET	REV.	DESCRIPTION	NO.
DELM-C-8100	1	COVER SHEET	1
DELM-P-8100	0	GENERAL PERMIT NOTES	2
DELM-P-8101	1	CONSTRUCTION SEQUENCE/SEEDING MIX	3
DELM-P-8102	0	HDD PROCEDURE NOTES	4
DELM-P-8103	0	HDD PROCEDURE NOTES	5
DELM-P-8200	1	EROSION AND SEDIMENT CONTROL PLAN	6
DELM-P-8201	1	EROSION AND SEDIMENT CONTROL PLAN	7
DELM-P-8202	1	EROSION AND SEDIMENT CONTROL PLAN	8
SHEET 1 OF 3	1	EROSION AND SEDIMENT CONTROL FIGURES	9
SHEET 2 OF 3	0	EROSION AND SEDIMENT CONTROL FIGURES	10
SHEET 3 OF 3	1	EROSION AND SEDIMENT CONTROL FIGURES	11

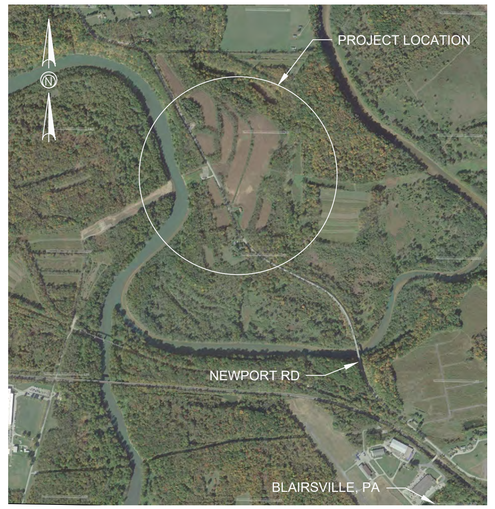


COUNTY MAP
N.T.S.

ENGINEER'S CERTIFICATION
I DO HEREBY CERTIFY TO THE BEST OF MY KNOWLEDGE, INFORMATION AND BELIEF, THAT THE EROSION AND SEDIMENT CONTROL AND POST CONSTRUCTION STORMWATER MANAGEMENT PLAN ARE TRUE AND CORRECT, REPRESENT ACTUAL FIELD CONDITIONS AND ARE IN ACCORDANCE WITH THE 25 PA CODE CHAPTERS 78 AND 102 OF THE DEPARTMENT'S RULES AND REGULATIONS. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMISSION OF FALSE INFORMATION, INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT.

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
BRANDON MICHAEL WALKER
ENGINEER
PE077056

07/23/20



Pennsylvania 811

NOT ALL UTILITIES ARE SHOWN ON THESE PLANS
THE LOCATION OF ALL UTILITIES (ABOVE OR BELOW GROUND) SHOWN ON THESE DRAWINGS ARE APPROXIMATE & WERE OBTAINED FROM USGS TOPO MAPS AND/OR UTILITY OWNERS. AUDUBON DOES NOT GUARANTEE THAT LOCATION SHOWN ON THE DRAWINGS ARE CORRECT. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO DETERMINE LOCATIONS OF EXISTING UTILITIES (ABOVE OR BELOW GROUND) & TO NOTIFY THE RESPECTIVE UTILITY OWNERS BEFORE BEGINNING CONSTRUCTION.

CALL BEFORE YOU DIG!
PENNSYLVANIA LAW REQUIRES
3 WORKING DAYS NOTICE FOR
CONSTRUCTION PHASE AND 10 WORKING DAYS IN DESIGN STAGE - STOP CALL
Pennsylvania One Call System Inc.
1-800-242-1776

DESIGN ONE CALL SERIAL NO.: 20151982217

APPLICANT:

ENBRIDGE

Texas Eastern Transmission, LP
5400 Westheimer Ct. Houston, TX 77056-5310 713 / 627-5400

PREPARED BY:

audubon
Field Solutions
10205 WESTHEIMER ROAD
SUITE 100
HOUSTON, TX 77042
PHONE: (281) 669-0590

GENERAL PERMIT NOTES

1. ALL EARTH DISTURBANCES, INCLUDING CLEARING AND GRUBBING AS WELL AS CUTS AND FILLS SHALL BE DONE IN ACCORDANCE WITH THE APPROVED EROSION AND SEDIMENT CONTROL PLAN (E&SCP). A COPY OF THE APPROVED DRAWINGS (STAMPED, SIGNED AND DATED BY THE REVIEWING AGENCY) MUST BE AVAILABLE AT THE PROJECT SITE AT ALL TIMES. THE REVIEWING AGENCY SHALL BE NOTIFIED OF ANY CHANGES TO THE APPROVED PLAN PRIOR TO IMPLEMENTATION OF THOSE CHANGES. THE REVIEWING AGENCY MAY REQUIRE A WRITTEN SUBMITTAL OF THOSE CHANGES FOR REVIEW AND APPROVAL AT ITS DISCRETION.

2. AT LEAST 7 DAYS PRIOR TO STARTING ANY EARTH DISTURBANCE ACTIVITIES, INCLUDING CLEARING AND GRUBBING, THE OWNER AND/OR OPERATOR SHALL INVITE ALL CONTRACTORS, THE LANDOWNER, APPROPRIATE MUNICIPAL OFFICIALS, THE E&SCP PREPARER, THE POST CONSTRUCTION STORMWATER MANAGEMENT (PCSM) PLAN PREPARER, THE LICENSED PROFESSIONAL RESPONSIBLE FOR OVERSIGHT OF CRITICAL STAGES OF IMPLEMENTATION OF THE PCSM PLAN, AND A REPRESENTATIVE FROM THE LOCAL CONSERVATION DISTRICT TO AN ON-SITE PRE CONSTRUCTION MEETING.

3. AT LEAST 3 DAYS PRIOR TO STARTING ANY EARTH DISTURBANCE ACTIVITIES, OR EXPANDING INTO AN AREA PREVIOUSLY UNMARKED, THE PENNSYLVANIA ONE CALL SYSTEM INC. SHALL BE NOTIFIED AT 1-800-242-1776 FOR THE LOCATION OF EXISTING UNDERGROUND UTILITIES.

4. ALL EARTH DISTURBANCE ACTIVITIES SHALL PROCEED IN ACCORDANCE WITH THE SEQUENCE PROVIDED ON THE PLAN DRAWINGS. DEVIATION FROM THAT SEQUENCE MUST BE APPROVED IN WRITING FROM THE LOCAL CONSERVATION DISTRICT OR BY THE DEPARTMENT PRIOR TO IMPLEMENTATION.

5. AREAS TO BE FILLED ARE TO BE CLEARED, GRUBBED, AND STRIPPED OF TOPSOIL TO REMOVE TREES, VEGETATION, ROOTS AND OTHER OBJECTIONABLE MATERIAL.

6. CLEARING GRUBBING, AND TOPSOIL STRIPPING SHALL BE LIMITED TO THOSE AREAS DESCRIBED IN EACH STAGE OF THE CONSTRUCTION SEQUENCE. GENERAL SITE CLEARING, GRUBBING AND TOPSOIL STRIPPING MAY NOT COMMENCE IN ANY STAGE OR PHASE OF THE PROJECT UNTIL THE E&SCP BEST MANAGEMENT PRACTICE (BMPS) SPECIFIED BY THE BMP SEQUENCE FOR THAT STAGE OR PHASE HAVE BEEN INSTALLED AND ARE FUNCTIONING AS DESCRIBED IN THIS E&SCP.

7. AT NO TIME SHALL CONSTRUCTION VEHICLES BE ALLOWED TO ENTER AREAS OUTSIDE THE LIMIT OF DISTURBANCE BOUNDARIES SHOWN ON THE PLAN MAPS. THESE AREAS MUST BE CLEARLY MARKED AND FENCED OFF BEFORE CLEARING AND GRUBBING OPERATIONS BEGIN.

8. TOPSOIL REQUIRED FOR THE ESTABLISHMENT OF VEGETATION SHALL BE STOCKPILED AT THE LOCATION(S) SHOWN ON THE PLAN MAP(S) IN THE AMOUNT NECESSARY TO COMPLETE THE FINISH GRADING OF ALL EXPOSED AREAS THAT ARE TO BE STABILIZED BY VEGETATION. EACH STOCKPILE SHALL BE PROTECTED IN THE MANNER SHOWN ON THE PLAN DRAWINGS. STOCKPILE HEIGHTS SHALL NOT EXCEED 35 FEET. STOCKPILE SLOPES SHALL BE 2H:1V OR FLATTER.

9. IMMEDIATELY UPON DISCOVERING UNFORESEEN CIRCUMSTANCES POSING THE POTENTIAL FOR ACCELERATED EROSION AND/OR SEDIMENT POLLUTION, THE OPERATOR SHALL IMPLEMENT APPROPRIATE BEST MANAGEMENT PRACTICES TO MINIMIZE THE POTENTIAL FOR EROSION AND SEDIMENT POLLUTION AND NOTIFY THE LOCAL CONSERVATION DISTRICT AND/OR THE REGIONAL OFFICE OF THE DEPARTMENT.

10. ALL BUILDING MATERIALS AND WASTES SHALL BE REMOVED FROM THE SITE AND RECYCLED OR DISPOSED OF IN ACCORDANCE WITH THE DEPARTMENT'S SOLID WASTE MANAGEMENT REGULATIONS AT 25 PA. CODE 260.1 ET SEQ..271.1, AND 287.1 ET SEQ. NO BUILDING MATERIALS OR WASTES OR UNUSED BUILDING MATERIALS SHALL BE BURNED, BURIED, DUMPED, OR DISCHARGED AT THE SITE.

11. ALL OFF-SITE WASTE AND BORROW AREAS MUST HAVE AN E&SCP APPROVED BY THE LOCAL CONSERVATION DISTRICT OR THE DEPARTMENT FULLY IMPLEMENTED PRIOR TO BEING ACTIVATED.

12. THE CONTRACTOR IS RESPONSIBLE FOR ENSURING THAT ANY MATERIAL BROUGHT ON SITE IS CLEAN FILL. FORM FP-001 MUST BE RETAINED BY THE PROPERTY OWNER FOR ANY FILL MATERIAL AFFECTED BY A SPILL OR RELEASE OF A REGULATED SUBSTANCE BUT QUALIFYING AS CLEAN FILL DUE TO ANALYTICAL TESTING.

13. ALL PUMPING OF WATER FROM ANY WORK AREA SHALL BE DONE ACCORDING TO THE PROCEDURE DESCRIBED IN THIS PLAN, OVER UNDISTURBED VEGETATED AREAS.

14. VEHICLES AND EQUIPMENT MAY ONLY ENTER THE WORKSITE THROUGH THE DESIGNATED ACCESS ROADS FOR THE PROJECT.

15. UNTIL THE SITE IS STABILIZED, ALL EROSION AND SEDIMENT BMPS SHALL BE MAINTAINED PROPERLY. MAINTENANCE SHALL INCLUDE INSPECTIONS OF ALL EROSION AND SEDIMENT BMPS AFTER EACH RUNOFF EVENT AND ON A WEEKLY BASIS. ALL PREVENTATIVE AND REMEDIAL MAINTENANCE WORK, INCLUDING CLEAN OUT, REPAIR, REPLACEMENT, REGRADING, RESEEDING, REMULCHING, AND RENETTING MUST BE PERFORMED IMMEDIATELY. IF THE E&SCP BMPS FAIL TO PERFORM AS EXPECTED, REPLACEMENT BMPS, OR MODIFICATIONS OF THOSE INSTALLED WILL BE REQUIRED.

16. A LOG SHOWING DATES THAT E&SCP BMPS WERE INSPECTED AS WELL AS ANY DEFICIENCIES FOUND AND THE DATE THEY WERE CORRECTED SHALL BE MAINTAINED ON THE SITE AND BE MADE AVAILABLE TO REGULATORY AGENCY OFFICIALS AT THE TIME OF INSPECTION.

17. SEDIMENT TRACKED ONTO PUBLIC ROADWAY OR SIDEWALK SHALL BE RETURNED TO THE CONSTRUCTION SITE IMMEDIATELY AND DISPOSED IN THE MANNER DESCRIBED IN THIS PLAN. IN NO CASE SHALL THE SEDIMENT BE WASHED, SHOVELED, OR SWEPT INTO ANY ROADSIDE DITCH, STORM SEWER, OR SURFACE WATER.

18. ALL SEDIMENT REMOVED FROM BMPS SHALL BE DISPOSED OF IN THE MANNER DESCRIBED ON THE PLAN DRAWINGS.

19. AREAS WHICH ARE TO BE TOPSOILED SHALL BE SCARIFIED TO A MINIMUM DEPTH OF 3 TO 5 INCHES- 6 TO 12 INCHES ON COMPACTED SOILS-PRIOR TO PLACEMENT OF TOPSOIL. AREAS TO BE VEGETATED SHALL HAVE A MINIMUM 4 INCHES OF TOPSOIL IN PLACE PRIOR TO SEEDING AND MULCHING. FILL OUTSLOPES SHALL HAVE A MINIMUM OF 2 INCHES OF TOPSOIL.

20. ALL FILLS SHALL BE COMPACTED AS REQUIRED TO REDUCE EROSION, SLIPPAGE, SETTLEMENT, SUBSIDENCE OR OTHER RELATED PROBLEMS. FILL INTENDED TO SUPPORT BUILDINGS, STRUCTURES AND CONDUITS, ETC. SHALL BE COMPACTED IN ACCORDANCE WITH LOCAL REQUIREMENTS OR CODES.

21. ALL EARTHEN FILLS SHALL BE PLACED IN COMPACTED LAYERS NOT TO EXCEED 9 INCHES IN THICKNESS.

22. FILL MATERIALS SHALL BE FREE OF FROZEN PARTICLES, BRUSH, ROOTS, SOD, OR OTHER FOREIGN OR OBJECTIONABLE MATERIALS THAT WOULD INTERFERE WITH OR PREVENT CONSTRUCTION OF SATISFACTORY FILLS.

23. FROZEN MATERIALS OR SOFT, MUCKY, OR HIGHLY COMPRESSIBLE MATERIALS SHALL NOT BE INCORPORATED INTO FILLS.

24. FILL SHALL NOT BE PLACED ON SATURATED OR FROZEN SURFACES.

25. SEEPS OR SPRINGS ENCOUNTERED DURING CONSTRUCTION SHALL BE HANDLED IN ACCORDANCE WITH THE STANDARD AND SPECIFICATION OF SUBSURFACE DRAIN OR OTHER APPROVED METHOD.

26. ALL GRADED AREAS SHALL BE PERMANENTLY STABILIZED IMMEDIATELY UPON REACHING FINISHED GRADE. CUT SLOPES IN COMPETENT BEDROCK AND ROCK FILLS NEED NOT BE VEGETATED. SEEDED AREAS WITHIN 50 FEET OF A SURFACE WATER, OR AS OTHERWISE SHOWN ON THE PLAN DRAWINGS, SHALL BE BLANKETED ACCORDING TO THE STANDARDS OF THIS PLAN.

27. IMMEDIATELY AFTER EARTH DISTURBANCE ACTIVITIES CEASE IN ANY AREA OR SUBAREA OF THE PROJECT, THE OPERATOR SHALL STABILIZE ALL DISTURBED AREAS. DURING NON-GERMINATING MONTHS, MULCH OR PROTECTIVE BLANKETING SHALL BE APPLIED AS DESCRIBED IN THE PLAN. AREAS NOT AT FINISHED GRADE, WHICH WILL BE REACTIVATED WITHIN 1 YEAR, MAY BE STABILIZED IN ACCORDANCE WITH THE TEMPORARY STABILIZATION SPECIFICATIONS. THOSE AREAS WHICH WILL NOT BE REACTIVATED WITHIN 1 YEAR SHALL BE STABILIZED IN ACCORDANCE WITH THE PERMANENT STABILIZATION SPECIFICATIONS.

28. PERMANENT STABILIZATION IS DEFINED AS A MINIMUM UNIFORM, PERENNIAL 70% VEGETATIVE COVER OR OTHER PERMANENT NON-VEGETATIVE COVER WITH A DENSITY SUFFICIENT TO RESIST ACCELERATED EROSION. CUT AND FILL SLOPES SHALL BE CAPABLE OF THE RESISTING FAILURE DUE TO SLUMPING, SLIDING, OR OTHER MOVEMENTS.

29. E&SCP BMPS SHALL REMAIN FUNCTIONAL AS SUCH UNTIL ALL AREAS TRIBUTARY TO THEM ARE PERMANENTLY STABILIZED OR UNTIL THEY ARE REPLACED BY ANOTHER BMP APPROVED BY THE LOCAL CONSERVATION DISTRICT OR THE DEPARTMENT.

30. UPON COMPLETION OF ALL EARTH DISTURBANCE ACTIVITIES AND PERMANENT STABILIZATION OF ALL DISTURBED AREAS, THE OWNER AND/OR OPERATOR SHALL CONTACT THE LOCAL CONSERVATION DISTRICT FOR AN INSPECTION PRIOR TO REMOVAL/CONVERSION OF THE E&SCP BMPS.

31. AFTER FINAL SITE STABILIZATION HAS BEEN ACHIEVED, TEMPORARY EROSION AND SEDIMENT BMPS MUST BE REMOVED OR CONVERTED TO PERMANENT POST CONSTRUCTION STORMWATER MANAGEMENT BMPS. AREAS DISTURBED DURING REMOVAL OR CONVERSION OF THE BMPS SHALL BE STABILIZED IMMEDIATELY. IN ORDER TO ENSURE RAPID REVEGETATION OF DISTURBED AREAS, SUCH REMOVAL/CONVERSIONS ARE TO BE DONE ONLY DURING THE GERMINATING SEASON.

32. UPON COMPLETION OF ALL EARTH DISTURBANCE ACTIVITIES AND PERMANENT STABILIZATION OF ALL DISTURBED AREAS, THE OWNER AND/OR OPERATOR SHALL CONTACT THE LOCAL CONSERVATION DISTRICT TO SCHEDULE A FINAL INSPECTION.

RECYCLING/DISPOSAL OF MATERIALS:

THE CONSTRUCTION CONTRACTOR SHALL REMOVE FROM THIS SITE, RECYCLE, OR DISPOSE OF ALL BUILDING MATERIALS, SEDIMENTS AND WASTES IN ACCORDANCE WITH THE DEPARTMENT'S SOLID WASTE MANAGEMENT REGULATIONS AT 25 PA. CODE 260.1 ET SEQ., 271.1 ET SEQ. THE CONSTRUCTION CONTRACTOR SHALL NOT ILLEGALLY BURY, DUMP, OR DISCHARGE ANY BUILDING MATERIAL OR WASTES AT THIS SITE.

THE CONSTRUCTION CONTRACTOR WILL IMPLEMENT THE PROPER MEASURES FOR DISPOSAL AND RECYCLING OF MATERIALS ASSOCIATED WITH OR FROM THE PROJECT SITE IN ACCORDANCE WITH DEP REGULATIONS. CONSTRUCTION WASTES INCLUDE, BUT ARE NOT LIMITED TO, EXCESS SOIL MATERIALS AND BUILDING MATERIALS THAT COULD ADVERSELY IMPACT WATER QUALITY.

THE CONSTRUCTION CONTRACTOR WILL INSPECT THE PROJECT AREA WEEKLY AND PROPERLY DISPOSE OF ALL CONSTRUCTION WASTES. MEASURES WILL BE PLANNED AND IMPLEMENTED FOR HOUSEKEEPING MATERIALS MANAGEMENT AND LITTER CONTROL. WHEREVER POSSIBLE, RE-USEABLE WASTES WILL BE SEGREGATED FROM OTHER WASTE AND STORED SEPARATELY FOR RECYCLING.

IF AN OFF-SITE LOCATION IS USED FOR BORROW OR DISPOSAL, THE CONTRACTOR IS RESPONSIBLE FOR DEVELOPING AND IMPLEMENTING ADEQUATE E&SCP CONTROL PLAN(S) AND SUBMITTING THE PLAN(S) TO DEP FOR APPROVAL PRIOR TO COMMENCEMENT OF SAID WORK.

REMEDIAL ACTIONS IF SEED AND MULCH ARE WASHED AWAY OR IF THE SEED MIX IS NOT GROWING:

1. THE AFFECTED AREA WILL BE LIMED, FERTILIZED, RE-SEEDED AND MULCHED AS NEEDED.
2. EROSION PROTECTION MATTING OR NETTING WILL BE APPLIED AS NEEDED.
3. STEPS 1 AND 2 WILL BE REPEATED AS NEEDED UNTIL A UNIFORM 70% PERENNIAL VEGETATIVE COVER IS ACHIEVED.

GENERAL NOTES:

1. ALL DIMENSIONS AND ELEVATIONS SHOWN ON THE DRAWINGS SHALL BE VERIFIED BY THE CONTRACTOR AND SHALL CONFORM TO THOSE SHOWN ON THE MECHANICAL, ELECTRICAL, AND STRUCTURAL DRAWINGS.

2. LOCATION OF PHYSICAL FEATURES AND UTILITIES ARE APPROXIMATE. CONTRACTOR SHALL VERIFY LOCATION OF FEATURES IN FIELD AND SHALL NOTIFY COMPANY OF DISCREPANCIES AFFECTING CONSTRUCTION.

3. PLUS AND MINUS ELEVATIONS ARE REFERENCED FROM FINISHED GRADE ELEVATION.

4. CONTRACTOR SHALL ENSURE THAT ALL STRUCTURES, EQUIPMENT, AND OTHER FACILITIES ARE ADEQUATELY SUPPORTED DURING CONSTRUCTION IN ORDER TO PREVENT EXCESSIVE DEFLECTIONS, STRESSES, OR SETTLEMENT.

5. COMPANY APPROVAL IS REQUIRED FOR ALL MODIFICATIONS ASSOCIATED WITH THE EXISTING GRADES, EQUIPMENT, STEEL, PIPING, OR OTHER IN-PLACE FACILITIES.

6. IN ACCORDANCE WITH PA ACT 187 OF 1996, CONTRACTOR SHALL NOTIFY UTILITIES PRIOR TO CONSTRUCTION USING PA ONE CALL, 1-800-242-1776.

7. CONTRACTOR SHALL BECOME FAMILIAR WITH THE SURVEY AND SUB-SURFACE INVESTIGATION REPORT BEFORE BEGINNING CONSTRUCTION.

8. SET PIPING AND FOUNDATIONS AT ELEVATIONS SHOWN, OR ON FIRM UNDISTURBED MATERIAL OF DESIGN BEARING CAPACITY, WHICHEVER IS LOWER. COMPANY SHALL VERIFY THAT EACH FOOTING PLACED IS BEARING ON ADEQUATE MATERIALS.

9. PRIOR TO ANY EARTHWORK OR OTHER CONSTRUCTION ACTIVITY, CONTRACTOR SHALL VERIFY THAT EROSION CONTROL MEASURES AND STORMWATER MANAGEMENT FACILITIES ARE IN PLACE. CONTRACTOR SHALL ADVISE COMPANY OF DEFICIENT EROSION CONTROL MEASURES.

10. ALL WORK SHALL BE CONDUCTED WITHIN THE BOUNDARIES AUTHORIZED IN THE PENNSYLVANIA DEPARTMENT OF ENVIRONMENTAL PROTECTION (PADEP) PERMIT DOCUMENTS AND AS AGREED WITH LAND OWNER. VERIFY WHICH PUBLIC ROADS MAY BE UTILIZED FOR SITE ACCESS.

11. PRIOR TO OPENING TRENCH, ENSURE ALL MATERIAL, INCLUDING SCREENING MATERIAL, IS ON SITE AND AVAILABLE FOR USE.

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
BRANDON MICHAEL WALKER
ENGINEER
PE077056
07/23/20

DWG. NO.	DESCRIPTION	REV	DSN	CK	DESCRIPTION	ITEM NO.	MATERIALS	QTY
		1	SNC	RG	ISSUED FOR APPROVAL (05/28/2020)			
REFERENCE DRAWINGS		REVISIONS						

audubon
Field Solutions
10205 WESTHEIMER ROAD
SUITE 100
HOUSTON, TX 77042
PHONE: (281) 669-0590

DRAWN BY	ENGINEERING APPROVALS				
	BID		CONSTRUCTION		
LGF		04/29/20			
TITLE	SIGNATURE	DATE	SIGNATURE	DATE	

CONEMAUGH RIVER CROSSING PROJECT
DELMONT TO ARMAGH
PROPOSED 24-INCH LINE 12 HDD INSTALLATION
EROSION AND SEDIMENT CONTROL GENERAL PERMIT NOTES

LOC. WESTMORELAND & INDIANA COUNTY, PA

ENBRIDGE
Texas Eastern Transmission, LP
5400 Westheimer Ct. Houston , Tx 77056-5310 713 / 627-5400

YEAR: 2020 | W.B.S. | SCALE: N/A | DWG. DELM-P-8100 | REV. 0

I.G.#

GENERAL NOTES:

1. THIS PLAN SET CONTAINS ALL INFORMATION FOR THE EROSION AND SEDIMENT CONTROL PLAN (E&SCP). THIS IS A PERMIT DOCUMENT ONLY. ADDITIONAL PLANS AND DOCUMENTATION ARE REQUIRED FOR CONSTRUCTION OF THE PROPOSED DEVELOPMENT.

2. FULL SIZE SHEETS OF THIS PLAN SET MAY BE PRINTED OUT ON 22-INCHx34-INCH SHEETS. ALL SCALES PRINTED OUT ON 11-INCHx17-INCH SHEETS ARE SCALED BY 1/2 (E.G., 1-INCH=100 IS EQUIVALENT TO 1-INCH=200 FEET WHEN THESE PLAN SETS ARE PRINTED ON 11-INCHx17-INCH).

3. IN THE EVENT ANY ADVERSE GEOTECHNICAL CONDITIONS ARE OBSERVED, THE ENGINEER SHOULD BE CONTACTED IMMEDIATELY. SUCH CONDITIONS MAY INCLUDE, BUT ARE NOT LIMITED TO, EXCESSIVE SEEPAGE, SLOUGHING OF MATERIAL, EXCESSIVELY WET MATERIAL, EXCESSIVE SETTLEMENT OF COMPACTED LAYERS, EXCESSIVE SOIL CRACKING, AND/OR MOVEMENT OF COMPACTED EARTHEN MATERIAL.

REFERENCE (ALL SHEETS):

1. SOILS INFORMATION FROM UNITED STATES DEPARTMENT OF AGRICULTURE, NATURAL RESOURCES CONSERVATION SERVICE WEB SOIL SURVEY (CURRENT).

2. HORIZONTAL DATUM IS NAD83. VERTICAL DATUM IS NAVD1988.

3. ALL NORTHING AND EASTING COORDINATES SHOWN IN PENNSYLVANIA STATE PLANE NORTH NAD83.

CONSTRUCTION SEQUENCE:

ALL EARTH DISTURBANCE ACTIVITIES SHALL PROCEED IN ACCORDANCE WITH THE FOLLOWING SEQUENCE:

1. AT LEAST SEVEN (7) DAYS BEFORE STARTING ANY EARTH DISTURBANCE ACTIVITIES, THE OWNER AND/OR OPERATOR SHALL NOTIFY THE PADEP BY EITHER TELEPHONE OR CERTIFIED MAIL OF THE INTENT TO COMMENCE EARTH DISTURBANCE ACTIVITIES. ATTENDANCE AT A PRE-CONSTRUCTION CONFERENCE IS REQUIRED UPON REQUEST OF THE PADEP.

2. AT LEAST THREE (3) DAYS BEFORE STARTING ANY EARTH DISTURBANCE ACTIVITIES, ALL CONTRACTORS INVOLVED IN THOSE ACTIVITIES SHALL NOTIFY THE PENNSYLVANIA ONE CALL SYSTEM INCORPORATED AT 1-800-242-1776 FOR THE LOCATION OF EXISTING UNDERGROUND UTILITIES.

3. INSTALL ROCK CONSTRUCTION ENTRANCE.

4. INSTALL COMPOST FILTER SOCK DOWNSLOPE OF ANY PROPOSED DISTURBED/EXCAVATED AREA AND STOCKPILES. INSTALL ANY UPSLOPE DIVERSION DITCHES, COLLECTION CHANNELS, DIVERSION BERMS, SEDIMENT TRAPS AND ASSOCIATED RIPRAP APRONS.

5. PERFORM CLEARING AND GRUBBING TO THOSE AREAS DESCRIBED IN EACH STAGE OF WORK. STOCKPILE TOPSOIL AS SHOWN AND INSTALL COMPOST FILTER SOCKS DOWNSLOPE OF STOCKPILES.

6. PERFORM GRADING ACTIVITIES, INCLUDING THE PCSM INFILTRATION BERM, DETAILED BY PROPOSED GRADING, NOTES, AND DETAILS SHOWN ON THE PLAN DRAWINGS. AS PER PROJECT SPECIFICATIONS, ADDITIONAL TEMPORARY PLACEMENT OF COMPOST FILTER SOCK MAY BE NECESSARY AT THE CONTRACTOR'S DISCRETION SHOULD ACCELERATED EROSION BE ENCOUNTERED DURING GRADING ACTIVITIES.

7. CONSTRUCT FACILITIES ACCORDING TO SPECIFICATIONS WITHIN THESE PLAN SHEETS INCLUDING ALL STABILIZATION MEASURES.

8. PLACE TOPSOIL IN ALL AREAS TO BE VEGETATED.

9. APPLY SEED AND MULCH TO DISTURBED AREAS AS SPECIFIED AND IN ACCORDANCE WITH THIS PLAN.

10. ANY TEMPORARY MEASURES (SUCH AS THE ROCK CONSTRUCTION ENTRANCE, COMPOST FILTER SOCK, COLLECTION CHANNEL, RIPRAP APRONS, ETC.) INSTALLED BY CONTRACTOR DURING GRADING, SHALL REMAIN IN PLACE UNTIL FINAL STABILIZATION HAS A MINIMUM UNIFORM 70% PERENNIAL VEGETATIVE COVER OR OTHER PERMANENT NON-VEGETATIVE COVER WITH A DENSITY SUFFICIENT TO RESIST ACCELERATED SURFACE EROSION AND SUBSURFACE CHARACTERISTICS SUFFICIENT TO RESIST SLIDING AND OTHER MOVEMENTS.

11. ONCE ACTIVITIES ARE COMPLETED AND ALL CONTRIBUTING AREAS ARE STABILIZED, MAINTAIN POST CONSTRUCTION STORMWATER MANAGEMENT (PCSM) BEST MANAGEMENT PRACTICE (BMP'S) DETAILED BY THE PCSM NOTES, AND DETAILS SHOWN ON THE E&SCP AND ALSO INCLUDED IN THE PCSM PLAN.

*NOTE: CONSTRUCTION ACTIVITIES MAY BE PERFORMED CONCURRENTLY OR ON PARALLEL PATHS WHERE APPROPRIATE, PROVIDED THAT ADEQUATE METHODS OF EROSION AND SEDIMENT CONTROL ARE IMPLEMENTED.

SEED MIX RECOMMENDATIONS: "NORTHERN ZONE"

GENERALLY DEFINED AS AREAS NORTH OF THE NORTHERN BORDERS OF ARKANSAS AND TENNESSEE.

UPLAND AREAS

LIME	4.0 TONS/ACRE
FERTILIZER	1000 LBS./ACRE (10-20-20)
MULCH (WHEAT STRAW)	3.0 TONS/ACRE

UPLAND SEED MIX	75 LBS./ACRE PURE LIVE SEED (PLS)
KENTUCKY BLUEGRASS	20%
RED FESCUE '	20%
KENTUCKY 31 TALL FESCUE '	15%
REDTOP	10%
PERENNIAL RYEGRASS	20%
WHITE CLOVER	5%
BIRDSFOOT TREFOIL (MINIMUM 20% HARD SEED)	10%

' FESCUE MUST BE ENDOPHYTE-FREE.

PASTURE MIX	20 LBS./ACRE PLS
(FOR USE ONLY IN DISTURBED PASTURE AREAS WITH LANDOWNER'S PERMISSION.)	
KENTUCKY BLUEGRASS	31%
MEDIUM RED CLOVER	26%
NORCEN TREFOIL	17%
POLY PERENNIAL RYE	26%

RECOMMENDED SEEDING DATES
(FOR THE ESTABLISHMENT OF TEMPORARY OR PERMANENT VEGETATION.)
SPRING: MARCH 15 - MAY 30
FALL: AUGUST 1 - OCTOBER 15

WINTER STABILIZATION

IF RESTORATION DOES NOT OCCUR PRIOR TO OCTOBER 15, SEED THE CONSTRUCTION ROW WITH 1.5 BUSHELS PER ACRE OF WINTER RYE OR SIMILAR VARIETY OF RYE AS REQUESTED BY THE LANDOWNER. MULCH THE CONSTRUCTION ROW AT 3.0 TONS PER ACRE WITH WHEAT STRAW, INCLUDING AREAS ADJACENT TO STREAMS AND WETLAND CROSSINGS. SEED SEGREGATED TOPSOIL PILES WITH WINTER RYE AND MULCH AT A RATE OF 3.0 TONS PER ACRE.

WETLAND AREAS DO NOT USE LIME OR FERTILIZER !!!

DO NOT USE FERTILIZER, LIME, OR MULCH WITHIN WETLANDS UNLESS REQUIRED IN WRITING BY THE APPROPRIATE FEDERAL OR STATE AGENCY (AS IDENTIFIED IN THE CLEARANCE PACKAGE/PERMIT BOOK). MULCH CONSISTS OF WEED-FREE STRAW, WOOD FIBER HYDROMULCH OR SOME FUNCTIONAL EQUIVALENT AS APPROVED BY THE EI AND CHIEF INSPECTOR. WHEN USED, APPLY MULCH (WHEAT STRAW) AT A RATE OF 3.0 TONS/ACRE.

WETLAND SEED MIX

ANNUAL RYEGRASS	40 LBS./ACRE PLS

COMPOST FILTER SOCK SIZING TABLE

FILTER SOCK ID	DRAWING NUMBER	SLOPE	UPSLOPE LENGTH	SOCK DIAMETER
		[%]	[FT]	[IN]
FS-1	DELM-P-8200	1%	270	12
FS-2	DELM-P-8200	1%	80	12
FS-3	DELM-P-8200	1%	160	12
FS-4	DELM-P-8200	1%	150	12
FS-5	DELM-P-8200	7%	80	12
FS-6	DELM-P-8201	23%	150	24
FS-7	DELM-P-8202	1%	170	12
FS-8	DELM-P-8202	2%	80	12

*SPACING BASED ON FIGURE 4.2 OF PA E&S CONTROL MANUAL, MARCH 2012

SILT FENCE SIZING TABLE

SILT FENCE ID	DRAWING NUMBER	SLOPE	UPSLOPE LENGTH	SILT FENCE TYPE	COMMENT
		[%]	[FT]		
SF-1	DELM-P-8200	2%	95	STANDARD	PERIMETER WORKSPACE BARRIER
SF-2	DELM-P-8200	2%	95	STANDARD	PERIMETER WORKSPACE BARRIER
SF-3	DELM-P-8201	2%	95	STANDARD	PERIMETER WORKSPACE BARRIER
SF-4	DELM-P-8201	7%	75	STANDARD	UPSLOPE AREA CONTROLLED WITH SLOPE BREAKER AND FILTERSOCK
SF-5	DELM-P-8201	2%	95	STANDARD	PERIMETER WORKSPACE BARRIER
SF-6	DELM-P-8201	5%	100	STANDARD	PERIMETER WORKSPACE BARRIER
	DELM-P-8202				
SF-7	DELM-P-8201	5%	100	STANDARD	PERIMETER WORKSPACE BARRIER
	DELM-P-8202				
SF-8	DELM-P-8202	9%	30	STANDARD	EDGE OF EXISTING GRAVEL ROAD
SF-9	DELM-P-8202	2%	120	STANDARD	
SF-10	DELM-P-8202	1%	95	STANDARD	
SF-11	DELM-P-8202	1%	60	STANDARD	
SF-12	DELM-P-8202	1%	100	STANDARD	UPDSLOPE AREA CONTROLLED WITH FILTERSOCK
SF-13	DELM-P-8202	5%	55	STANDARD	

*SPACING BASED ON FIGURE 4.4 OF PA E&S CONTROL MANUAL, MARCH 2012

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
BRANDON MICHAEL WALKER
ENGINEER
PE077056

07/23/20

DWG. NO.	DESCRIPTION	REV	DSN	CK	DESCRIPTION	ITEM NO.	MATERIALS	QTY
		1	LGF	RG	ISSUED FOR APPROVAL (07/23/2020)			
		0	LGF	RG	ISSUED FOR APPROVAL (05/15/2020)			

REFERENCE DRAWINGS | REVISIONS

audubon Field Solutions
10205 WESTHEIMER ROAD
SUITE 100
HOUSTON, TX 77042
PHONE: (281) 669-0590

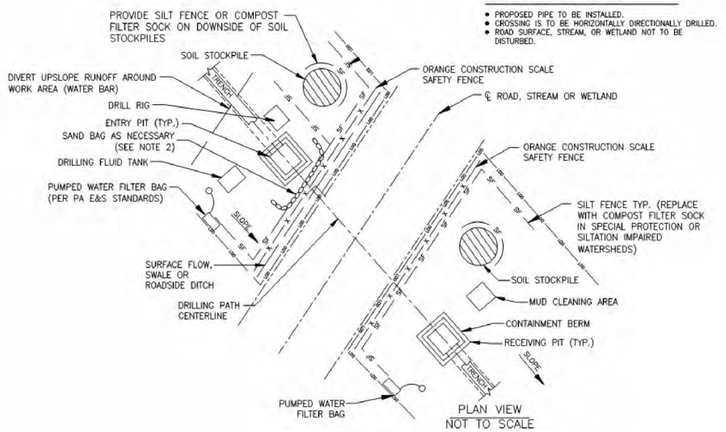
DRAWN BY	ENGINEERING APPROVALS BID		CONSTRUCTION	
LGF		04/29/20		
TITLE	SIGNATURE	DATE	SIGNATURE	DATE

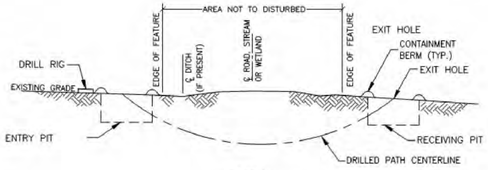
CONEMAUGH RIVER CROSSING PROJECT
DELMONT TO ARMAGH
PROPOSED 24-INCH LINE 12 HDD INSTALLATION
CONSTRUCTION SEQUENCE/SEEDING
LOC. WESTMORELAND & INDIANA COUNTY, PA

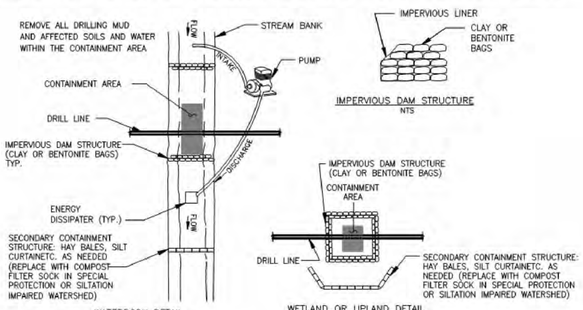
ENBRIDGE
Texas Eastern Transmission, LP
5400 Westheimer Ct. Houston , Tx 77056-5310 713 / 627-5400

YEAR: 2020 | W.B.S. | SCALE: N/A | DWG. DELM-P-8101 | REV. 1

S.F.







HORIZONTAL DIRECTIONAL DRILLING

CONSTRUCTION NOTES:

- PROPOSED PIPE TO BE INSTALLED.
- CROSSING IS TO BE HORIZONTALLY DIRECTIONALLY DRILLED.
- ROAD SURFACE, STREAM, OR WETLAND NOT TO BE DISTURBED.

HDD GENERAL NOTES:

1. TEMPORARY PIPE CULVERT 12" MINIMUM DIAMETER NOT REQUIRED IF SWALE/DITCH IS RESTORED THE SAME DAY THAT IT IS DISTURBED OR IF NO SWALE/DITCH IS PRESENT.
2. RUNOFF FROM ROADWAY DITCHES OR SURFACE FEATURES MUST BE DIVERTED AROUND ENTRY EXIT PITS (SAND BAG, DIKE, ETC.) OR OVER PITS (PIPE CULVERT WITH SAND BAGS TO CHANNELIZE FLOW).
3. INSTALL ROCK CONSTRUCTION ENTRANCES PER THE PLANS.
4. THE CONTRACTOR WILL AVOID PLACING BORE PITS WITHIN WETLANDS UNLESS ALL OTHER OPTIONS ARE EXHAUSTED. IF NO OTHER OPTION IS AVAILABLE THE BORE PITS WILL BE PERMITTED AS DISTURBANCE AND WETLAND IMPACTS UNDER CHAPTER 102 AND 105. ALL STOCKPILES, MUD CLEANING AREAS, AND OTHER WORK NOT REQUIRED WITHIN THE BORE PIT VICINITY WILL BE LOCATED AT LEAST 10 FEET AWAY FROM ALL WETLANDS.

① HDD

CONTINGENCY PLAN DETAILS FOR WATERBODY, WETLAND, & UPLAND INADVERTENT RETURNS

② CONTINGENCY PLAN DETAILS

PIPELINE HDD PROCEDURE

THE CONSTRUCTION OF THE PROJECT WILL INVOLVE THE USE OF THE HORIZONTAL DIRECTIONAL DRILLING ("HDD") INSTALLATION TECHNIQUE FOR AVOIDING ENVIRONMENTALLY SENSITIVE RESOURCES OR OBSTRUCTIONS THAT OCCUR ALONG THE PROJECT PIPELINE ROUTE. THIS BEST DRILLING PRACTICE PLAN ("PLAN") HAS BEEN DEVELOPED TO MINIMIZE OR QUICKLY RESOLVE POSSIBLE INADVERTENT EFFECTS BY IDENTIFYING APPROPRIATE CORRECTIVE ACTIONS FOR VARIOUS POTENTIAL SCENARIOS THAT MAY BE ENCOUNTERED DURING HDD OPERATIONS. THE PURPOSE OF THIS DOCUMENT IS TO PROVIDE A DESCRIPTION OF PROPOSED HDD WORK ACTIVITIES, THE HDD WORKING PROCEDURES, AND MONITORING FOR INADVERTENT RETURNS DURING HDD ACTIVITIES ON THE PROJECT. THE FOLLOWING SECTIONS OF THIS PLAN PROVIDE THE PROCESSES TO BE IMPLEMENTED IN THE CASE OF INADVERTENT RETURNS OR RETURNS OF DRILLING FLUID DURING HDD ACTIVITIES.

DESCRIPTION OF WORK

THE HDD METHOD REQUIRES ESTABLISHING STAGING AREAS AT BOTH ENDS OF THE PROPOSED CROSSING, TYPICALLY KNOWN AS THE ENTRY AND EXIT POINTS, OR WORKSPACES. THE PROCESS COMMENCES WITH THE DRILLING OF A PILOT HOLE ALONG A PREDETERMINED PATH BENEATH THE OBSTRUCTION, WETLAND OR WATERBODY. ONCE THE PILOT HOLE HAS BEEN COMPLETED, THE DRILLED HOLE IS ENLARGED WITH ONE OR MORE PASSES OF A REAMER UNTIL THE DIAMETER OF THE HOLE IS ADEQUATE TO COMPLETE THE PULL–BACK (INSTALLATION) OF THE PIPELINE. ONCE THE REAMING PASS(S) ARE COMPLETED, PREFABRICATED PIPE SEGMENTS ARE THEN PULLED THROUGH THE HOLE TO COMPLETE THE INSTALLATION. ADDITIONAL WELDING TO JOIN THE PREFABRICATED SEGMENTS MAY BE REQUIRED DURING THE PULLBACK PROCESS. WHILE THE HDD METHOD IS A COMMONLY USED, PROVEN TECHNOLOGY, THERE IS THE POTENTIAL FOR UNINTENDED EFFECTS THAT COULD OCCUR AS A RESULT OF THE DRILLING.

DRILLING FLUIDS

THE HDD PROCESS USES ENGINEERED DRILLING FLUIDS TO FACILITATE MANY OF THE HDD OPERATIONS. DRILLING FLUID IS A SLURRY COMPOSED PRIMARILY OF WATER AND BENTONITE CLAY (TYPICALLY 95 PERCENT WATER). BENTONITE (SODIUM MONTMORILLONITE) IS NATURALLY OCCURRING CLAY, USUALLY MINED IN WYOMING, WHICH IS EXTREMELY HYDROPHILIC AND CAN ABSORB UP TO TEN TIMES ITS WEIGHT IN WATER. BENTONITE IS NOT CONSIDERED A HAZARDOUS MATERIAL, AS DEFINED BY THE ENVIRONMENTAL PROTECTION AGENCY. IT IS NON–TOXIC TO THE AQUATIC ENVIRONMENT. THE COMPOSITION OF THE DRILLING FLUIDS AND ITS ENGINEERING PROPERTIES ARE TESTED TO ENSURE THEIR SUITABILITY FOR THE GIVEN SUBSURFACE CONDITIONS ENCOUNTERED ALONG THE ALIGNMENT AND AT EACH INDIVIDUAL HDD LOCATION.

THE SLURRY IS DESIGNED TO:

- STABILIZE THE HOLE AGAINST COLLAPSE;
- LUBRICATE, COOL, AND CLEAN THE CUTTERS;
- TRANSPORT CUTTINGS BY SUSPENSION AND FLOW TO ENTRY AND EXIT POINTS; AND REDUCE SOIL FRICTION AND REQUIRED PULL LOADS DURING PILOT HOLE, REAMING, AND CARRIER PIPE INSTALLATION.

DEPENDING ON SUBSURFACE CONDITIONS ENCOUNTERED, CERTAIN LOST CIRCULATION MATERIALS (LCMS) AND SPECIAL POLYMERS MAY ALSO BE INTRODUCED IN THE DRILLING FLUID MIXTURE. LOST CIRCULATION MATERIALS MAY BE USED DURING INADVERTENT RETURN EVENTS AND/OR IN CERTAIN CASES WHEN DRILLING FLUID CIRCULATION SEEMS TO BE DIMINISHING. IN THE EVENT THAT EXISTING FLOW PATHS (FAULTS, FRACTURES, VOIDS, ETC.) INTERSECT THE HDD PATH, LCMS MAY BE USED IN AN ATTEMPT TO SEAL AROUND THE BOREHOLE AND PREVENT DRILLING FLUID FROM ESCAPING INTO THE FORMATION AND ALLOW FOR THE REESTABLISHMENT OF DRILLING FLUID RETURNS TO THE ENTRY AND/OR EXIT PITS. MANY TYPES OF LCMS ARE AVAILABLE FOR USE DURING HDD OPERATIONS THAT ARE INERT AND ENVIRONMENTALLY BENIGN.

ENBRIDGE IS IN THE EARLY PHASES OF SELECTING PIPELINE AND HDD CONSTRUCTION CONTRACTORS. THEREFORE, AT THIS TIME, ENBRIDGE IS UNABLE TO IDENTIFY THE SPECIFIC LCMS AND POLYMERS THAT MAY BE USED ON THE PROJECT. FOR EXAMPLE, DRILLING FLUID ADDITIVES THAT MAY BE USED IN CLAY WILL NOT LIKELY BE BENEFICIAL IN ROCK. CONSIDERATION IS ALSO GIVEN TO THE VARYING GEOLOGICAL FORMATION THE PROJECT TRAVERSE.

AFTER HDD CONTRACTOR SELECTION IS COMPLETED AND PRIOR TO THE START OF CONSTRUCTION, THE HDD CONTRACTORS WILL BE REQUIRED TO SUBMIT A LIST OF DRILLING FLUID ADDITIVES (E.G., POLYMERS, LCM, ETC.) PROPOSED FOR USE ON THE PROJECT TO ENBRIDGE FOR REVIEW AND APPROVAL. ENBRIDGE WILL EVALUATE THE CONTRACTOR'S LIST OF PROPOSED POLYMERS, DETERMINE WHICH OF THE PROPOSED PRODUCTS WILL BE AUTHORIZED FOR PROJECT USE AND PROVIDE THAT LIST TO REGULATORY AUTHORITIES STAFF. ENBRIDGE WILL INITIALLY DETERMINE THE PRODUCTS TO BE AUTHORIZED FOR PROJECT USE BASED ON COMPLIANCE WITH NSF 60 STANDARDS. NSF 60 IS A STANDARD THAT ESTABLISHES HEALTH AND SAFETY CRITERIA FOR THE CHEMICAL TREATMENT OF DRINKING WATER AND CONSEQUENTLY, DRINKING WATER WELL DEVELOPMENT ("NSF/ANSI STANDARD 60"). IN ADDITION TO NSF 60 CRITERIA, ANY OTHER APPLICABLE FEDERAL OR STATE REQUIREMENTS WILL ALSO BE CONSIDERED DURING THE REVIEW PROCESS. AFTER THIS PROCESS HAS BEEN COMPLETED, ENBRIDGE WILL SUBMIT TO REGULATORY AUTHORITIES A LIST OF SPECIFIC ADDITIVES PLANNED TO BE USED ON THE PROJECT.

IN LIEU OF SPECIFIC POLYMER IDENTIFICATION, AT THIS TIME, ENBRIDGE OFFERS THE FOLLOWING INFORMATION ON CATEGORIES OF POLYMERS THAT MAY BE USED DURING HDD OPERATIONS:

- BOREHOLE STABILIZERS/VISCOSIFERS: POLYMERS USED TO INCREASE VISCOSITY AND GEL STRENGTH OF WATER/BENTONITE DRILLING FLUIDS.
- LOST CIRCULATION MATERIALS: CAN BE POLYMERS BUT SOMETIMES OTHER BIO–DEGRADABLE MATERIALS ARE USED AS LCMS (I.E. WALNUT SHELLS, PAPER ETC.)

MOST DRILLING FLUIDS, DRILLING FLUID ADDITIVES AND POLYMERS USED IN THE HDD INDUSTRY ARE NSF 60 COMPLIANT, AS THESE PRODUCTS ARE USED THERE WILL BE NO EFFECTS ON WATER QUALITY.

HDD WORKING PROCEDURES

PRIOR TO STARTING ANY HDD DRILLING THE HI AND EI WILL VERIFY THAT ALL ENVIRONMENTAL CONTROLS ARE IN PLACE.

THERE WILL BE THE POTENTIAL FOR INADVERTENT RETURNS OR LOSS OF DRILLING FLUIDS FROM THE BORED HOLE. HOWEVER, DRILLING FLUIDS THAT ARE RETURNED WILL LIKELY CONTAIN A LOWER CONCENTRATION OF BENTONITE WHEN THEY SURFACE BECAUSE THAT MIXTURE MAY BE FILTERED AND SOMEWHAT DILUTED AS IT PASSES THROUGH EXISTING SEDIMENTS OF VARIOUS TYPES.

INADVERTENT RETURNS MAY OCCUR AS A RESULT OF ROCK FRACTURES, LOW DENSITY/LOW STRENGTH SOILS, AND UNCONSOLIDATED GEOLOGY, WHICH WERE NOT FORESEEN DURING THE DESIGN PHASE. INADVERTENT RETURNS ARE READILY DETECTED AT THE SURFACE AS SEEPAGE (POOLING OF DRILLING MUD AT THE SURFACE) OR A LOSS OF CIRCULATION OF THE DRILLING FLUID. WHEN THE OPERATOR OBSERVES A LOSS OF DRILLING FLUID RETURNING, IT IS AN INDICATOR THAT SEEPAGE MAY BE OCCURRING. PRIOR TO THE START OF DRILLING OPERATIONS, SITE–SPECIFIC HDD PROCEDURES WILL BE REVIEWED WITH THE HDD CONTRACTOR. AT A MINIMUM, THE HDD PROCEDURES WILL ADDRESS THE FOLLOWING:

MONITORING ANNULAR PRESSURE

INADVERTENT RETURNS MAY OCCUR WHEN THE PRESSURE OF THE DRILLING FLUID IN THE BORED HOLE EXCEEDS THE LIMITING STRENGTH OF THE SOILS. EACH PILOT HOLE WILL INCORPORATE "PRESSURE WHILE DRILLING" (PWD) INSTRUMENTATION. THE PWD TOOL MEASURES THE FLUID PRESSURE NEAR THE DRILL BIT. PRESSURES MAY INCREASE WHEN THERE IS AN OBSTRUCTION TO ANNULAR FLOW SOMEWHERE BETWEEN THE BIT AND THE ENTRY AT GROUND SURFACE. IF PRESSURES RISE OR SPIKE, THE DRILLER CAN INITIATE REMEDIAL ACTIONS (SEE BELOW) PRIOR TO SEEING ANY INADVERTENT RETURN AT THE SURFACE.

RETURN CIRCULATION

ONCE IT IS INDICATED TO THE DRILLER THAT DRILLING FLUID CIRCULATION IS DISSIPATING OR THAT A RETURN HAS OCCURRED, THE DRILLER HAS THE FOLLOWING OPTIONS (OR ANY COMBINATION OF THESE OPTIONS):

- DECREASE PUMP PRESSURE;
- DECREASE PENETRATION RATE;
- RETRACT THE DRILL STRING A DISTANCE TO RESTORE CIRCULATION ("SWAB" THE HOLE);
- INTRODUCE ADDITIONAL DRILLING FLUID FLOW ALONG THE HOLE USING "WEEPER" SUBS; AND
- INTRODUCE LOST CIRCULATION ADDITIVES TO THE DRILLED HOLE.

INADVERTENT RETURNS AT ACCESSIBLE LOCATIONS

IF INADVERTENT RETURNS ARE OBSERVED ON THE GROUND SURFACE ALONG PORTIONS IN THE ALIGNMENT THAT ARE ACCESSIBLE, CONTAINMENT AND RECOVERY OPERATIONS WILL BE COMPLETED IN ACCORDANCE WITH THE PROCEDURES DISCUSSED IN THIS PLAN. ONCE THE INADVERTENT RETURN IS CONTAINED, DRILLING OPERATION WILL RESUME.

INADVERTENT RETURNS AT IN–ACCESSIBLE LOCATIONS

IF INADVERTENT RETURNS ARE OBSERVED ON THE GROUND SURFACE ALONG PORTIONS OF THE ALIGNMENT THAT ARE INACCESSIBLE; THE FOLLOWING PROCEDURES WILL BE FOLLOWED:

- CONTRACTOR WILL ENSURE ALL REASONABLE MEASURES WITHIN THE LIMITATIONS OF CURRENT TECHNOLOGY HAVE BEEN TAKEN TO RE–ESTABLISH CIRCULATION; AND
- CONTINUE DRILLING UTILIZING A MINIMAL AMOUNT OF DRILLING FLUID AS REQUIRED TO PENETRATE THE FORMATION OR TO MAINTAIN A SUCCESSFUL CARRIER PIPE PULL BACK.

MONITORING AND REPORTING OF INADVERTENT RETURNS

THE ACTIONS IN THIS PLAN ARE TO BE IMPLEMENTED BY THE FOLLOWING PERSONNEL:

HDD INSPECTOR

ENBRIDGE WILL DESIGNATE A HDD INSPECTOR (HI) FOR THE PROJECT. THE HI WILL HAVE OVERALL AUTHORITY FOR CONSTRUCTION ACTIVITIES THAT OCCUR ON THEIR DESIGNATED HDD OF THE PROJECT. THE HDD INSPECTORS WILL REPORT TO A CHEF INSPECTOR (CI) THAT IS IN CHARGE OF THE OVERALL PROJECT. THE HI HAS THE TOTAL RESPONSIBILITY TO VERIFY THAT ALL HDD PROCEDURES ARE FOLLOWED. IF ANY HDD PROCEDURE IS NOT BEING FOLLOWED THE HDD WILL BE STOPPED AND THE CI WILL BE NOTIFIED. THE PROCEDURE WILL BE REVIEWED AGAIN WITH THE HDD CONTRACTORS MANAGEMENT TEAM TO MAKE SURE THAT ALL PROCEDURES ARE BEING FOLLOWED.

ENVIRONMENTAL INSPECTOR

ONE ENVIRONMENTAL INSPECTOR (EI) WILL BE DESIGNATED BY ENBRIDGE TO EACH SPREAD. THE EI WILL HAVE PEER STATUS WITH ALL OTHER CRAFT INSPECTORS AND WILL REPORT DIRECTLY TO THE CI WHO HAS OVERALL AUTHORITY. THE EI, ALONG WITH ALL OTHER INSPECTORS AND INSPECTION PERSONNEL, WILL HAVE THE AUTHORITY TO STOP ACTIVITIES THAT VIOLATE THE ENVIRONMENTAL CONDITIONS OF THE REGULATORY AUTHORITIES CERTIFICATE (IF APPLICABLE), OTHER FEDERAL AND STATE PERMITS, OR LANDOWNER REQUIREMENTS AND TO ORDER CORRECTIVE ACTION.

HDD SUPERINTENDENT

THE HDD SUPERINTENDENT IS THE SENIOR ON–SITE REPRESENTATIVE OF THE HDD CONTRACTOR. THE HDD SUPERINTENDENT HAS OVERALL RESPONSIBILITY FOR IMPLEMENTING THIS PLAN ON BEHALF OF THE HDD CONTRACTOR. THE HDD SUPERINTENDENT WILL BE FAMILIAR WITH THE ASPECTS OF THE DRILLING ACTIVITY, THE CONTENTS OF THE PLAN AND THE CONDITIONS OF APPROVAL UNDER WHICH THE ACTIVITY IS PERMITTED TO TAKE PLACE. THE HDD SUPERINTENDENT WILL MAKE AVAILABLE A COPY OF THIS PLAN AND THE CONDITIONS OF APPROVAL UNDER WHICH THE ACTIVITY IS PERMITTED TO TAKE PLACE. THE HDD SUPERINTENDENT WILL MAKE AVAILABLE A COPY OF THIS PLAN TO THE APPROPRIATE CONSTRUCTION PERSONNEL. THE HDD SUPERINTENDENT WILL ENSURE THAT WORKERS ARE PROPERLY TRAINED AND FAMILIAR WITH THE NECESSARY PROCEDURES FOR RESPONSE TO AN INADVERTENT RETURN.

HDD OPERATOR

THE HDD OPERATOR IS THE HDD CONTRACTOR'S DRILLER OPERATING THE DRILLING RIG AND MUD PUMPS. THE HDD OPERATOR IS RESPONSIBLE FOR MONITORING CIRCULATION BACK TO THE ENTRY AND EXIT LOCATIONS. IN THE EVENT OF LOSS OF CIRCULATION, THE HDD OPERATOR MUST COMMUNICATE THE EVENT TO THE HDD SUPERINTENDENT AND HDD CONTRACTOR FIELD CREWS. THE HDD OPERATOR IS RESPONSIBLE FOR STOPPAGE OR CHANGES TO THE DRILLING PROGRAM IN THE EVENT OF OBSERVED INADVERTENT RETURNS.

HDD CONTRACTOR PERSONNEL

DURING HDD INSTALLATION, FIELD CREWS WILL BE RESPONSIBLE FOR MONITORING THE HDD ALIGNMENT ALONG WITH ENBRIDGE'S FIELD REPRESENTATIVE(S). FIELD CREWS, IN COORDINATION WITH THE EI, ARE RESPONSIBLE FOR TIMELY NOTIFICATIONS AND RESPONSES TO OBSERVED RETURNS TO THE CI AND APPROPRIATE AGENCIES, IN ACCORDANCE WITH THIS PLAN. THE EI AND CI ULTIMATELY MUST APPROVE THE ACTION PLAN FOR MITIGATING THE RETURN. THE HDD CONTRACTOR WILL HAVE PERSONNEL THAT IS ASSIGNED TO MONITOR THE HDD PATH. THEIR RESPONSIBILITY IS TO MONITOR THE HDD PATH DURING THE HDD PROCESS UNTIL THE PIPE IS PULLED INTO THE HDD HOLE. THERE WILL BE GOOD RADIO COMMUNICATION WITH THE HDD OPERATOR AND THE GROUND PERSONNEL ON THE HDD PATH. IF ANY INADVERTENT RELEASES IS DISCOVERED THE HDD WILL BE STOPPED UNTIL THE RELEASE IS CONTAINED AND ENBRIDGE GIVES THE HDD CONTRACTOR PERMISSION TO START THE HDD PROCESS WORK AGAIN.

TRAINING

PRIOR TO DRILLING, THE HDD SUPERINTENDENT, HI, AND THE EI WILL VERIFY THAT THE HDD OPERATOR AND FIELD CREW RECEIVE THE FOLLOWING SITE–SPECIFIC TRAINING, BUT NOT LIMITED TO:

- PRIOR TO THE START OF THE HDD EACH PERSON INVOLVED WITH THE HDD WILL BE REQUIRED TO GO THROUGH TRAINING, THIS TRAINING WILL DISCUSS THE HDD PROCEDURES INCLUDING ANY INADVERTENT RETURNS REPORTING;
- PROJECT SPECIFIC SAFETY AND ENVIRONMENTAL TRAINING;
- REVIEW PROVISION OF THIS PLAN AND SITE–SPECIFIC PERMIT REQUIREMENTS;
- REVIEW LOCATION OF SENSITIVE ENVIRONMENTAL RESOURCES AT THE SITE;
- REVIEW DRILLING PROCEDURES FOR RETURN PREVENTION;
- REVIEW THE SITE–SPECIFIC MONITORING REQUIREMENTS;
- REVIEW THE LOCATION AND OPERATION OF RETURN CONTROL EQUIPMENT AND MATERIAL; AND
- REVIEW PROTOCOLS FOR REPORTING OBSERVED INADVERTENT RETURNS.

MONITORING & REPORTING

THE HDD ALIGNMENT WILL BE "WALKED" AND OBSERVED FOR INADVERTENT RETURNS AT LEAST FOUR TIMES PER SHIFT. EACH INSPECTION WILL BE NOTED IN THE HDD CONTRACTOR'S DAILY REPORT AND THE ENBRIDGE CHECK LIST. THIS PROCESS WILL BE EVALUATED FOR EACH DRILL. SOME HDD WILL REQUIRE MORE WALKED AND OBSERVED PROCESS. THE TIMING FOR THE INSPECTION WALKS WILL BE AGREED TO BY THE HDD CONTRACTOR AND ENBRIDGE HI BEFORE THE HDD STARTS. THE TIMING WILL BE RECORDED IN BOTH THE DAILY LOGS FOR BOTH HDD CONTRACTOR AND ENBRIDGE HI.

IF THE HDD OPERATOR OBSERVES A LOSS OF CIRCULATION, THE OPERATOR WILL NOTIFY THE HDD SUPERINTENDENT, HI AND FIELD CREWS OF THE EVENT AND APPROXIMATE POSITION OF THE CUTTING HEAD. WHERE PRACTICAL, A MEMBER OF THE FIELD CREW WILL VISUALLY INSPECT THE GROUND SURFACE NEAR THE POSITION OF THE CUTTING HEAD, SURFACE WATER, WELLS, AND MAPPED SPRINGS WITHIN 2,000 FEET OF THE HDD SITE WILL ALSO BE VISUALLY INSPECTED.

TYPICALLY, INADVERTENT RETURNS ARE MOST OFTEN DETECTED IN THE AREA NEAR THE ENTRY OR EXIT POINTS (APPROXIMATELY 200–FEET) OF THE DRILL ALIGNMENT WHERE THE HDD PATH IS AT SHALLOW DEPTHS, ABOVE BEDROCK, AND IN PERMEABLE/POROUS SOILS. IN THESE OCCURRENCES THE HDD SUPERINTENDENT, EI, AND CI WILL DETERMINE AN ESTIMATED VOLUME AND THE BEST METHODS FOR CONTAINMENT.

IF AN INADVERTENT RETURN IS OBSERVED SOMEWHERE BEYOND:

- FIELD CREW WILL NOTIFY (VIA HAND–HELD RADIO OR CELL PHONE) THE HDD OPERATOR AND CI.
- THE HDD OPERATOR WILL TEMPORARILY CEASE PUMPING OF THE DRILLING FLUID AND NOTIFY THE HDD SUPERINTENDENT AND CI. THE HDD SUPERINTENDENT WILL ASSESS THE DRILLING PARAMETERS (DEPTH, TYPE OF FORMATION, FLUID FLOW RATE, AND DRILLING FLUID CHARACTERISTICS) AND PROPOSE APPROPRIATE CHANGES.
- THE HI WILL NOTIFY AND COORDINATE A RESPONSE WITH THE EI. THEY WILL ALSO ASSESS THE POTENTIAL OF THE RETURN TO REACH ADJACENT WATERBODIES, WETLANDS, OR OTHER TYPES OF INFRASTRUCTURE (E.G., WELLS).
- THE EI, IN COORDINATION WITH THE HDD SUPERINTENDENT AND HI WILL DETERMINE WHEN DRILLING OPERATIONS CAN RESUME. THE DRILLING PROCESS WILL NOT BE ALLOWED TO RESUME UNTIL AN ENBRIDGE REPRESENTATIVE APPROVES THE HDD DRILLING TO RESUME.
- THE ENBRIDGE REPRESENTATIVE WILL NOTIFY REGULATORY AUTHORITIES AND THE APPROPRIATE PERMITTING AUTHORITIES AS NECESSARY OF THE EVENT AND PROPOSED RESPONSE AND PROVIDE REQUIRED DOCUMENTATION WITHIN 24 HOURS.
- THE CI WILL PREPARE A REPORT THAT SUMMARIZES THE INCIDENT.

RESPONSE TO INADVERTENT RETURNS

THE HDD SUPERINTENDENT, EI, AND HI WILL COORDINATE INSTALLATION OF APPROPRIATE CONTAINMENT STRUCTURES. SITE TOPOGRAPHY IN CONJUNCTION WITH ACCESS FOR PERSONNEL AND EQUIPMENT TO THE RETURN SITE ARE MAJOR FACTORS IN DETERMINING THE METHODS USED FOR CONTAINMENT AND DISPOSAL. TYPICALLY, CONTAINMENT IS ACHIEVED BY EXCAVATING A SMALL SUMP PIT (APPROXIMATELY 5–CUBIC YARDS) AT THE SITE OF THE RETURN AND/OR SURROUNDING THE RETURN WITH FILTER SOCK AND/OR SAND BAGS. ONCE CONTAINED, THE DRILLING FLUID IS EITHER TRANSPORTED BACK TO THE HDD DRILLING RIG OR TO A DISPOSAL SITE.

THE HDD CONTRACTOR WILL HAVE ON–SITE, PRIOR TO THE DRILLING, AN APPROPRIATE INVENTORY OF MATERIALS AND EQUIPMENT TO CONTAIN INADVERTENT RETURNS. THIS EQUIPMENT WILL BE ON STAND BY FOR THE ENTIRETY OF THE DRILLING PROCESS. THE MATERIAL AND EQUIPMENT WILL INCLUDE, BUT NOT BE LIMITED TO:

- COMPOST FILTER SOCK (12–INCH TO 36–INCH IN ADDITION TO THE PERIMETER CONTROLS SHOWN ON THE DRAWINGS)
- SAND BAGS
- HAND TOOLS (SHOVELS, RAKES, ETC.)
- PUMPS AND HOSES (THREE, 3–INCH TRASH PUMPS WITH 300 FEET OF DISCHARGE HOSES AT EACH HDD LOCATION)
- PUMPED WATER FILTER BAGS
- VACUUM TRUCK(S) (60 BBL OR GREATER CAPACITY)
- BACKHOE
- EQUIPMENT MATS
- AQUA BARRIERS/TURBIDITY CURTAINS
- PERMANENT SEEDING RESTORATION (PER E&S PLAN)

THE SITE–SPECIFIC RESPONSE WILL FOLLOW THE GUIDELINES PROVIDED IN THE FOLLOWING SECTIONS.

UPLAND LOCATIONS

- EVALUATE THE AMOUNT OF RETURNS TO DETERMINE IF CONTAINMENT STRUCTURES ARE WARRANTED AND IF THEY WILL EFFECTIVELY CONTAIN THE RETURN.
- PROMPTLY IMPLEMENT APPROPRIATE CONTAINMENT MEASURES AS NEEDED TO CONTAIN AND RECOVER THE SLURRY.
- IF THE RETURN IS WITHIN 100–FEET OF A WETLAND OR WATERBODY, COMPOST FILTER SOCK WILL BE INSTALLED BETWEEN THE RETURN SITE AND THE WETLAND OR WATERBODY.
- IF THE RETURN CANNOT BE CONTAINED, THEN THE OPERATOR MUST SUSPEND DRILLING OPERATIONS UNTIL APPROPRIATE CONTAINMENT IS IN PLACE.
- REMOVE THE FLUIDS USING EITHER A VACUUM TRUCK OR BY PUMPING TO A LOCATION WHERE A VACUUM TRUCK IS ACCESSIBLE.
- RESTORE UPLAND AREA WITH PERMANENT SEEDING, MULCH AND SOIL SUPPLEMENTS PER THE APPROVED E&SCP.

WETLAND AND MINOR WATERBODY LOCATIONS

- EVALUATE THE AMOUNT OF RETURN TO DETERMINE IF CONTAINMENT STRUCTURES ARE WARRANTED AND IF THEY WILL EFFECTIVELY CONTAIN THE RETURN.
- PROMPTLY IMPLEMENT APPROPRIATE CONTAINMENT MEASURES TO CONTAIN AND RECOVER THE SLURRY, EFFORTS TO CONTAIN AND RECOVER SLURRY IN WETLANDS OR STREAM MAY RESULT IN FURTHER DISTURBANCE BY EQUIPMENT AND PERSONNEL, AND POSSIBLY OFFSET THE BENEFIT GAINED IN REMOVING THE SLURRY.
- IF THE RETURN CANNOT BE CONTROLLED OR CONTAINED, IMMEDIATELY SUSPEND DRILLING OPERATIONS UNTIL APPROPRIATE CONTROLS CAN BE IMPLEMENTED AND THE ASSESSMENT OF THE IMPACT TO THE WETLAND IS COMPLETED BY THE EI AND THE GOVERNING AGENCY. DRILLING MAY COMMENCE WHEN APPROVED MEASURES ARE IN PLACE AND INSPECTED BY THE EI. THE ENBRIDGE CONSTRUCTION MANAGER MUST APPROVE THE HDD DRILLING TO RESUME.

MAJOR WATERBODY LOCATIONS

ENBRIDGE'S PROPOSED HDD IS BEING DESIGNED TO MINIMIZE THE POTENTIAL FOR INADVERTENT RETURNS. ENBRIDGE'S CONTRACTOR(S) MAY ALSO EMPLOY THE TECHNIQUES DESCRIBED BELOW TO REDUCE THE POSSIBILITY OF INADVERTENT RETURNS.

SURFACE CASING

IF DEEMED NECESSARY, SURFACE CASING MAY BE INSTALLED IN CERTAIN INSTANCES. SURFACE CASING PROVIDES A CONDUIT TO ALOW DRILLING FLUIDS TO RETURN FROM THE DRILL PATH BACK TO THE SURFACE. ADDITIONALLY, SURFACE CASING HELPS ISOLATE THE DRILL PATH FROM THE REGIONS OF UNSTABLE OVERBURDEN MATERIAL.

INTERSECT METHOD

ENBRIDGE'S CONTRACTOR'(S) MAY DRILL SOME OF THE PILOT HOLES FROM BOTH SIDES OF THE CROSSING AND PERFORM AN INTERSECT NEAR A PREDETERMINED POINT, USUALLY NEAR THE MIDDLE OF THE CROSSING. THE INTERSECT METHOD IS WIDELY USED IN LONG, LARGE DIAMETER HDDS. THE INTERSECT METHOD REDUCES THE LENGTH THAT MUST BE DRILLED FROM EACH END AND THEREBY DECREASES THE DISTANCE THAT DRILLING FLUIDS NEED TO BE PUMPED IN ORDER TO RETURN TO SURFACE AT THE ENTRY/EXIT POINTS. UTILIZATION OF THIS METHOD IS PARTICULARLY ADVANTAGEOUS IN LONGER CROSSINGS BECAUSE THE REDUCED DISTANCE THAT DRILLING FLUID MUST BE PUMPED SUBSEQUENTLY DECREASES THE FLUID PRESSURE REQUIRED FOR THE DRILLING FLUID TO TRAVEL BACK TO THE ENTRY/EXIT POINTS

IN THE EVENT OF AN INADVERTENT RETURN IN A FLOWING WATERDODY, THE FOLLOWING APPROACH WILL GENERALLY BE FOLLOWED AFTER THE INADVERTENT RETURN HAS BEEN ISOLATED AND THE FLOW HAS STOPPED. DUE TO THE UNPREDICTABLE NATURE OF THE LOCATIONS AND ENVIRONMENT IN WHICH INADVERTENT RETURNS MAY APPEAR, THE DESCRIPTION CANNOT ENCOMPASS ALL POSSIBLE APPROACHES TO CLEAN–UP UNDER ALL CONDITIONS. AGENCY STAFF AND OTHER EXPERTS WILL BE CONSULTED TO EXTENT PRACTICABLE IN THE DEVELOPMENT OF REMEDIAL CLEAN–UP TECHNIQUES, AS REQUIRED.

THE FOLLOWING ARE STANDARD RESPONSE TECHNIQUES THAT MAY BE APPLIED:

- IF THE BENTONITE MATERIAL FLOWS OVERLAND PRIOR TO ENTERING THE WATERBODY, INSTALLATION OF COMPOST FILTER SOCK OR SANDBAG DAMS AT THE POINT OF ENTRY WILL BE USED TO REDUCE OR STOP THE FLOW; IF THE VENT IS DIRECTLY INTO THE WATERBODY, OTHER MEANS TO ISOLATE THE VENT SITE FROM THE FLOWING WATERBODY WILL BE USED.
- USING A VACUUM TRUCK OR PUMP(S), WITH A SUFFICIENT HOSE, PERSONNEL WILL REMOVE THE BENTONITE, WORKING FROM DOWNSTREAM TO UPSTREAM, TO ALLOW MAXIMUM VISIBILITY. HAND TOOLS MAY BE USED TO SCARIFY THE SEDIMENTS AND ENSURE REMOVAL TO THE MAXIMUM EXTENT PRACTICABLE.
- IF PUMPS ARE USED, DISCHARGED WATER SHALL BE TO AN IMPERMEABLE STRUCTURE OR TO FILTERING DEVICES SUCH AS A COMPOST FILTER SOCK SUMP OR PUMPED WATER FILTER BAGS.
- IF NECESSARY, WATER MAY BE DIVERTED USING TEMPORARY BARRIERS TO ISOLATE THE IMPACT AREA. ONLY A PORTION OF THE STREAM WILL BE DIVERTED TO MINIMIZE DEWATERING IMPACTS. WATER WILL BE ABLE TO PASS THROUGH THE SITE IN ITS NATURAL CONDITION.
- IF IT IS IMPRACTABLE TO REMOVE THE DRILL FLUID FROM THE SURFACE WATER, A CLEAR WRITTEN EXPLANATION WILL BE SUBMITTED TO THE APPLICABLE REGULATORY AGENCIES.
- ANY DISTURBED SOILS WILL BE STABILIZED IMMEDIATELY WITH EROSION CONTROL MATTING, SEEDING AND SOIL SUPPLEMENTS, OR RIPRAP, DEPENDING ON THE SITE CONDITIONS.
- EXPOSED SOILS WILL HAVE TEMPORARY EROSION CONTROL MEASURE ESTABLISHED AS SOON AS PRACTICAL WITH PERMANENT EROSION CONTROLS ESTABLISHED AS SOON AS POSSIBLE AS DESCRIBED IN THE PROJECT E&SCP.
- DISTURBANCE OF VEGETATION WILL BE KEPT TO MINIMUM AND ALL DISTURBED VEGETATION WILL BE RESTORED.

BRANDON MICHAEL WALKER
PE077056
07/23/20

DWG. NO.	DESCRIPTION	REV	DSN	CK	DESCRIPTION	ITEM NO.	MATERIALS	QTY
		0	SNC	RG	ISSUED FOR APPROVAL (05/28/2020)			
REFERENCE DRAWINGS		REVISIONS						

audubon
Field Solutions
10205 WESTHEIMER ROAD
SUITE 100
HOUSTON, TX 77042
PHONE: (281) 669–0590

ENGINEERING APPROVALS

DRAWN BY	BID		CONSTRUCTION	
LGF		04/29/20		
TITLE	SIGNATURE	DATE	SIGNATURE	DATE

CONEMAUGH RIVER CROSSING PROJECT
DELMONT TO ARMAGH
PROPOSED 24–INCH LINE 12 HDD INSTALLATION
EROSION AND SEDIMENT CONTROL HDD PROCEDURE NOTES

LOC. WESTMORELAND & INDIANA COUNTY, PA

ENBRIDGE
Texas Eastern Transmission, LP
5400 Westheimer Ct. Houston , Tx 77056-5310 713 / 627-5400

YEAR: 2020 | W.B.S. | SCALE: N/A | DWG. DELM–P–8102 | REV. 0

PIPELINE HDD PROCEDURE (CONTINUED)

CLEAN UP

AFTER COMPLETION OF THE HDD INSTALLATION, THE CI AND THE HDD SUPERINTENDENT WILL DEVELOP SITE-SPECIFIC CLEAN-UP MEASURES FOR APPROVAL BY THE EI. POTENTIAL FOR SECONDARY IMPACT FROM THE CLEAN-UP PROCESS WILL BE EVALUATED, AS WELL AS THE BENEFITS OF CLEAN-UP ACTIVITIES.

THE FOLLOWING MEASURES MAY BE USED:

- DRILLING MUD MAY BE CLEANED UP BY HAND USING HAND SHOVELS, BUCKETS AND SOFT BRISTLED BROOMS MINIMIZING DAMAGE TO EXISTING VEGETATION.
- FRESH WATER WASHES MAY BE EMPLOYED IF DEEMED BENEFICIAL AND FEASIBLE.
- CONTAINMENT STRUCTURES WILL BE PUMPED OUT AND THE GROUND SURFACE SCRAPED TO BARE TOPSOIL MINIMIZING LOSS OF TOPSOIL OR DAMAGE TO ADJACENT VEGETATION.
- THE RECOVERED DRILLING FLUID WILL BE RECYCLED OR DISPOSED OF AT AN APPROVED UPLAND LOCATION OR DISPOSAL FACILITY. RECOVERED DRILLING FLUID WILL NOT BE DISPOSED OF IN STREAMS OR STORM DRAINS.
- ALL CONTAINMENT STRUCTURES WILL BE REMOVED.
- RECOVERED MATERIALS WILL BE COLLECTED IN CONTAINERS FOR TEMPORARY STORAGE PRIOR TO REMOVAL FROM THE SITE.

HDD CONTINGENCY PLANS

IN THE UNLIKELY EVENT THE HDD CROSSING CANNOT BE COMPLETED ON THE FIRST ATTEMPT, THE APPROVED CONSTRUCTION WORKSPACE AND RIGHTS OF WAY ARE SUFFICIENT TO ALLOW MULTIPLE ATTEMPTS TO INSTALL THE HDD. ANY ABANDONED HDD BORE HOLES WILL BE FILLED WITH GROUT IN THEIR ENTIRETY. IN MOST CASES, SEVERAL ATTEMPTS CAN BE MADE WITHIN THE PERMITTED WORKSPACE BY SLIGHTLY MODIFYING THE HDD GEOMETRY TO ADJUST EITHER THE DEPTH OF THE DRILL PROFILE AND/OR THE HORIZONTAL ALIGNMENT. ADJUSTMENTS IN THE ALIGNMENT AND PROFILE DEPTH CAN, OFTEN TIMES, MINIMIZE CONTACT WITH OR COMPLETELY AVOID LOCALIZED PROBLEMATIC FORMATIONAL ZONES.

IF PROBLEMS PERSIST ALONG THE ORIGINAL DRILL ALIGNMENT, INCLUDING AT ALTERNATE DEPTHS FROM THE FIRST ATTEMPT, THE HDD RIG CAN BE OFFSET LEFT OR RIGHT AND A SECOND PILOT HOLE CAN BE INITIATED ALONG A NEW ALIGNMENT DESIGNED WITH DATA COLLECTED DURING THE FIRST ATTEMPT. THE DRILLING DATA COLLECTED ALONG WITH THE FIRST ALIGNMENT WILL BE UTILIZED TO CREATE A NEW DESIGN THAT WILL, TO THE EXTENT PRACTICAL, MINIMIZE CONTACT WITH PROBLEMATIC FORMATIONAL ZONES ENCOUNTERED DURING THE INITIAL ATTEMPT. IF A FIRST ATTEMPT ALONG THE NEW ALIGNMENT IS NOT SUCCESSFUL, AS DESCRIBED ABOVE, SEVERAL ATTEMPTS CAN BE MADE AT VARIOUS DEPTHS ALONG THE NEW ALIGNMENT.

IF ALL ATTEMPTS FAIL ALONG THIS NEW ALIGNMENT, THE HDD RIG AND EQUIPMENT CAN AGAIN BE MOVED LEFT OR RIGHT WITHIN THE WORKSPACE AND A THIRD NEW PILOT HOLE INITIATED ALONG A NEW DESIGN ALIGNMENT THAT MINIMIZES CONTACT WITH PROBLEMATIC FORMATIONAL ZONES ENCOUNTERED ALONG BOTH THE INITIAL AND SECONDARY ATTEMPTS. IF A FIRST ATTEMPT AT THIS LOCATION ALSO PROVES UNSUCCESSFUL, AS DESCRIBED ABOVE, SEVERAL ATTEMPTS CAN BE MADE AT VARIOUS DEPTHS ALONG THIS ALIGNMENT. IN SUMMARY, THE CONSTRUCTION WORKSPACE CONTAINS SUFFICIENT ROOM TO ALLOW NUMEROUS HDD ATTEMPTS; THEREFORE THESE TECHNIQUES CAN BE UTILIZED UNTIL EITHER THE HDD IS SUCCESSFULLY INSTALLED OR ALL POSSIBILITIES OF A SUCCESSFUL HDD INSTALLATION HAVE BEEN EXHAUSTED.

IN THE VERY UNLIKELY EVENT THAT AN HDD CANNOT BE SUCCESSFULLY INSTALLED, THE METHODS PRESENTED BELOW AND THE ASSOCIATED REQUIRED ACTIVITIES CAN BE CONSIDERED AS POTENTIAL OPTIONS.

REROUTE PIPELINE TO ATTEMPT HDD AT AN ALTERNATE LOCATION OUTSIDE OF THE PROPOSED PIPELINE CONSTRUCTION ROW

- PIPELINE ALIGNMENT WILL BE ALTERED AND A NEW HDD CROSSING WILL BE DESIGNED AT A LOCATION THAT POTENTIALLY WILL POSE LESSER INSTALLATION CHALLENGES.
- THE PROPOSED CHANGE IN LOCATION WILL BE SELECTED VIA DESKTOP ANALYSIS USING EXISTING AERIAL PHOTOGRAPHY AND OTHER AVAILABLE DATA.
- SURVEY PERMISSION WILL BE REQUIRED BEFORE THE REQUIRED CIVIL, ENVIRONMENTAL AND CULTURAL SURVEYS CAN BE PERFORMED. ONCE SURVEY PERMISSION HAS BEEN OBTAINED AND THE AREA IS DETERMINED TO BE ACCEPTABLE FROM A CULTURAL AND ENVIRONMENTAL PERSPECTIVE, GEOTECHNICAL AND GEOPHYSICAL INVESTIGATIONS WILL BE INITIATED TO SUPPORT DESIGN OF A HDD AT THE NEW LOCATION.
- APPROVAL FROM REGULATORY AUTHORITIES, USACE AND STATE AGENCIES WILL BE REQUIRED BEFORE THE HDD IS ATTEMPTED AT THE NEW LOCATION.

OPEN CUT CROSSING;

- THIS METHOD INVOLVES THE EXCAVATION OF A TRENCH THROUGH THE WETLAND OR STREAM.
- ADDITIONAL ARMORING OF THE PIPE IN THE RIVER BOTTOM COULD BE REQUIRED TO PROTECT THE INTEGRITY OF THE PIPE.
- EQUIPMENT WOULD HAVE TO WORK IN THE WETLAND OR STREAMS AND STATE MANDATED TURBIDITY LIMITS WOULD APPLY.
- APPROVALS FROM REGULATORY AUTHORITIES, USACE AND STATE AGENCIES WILL BE REQUIRED BEFORE THE CONSTRUCTION BEGINS.
- THIS TYPE OF CROSSING WOULD ALSO ONLY BE CONSIDERED AS LAST RESORT IN THE CASE WHEN ALL OTHER ALTERNATIVES PROVE TO BE UNFEASIBLE.

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
BRANDON MICHAEL WALKER
ENGINEER
PE077056
COMMONWEALTH OF PENNSYLVANIA

07/23/20

DWG. NO.	DESCRIPTION	REV	DSN	CK	DESCRIPTION
		1	SNC	RG	ISSUED FOR APPROVAL (05/28/2020)

REFERENCE DRAWINGS | REVISIONS | ITEM NO. | MATERIALS | QTY

IC #

audubon
Field Solutions
10205 WESTHEIMER ROAD
SUITE 100
HOUSTON, TX 77042
PHONE: (281) 669-0590

DRAWN BY	ENGINEERING APPROVALS			
	BID		CONSTRUCTION	
LGF		04/29/20		
TITLE	SIGNATURE	DATE	SIGNATURE	DATE

CONEMAUGH RIVER CROSSING PROJECT
DELMONT TO ARMAGH
PROPOSED 24-INCH LINE 12 HDD INSTALLATION
EROSION AND SEDIMENT CONTROL HDD PROCEDURE NOTES

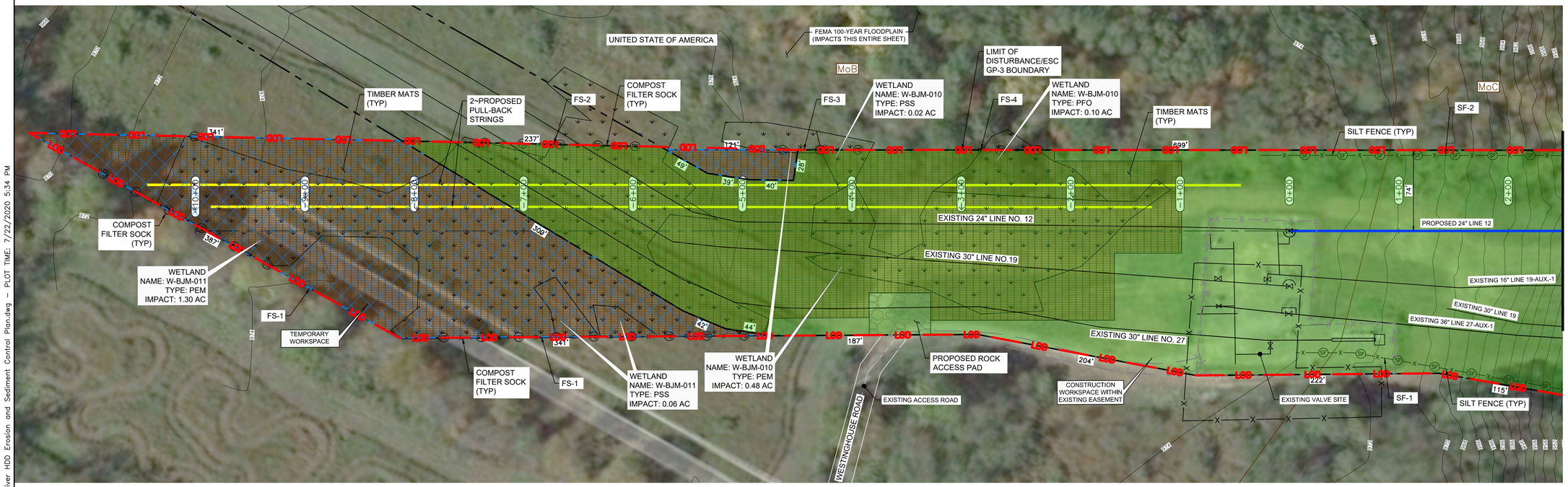
LOC. WESTMORELAND & INDIANA COUNTY, PA

ENBRIDGE

Texas Eastern Transmission, LP
5400 Westheimer Ct. Houston , Tx 77056-5310 713 / 627-5400

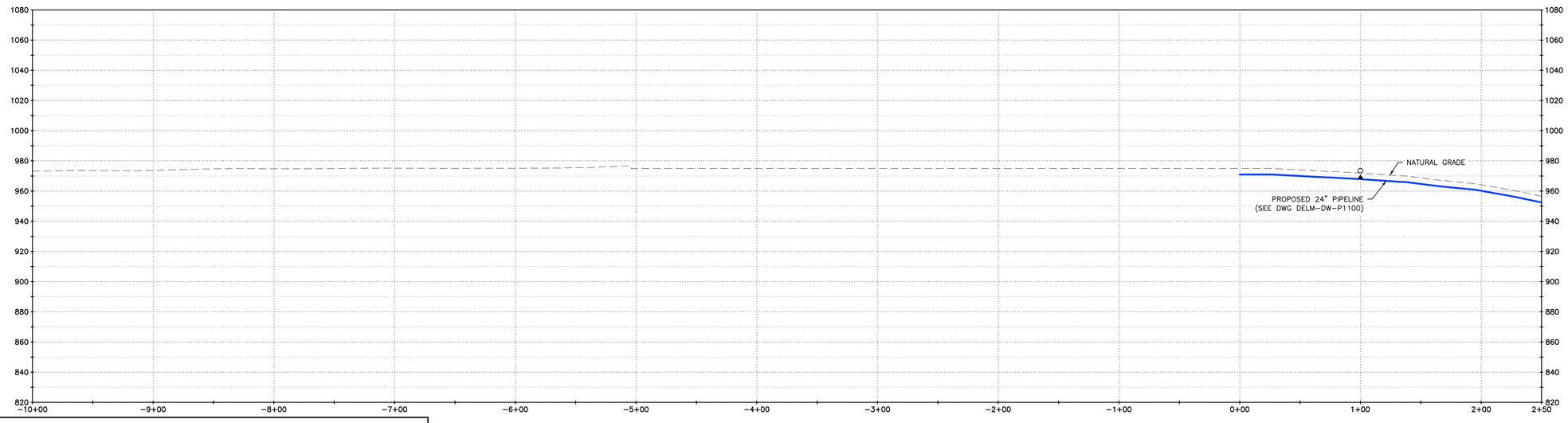
YEAR: 2020	W.B.S.	SCALE: N/A	DWG. DELM-P-8103	REV. 0

DERRY TOWNSHIP,
WESTMORELAND COUNTY,
PENNSYLVANIA



GRAPHIC SCALE
50' 25' 0' 50'

LAND USE | PASTURE



SOIL TYPE LEGEND

MoA	MONOGAHELA SILT LOAM (0 TO 3 PERCENT SLOPES)
MoB	MONOGAHELA SILT LOAM (3 TO 8 PERCENT SLOPES)
MoC	MONOGAHELA SILT LOAM (8 TO 15 PERCENT SLOPES)
GoF	GILPIN-ROCK OUTCROP COMPLEX (45 TO 100 PERCENT SLOPES)
AhB	ALLEGHENY SILT LOAM (3 TO 8 PERCENT SLOPES)
AhC	ALLEGHENY SILT LOAM (8 TO 15 PERCENT SLOPES)
W	WATER

LEGEND

- EXISTING CONTOURS
- PROPERTY LINE
- COUNTY LINE
- ASSUMED FLOODWAY (50 FEET)
- EXISTING WETLAND
- EXISTING EASEMENT
- EXISTING ACCESS ROAD
- FENCE
- FOREIGN PIPELINE
- TEXAS EASTERN PIPELINE
- OVERHEAD WIRES
- LIMIT OF DISTURBANCE/ ESCGP-3 BOUNDARY
- CAPPED & GROUTED PIPELINE
- PROPOSED PIPELINE (HDD)
- PROPOSED PIPELINE (REPLACEMENT)
- PROPOSED PIPELINE (STANDARD LAY)
- PROPOSED PULL-BACK STRING
- PROPOSED SILT FENCE (BY TYPE)
- PROPOSED COMPOST FILTER SOCK
- PROPOSED SLOPE BREAKER
- PROPOSED TRENCH BREAKER
- PROPOSED ORANGE SAFETY FENCE
- PROPOSED TIMBER MAT
- PROPOSED EROSION CONTROL BLANKET
- PROPOSED STONE CONSTRUCTION ENTRANCE
- SOIL TYPE BOUNDARY AND SOIL BOUNDARY
- LAND USE TYPE BOUNDARY AND LAND USE BOUNDARY
- ADDITIONAL PERMANENT EASEMENT
- CONSTRUCTION WORKSPACE WITHIN EXISTING EASEMENT
- TEMPORARY WORKSPACE
- DRILL TARGET
- VALVE

REV	DSN	CK	DESCRIPTION	
2	LGF	RG	ISSUED FOR APPROVAL	(07/23/2020)
1	LGF	RG	ISSUED FOR APPROVAL	(05/28/2020)
			REVISIONS	

audubon Field Solutions
10205 WESTHEIMER ROAD
SUITE 100
HOUSTON, TX 77042
PHONE: (281) 669-0590

ENGINEERING APPROVALS				
DRAWN BY	BID		CONSTRUCTION	
LGF		04/13/20		
TITLE	SIGNATURE	DATE	SIGNATURE	DATE

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
BRANDON MICHAEL WALKER
ENGINEER
PE077056
07/23/20

CONEMAUGH RIVER CROSSING PROJECT
DELMONT TO ARMAGH
PROPOSED 24-INCH LINE 12 HDD INSTALLATION
EROSION AND SEDIMENT CONTROL PLAN
LOC. WESTMORELAND & INDIANA COUNTY, PA

ENBRIDGE
Texas Eastern Transmission, LP
5400 Westheimer Ct. Houston , Tx 77056-5310 713 / 627-5400

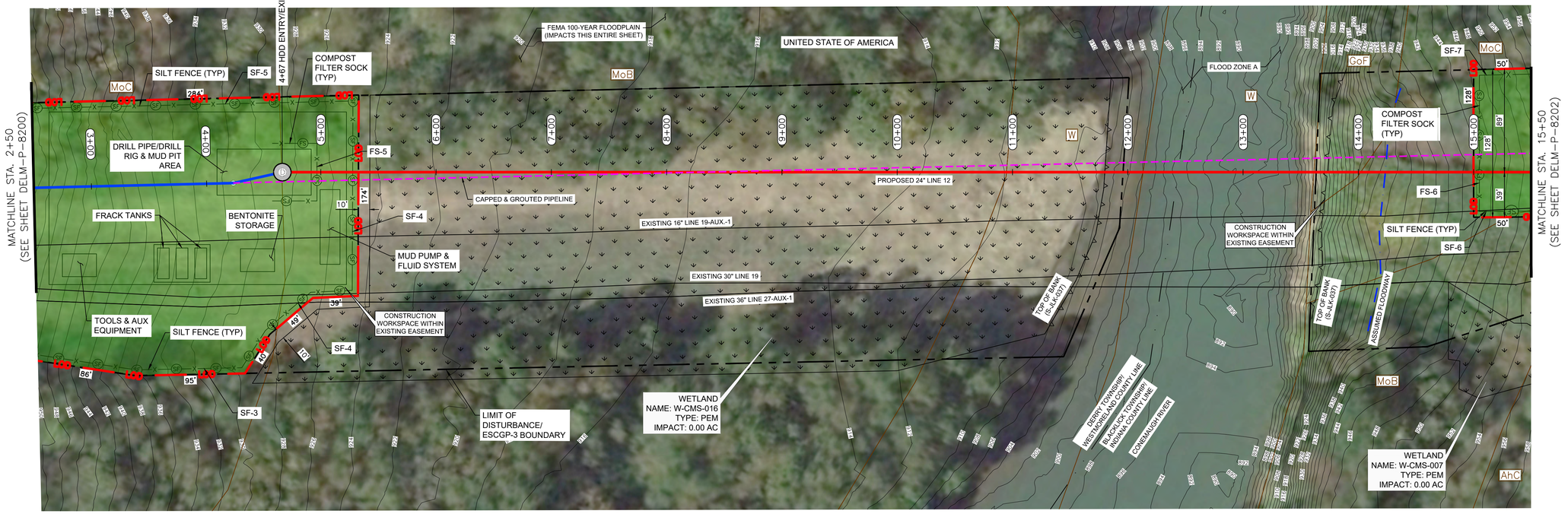
YEAR: 2020 | W.B.S. | SCALE: 1=50'H, 1"=40'V | DWG. DELM-P-8200 | REV. 1

S:\AFS\Projects\Enbridge\Conemaugh_River_Xing\190913 - Conemaugh River Xing\801_Mapping\001_Alignment\Erosion and Sediment Control Plan\Conemaugh River HDD Erosion and Sediment Control Plan.dwg — PLOT TIME: 7/22/2020 5:34 PM

S:\AFS\Projects\Enbridge\Conemaugh_River_Xing\190913 - Conemaugh River HDD Erosion and Sediment Control Plan\Conemaugh River Xing\801_Mapping\001_Alignment\Erosion and Sediment Control Plan.dwg — PLOT TIME: 7/22/2020 5:37 PM

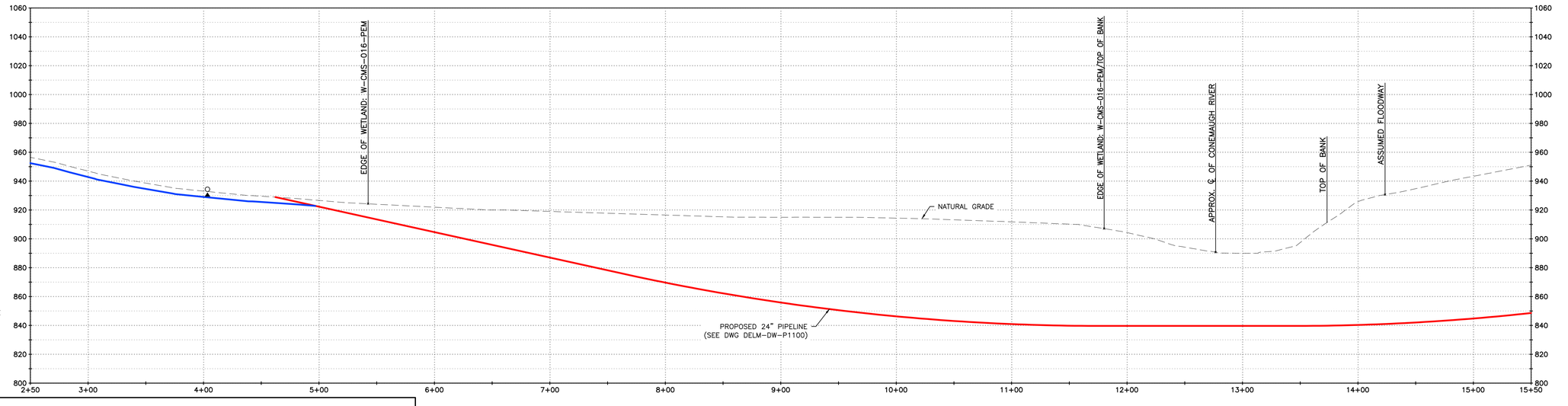
DERRY TOWNSHIP,
WESTMORELAND COUNTY,
PENNSYLVANIA

BLACKLICK TOWNSHIP,
INDIANA COUNTY,
PENNSYLVANIA



GRAPHIC SCALE
50' 25' 0' 50'

LAND USE	PASTURE	OPEN WATER	PASTURE



SOIL TYPE LEGEND

MoA	MONONGAHELA SILT LOAM (0 TO 3 PERCENT SLOPES)
MoB	MONONGAHELA SILT LOAM (3 TO 8 PERCENT SLOPES)
MoC	MONONGAHELA SILT LOAM (8 TO 15 PERCENT SLOPES)
GoF	GILPIN-ROCK OUTCROP COMPLEX (45 TO 100 PERCENT SLOPES)
AhB	ALLEGHENY SILT LOAM (3 TO 8 PERCENT SLOPES)
AhC	ALLEGHENY SILT LOAM (8 TO 15 PERCENT SLOPES)
W	WATER

LEGEND

- EXISTING CONTOURS
- PROPERTY LINE
- COUNTY LINE
- ASSUMED FLOODWAY (50 FEET)
- EXISTING WETLAND
- EXISTING EASEMENT
- EXISTING ACCESS ROAD
- FENCE
- FOREIGN PIPELINE
- TEXAS EASTERN PIPELINE
- OVERHEAD WIRES
- LIMIT OF DISTURBANCE/ ESCGP-3 BOUNDARY
- CAPPED & GROUTED PIPELINE
- PROPOSED PIPELINE (HDD)
- PROPOSED PIPELINE (REPLACEMENT)
- PROPOSED PIPELINE (STANDARD LAY)
- PROPOSED PULL-BACK STRING
- PROPOSED SILT FENCE (BY TYPE)
- PROPOSED COMPOST FILTER SOCK
- PROPOSED SLOPE BREAKER
- PROPOSED TRENCH BREAKER
- PROPOSED ORANGE SAFETY FENCE
- PROPOSED TIMBER MAT
- PROPOSED EROSION CONTROL BLANKET
- PROPOSED STONE CONSTRUCTION ENTRANCE
- SOIL TYPE BOUNDARY AND SOIL BOUNDARY
- LAND USE TYPE BOUNDARY AND LAND USE BOUNDARY
- ADDITIONAL PERMANENT EASEMENT
- CONSTRUCTION WORKSPACE WITHIN EXISTING EASEMENT
- TEMPORARY WORKSPACE
- DRILL TARGET
- VALVE

REV	DSN	CK	DESCRIPTION	
2	LGF	RG	ISSUED FOR APPROVAL	(07/23/2020)
1	LGF	RG	ISSUED FOR APPROVAL	(05/28/2020)

REVISIONS

audubon Field Solutions
10205 WESTHEIMER ROAD
SUITE 100
HOUSTON, TX 77042
PHONE: (281) 669-0590

	ENGINEERING APPROVALS				
DRAWN BY	BID		CONSTRUCTION		
LGF		04/13/20			
TITLE	SIGNATURE	DATE	SIGNATURE	DATE	

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
BRANDON MICHAEL WALKER
ENGINEER
PE077056

07/23/20

CONEMAUGH RIVER CROSSING PROJECT
DELMONT TO ARMAGH
PROPOSED 24-INCH LINE 12 HDD INSTALLATION
EROSION AND SEDIMENT CONTROL PLAN
LOC. WESTMORELAND & INDIANA COUNTY, PA

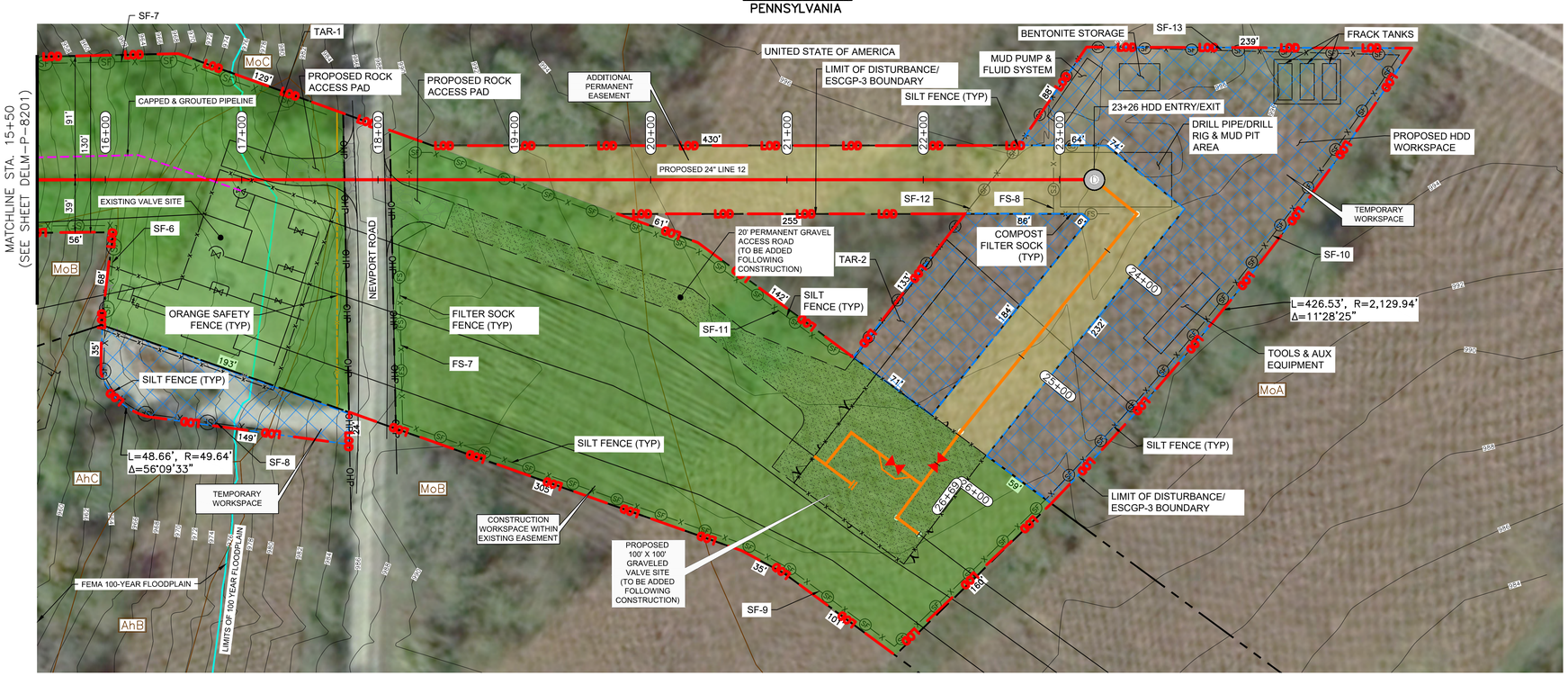
ENBRIDGE

Texas Eastern Transmission, LP
5400 Westheimer Ct. Houston , Tx 77056-5310 713 / 627-5400

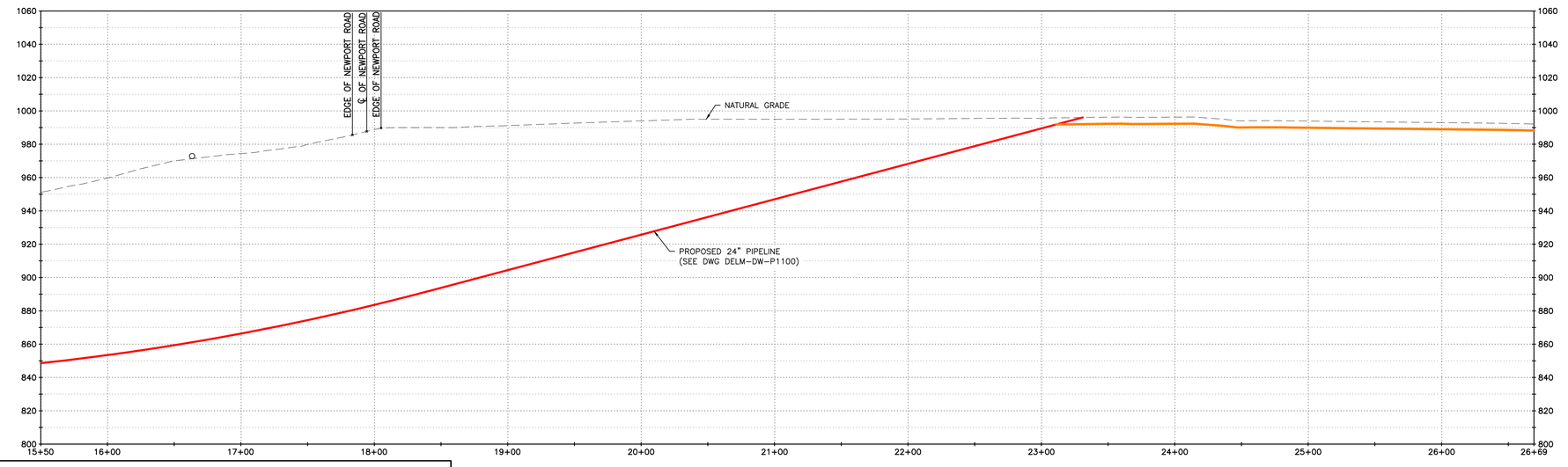
YEAR: 2020	W.B.S.	SCALE: 1=50'H, 1"=40'V	DWG. DELM-P-8201	REV. 1

S:\AFS\Projects\Enbridge\Conemaugh_River_Xing\190913 - Conemaugh River Xing\801_Mapping\001_Alignment\Erosion and Sediment Control Plan\Conemaugh River HDD Erosion and Sediment Control Plan.dwg — PLOT TIME: 7/22/2020 5:41 PM

BLACKLICK TOWNSHIP,
INDIANA COUNTY,
PENNSYLVANIA



LAND USE		PASTURE	ROW	PASTURE	



SOIL TYPE LEGEND

- MoA — MONOGAHELA SILT LOAM (0 TO 3 PERCENT SLOPES)
- MoB — MONOGAHELA SILT LOAM (3 TO 8 PERCENT SLOPES)
- MoC — MONOGAHELA SILT LOAM (8 TO 15 PERCENT SLOPES)
- GoF — GILPIN-ROCK OUTCROP COMPLEX (45 TO 100 PERCENT SLOPES)
- AhB — ALLEGHENY SILT LOAM (3 TO 8 PERCENT SLOPES)
- AhC — ALLEGHENY SILT LOAM (8 TO 15 PERCENT SLOPES)
- W — WATER

LEGEND

- 900 — EXISTING CONTOURS
- PROPERTY LINE
- COUNTY LINE
- ASSUMED FLOODWAY (50 FEET)
- EXISTING WETLAND
- EXISTING EASEMENT
- EXISTING ACCESS ROAD
- FENCE
- FOREIGN PIPELINE
- TEXAS EASTERN PIPELINE
- OHP — OVERHEAD WIRES
- LIMIT OF DISTURBANCE/ ESCGP-3 BOUNDARY
- CAPPED & GROUTED PIPELINE
- PROPOSED PIPELINE (HDD)
- PROPOSED PIPELINE (REPLACEMENT)
- PROPOSED PIPELINE (STANDARD LAY)
- PROPOSED PULL-BACK STRING
- SF — PROPOSED SILT FENCE (BY TYPE)
- FS — PROPOSED COMPOST FILTER SOCK
- PROPOSED SLOPE BREAKER
- PROPOSED TRENCH BREAKER
- PROPOSED ORANGE SAFETY FENCE
- PROPOSED TIMBER MAT
- PROPOSED EROSION CONTROL BLANKET
- PROPOSED STONE CONSTRUCTION ENTRANCE
- MoB — SOIL TYPE BOUNDARY AND SOIL BOUNDARY
- MLF — LAND USE TYPE BOUNDARY AND LAND USE BOUNDARY
- ADDITIONAL PERMANENT EASEMENT
- CONSTRUCTION WORKSPACE WITHIN EXISTING EASEMENT
- TEMPORARY WORKSPACE
- DRILL TARGET
- VALVE

REV	DSN	CK	DESCRIPTION	
			REVISIONS	
1	LGF	RG	ISSUED FOR APPROVAL	(07/23/2020)
0	LGF	RG	ISSUED FOR APPROVAL	(05/28/2020)

audubon Field Solutions
10205 WESTHEIMER ROAD
SUITE 100
HOUSTON, TX 77042
PHONE: (281) 669-0590

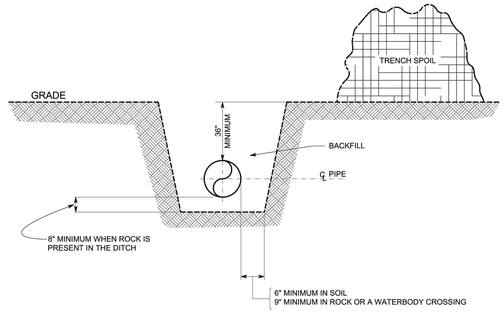
REGISTERED PROFESSIONAL ENGINEER
BRANDON MICHAEL WALKER
PE077056
COMMONWEALTH OF PENNSYLVANIA
07/23/20

ENGINEERING APPROVALS					
DRAWN BY	BID		CONSTRUCTION		
LGF		04/13/20			
TITLE	SIGNATURE	DATE	SIGNATURE	DATE	

CONEMAUGH RIVER CROSSING PROJECT
DELMONT TO ARMAGH
PROPOSED 24-INCH LINE 12 HDD INSTALLATION
EROSION AND SEDIMENT CONTROL PLAN
LOC. WESTMORELAND & INDIANA COUNTY, PA

ENBRIDGE
Texas Eastern Transmission, LP
5400 Westheimer Ct. Houston , Tx 77056-5310 713 / 627-5400

YEAR: 2020	W.B.S.	SCALE: 1=50'H, 1"=40'V	DWG. DELM-P-8202	REV. 1



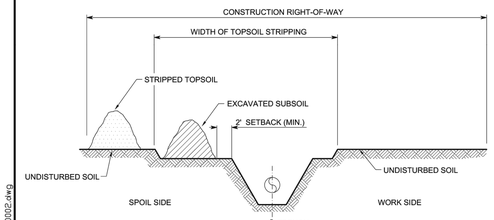
CROSS-SECTION VIEW

NOTES:

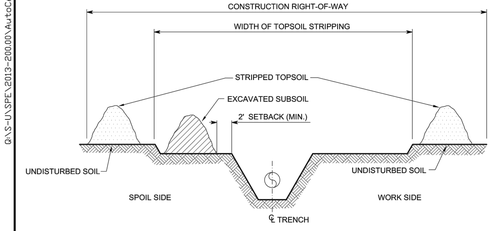
1. ALL PRECONSTRUCTION CONTOURS WILL BE RE-ESTABLISHED UPON COMPLETION OF PIPE INSTALLATION. EXCEPT IN WETLANDS, A CROWN MAY BE LEFT TO ACCOUNT FOR DITCH SETTLING, AS DIRECTED BY THE ENVIRONMENTAL INSPECTOR.
2. IN COLD WATER FISHERY STREAMS, THE TOP 12" OF THE TRENCH WILL BE BACKFILLED WITH CLEAN GRAVEL OR NATIVE COBBLES UNLESS OTHERWISE SPECIFIED BY THE PERMITTING AGENCY.

G:\S-U\SPE\2013-200.00\AutoCAD\Final\es0001.dwg
Wayne Sicora 5/28/2014 11:36 AM
I.G. ES0001.DWG

	TYPICAL TRENCH DETAIL	FIGURE CW-1
		DWG. ES-0001 REV.



DITCH PLUS SPOILSIDE TOPSOIL SEGREGATION



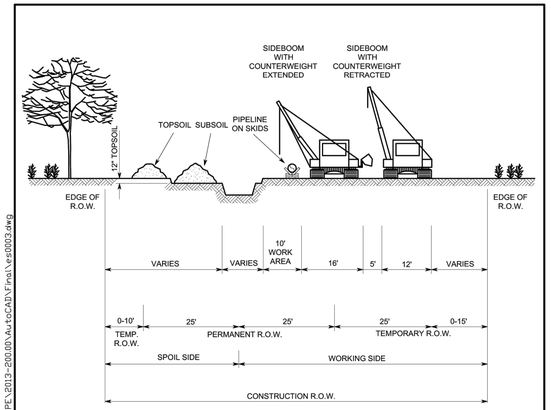
FULL RIGHT-OF-WAY TOPSOIL STRIPPING

NOTES:

1. TOPSOIL MAY BE STORED IN LOCATIONS AS SHOWN ABOVE OR AT OTHER COMPANY APPROVED LOCATIONS WITHIN THE CONSTRUCTION R.O.W.
2. LEAVE GAPS IN SPOIL PILES FOR WATER RUN-OFF.
3. MAINTAIN SEPARATION OF SALVAGED TOPSOIL AND SUBSOIL THROUGHOUT ALL CONSTRUCTION ACTIVITIES.
4. STABILIZE TOPSOIL PILES AND MINIMIZE LOSS DUE TO WATER OR WIND EROSION WITH USE OF SEDIMENT BARRIERS, MULCH, TEMPORARY SEEDING, TACKIFIERS OR FUNCTIONAL EQUIVALENTS, WHERE NECESSARY.

G:\S-U\SPE\2013-200.00\AutoCAD\Final\es0002.dwg
Wayne Sicora 6/9/2014 9:59 PM
I.G. ES0002.DWG

	RIGHT-OF-WAY TOPSOIL SEGREGATION TECHNIQUES	FIGURE CW-2
		DWG. ES-0002 REV.



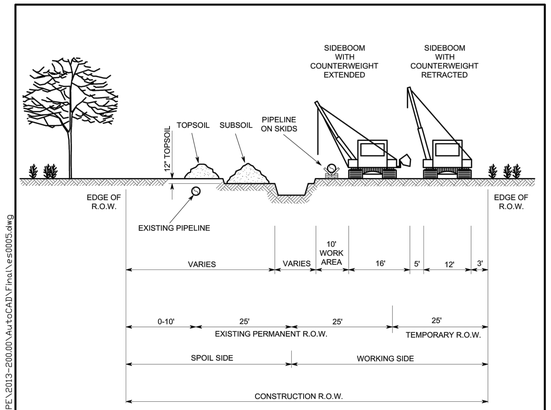
PIPE DIAMETER	SPOIL SIDE (FT.)	WORKING SIDE (FT.)	CONSTRUCTION R.O.W. (FT.)
12" OR LESS	25	50	75
14" - 30"	35	50	85
36" - 42"	35	65	100
WETLANDS	25	50	75

NOTES:

1. ALTHOUGH THE DIMENSIONS SHOWN ARE TYPICAL, SOME VARIATIONS MAY EXIST DUE TO SITE SPECIFIC CONDITIONS. UNLESS OTHERWISE INDICATED ON THE ALIGNMENT SHEETS, THE MAXIMUM WIDTH OF THE CONSTRUCTION RIGHT-OF-WAY SHALL BE AS SHOWN IN THE TABLE FOR THE APPROPRIATE PIPE DIAMETER.
2. TOPSOIL SEGREGATION METHODS WILL BE USED IN ALL RESIDENTIAL AREAS AND WHEN THE CONSTRUCTION ROW IS WIDER THAN 30 FEET IN CULTIVATED OR ROTATED AGRICULTURAL LANDS, MANAGED PASTURES, HAYFIELDS, AND OTHER AREAS AT THE LANDOWNER'S OR LAND MANAGEMENT AGENCY'S REQUEST. FOR WETLANDS, SEGREGATE THE TOP 12 INCHES OF TOPSOIL WITHIN THE DITCH LINE, EXCEPT IN AREAS WHERE STANDING WATER IS PRESENT OR SOILS ARE SATURATED.

G:\S-U\SPE\2013-200.00\AutoCAD\Final\es0003.dwg
Wayne Sicora 5/28/2014 11:44 AM
I.G. ES0003.DWG

	TYPICAL CONSTRUCTION WIDTHS ACQUIRING NEW PERMANENT RIGHT-OF-WAY	FIGURE CW-3
		DWG. ES-0003 REV.



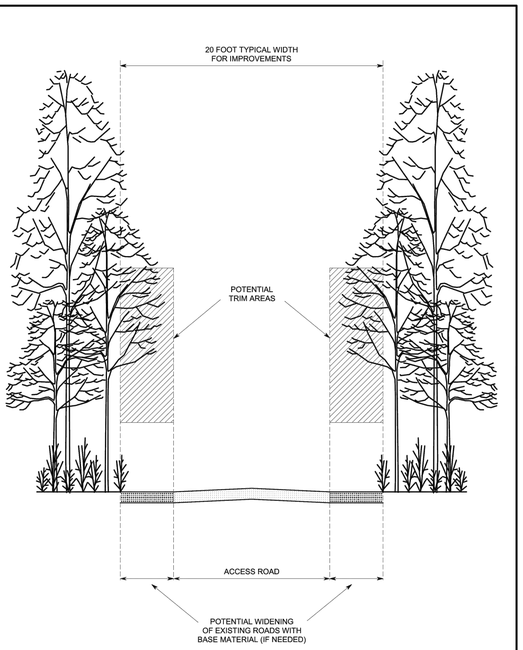
PIPE DIAMETER	SPOIL SIDE (FT.)	WORKING SIDE (FT.)	CONSTRUCTION R.O.W. (FT.)
12" OR LESS	25	50	75
14" - 30"	35	50	85
36" - 42"	35	50	85
WETLANDS	25	50	75

NOTES:

1. ALTHOUGH THE DIMENSIONS SHOWN ARE TYPICAL, SOME VARIATIONS MAY EXIST DUE TO SITE SPECIFIC CONDITIONS. UNLESS OTHERWISE INDICATED ON THE ALIGNMENT SHEETS, THE MAXIMUM WIDTH OF THE CONSTRUCTION RIGHT-OF-WAY SHALL BE AS SHOWN IN THE TABLE FOR THE APPROPRIATE PIPE DIAMETER.
2. TOPSOIL SEGREGATION METHODS WILL BE USED IN ALL RESIDENTIAL AREAS AND WHEN THE CONSTRUCTION ROW IS WIDER THAN 30 FEET IN CULTIVATED OR ROTATED AGRICULTURAL LANDS, MANAGED PASTURES, HAYFIELDS, AND OTHER AREAS AT THE LANDOWNER'S OR LAND MANAGEMENT AGENCY'S REQUEST. FOR WETLANDS, SEGREGATE THE TOP 12 INCHES OF TOPSOIL WITHIN THE DITCH LINE, EXCEPT IN AREAS WHERE STANDING WATER IS PRESENT OR SOILS ARE SATURATED.
3. IF THE WORKING SIDE MUST BE GREATER THAN 50 FEET (i.e. TEMPORARY WORKSPACE IS GREATER THAN 25 FEET), COMPANY MUST REQUEST APPROVAL FROM THE F.E.R.C.

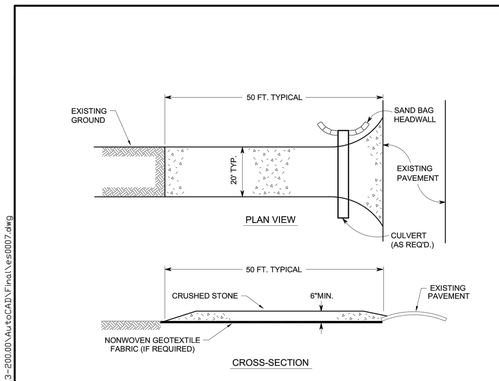
G:\S-U\SPE\2013-200.00\AutoCAD\Final\es0005.dwg
Wayne Sicora 5/28/2014 11:47 AM
I.G. ES0005.DWG

	TYPICAL CONSTRUCTION WIDTHS NOT ACQUIRING NEW PERMANENT RIGHT-OF-WAY (MULTIPLE LINE SYSTEM)	FIGURE CW-5
		DWG. ES-0005 REV.



G:\S-U\SPE\2013-200.00\AutoCAD\Final\es0006.dwg
Wayne Sicora 5/28/2014 12:43 PM
I.G. ES0006.DWG

	ACCESS ROAD CROSS SECTION	FIGURE RD-1
		DWG. ES-0006 REV.

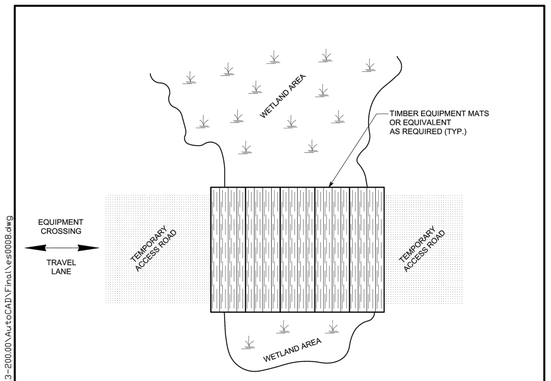


CONSTRUCTION SPECIFICATIONS:

1. STONE SIZE = 4" - 6" AVG. DIAMETER
2. ALL STONE MUST BE PLACED ON NON-WOVEN GEOTEXILE FABRIC IF USED IN RESIDENTIAL OR AGRICULTURAL AREAS.
3. LENGTH = FIFTY (50) FOOT TYPICAL (IF SITE CONDITIONS ALLOW)
4. WIDTH = TWENTY (20) FOOT TYPICAL.
5. THICKNESS = SIX (6) INCHES MINIMUM.
6. ALL SURFACE WATER FLOWING OR DIVERTED TOWARD CONSTRUCTION ENTRANCES SHALL BE PIPED ACROSS THE ENTRANCE. IF PIPING IS IMPRACTICAL, A DRIVEABLE BERM OR OTHER TEMPORARY EROSION CONTROL DEVICE CAN BE USED.
7. THE ENTRANCE SHALL BE PERIODICALLY INSPECTED AND MAINTAINED IN A CONDITION THAT MINIMIZES TRACKING OR FLOWING OF SEDIMENT ONTO ROADWAYS. MAINTENANCE MAY INCLUDE PERIODIC TOP DRESSING WITH ADDITIONAL STONE OR THE REPAIR / CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ANY SEDIMENT THAT IS SPILLED, DROPPED, WASHED OR TRACKED ONTO ROADWAYS MUST BE REMOVED AS SOON AS PRACTICAL.

G:\S-U\SPE\2013-200.00\AutoCAD\Final\es0007.dwg
Wayne Sicora 6/9/2014 4:01 PM
I.G. ES0007.DWG

	ROCK ACCESS PAD	FIGURE RD-2
		DWG. ES-0007 REV.



NOTE:

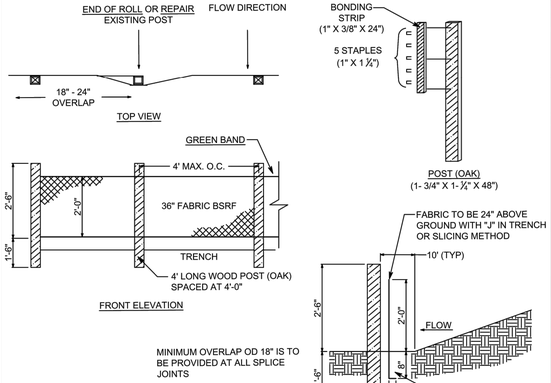
1. SILT FENCE OR STRAW BALES MAY BE USED, AS NECESSARY, TO PREVENT SEDIMENT FROM MIGRATING OUTSIDE OF ACCESS ROAD LIMITS.

COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL BRANDON MICHAEL WALKER ENGINEER PE077056 PENNSYLVANIA

07/23/20

G:\S-U\SPE\2013-200.00\AutoCAD\Final\es0008.dwg
Wayne Sicora 5/28/2014 11:55 AM
I.G. ES0008.DWG

	TYPICAL TEMPORARY ACCESS ROAD THROUGH WETLANDS	FIGURE RD-3
		DWG. ES-0008 REV.



MINIMUM OVERLAP OD 18" IS TO BE PROVIDED AT ALL SPLICE JOINTS

*FOR TABLE OF SPECIFIC SIZING SEE DRAWING DELM-P-8101

INSTALLATION REQUIREMENTS:

- WHEN USING BELTED SILT RETENTION FENCE (BSRF), PLACE IT:
  - BETWEEN DISTURBED AREAS AND DOWN-SLOPE ENVIRONMENTAL RESOURCE AREAS
  - AT THE BASE OF ALL SLOPES NEXT TO WETLANDS, WATERBODIES, AND ROAD CROSSINGS
  - AT THE INLET AND OUTLET OF OPEN DRAINAGE STRUCTURES
  - APPROXIMATELY 8 FEET BEYOND THE TOE OF THE SLOPE TO GIVE THE SEDIMENT ROOM TO COLLECT (IF POSSIBLE
- 4' X 1 ½" X 1 ½" WOOD (OAK) STAKES ARE PLACED AT FOUR (4') INTERVALS TO A DEPTH WHICH WILL ALLOW 24" OF FABRIC TO BE ABOVE GROUND.
- THE FABRIC IS THEN STRETCHED ALONG THE INSIDE PERIMETER OF THE STAKES, PULLED TIGHTLY AND HELD IN PLACE WITH 1" X 3/8" X 24" BONDING STRIPS ATTACHED TO THE WOOD (OAK) STAKES WITH FIVE (5) 1" X 1 ½" STAPLES. THIS BONDS THE FABRIC AND SUPPORT SYSTEM (SCRIM) TO THE VERTICAL SUPPORT POSTS.
- THE REMAINING FABRIC IS TUCKED INTO THE TRENCH FORMING A "J" AND WHEN FILLED WITH DIRT CREATES A "GROUND BITE".
- BSRF FABRIC SHOULD BE PURCHASED IN CONTINUOUS ROLLS AND CUT TO THE LENGTH OF THE BARRIER TO AVOID JOINTS. WHEN JOINTS ARE NECESSARY, USE AN 18"-24" OVERLAP AS SHOWN IN THE TOP VIEW.
- THIS IS DESIGNED FOR CONTROL OF SHEET FLOW. SILT FENCE SHALL NOT BE INSTALLED ACROSS STREAMS, DITCHES, WATERWAYS , OR ANYWHERE THERE IS CONCENTRATED FLOW. SILT FENCE SHALL NOT BE PLACED AROUND STORM WATER INLETS WHICH ARE DESIGNED TO RECEIVE CONCENTRATED FLOW.

MAINTENANCE REQUIREMENTS:

- INSPECT SILT FENCE:
  - DAILY IN AREAS OF ACTIVE CONSTRUCTION
  - WEEKLY IN AREAS WITH NO CONSTRUCTION
  - WITHIN 24 HOURS FOLLOWING EACH RAINFALL EVENT OF ≥ 0.25 INCH.
- REPAIR OR REPLACE SILT FENCE AS NEEDED
- REMOVE ACCUMULATED SEDIMENTS TO AN UPLAND AREA WHEN SEDIMENT REACHES 1/2 THE ABOVE GROUND HEIGHT OF THE SILT FENCE.

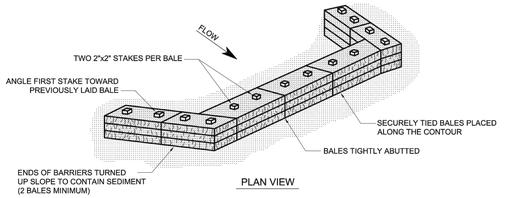
I.G. ES0011.DWG

	BELTED SILT RETENTION FENCE DETAIL	FIGURE EC-1
		ES-0011

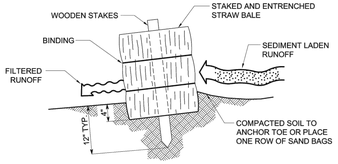
REV	DSN	CK	DESCRIPTION
1	LGF	RG	ISSUED FOR CONSTRUCTION (07/23/2020)
0	LGF	RG	ISSUED FOR CONSTRUCTION (05/15/2020)

ENBRIDGE
Texas Eastern Transmission, LP
5400 Westheimer Ct, Houston , Tx 77056-5310 713 / 627-5400

DRAWN: LGF	DATE: 04/29/20	EROSION AND SEDIMENT CONTROL FIGURES	
CHECKED: RG	DATE: 04/29/20	W.B.S. NO.	YEAR: 2020	SHEET 1 OF 3



PLAN VIEW



CROSS-SECTION

INSTALLATION REQUIREMENTS:

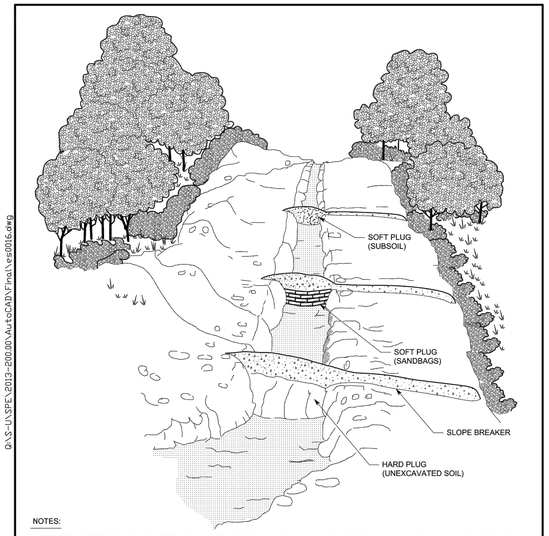
- WHEN USING STRAW BALES, PLACE THEM:
  - WITH THEIR ENDS TIGHTLY ABUTTING AND EMBEDDED IN THE SOIL A TYPICAL OF 4".
  - BETWEEN DISTURBED AREAS AND DOWN-SLOPE ENVIRONMENTAL RESOURCE AREAS.
  - AT THE BASE OF ALL SLOPES NEXT TO WETLANDS, WATERBODIES, AND ROAD CROSSINGS
  - AT THE INLET AND OUTLET OF OPEN DRAINAGE STRUCTURES.
  - APPROXIMATELY 6 FEET BEYOND THE TOE OF THE SLOPE TO GIVE THE SEDIMENT ROOM TO COLLECT.
- KEY IN THE BOTTOM OF THE BALE. IN AREAS WHERE IT IS NOT FEASIBLE TO TRENCH IT IN (LEDGES, ROCKY SOIL, LARGE TREE ROOTS, ETC.), USE NATIVE SOIL AS BACKFILL UP-SLOPE OF THE BALE OR PLACE ONE ROW OF SAND BAGS.
- DO NOT STAKE OR TRENCH IN PLACE STRAW BALES USED ON EQUIPMENT BRIDGES OR ON MATS ACROSS THE TRAVEL LANE.
- IF USED IN CONJUNCTION WITH SILT FENCE, BALES ARE PLACED DOWNSLOPE / UPSLOPE OF THE SILT FENCE AND DO NOT NEED TO BE TRENCHED IN.

MAINTENANCE REQUIREMENTS:

- INSPECT BALES:
  - DAILY IN AREAS OF ACTIVE CONSTRUCTION.
  - WEEKLY IN AREAS WITH NO CONSTRUCTION.
  - WITHIN 24 HOURS FOLLOWING EACH RAINFALL EVENT OF ≥ 0.5 INCH.
- REPAIR OR REPLACE BALES AS NEEDED.
- REMOVE ACCUMULATED SEDIMENTS TO AN UPLAND AREA AS NEEDED.

Q:\S-U\SPE\2013-200.00\AutoCAD\Final\es0012.dwg
Wayne Sicora
5/29/2014 7:30 AM
I.G. ES0012.DWG

STRAW BALE DETAIL | FIGURE EC-2 | DWG. ES-0012 | REV.

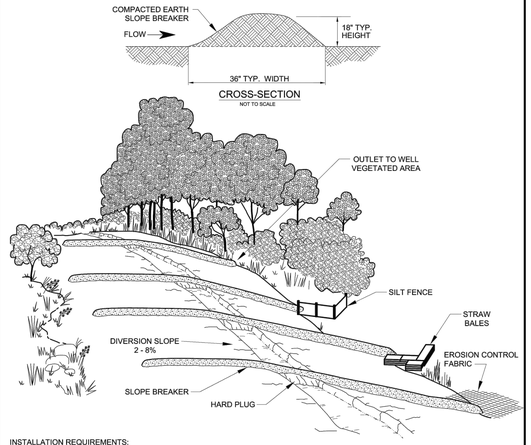


NOTES:

1. TEMPORARY TRENCH PLUG MATERIALS MAY CONSIST OF UNEXCAVATED PORTIONS OF THE TRENCH (HARD PLUG), COMPACTED SUBSOIL OR SANDBAGS PLACED ACROSS THE DITCH (SOFT PLUG), OR SOME FUNCTIONAL EQUIVALENT. THESE OPTIONS ARE DEPICTED ABOVE. DO NO USE TOPSOIL FOR TRENCH PLUGS.
2. POSITION TEMPORARY TRENCH PLUGS, AS NECESSARY, TO REDUCE TRENCHLINE EROSION AND MINIMIZE THE VOLUME AND VELOCITY OF TRENCH WATER FLOW AT THE BASE OF SLOPES.
3. TEMPORARY TRENCH PLUGS MAY BE USED IN CONJUNCTION WITH SLOPE BREAKERS TO DIVERT TRENCH WATER OVERFLOW AND PREVENT OVERFLOW INTO SENSITIVE RESOURCE AREAS.
4. DIVERT TRENCH OVERFLOW TO A WELL-VEGETATED OFF-R.O.W. LOCATION OR INSTALL APPROPRIATE ENERGY DISSIPATING DEVICE.
5. USE TEMPORARY TRENCH PLUGS AT WATERBODY CROSSINGS, AS NECESSARY.

Q:\S-U\SPE\2013-200.00\AutoCAD\Final\es0016.dwg
Wayne Sicora
5/29/2014 8:49 AM
I.G. ES0016.DWG

TEMPORARY TRENCH PLUG OPTIONS | FIGURE EC-6 | DWG. ES-0016 | REV.



INSTALLATION REQUIREMENTS:

- INSTALL SLOPE BREAKERS IN ALL DISTURBED AREAS AS NECESSARY TO AVOID EXCESSIVE EROSION AT THE LOCATIONS SHOWN ON THE CONSTRUCTION DRAWINGS OR AS APPROVED BY THE ENVIRONMENTAL INSPECTOR (EI).
- MUST BE INSTALLED ON SLOPES GREATER THAN 5% WHERE THE BASE OF THE SLOPE IS LESS THAN 50 FEET FROM A WATERBODY, WETLAND OR ROAD CROSSING AT THE FOLLOWING MINIMUM SPACING:

SLOPE (%)	SPACING (FT.)
5 - 15	300
> 15 - 30	200
> 30	100

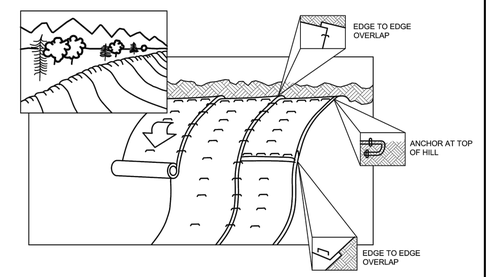
- CONSTRUCT USING SAND BAGS, STAKED STRAW BALES, SILT FENCE, OR SOIL.
- INSTALL WITH A 2 - 8% OUTFALL ANGLE.
- POSITION OUTFALL TO PREVENT SEDIMENT DISCHARGE INTO WETLANDS, WATERBODIES, OR OTHER SENSITIVE RESOURCES.
- FILTER RUN-OFF WATER BY CONSTRUCTING THE OUTLET IN A WELL VEGETATED STABLE AREA, OR BY USING AN ENERGY DISSIPATING DEVICE (SILT FENCE, STRAW BALES, EROSION CONTROL FABRIC). IF NEEDED, THE TYPE OF ENERGY DISSIPATION DEVICE WILL DEPEND ON SITE CONDITIONS (OPTIONS ARE DEPICTED ABOVE).

MAINTENANCE REQUIREMENTS:

- INSPECT DURING CONSTRUCTION AND MAKE REPAIRS AS NEEDED.
- KEEP THE CHANNEL FREE OF DEBRIS AND OBSTRUCTIONS.

Q:\S-U\SPE\2013-200.00\AutoCAD\Final\es0017.dwg
Wayne Sicora
5/23/2014 11:09 AM
I.G. ES0017.DWG

TEMPORARY SLOPE BREAKERS | FIGURE EC-7 | DWG. ES-0017 | REV.

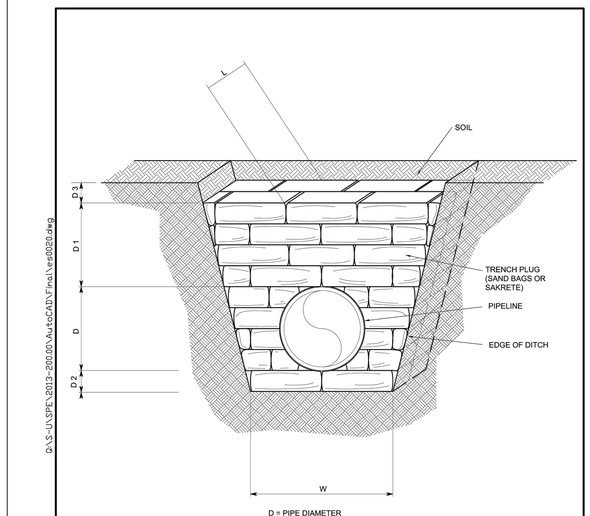


NOTES:

1. EROSION CONTROL BLANKETS (FABRIC) SHALL BE USED AT LOCATIONS IDENTIFIED IN THE PLAN AND/OR AS DIRECTED BY THE ENVIRONMENTAL INSPECTOR.
2. EROSION CONTROL BLANKETS SHALL MEET THE REQUIREMENTS SPECIFIED IN THE PLAN AND/OR AS DIRECTED BY THE ENVIRONMENTAL INSPECTOR.
3. STAPLES SHALL BE MADE OF 11 GAUGE WIRE, U-SHAPED WITH 6" LEGS AND A 1" CROWN. STAPLES SHALL BE DRIVEN INTO THE GROUND FOR THE FULL LENGTH OF THE STAPLE LEGS.
4. BLANKETS SHALL BE INSTALLED ACCORDING TO MANUFACTURER SPECIFICATIONS OR AS STATED BELOW:
   - EXTEND TOP OF BLANKET 3 FEET PAST THE UPPER EDGE OF THE SLOPE.
   - ANCHOR ("KEY") THE UPPER EDGE OF THE BLANKET INTO THE SLOPE USING A 6" DEEP TRENCH AND ROLL THE BLANKET DOWN THE HILL. DOUBLE STAPLE EVERY 12" BEFORE BACKFILLING AND COMPACTING TRENCH.
   - INSTALL LOOSELY ON SLOPE AND AVOID STRETCHING EROSION CONTROL BLANKETS DURING INSTALLATION.
   - BRING ROLL BACK OVER THE TOP OF THE TRENCH AND CONTINUE TO ROLL DOWN SLOPE. STAPLE EVERY 12" WHERE BLANKETS EXIT THE TRENCH AT THE TOP OF THE SLOPE.
   - WHEN BLANKETS ARE SPLICED DOWN-SLOPE TO ADJOINING BLANKETS (SLOPE OR STREAMBANK MATS), THE UPPER BLANKET SHALL BE PLACED OVER THE LOWER (SHINGLE STYLE) WITH APPROXIMATELY 6" OF OVERLAP. STAPLE THROUGH THE OVERLAPPED AREA EVERY 12".
   - OVERLAP ADJACENT BLANKETS 6". STAPLE EDGES OF BLANKETS AND CENTER EVERY 36".
5. IN LIVESTOCK AREAS WHERE EROSION CONTROL BLANKETS ARE APPLIED TO THE SLOPES, FENCING WILL BE USED IF NECESSARY TO EXCLUDE LIVESTOCK, WITH PERMISSION OF THE LANDOWNER.
6. MONITOR WASHOUTS, STAPLE INTEGRITY OR BLANKET MOVEMENT. REPLACE OR REPAIR AS NECESSARY.
7. DO NOT USE SYNTHETIC MONOFILAMENT MESH / NETTED MATERIALS IN AREAS DESIGNATED AS SENSITIVE WILDLIFE HABITAT, UNLESS THE PRODUCT IS SPECIFICALLY DESIGNED TO MINIMIZE HARM TO WILDLIFE.

Q:\S-U\SPE\2013-200.00\AutoCAD\Final\es0024.dwg
Wayne Sicora
5/27/2014 10:30 AM
I.G. ES0024.DWG

TYPICAL EROSION CONTROL BLANKETS ON SLOPES | FIGURE EC-14 | DWG. ES-0024 | REV.



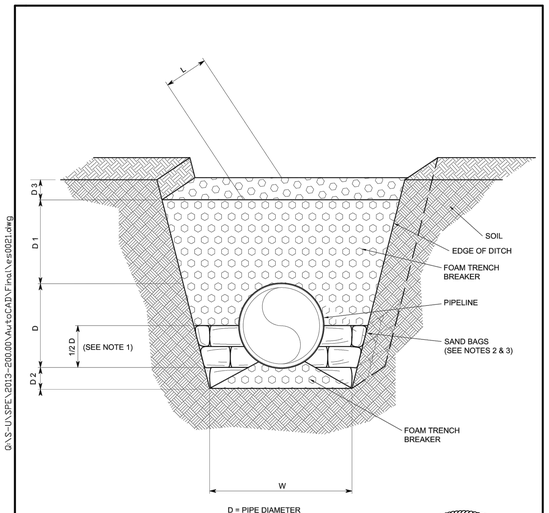
D = PIPE DIAMETER
D1 = APPROXIMATELY 24"
D2 = APPROXIMATELY 6" (8" MIN. IN ROCK)
D3 = APPROXIMATELY 12"
W = D + 2 to 4 FEET
L = APPROXIMATELY 18" - 24"
D1 + D3 = 36" MINIMUM

NOTE:

1. USE OF SAKRETE SHALL REQUIRE PRIOR COMPANY APPROVAL.
2. TOPSOIL SHALL NOT BE USED TO CONSTRUCT BREAKERS.
3. DO NOT INSTALL TRENCH BREAKERS WITHIN A WETLAND.

Q:\S-U\SPE\2013-200.00\AutoCAD\Final\es0020.dwg
Wayne Sicora
5/29/2014 1:41 PM
I.G. ES0020.DWG

TRENCH BREAKER DETAIL (SACK) | FIGURE EC-10 | DWG. ES-0020 | REV.



D = PIPE DIAMETER
D1 = APPROXIMATELY 24"
D2 = APPROXIMATELY 6" (8" MIN. IN ROCK)
D3 = APPROXIMATELY 12"
W = D + 2 to 4 FEET.
L = APPROXIMATELY 18" - 24"
D1 + D3 = 36" MINIMUM

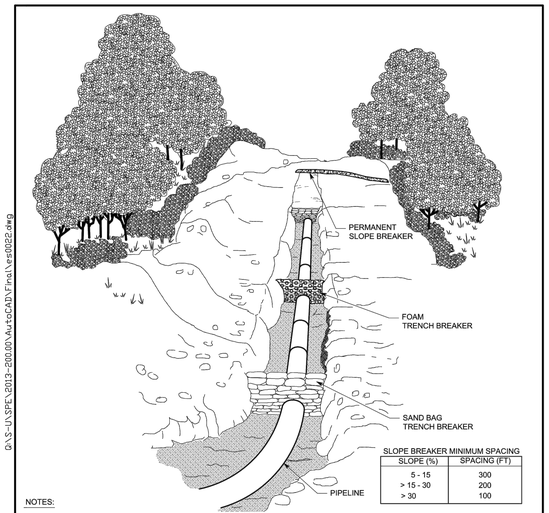
NOTE:

1. A MINIMUM OF TWO LAYERS OF BAGS SHALL BE INSTALLED.
2. THE ADDITION OF SAND BAGS UNDER THE FOAM WILL BE PLACED AS PRESCRIBED IN THE E&S PLAN OR AT THE DISCRETION OF THE ENVIRONMENTAL INSPECTOR (EI).
3. FOAM TRENCH BREAKERS ARE TO BE USED WITHIN UPLAND AREAS. DO NOT USE FOAM TRENCH BREAKERS AT WATERBODY OR WETLAND BOUNDARIES..

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
BRANDON MICHAEL WALKER
ENGINEER
PE077056
COMMONWEALTH OF PENNSYLVANIA
07/23/20

Q:\S-U\SPE\2013-200.00\AutoCAD\Final\es0021.dwg
Wayne Sicora
6/3/2014 11:07 AM
I.G. ES0021.DWG

TRENCH BREAKER DETAIL (FOAM) | FIGURE EC-11 | DWG. ES-0021 | REV.



SLOPE BREAKER MINIMUM SPACING

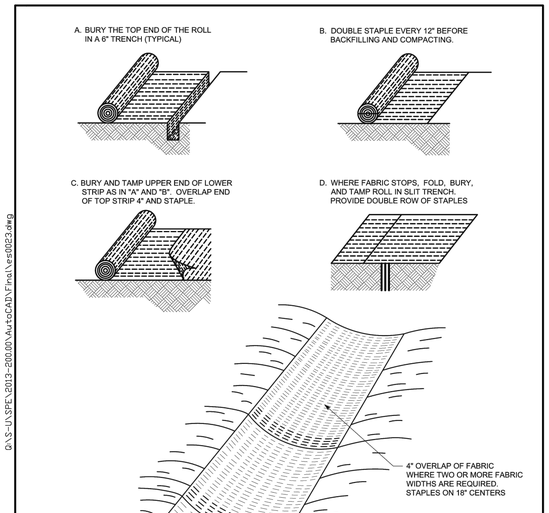
SLOPE (%)	SPACING (FT)
5 - 15	300
> 15 - 30	200
> 30	100

NOTES:

1. PERMANENT TRENCH BREAKER MATERIALS WILL CONSIST OF SAND BAGS, POLYURETHANE FOAM OR SOME FUNCTIONAL EQUIVALENT PLACED ACROSS THE DITCH AS IDENTIFIED IN PERMIT REQUIREMENTS. DO NOT USE TOPSOIL FOR TRENCH BREAKERS. THESE OPTIONS ARE DEPICTED ABOVE.
2. PERMANENT TRENCH BREAKERS, WHICH ARE USED IN CONJUNCTION WITH SLOPE BREAKERS, SHALL BE INSTALLED AT THE LOCATIONS SHOWN ON THE CONSTRUCTION DRAWINGS OR AS DETERMINED IN THE FIELD BY THE ENVIRONMENTAL INSPECTOR.
3. AT A MINIMUM, INSTALL A TRENCH BREAKER AT THE BASE OF SLOPES GREATER THAN 5 PERCENT WHERE THE BASE OF THE SLOPE IS LESS THAN 50 FEET FROM A WATERBODY OR WETLAND AND WHERE NEEDED TO AVOID DRAINING A WATERBODY OR WETLAND.
4. INSTALL TRENCH BREAKERS AT WETLAND BOUNDARIES AND/OR SEAL THE TRENCH BOTTOM AS NECESSARY TO MAINTAIN THE ORIGINAL WETLAND HYDROLOGY. DO NOT INSTALL TRENCH BREAKERS WITHIN A WETLAND.
5. IN AGRICULTURAL FIELDS AND RESIDENTIAL AREAS WHERE SLOPE BREAKERS ARE NOT TYPICALLY REQUIRED, INSTALL TRENCH BREAKERS AT THE SAME SPACING AS IF PERMANENT SLOPE BREAKERS WERE REQUIRED.

Q:\S-U\SPE\2013-200.00\AutoCAD\Final\es0022.dwg
Wayne Sicora
6/3/2014 10:13 AM
I.G. ES0022.DWG

PERMANENT TRENCH BREAKER OPTIONS | FIGURE EC-12 | DWG. ES-0022 | REV.



Q:\S-U\SPE\2013-200.00\AutoCAD\Final\es0023.dwg
Wayne Sicora
5/29/2014 11:06 PM
I.G. ES0023.DWG

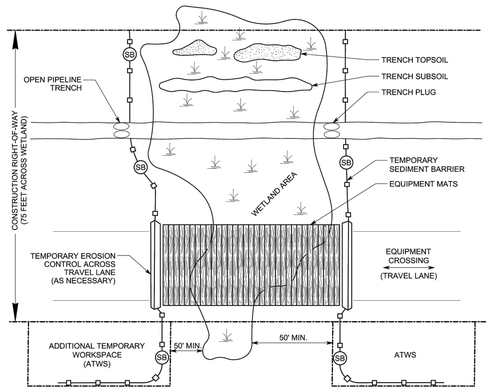
EROSION CONTROL FABRIC INSTALLATION | FIGURE EC-13 | DWG. ES-0023 | REV.

REV	DSN	CK	DESCRIPTION
1	SNC	RG	ISSUED FOR APPROVAL (05/28/2020)

ENBRIDGE
Texas Eastern Transmission, LP
5400 Westheimer Ct. Houston , Tx 77056-5310 713 / 627-5400

DRAWN: LGF | DATE: 04/29/20 | EROSION AND SEDIMENT CONTROL FIGURES
CHECKED: RG | DATE: 04/29/20 | W.B.S. NO. | YEAR: 2020 | SHEET 2 OF 3

S:\AFS\Projects\Enbridge\Conemaugh_River_Xing\190913 - Conemaugh River Xing\801_Mapping\001_Alignment\Erosion and Sediment Control Plan\Conemaugh River HDD Erosion and Sediment Control Plan SNC COVER AND NOTES.dwg - PLOT TIME: 5/26/2020 10:00 AM

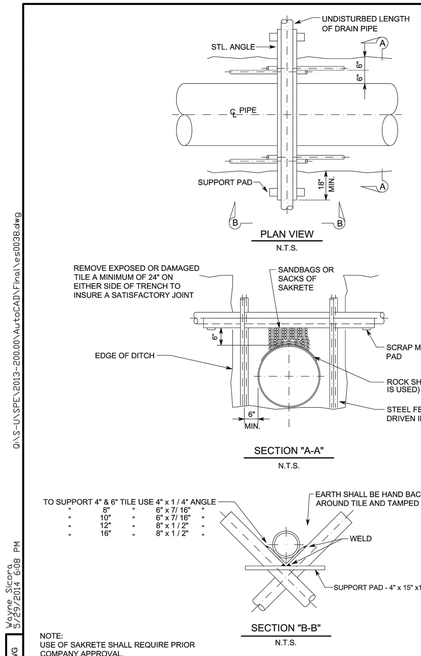


NOTES:

1. IN WETLANDS, EQUIPMENT MATS OR LOW GROUND WEIGHT EQUIPMENT SHALL BE UTILIZED IN SATURATED GROUND CONDITIONS.
2. LIMIT PULLING OF TREE STUMPS AND GRADING TO DIRECTLY OVER TRENCHLINE, EXCEPT IN SITUATIONS THAT THE CHIEF INSPECTOR AND ENVIRONMENTAL INSPECTOR DETERMINE SAFETY-RELATED CONSTRUCTION CONSTRAINTS REQUIRE GRADING OR THE REMOVAL OF STUMPS FROM UNDER THE WORKING SIDE.
3. SEGREGATE THE TOP 12 INCHES OF TOPSOIL WITHIN THE DITCHLINE IN WETLANDS, EXCEPT IN AREAS WHERE STANDING WATER IS PRESENT OR SOILS ARE SATURATED.
4. DO NOT TRENCH THE WETLAND UNTIL THE PIPELINE IS ASSEMBLED AND READY FOR LOWERING IN.
5. CONCRETE COATING OR PIPELINE WEIGHTS OF AN APPROPRIATE TYPE, WEIGHT AND SPACING WILL BE USED AS REQUIRED. NO CONCRETE COATING ACTIVITIES WITHIN 100 FEET OF A WETLAND OR WATERBODY BOUNDARY, UNLESS THE LOCATION IS AN EXISTING INDUSTRIAL SITE DESIGNATED FOR SUCH USE.
6. INSTALL SEDIMENT BARRIERS (SB) ALONG THE EDGE OF THE CONSTRUCTION RIGHT-OF-WAY AS NECESSARY TO CONTAIN SPOIL AND SEDIMENT WITHIN THE CONSTRUCTION RIGHT-OF-WAY THROUGH WETLANDS.
7. IN THE TRAVEL LANE, SEDIMENT BARRIERS MAY CONSIST OF REMOVABLE SEDIMENT BARRIERS OR DRIVABLE BERMS.
8. AT THE BASE OF SLOPES (GREATER THAN 5 PERCENT) THAT ARE LESS THAN 50 FEET FROM A WETLAND, INSTALL AND MAINTAIN TEMPORARY SEDIMENT BARRIERS ACROSS THE ENTIRE CONSTRUCTION RIGHT-OF-WAY UNTIL REVEGETATION IS SUCCESSFUL.
9. NO FERTILIZER OR LIME SHALL BE USED WITHIN WETLANDS.
10. DEWATER THE TRENCH IN A MANNER THAT DOES NOT CAUSE EROSION OR RESULT IN SILT-LADEN WATER FLOWING INTO ANY WETLAND.

I.S. ES0032.DWG	TYPICAL STANDARD WETLAND CROSSING	FIGURE WC-1
		DWG. ES-0032 REV.

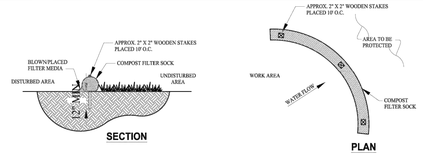
Q:\S-U\SPEC\2013-200.00\Autocad\Final\es0032.dwg
Wayne Sicora
6/30/2014 10:32 AM



NOTE:
USE OF SAKRETE SHALL REQUIRE PRIOR COMPANY APPROVAL.

I.S. ES0038.DWG	DRAIN TILE REPAIR PROCEDURE	FIGURE SU-1
		DWG. ES-0038 REV.

Q:\S-U\SPEC\2013-200.00\Autocad\Final\es0038.dwg
Wayne Sicora
5/29/2014 6:08 PM



*FOR TABLE OF SPECIFIC SIZING SEE DRAWING DELM-P-8101

MATERIAL TYPE	3 mil HDPE	5 mil HDPE	5 mil HDPE	MULTI-FILAMENT POLYPROPYLENE (MFPP)	HEAVY-DUTY MULTI-FILAMENT POLYPROPYLENE (HDMFPP)
MATERIAL CHARACTERISTICS	PHOTO-DEGRADABLE	PHOTO-DEGRADABLE	BIO-DEGRADABLE	PHOTO-DEGRADABLE	PHOTO-DEGRADABLE
SOCK DIAMETERS	12" 18"	12" 18" 24" 32"	12" 18" 24" 32"	12" 18" 24" 32"	12" 18" 24" 32"
MESH OPENING	3/8"	3/8"	3/8"	3/8"	1/8"
TENSILE STRENGTH		26 psi	26 psi	44 psi	202 psi
ULTRAVIOLET STABILITY % ORIGINAL STRENGTH (ASTM G-155)	23% at 1000 hr.	23% at 1000 hr.		100% at 1000 hr.	100% at 1000 hr.
MINIMUM FUNCTIONAL LONGEVITY	6 MONTHS	9 MONTHS	6 MONTHS	1 YEAR	2 YEARS
TWO-PLY SYSTEMS					
INNER CONTAINMENT NETTING		HDPE BIAXIAL NET CONTINUOUSLY WOUND FUSION-WELDED JUNCTURES 3/4" x 3/4" MAX. APERTURE SIZE			
OUTER FILTRATION MESH		COMPOSITE POLYPROPYLENE FABRIC (WOVEN LAYER AND NON-WOVEN FLEECE MECHANICALLY FUSED VIA NEEDLE PUNCH) 3/16" MAX. APERTURE SIZE			
SOCK FABRICS COMPOSED OF BURLAP MAY BE USED ON PROJECTS LASTING 6 MONTHS OR LESS.					

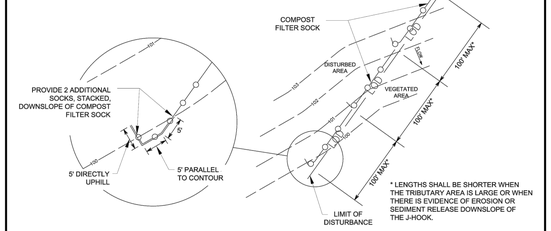
ORGANIC MATTER CONTENT	25% - 100% (DRY WEIGHT BASIS)
ORGANIC PORTION	FIBROUS AND ELONGATED
pH	5.5 - 8.5
MOISTURE CONTENT	30% - 60%
PARTICLE SIZE	30% - 50% PASS THROUGH 3/8" SIEVE
SOLUBLE SALT CONCENTRATION	5.0 dS/m (mmhos/cm) MAXIMUM

*FOR TABLE OF SPECIFIC SIZING SEE DRAWING DELM-P-8101

NOTES:

1. ALL MATERIAL TO MEET MANUFACTURER SPECIFICATIONS.
2. COMPOST FILTER SOCK FILL TO MEET APPLICATION REQUIREMENTS.
3. COMPOST MATERIAL TO BE DISPERSED ON SITE, AS DETERMINED BY CONSTRUCTION CONTRACTOR.
4. COMPOST FILTER SOCK SHALL BE PLACED AT EXISTING LEVEL GRADE. BOTH ENDS OF THE SOCK SHALL BE EXTENDED AT LEAST 8 FEET UP SLOPE AT 45 DEGREES TO THE MAIN SOCK ALIGNMENT.
5. TRAFFIC SHALL NOT BE PERMITTED TO CROSS FILTER SOCKS.
6. ACCUMULATED SEDIMENT SHALL BE REMOVED WHEN IT REACHES 1/2 THE ABOVE GROUND HEIGHT OF THE SOCK AND DISPOSED IN THE MANNER DESCRIBED ELSEWHERE IN THE PLAN.
7. SOCKS SHALL BE INSPECTED WEEKLY AND AFTER EACH RUNOFF EVENT. DAMAGED SOCKS SHALL BE REPAIRED ACCORDING TO MANUFACTURER'S SPECIFICATIONS OR REPLACED WITHIN 24 HOURS OF INSPECTION WITH ADDITIONAL SOCK OR ROCK FILTER.
8. BIODEGRADABLE FILTER SOCK SHALL BE REPLACED AFTER 6 MONTHS; PHOTODEGRADABLE SOCKS AFTER 1 YEAR. POLYPROPYLENE SOCKS SHALL BE REPLACED ACCORDING TO MANUFACTURER'S RECOMMENDATIONS.
9. UPON STABILIZATION OF THE AREA TRIBUTARY TO THE SOCK, STAKES SHALL BE REMOVED. THE SOCK MAY BE LEFT IN PLACE AND VEGETATED OR REMOVED. IN THE LATTER CASE, THE MESH SHALL BE CUT OPEN AND THE MULCH SPREAD AS A SOIL SUPPLEMENT.

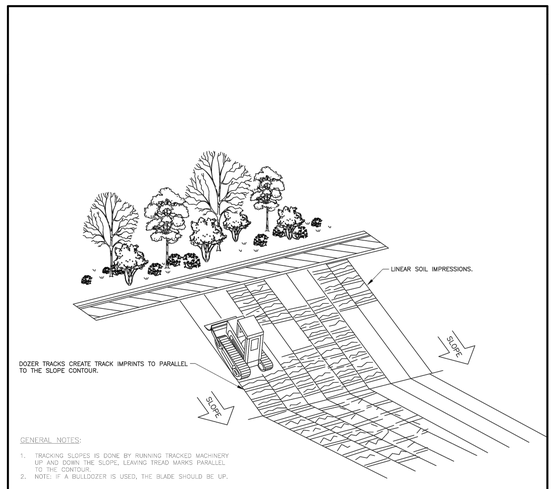
AECOM FOSTER PLAZA 6 681 ANDERSEN DRIVE, SUITE 400 PITTSBURGH, PA 15220	ENBRIDGE TEXAS EASTERN TRANSMISSION, LP			
	DATE: 7/20/2016	SCALE: NOT TO SCALE	DRAWING NO. DETAIL 7	COMPOST FILTER SOCK 2020 PENN JERSEY INTEGRITY
PREPARED BY: CDB	CHECKED BY: MDC	APPROVED BY: SG	REV. DATE: 01/14/2020	PROJECT NO. 60594173



J-HOOK SEDIMENT BARRIER CONFIGURATION
N.T.S.

* LENGTHS SHALL BE SHORTER WHEN THE TRIBUTARY AREA IS LARGE OR WHEN THERE IS EVIDENCE OF EROSION OR SEDIMENT RELEASE DOWNSLOPE OF THE J-HOOK.

I.S.	J-HOOK DETAIL	DESIGN MANAGER		E&S FIGURE
		PROJ. DIRECTOR		
		TECH. SERVICES DIRECTOR		DWG. ES-T100 REV.
			INITIALS DATE	



GENERAL NOTES:

1. TRACKING SLOPES IS DONE BY RUNNING TRACKED MACHINERY UP AND DOWN THE SLOPE, LEAVING TREAD MARKS PARALLEL TO THE CONTOUR.
2. NOTE: IF A BULLDOZER IS USED, THE BLADE SHOULD BE UP.

TRACKING SLOPE DETAIL
SCALE: N.T.S.

I.S.	TRACKING SLOPE DETAIL	DESIGN MANAGER		E&S FIGURE
		PROJ. DIRECTOR		
		TECH. SERVICES DIRECTOR		DWG. REV.
			INITIALS DATE	

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
BRANDON MICHAEL WALKER
ENGINEER
PE077056

07/23/20

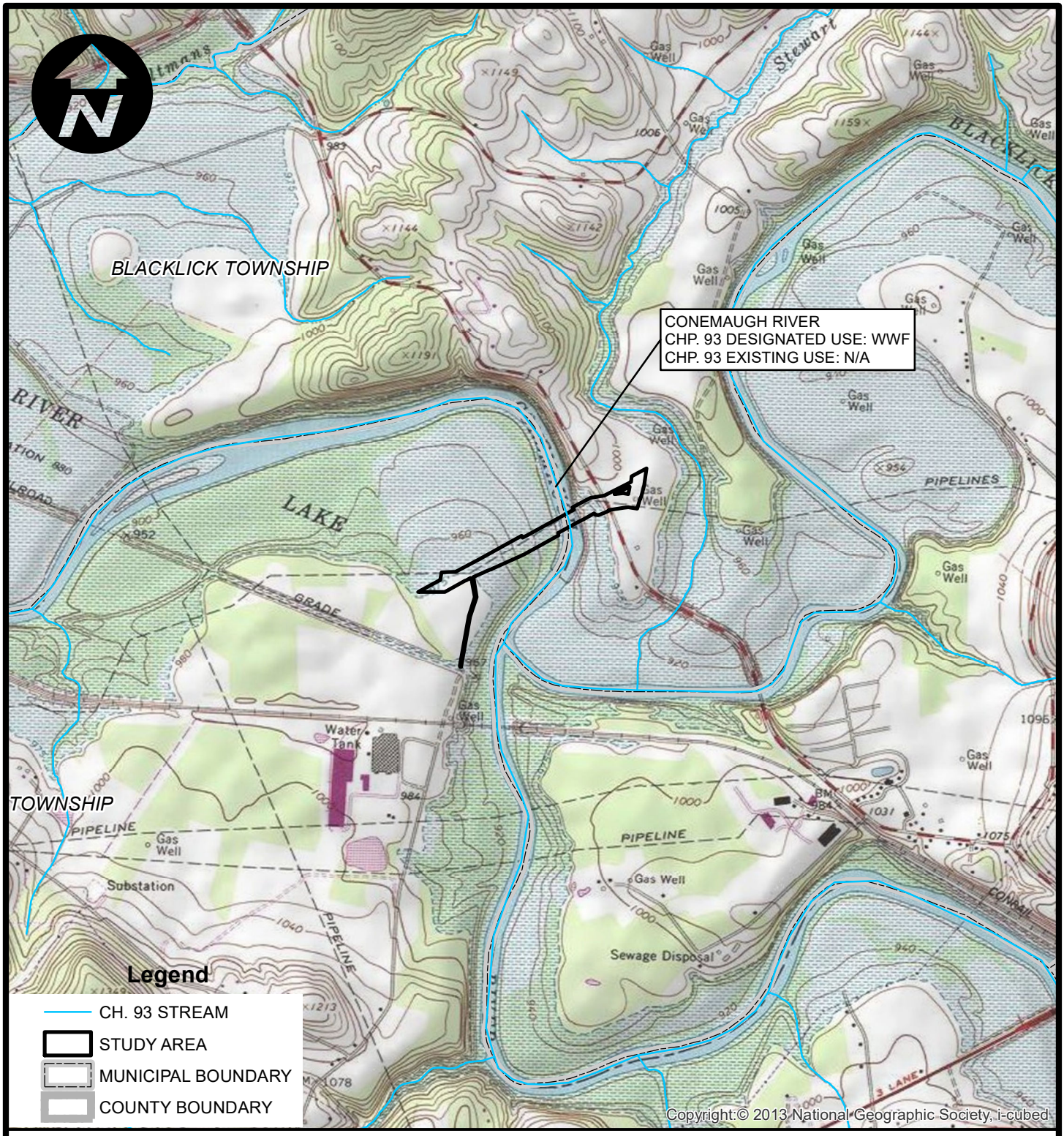
REV	DSN	CK	DESCRIPTION	REV	DSN	CK	DESCRIPTION
1	LGF	RG	ISSUED FOR CONSTRUCTION (07/23/2020)				
0	SNC	RG	ISSUED FOR APPROVAL (05/28/2020)				

ENBRIDGE
Texas Eastern Transmission, LP
5400 Westheimer Ct. Houston , Tx 77056-5310 713 / 627-5400

DRAWN: LGF	DATE: 04/29/20	EROSION AND SEDIMENT CONTROL FIGURES	
CHECKED: RG	DATE: 04/29/20	W.B.S. NO.	YEAR: 2020 SHEET 3 OF 3

S:\AFS\Projects\Enbridge\Conemaugh_River_Xing\190913 - Conemaugh River Xing\801_Mapping\001_Alignment\Erosion and Sediment Control Plan\Conemaugh River HDD Erosion and Sediment Control Plan SNC COVER AND NOTES_recover.dwg - PLOT TIME: 5/26/2020 5:10 PM

Appendix B
USGS Project Location Map



USGS QUAD NAME: BLAIRSVILLE, PA
BLACKLICK TOWNSHIP, INDIANA COUNTY AND DERRY TOWNSHIP, WESTMORELAND COUNTY, PA
SITE CENTER: 40° 27' 21.15" N AND 79° 17' 57.81" W

TOPO SOURCE: SEAMLESS DIGITAL RASTER GRAPHIC-N.P.S. NATURAL PHYSICAL MAP & U.S.G.S. TOPOGRAPHIC MAP 2013, NATIONAL GEOGRAPHIC SOCIETY, ICUBED

AECOM
FOSTER PLAZA 6
681 ANDERSEN DRIVE, SUITE 120
PITTSBURGH, PA 15220

ENBRIDGE

TEXAS EASTERN TRANSMISSION, LP

PREPARED BY:	CHECKED BY:	APPROVED BY:
JAS	MAB	SLH

DATE:	SCALE:	DRAWING NO.
4/23/2020	1 " = 2,000 '	**FIGURE 1**
	PROJECT NO.	LOCATION MAP
Page 1 of 1	60594173	2020 INTEGRITY PROGRAM
		CONEMAUGH RIVER CROSSING PROJECT
		INDIANA AND WESTMORELAND COUNTIES, PENNSYLVANIA

Appendix C
Erosion and Sediment Control Plan Narrative

Erosion and Sediment Control Plan

Texas Eastern Transmission, LP
Conemaugh River Crossing Project
Indiana and Westmoreland Counties, Pennsylvania

June 2020

Submitted By:
Texas Eastern Transmission, LP
890 Winter Street, Suite 300
Waltham, MA 02451

Prepared By:
AECOM
715 Washington Boulevard
Williamsport, Pennsylvania 17701

ENBRIDGE

TABLE OF CONTENTS

TABLES

FIGURES

E&SCP DRAWINGS

APPENDICES

1.0 PROJECT OVERVIEW

1.1 INTRODUCTION

AECOM Technical Services, Inc. (AECOM) has prepared this Erosion and Sediment Control Plan (E&SCP) for Texas Eastern Transmission, LP (Texas Eastern). The purpose of this Plan is to address control of accelerated erosion and sedimentation resulting from earth disturbance activities associated with the Conemaugh River Crossing Project (Project) located in Blacklick Township, Indiana County and Derry Township, Westmoreland County, Pennsylvania (PA). The Project involves replacing a section of their existing Line 12, a 24-inch natural gas pipeline, beneath the Conemaugh River. This E&SCP, if properly implemented, will provide for effective erosion and sediment controls (E&SCs) throughout construction.

The purpose of this E&SCP document is to minimize and/or avoid potential adverse environmental impacts due to the operation and maintenance activities associated with the natural gas pipeline. The proposed practices are intended to maintain, to the fullest extent practicable, the integrity of sensitive resources such as wetlands and streams or protected habitats, if any, located within the work areas. The Plan consists of this written narrative and the attached appendices including plan drawings and design calculations. It was developed to be in accordance with the requirements of 025 PA Administrative Code Chapters 78 and 102, as well as the Clean Streams Law (35 P. S. §§ 691.1001), as amended, utilizing guidelines and best management practices (BMP) information provided in the PA Department of Environmental Protection (PADEP) document: *Erosion and Sediment Control Best Management Practice Manual*, dated March 2012.

An up-to-date copy of this E&SCP (including this narrative and all appendices) shall be maintained and available at the Project site during all stages of earth disturbance activity.

1.2 PROJECT DESCRIPTION

The Project involves replacing a section of Texas Eastern's existing Line 12, 24-inch diameter natural gas pipeline, due to the discovery of an anomaly adjacent to the Conemaugh River that required investigation and repair to comply with United States (US) Department of Transportation (DOT) Pipeline and Hazardous Materials Safety Administration (PHMSA) regulations. A section of Line 12 will be replaced in-situ from the existing mainline valve (MLV) on the west side of the Conemaugh River to the horizontal direction drilling (HDD) bore pit; HDD will be used to install a section of pipeline under the Conemaugh River; and a section of pipeline will be installed between the HDD bore pit and a new MLV on the east side of the Conemaugh River. Approved Chapter 105/Section 404 permit(s) from PADEP and/or US Army Corps of Engineers (USACE) are to be obtained prior to any wetland or stream crossing.

The Project is located mostly within existing maintained right-of-way (ROW) on either side of the Conemaugh River, but will require some temporary workspace outside of the existing ROW as well as a small area of new permanent easement. Laydown areas and temporary workspaces will be utilized within the ROW during construction. Approximately 0.76 acres of new ROW will be acquired to accommodate the new pipeline connecting the HDD segment to the new MLV in the existing easement. The The ROW will be accessed via Westinghouse Road on the west side of the Conemaugh River and via Newport Road on the east side. A new permanent access road 20 feet wide and 375 feet long will be installed on the east side of the river from Newport Road to access the new permanent MLV.

Approximately 12.23 acres of earth disturbance will occur as a result of the Project. These disturbances will be temporary with the exception of the 0.45 acres required for the permanent MLV and access road. Once the pipeline is installed, the LOD will be restored to original topographic conditions and disturbed areas will be immediately seeded and mulched. Best Management Practices (BMPs) will be used during all phases of

construction. Texas Eastern proposes to begin construction in February 2021 and ending in June 2021. The area and duration of earth disturbance are to be minimized to the extent practical.

The outline of this plan is organized based on the Notice of Intent (NOI) Checklist included in Section 1 of this ESCGP-3 Permit Application.

2.0 EXISTING CONDITIONS

The Project area has, with the exception of an agricultural area, been utilized as a utility corridor for the existing Texas Easter ROW. The USACE is the primary land owner of the entire project area including an area of East side of River that is leased to the PA Game Commission (PGC).

The Project is located mostly within existing maintained ROW on either side of the Conemaugh River, but will require some temporary workspace outside of the existing ROW as well as a small area of new permanent easement. There are currently four high-pressure natural gas transmission pipelines in operation within the project ROW, the 24-inch Line 12, the 30-inch Line 19, the 16-inch Line 19-AUX and the 36-inch Line 27-AUX. Through periodic vegetation management, the ROW is maintained in a mixed herbaceous and shrub state. Immediately surrounding the ROW within the Project area are agricultural fields and forestland.

3.0 TOPOGRAPHIC FEATURES

Terrain along the ROW consists of flat to gradually sloping land on the west side of the river and steep sloping to flat land on the east side of the river. Site elevations vary from 992 feet to 880 feet above mean sea level as shown on the United States Geological Survey (USGS) 7.5-minute quadrangle (Blairsville) depicted on the Project Location Map provided as Figure 1.

The E&SCP Drawings depict the topography of the site and the surrounding area as well as all relevant existing site features. The existing features include the topography of the project site and the surrounding area, mapped soil boundaries, municipal and county boundaries, known property, easement, and right-of-way boundaries, roadways, streams, watercourses, existing structures, existing ground cover (including tree lines and other significant vegetative features), utilities, and other important features.

4.0 SOIL CHARACTERISTICS

4.1 SOIL IDENTIFICATION

Seven soil map units are located within the Project Area. The soils of the site are shown on the E&SCP Drawings, and the soil limitations of the site are shown on the Table 1. This table contains the types, depth, slope and limitations of the soils within the project area. Additional information in the soil report includes data on the physical characteristics of the soils, such as their texture, resistance to erosion and suitability for the intended use. The limitation of soils pertaining to earthmoving projects, and the means to address the identified soils limitations are included on the E&SCP drawings.These soil boundaries and associated information were obtained from the United States Department of Agriculture (USDA) Soil Survey Geographic (SSURGO) database.

To counteract erodible soils, erosion controls will be in place and functional prior to earth disturbances, and stabilization practices will be implemented in disturbed areas as soon as practical.

4.2 CONSTRUCTION TECHNIQUES OR SPECIAL CONSIDERATIONS TO ADDRESS LIMITATIONS

See Table 1 and ESCP Drawings for soil series and limitations crossed by the Project. In most situations, typical pipeline construction equipment and BMPs will be sufficient to manage the proposed work. At a minimum, trench plugs and ROW diversions (waterbars) will be installed where indicated on the plans and on slopes in order to prevent stormwater-related erosion problems during construction and after backfilling.

Severe erosion hazard limitations shall be immediately reduced by the installation and maintenance of ROW diversions, sediment barriers, and seed and mulch. Proposed permanent access roads will be graded to direct stormwater into Post-Construction Stormwater Management (PCSM) BMPs. Permanent controls such as permanent seeding and mulching shall reduce the long-term potential for erosion. Soils disturbed during construction activities will be returned to pre-construction contours once work activities are complete and the area will be revegetated and stabilized.

5.0 EARTH DISTURBANCE ACTIVITY

5.1 LIMITS OF DISTURBANCE

The necessary permits and authorizations from PADEP or conservation district, related to the earth disturbance activity need to be obtained before commencing the earth disturbance activity. The amount of earth disturbed is to be minimized as much as possible.The Project area contained within the LOD including pipeline and additional workspaces is approximately 12.23 acres and is shown on the E&SCP Drawings. These drawings depict the proposed facilities and site features and include the limits of earth disturbance, the locations of existing roads, and the location of proposed BMPs. This disturbance is to be temporary and disturbed areas are to be immediately seeded and mulched upon placement of the proposed pipeline and associated fill.

5.2 PROPOSED IMPROVEMENTS AND LAND USES

The pipeline will be constructed in Indiana and Westmoreland Counties. The Project will involve the replacement of an existing segment of pipeline, primarily across agricultural land and maintained ROW. No permanent topographic or land cover changes are proposed aside from long-term maintenance to trim woody vegetation and occasional mowing. Upon completion of construction, any disturbed areas will be stabilized with vegetative cover as indicated on the E&SC Plan drawings.

6.0 PROJECT SITE RUNOFF

The Project area is linear in nature. The majority of runoff from the Project will occur through overland flow from temporarily disturbed areas to existing agricultural and forested areas. Construction will occur so that the Project will be returned to pre-construction contours allowing for the existing drainage patterns to be intact. No permanent changes to topography or drainage patterns are proposed.

The Project proposes the construction of one permanent gravel access road and one permanent gravel mainline valve site. An infiltration trench is proposed along the access road to mitigate the increase in peak rates and runoff volumes caused by the addition of permanent impervious areas. Due to the linear nature of the remaining portions of this Project and the negligible change in land use from pre to post-construction conditions, it is anticipated that there will be no increase in runoff volume and peak rate of discharge for the Project, outside of the proposed permanent gravel areas.

Please see Appendix A (Calculations) in Section 6 of the ESCGP-3 Application for calculations performed to size the infiltration basin.

7.0 SURFACE WATER CLASSIFICATION

AECOM completed a wetland and watercourse investigation of the project area. The boundary of this site investigation and all environmental resources identified during this investigation are contained within the *Wetland and Watercourse Delineation Report* included in Appendix A.

The Site drains to the Conemaugh River, which is located in the Allegheny River basin. The Conemaugh River has PA Code, Title 25, Chapter 93 designated protected aquatic life uses of *Warm Water Fishes* (*WWF*) (PADEP, 2020). PADEP does not list the Conemaugh River as having an Existing Use Classification (PADEP, 2020b). The Conemaugh River is not listed by the Pennsylvania Fish and Boat Commission (PFBC) as Stocked Trout Waters nor is it listed by the PFBC as Wild Trout Waters (PFBC, 2020a, 2020b, and 2020c).

According to the 2018 Pennsylvania Integrated Water Quality Monitoring and Assessment Report, the Conmeaugh River is not listed as a siltation impaired waterbody (PADEP, 2018).

Three wetlands identified by the U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) are located within the Study Area as shown on Figure 2 in the attached *Wetland and Watercourse Delineation Report* (Appendix A). They are identified as follows:

- L1UBHh – lacustrine, limnetic, unconsolidated bottom, permanently flooded, diked/impounded wetland,
- L2USAh – lacustrine, littoral, unconsolidated shore, temporary flooded, diked/impounded wetland, and
- PFO1/USAh – palustrine, forested, broad-leaved deciduous, unconsolidated shore, temporary flooded, diked/impounded wetland (USFWS, 2018).

The attached E&SCP Drawings depict the locations of the Conemaugh River and the field-delineated wetlands in and near the LOD for the Project. A summary of all surface water features crossed by the LOD of the Project is provided in the Chapter 105 Permit Application.

7.1 STREAM CROSSINGS

The Conemaugh River is the only stream crossing associated with this Project. The Conemaugh River will be crossed via HDD bore, resulting in no surficial impacts. This crossing is shown on the E&SCP Drawings and additional information on the construction sequence associated with the HDD of this stream is provided in Section 9.2

7.2 WETLAND CROSSINGS

Three wetland crossings were identified along the proposed Project area. One wetland is being crossed via HDD, resulting in no surficial impacts. Two wetlands will be crossed via matting to create temporary workspace for construction activities. These crossings are shown on the E&SCP Drawings and additional information on the construction sequence associated with on these wetland crossings is provided in Section 9.2.

7.3 FLOODWAY CROSSINGS

The floodway associated with the Conemaugh River crossings will be crossed via HDD bore, resultling in no surficial impacts.

8.0 BMP DESCRIPTION NARRATIVE

The E&SC BMPs for this earth disturbance activity have been planned to minimize the extent and duration of the proposed earth disturbance, to protect existing drainage features and vegetation, minimize soil compaction, and employ measures and controls that minimize the generation of increased runoff. Specific BMPs have been selected for this site in order to achieve these broad goals. The location of each proposed BMP is shown on the E&SCP drawings. These BMPs are the minimum controls necessary to protect off-site areas from sediment-laden runoff generated within the LOD. Additional controls may be required depending on the progress of construction and varying conditions encountered.

Temporary controls that will be used or may be used based on field conditions are described below. Other structural controls as described below may also be used as deemed necessary based on conditions encountered in the field. Installation guidelines and locations for the BMPs are as shown on the E&SCP Drawings and Standard Detail Sheets. The temporary control measures that will be utilized on this Project include, but are not limited to:

8.1 TEMPORARY STRUCTURAL PRACTICES

Rock Construction Entrances: In order to prevent the tracking of mud onto paved roadways, rock construction entrances (RCEs) shall be installed from any public road, as shown on the E&SCP Drawings and Standard Detail Sheets. The Contractor may deviate from the locations shown on the plan within the LOD, but must obtain approval from the Permittee and Sealing ESCGP-3 Engineer. Upon site stabilization, the RCEs shall be removed along with any unsuitable material, and the area restored according to the Construction Sequence in Section 9.2. All sediment deposited on public roadways shall be removed by the Contractor immediately. Washing the roadway or sweeping the deposits into roadway ditches, sewers, culverts or other drainage courses is not acceptable. Gravel will be used to limit dust and erodibility.

Temporary Waterbars: Waterbars will be installed in accordance with the Standard Detail on the drawings to reduce the velocity of water flow during rain events. Waterbars should be constructed at a slope of 2 percent and discharge to a well-vegetated area. Waterbars should not discharge into an open trench. Waterbars should be oriented so that runoff will be directed towards the downslope side of the disturbed area and avoid flowing back onto the ROW. Obstructions (e.g., sediment barriers, etc.) should not be placed in any waterbars. They should be located below the discharge end of the waterbar. Only temporary waterbars will be used in agricultural and residential areas.

Compost Filter Sock (CFS): CFS is a sediment barrier consisting of a mesh sock and coarse compost. CFS will be placed to control runoff and collect sedimentation. Compost filter socks are specified on the E&SCP Drawings. CFS is an Antidegredation Best Available Combination of Technologies (ABACT) control usually used for EV and HQ watersheds. The Project is not located in an EV or HQ watershed and is not required anywhere within the LOD, however it will provide better sediment control in the areas around the temporary matting over wetlands. CFS will be installed in accordance with the Standard Detail Sheets. CFS locations are clearly depicted on the E&SCP Drawings.

Belted Silt Fence: Belted Silt Fence is a sediment barrier constructed from filter fabric attached to support stakes or poles. Silt fence will be installed to control runoff from HDD workspace, in accordance with the Standard Detail Sheets.

Erosion Control Blanket (ECB): ECB is a soil covering made from straw, coir, excelsior, or synthetic material used to minimize the potential for erosion or an exposed soil until a suitable vegetative cover can be

established. ECB will be place in the Project area where a slope greater than 33 percent exists (unless located in an agricultural area).

Vertical Tracking Slope: Vertical Tracking Slopes will be performed on all disturbed slopes so that the track marks will be in parallel with the contour and encourages revegetation. Tracking will be performed prior to placement of any ECB.

Orange Safety Fence: Orange safety fence shall be installed at the borders of all streams, wetlands, and public roads to provide a visible barrier to construction equipment and activities.

Restoration: All improved areas disturbed by construction shall be restored to pre-construction contours and revegetated to a minimum uniform 70 percent perennial vegetative cover per Table 2.

Additional Requirements: Any additional requirements to adequately control E&SC pollution shall be the responsibility of the Contractor and shall be considered incidental to construction activities.

Temporary Wetland Crossings: Temporary wetland crossings should be constructed from materials that can be placed with a minimum of disturbance to the soil surface and completely removed when no longer needed. Stabilized crossing methods are shown on the Standard Detail Sheets. Timber mats (or equivalent) are required for wetland crossings regardless if there is standing water or saturated soil at the time of construction or the soil is firm enough to avoid rutting.

8.2 PERMANENT STRUCTURAL PRACTICES

Permanent Waterbars Waterbars will be installed in accordance with the Standard Detail Sheets. No permanent waterbars are to be installed in agricultural or residential areas. Water bars on ROWs shall be left in place after permanent stabilization has been achieved. Maintenance of water bars shall be provided until ROW has achieved permanent stabilization.

Infiltration trench: Infiltration trench will be installed as shown on Permit Drawings and according to the Standard Detail Sheets. Infiltration trenches mitigate increased runoff due to increased impervious areas added to the Project by the proposed permanent access road. Disturbance to proposed infiltration trench construction areas will be minimized to the extent practicable during construction of the pipeline/facilities. The infiltration trench will be maintained to their full dimension and infiltration capacity for the life of the project. Refer to the PCSM/SR Plan Narrative for PCSM/SR BMP Section 8.0 for PCSM/SR Installation Sequence.

Trench Plugs: Trench plugs are specified on the E&SCP drawings to inhibit channelized flow which may occur in the trench when open during construction. Trench plugs should be installed in accordance with the trench plug detail contained within the Standard Details.

8.3 PERMANENT AND TEMPORARY VEGETATIVE PRACTICES

As indicated on the E&SCP drawings, disturbed areas are to be temporarily stabilized if construction activity is expected to cease more than 4 days. Upon completion of construction activity, disturbed areas are to be permanently stabilized.

Permanent Vegetative Stabilization Immediately upon completion of final grading, disturbed areas will receive topsoil and permanent vegetative stabilization, defined as a minimum uniform 70 percent perennial vegetative cover. The disturbed areas will be permanently stabilized in accordance with Table 2. For disturbed areas, the topsoil will be segregated and replaced following construction. The vegetative restoration method will be determined with consultation with the landowner in cultivated or rotated cropland.

Temporary Vegetative Practices (Interim Stabilization) Upon temporary cessation of an earth disturbance activity or any stage or phase of an activity where a cessation of earth disturbance activities will exceed four days, the site shall be immediately seeded, mulched, or otherwise protected from accelerated erosion and sedimentation pending future earth disturbance activities. For an earth disturbance activity or any stage or phase of an activity to be considered temporarily stabilized, the disturbed areas shall be covered with one of the following: a minimum uniform coverage of mulch and seed, with a density capable of resisting accelerated E&S, or an acceptable BMP which temporarily minimizes accelerated erosion and sedimentation. Temporary stabilization will not occur on active vehicular travel ways, stockpiles, and ditch spoil areas unless earth disturbance activities are ceased in areas for four days or more. Refer to Table 3 for temporary seeding specifications.

Mulching The purpose of mulch is to reduce runoff and erosion, prevent surface compaction or crusting, conserve moisture, aid in establishing plant cover, and control weeds. Mulch shall be applied on any area subject to erosion, or which has unfavorable conditions for plant establishment and growth. The practice may be used alone or in conjunction with other structural and vegetative conservation practices, such as waterways, ponds, sediment traps or critical area planting. On sediment producing areas where the period of exposure is less than 2 months, mulch materials shall be applied according to the following guidelines:

1. Straw mulch shall be applied at the rate of 3 tons per acre. Chemically treated or salted straw is not acceptable as mulch.

2. Straw mulch shall be anchored immediately after application by at least 1 of the following methods.

    a. "Crimped" into the soil using tractor drawn equipment (straight bladed coulter or similar). This method is limited to slopes no steeper than 3:1. Machinery should be operated on the contour. (Crimping of hay or straw by running it over with tracked machinery is not recommended)

    b. Asphalt, either emulsified or cut-back, containing no solvents or other diluting agents toxic to plant or animal life, uniformly applied at the rate of 31 gallons per 1,000 square feet.

    c. Synthetic binders (chemical binders) may be used as recommended by the manufacturer to anchor mulch provided sufficient documentation is provided to show that it is non-toxic to native plant and animal species.

    d. Lightweight plastic, fiber, or paper nets may be stapled over the mulch according to the manufacturer's recommendations.

Mulched areas shall be checked weekly and after each runoff event (e.g., rain, snowmelt, etc.) for damage until the desired purpose of the mulching is achieved. Damaged portions of the mulch or tie-down material shall be repaired upon discovery.

Fertilizing Practices

1. Fertilization Rates: For permanent stabilization apply 10-20-20 at 1,000 pounds per acre and for temporary stabilization apply 10-10-10 at 500 pounds per acre, unless the soil test determines that the rate can be less than these minimums. Soil testing will occur on each property and land type to obtain site specific fertilization rates. Results will be provided to construction contractors and environmental inspectors at time of restoration.
2. Fertilizer and lime are not to be used in stream or wetland areas.

9.0 BMP INSTALLATION SEQUENCE NARRATIVE

9.1 GENERAL

Refer to the E&SCP drawings for the location of the proposed work and the associated BMPs. A generalized construction sequence is provided below. The construction sequence is intended to provide a general course of action in order to conform to the applicable regulatory agency requirements for temporary and permanent soil E&SCs. Necessary parts for proper and complete execution of work pertaining to this plan, whether specifically mentioned or not, are to be performed by the contractor. It is not intended that the drawings and this report show every detailed piece of material or equipment. The contractor shall comply with all requirements listed in this section. The contractor may be required to alter controls based on effectiveness of controls or differing conditions encountered in the field.

Construction may begin as early as February 2021 and conclude within six months. A General Sequence of Construction is presented below. It should be noted that wherever practical, construction activities will occur simultaneously. Some of these activities may occur before or after their position in the sequence without detriment. Any proposed major deviation from the approved construction sequencing must first be submitted by the permitee for review and approval by the PADEP.

9.2 CONSTRUCTION SEQUENCE

A pre-construction meeting, with a minimum of seven (7) days advance notice, is required prior to the start of any construction activity, including any earth disturbance activities such as clearing and grubbing). Texas Eastern shall invite all contractors, landowner(s), PADEP, County Conservation District(s) (CCD), and the E&SCP preparer must be invited to this meeting,.

A copy of the approved ESCGP-3, application package and other required permits (stamped, signed, and dated by the reviewing agency) must always be available at the Project site .

Pipeline construction is accomplished through a set of sequential operations: Surveying; Installation of BMPs; Clearing and Grubbing; Grading; Trenching; Pipe Stringing, Assembly and Welding; Lowering-In; Trench Backfill; HDD bore; Hydrostatic Testing and Final Tie-In; Final Grading; and Permanent Stabilization. The construction spread shall proceed along the pipeline right-of-way to complete these activities as one continuous operation in order to minimize the duration of earth disturbance. The full sequence of construction activities for this Project, from initial clearing through permanent stabilization (with seed and mulch), is not anticipated to exceed 6 months, weather permitting. If mechanical completion occurs in the late fall or winter, the right-of-way shall be stabilized for the winter as outlined in the sequence below. Permanent stabilization shall commence at the beginning of the next available growing period.

1. Invite PADEP and Local County Conservation Districts to a pre-construction meeting(s) with a minimum notice of seven days. See PADEP and CCD contact information below.
    a. Pennsylvania Department of Environmental Protection, Regional Permit Coordination Office. 717-783-2300
    b. Westmoreland County Conservation District; 724-837-5271
    c. Indiana County Conservation District; 724-471-4751

2. Pre-Construction Activities: Prior to commencement of construction activities or any earth disturbance activity, locate and clearly mark (stake, flag) the pipeline centerline, the authorized LOD, approved access roads and construction entrances, and sensitive areas such as wetlands, streams, and areas proposed for infiltration.

3. Site Access: Prior to initiating construction activities, rock construction entrances (RCE) and the associated BMPs shall be installed per the details provided in this E&SCP. See plan drawings for specific locations.

4. BMP Installation: Install perimeter BMPs as specified in this E&SCP immediately following site access and prior to initiating mechanized land clearing, grubbing or any other earth disturbance activities. The clearing and grubbing associated with BMP installation shall be limited to the minimum necessary to complete installation of these BMPs.

5. Clearing and Grubbing: Perimeter BMPs shall be installed and functioning prior to initiating mechanized land clearing and grubbing, or any other earth disturbance activity. Clearing and grubbing operations shall be limited to the extent practical and shall not extend beyond the authorized LOD. Logs shall be placed in designated areas as authorized by landowner agreements or hauled offsite. Progressive clearing and grubbing operations, beginning in the location of BMPs and support areas, may proceed as long as installation of BMPs keeps pace with clearing and grubbing activities.

6. Access Roads: Temporary access roads will be installed and course base aggregate will be placed up to 75% of final grade, BMPs will be placed along the access road along with other controls as needed to prevent erosion and runoff from leaving the site while construction is active on the Right of Way. Previously existing E&SC/PCSM BMPs will be replaced/maintained as necessary (pertaining to their continued operation and maintenance). The permanent access road will be installed after construction activities are completed.

7. Topsoil Segregation: Strip and stockpile topsoil within the LOD, typically on the non-working side of the LOD. Maintain temporary soil stockpiles within existing BMPs. Topsoil stockpiles shall be immediately stabilized with temporary seed and mulch in accordance with the Seed Mixtures and Mulch for Revegetation table provided in this E&SCP. Topsoil stockpiles that will remain in place for over thirty days (30) shall be permanently stabilized per the Seed Mixtures and Mulch for Revegetation table provided in this E&SCP.

8. Grading: Site grading shall proceed in areas where BMPs have been installed as specified in this E&SCP and are functioning properly. Installation of diversion measures, including waterbars or other PADEP-approved diversions, shall be completed during the initial phases of the grading operations. The spacing of waterbars shall conform to the details provided in this E&SCP. The contractor shall install waterbars and other BMPs at the end of each working day.

9. Temporary Stabilization: Upon temporary cessation of an earth disturbance activity or any phase of an activity where the cessation of earth disturbance activities will exceed four (4) calendar days, the site shall be temporarily stabilized with seed and mulch (per the Seed Mixtures and Mulch for Revegetation table) or otherwise protected from accelerated erosion and sedimentation pending future earth disturbance activities. Areas with slopes exceeding 3:1 shall be temporarily stabilized with hydraulically applied mulch, or equivalent.

10. Pipeline Installation: Pipeline installation, including trenching, stringing, pipe assembly and welding, lowering-in, and backfilling, shall proceed only in areas where the required BMPs have been installed and are functioning properly. Trench breakers shall be installed per standard spacing specification on E&SCPs once the pipeline is lowered into place. Work shall be planned to minimize the duration

of open trench and earth disturbance. When possible, trench spoil shall be placed on the upslope side of the right-of-way and serve as a temporary diversion for upslope runoff during pipeline installation. Maintain, repair and re-install BMPs as necessary for the duration of pipeline construction.

11. HDD Bore: The boring will be performed utilizing a directional or HDD boring machine. There will be earthwork associated with leveling the area for the setup of the boring machine. Appropriate sediment barriers shall be installed downslope of boring machine setup areas and all excavated material shall be placed in the designated area as indicated on the E&SCP Drawings. The boring, casing and connection of lines will be completed during the excavation for the boring machine setup. Any groundwater that needs to be pumped from the excavated trench will be removed by discharge through a pumped water filter bag to a vegetated upland area.

12. Hydrostatic Testing and Final Tie-In: Hydrostatic testing process shall be initiated after completion of backfilling operations, or prior to the installation of the HDD pullback section. Hydrostatic test water will collected in tanks and disposed of off-site at an appropriate facility. The final tie-ins shall be completed and backfilled within five (5) calendar days after successful completion of hydrostatic testing, weather conditions permitting.

13. Final Grading and Permanent Stabilization: Initiate final grading immediately following completion of hydrostatic testing and final tie-ins. The LOD shall be returned as close to pre-construction grade and contours as practical. Permanent stabilization shall proceed upon completion of final grading. Permanent stabilization includes installation of permanent BMPs (i.e., water bars), amending topsoil (as necessary), seeding and mulching. Agricultural lands shall be restored in accordance with the landowner's specifications. Permanent stabilization is estimated to be complete within 60 calendar days weather permitting.

14. Winter Stabilization: If pipeline installation is completed during the late fall or winter, the site shall be temporarily stabilized with seed and mulch (per the Seed Mixtures and Mulch for Revegetation table). In general, permanent stabilization will not be conducted past October 15. Permanent stabilization may occur later than October 15 if weather conditions are favorable. If winter stabilization is required, permanent stabilization and plantings shall commence at the beginning of the next available growing period.

15. Install permanent access roads and associated stormwater BMPs in accordance with the Post Construction Stormwater Management (PCSM) Plans.

16. Post-Construction: Remove temporary BMPs in areas where 70% uniform, vegetative cover has been achieved and the site has been stabilized in accordance with this E&SCP and applicable permit conditions. Immediately stabilize any disturbance associated with removal of BMPs.

10.0 SUPPORTING CALCULATIONS AND MEASUREMENTS

E&SC BMPs, such as sediment barriers, RCEs, pumped water filter bags, waterbars, erosion control blankets, and trench plugs will be placed as appropriate to mitigate earth pollution resulting from disturbance activities. Calculations are not required for the proposed E&SC BMPs.

All compost filter socks (CFS) are assumed to be 12 or 18-inches in diameter. Please see CFS and belted silt fence Detail Drawing for dimensions used to size sediment barriers.

The Project proposes the construction of one new permanent gravel access road and one new graveled MLV. The installation of infiltration trench downgradient of the access road is expected to mitigate the runoff volume. Due to the linear nature of this Project and the negligible change in land use from pre to post-construction conditions, it is anticipated that there will be no increase in runoff volume and peak rate of discharge for the Project.

Please see Appendix A (Calculations) in Section 6 of the ESCGP-3 Application for calculations performed to size the infiltration trench adjacent to the permanent access road.

11.0 E&SC PLAN DRAWINGS

The Permit Drawings depict the proposed Project and BMPs along with applicable details provided in the Details Drawings of this section.

12.0 MAINTENANCE PROGRAM

Temporary and permanent BMPs will be used during construction activities to avoid and/or minimize adverse environmental effects of construction activities. A maintenance program that provides for routine inspection, as well as repair and replacement as necessary, is essential to effective and efficient operation of the proposed E&SC BMPs. Implementation of the following maintenance plan is a key component in achieving the intent of this E&SCP and minimizing accelerated erosion and sedimentation from the proposed earth disturbance. The permittee and any co-permittees shall be responsible for implementing the maintenance program presented on the Standard Details included in the E&SCP Drawings.

12.1 INSPECTION AND MAINTENANCE BMPs

E&SC BMP inspection will occur on a weekly basis and after each stormwater event. Until the site is stabilized, E&SC BMPs must be maintained properly. Preventative and corrective maintenance work, including clean-out, repair, replacement, regrading, reseeding, remulching, and renetting must be performed. If E&SC BMPs fail to perform as expected, replacement BMPs or modifications to those installed will be required.

The following inspection and maintenance practices will be used to maintain E&SCs on-site. After construction is completed and site has reached final grade and a minimum uniform 70 percent perennial vegetative cover has been achieved, all temporary BMPs will be removed and any land disturbed by removal will be permanently stabilized.

- Maintenance and inspection of sediment control facilities shall conform to PA Code Chapter 102 and 105 regulations.
- The Contractor shall make certain that all runoff is directed to the sediment control devices.
- E&SC measures will be in-place and inspected at the end of the workday in active construction areas. E&SC measures will also be inspected weekly and after each runoff event. Discharge locations shall be inspected to ascertain effectiveness of controls. Repair, maintenance, and additional control measures will be implemented immediately.

- Inspection reports and punch list must be emailed to the Texas Eastern compliance manager at the end of each workday.
- Logs of sediment control inspection must be kept with inspectors' construction records and include date, time, and condition of BMPs and any necessary maintenance.
- Inspections of all E&SC BMPs shall be conducted weekly and after each measurable rain event. Damaged BMPs will be repaired or replaced immediately upon discovering the damage and a written report must be submitted to the compliance manager with corrective action.
- Compliance Managers must contact County Conservation District immediately to report any compliance issues.
- Upon discovering unforeseen circumstances posing the potential for accelerated erosion and/or sediment pollution, the environmental inspector will request implementation of appropriate BMPs to eliminate the potential for accelerated erosion and/or sediment pollution. ESCGP-3 Plan Sheets shall be redlined to record all BMP modifications and kept on-site.
- If E&SCP BMPs are found to be inoperative or ineffective during an inspection, the CCD should be contacted within 24 hours, followed by the submission of a written noncompliance report to the CCD within 5 days of the initial inspection.
- Areas not identified as having maintained permanent stabilization (minimum uniform 70 percent perennial vegetative cover) will require action to be taken, such as reseeding, removal of excessive mulch, or other stabilization methods. These areas shall be monitored until permanent stabilization has become established.
- If during construction, concentrated flow areas form due to any storm event and any area becomes unstable, the area will be stabilized by installing rock filters or additional BMPs in the concentrated flow areas. Any required repairs or maintenance shall be made within 72 hours.
- Waterbars are to be inspected weekly and after runoff events. Accumulated sediment shall be removed from waterbars. Worn and ineffective waterbars shall be replaced immediately after discovering the damage.
- Sediment must be removed from sediment barriers once accumulation reaches one-half the above ground height of the barrier. Repair all undercutting or erosion of the toe anchor with compacted backfill material. Adhere to the manufacturer's recommendations for replacing sediment barriers due to weathering.
- Any portion of the sediment barrier that is undermined or overtopped will be immediately repaired. If the section continues to be overtopped or undermined, a rock filter outlet will be installed to replace the section.
- Sediment removed from sediment barriers shall be mixed in with the other waste soil on the construction site and properly disposed.
- The pumping rate to filter bags (if required) for pumped water shall be one-half the maximum pumping rate recommended by the manufacturer. Filter bags will be inspected daily. When the filter bag is one-half full of sediment, it will be disposed of as outlined section in 13.1.

- All site entrance and exit points will be inspected on a daily basis for evidence of off-site tracking of mud. It is the responsibility of the Contractor to clean streets and roads of mud and/or dust and take whatever steps are necessary to keep the streets and roads in a clean and dust-free condition.

- Access road gravel thickness shall be consistently maintained. A stockpile shall be maintained on-site for this purpose.

- RCE thickness shall be consistently maintained to the specified dimensions. All sediment deposited on paved roadways shall be removed and returned to the construction site immediately. If excessive amounts of sediment are being deposited on roadway, extend length of RCE by 50-foot increments until condition is alleviated or install wash rack. Washing the roadway or sweeping the deposits into roadway ditches, sewers, culverts, or other drainage courses is not acceptable.

- When encountering blanket movement or a wash-out (i.e., visible riling/gullies) of erosion control blankets and hydraulically applied erosion control blankets used on slopes, these areas will be regraded, reseeded, and remulched per manufacturer's specifications within 4 calendar days of inspection.

- Revegetated areas shall be inspected weekly and after runoff events for bare spots, washouts, and healthy growth during construction. Identified bare spots and washouts shall be repaired within 24 hours upon inspection, weather permitting.

- All soil stockpiles that are to remain more than 4 days shall be seeded with temporary grass and mulched, as noted in the seeding specification on the construction drawings. In no case should an area exceeding 15,000 square feet (which is to be stabilized by vegetation) reach final grade without being seeded and mulched.

- All sediment control measures shall remain in place until the disturbed areas are stabilized and a minimum uniform 70 percent perennial vegetative cover is established.

- Any slope on the Project site that appears suspect to slope slippage requires a geotechnical specialist to inspect the area immediately. If conditions warrant, mitigating geotechnical design features can be employed at the discretion of the construction manager. Slip prone slopes have been identified prior to construction, see Geotechnical Report.

- In order to facilitate restoration of native vegetation, grading and stump removal conducted during construction shall be limited to the trenchline through wetland and riparian areas, except as required to create a safe and level workspace.

- Routine vegetation mowing or clearing of the permanent right-of-way in wetlands should not exceed a width of 50 feet, centered on the pipeline. To facilitate periodic inspection and maintenance activities, a maximum 75-foot-wide corridor centered on the pipeline may be cleared at a frequency necessary to maintain the 50-foot corridor in an herbaceous state. In addition, trees within 25 feet of the pipeline with roots that could compromise the integrity of pipeline coating may be selectively cut and removed from the permanent right-of-way. The remaining portion of the right-of-way shall be allowed to permanently re-vegetate with native plant species. Do not conduct any routine vegetation mowing or clearing in wetlands or riparian buffers located between HDD entry and exit points.

12.2 INSPECTION AND MAINTENANCE SCHEDULE

Temporary Erosion and Sediment Controls - Inspection and Maintenance Schedule		
BMP	Inspection Frequency	Maintenance to be Performed
Waterbars	Weekly and After Runoff Events	Accumulated sediment shall be removed from waterbars. Worn and ineffective waterbars shall be replaced.
Sediment Barriers (Compost Filter Sock, Silt Fence)	Weekly and After Runoff Events	• Sediment must be removed from sediment barriers once accumulation reaches one-half the above ground height of the barrier. Repair all undercutting of erosion of the toe anchor with compacted backfill material. Adhere to the manufacturer's recommendations for replacing sediment barriers due to weathering. • Any portion of the sediment barrier that is undermined or overtopped will be immediately repaired. If the section continues to be overtopped or undermined, a rock filter outlet will be installed to replace the section. • Sediment removed from sediment barriers shall be mixed in with the other waste soil on the construction site and property disposed. • Damaged or deteriorated portions of the wood chip filter berm shall be replaced immediately upon inspection.
Filter Bags	Daily	When the filter bag is one-half full of sediment, it will be disposed of as outlined in the E&SCP.
Rock Construction Entrance (RCE)	Consistently Maintained	All sediment deposited on paved roadways shall be removed and returned to the construction site immediately. If excessive amounts of sediment are being deposited on roadway, extend length of rock construction entrance by 50 foot increments until condition is alleviated or install wash rack. Washing the roadway or sweeping the deposits into roadway ditches, sewers, culverts or other drainage courses is not acceptable. Replace any damaged culvert pipe within 8 hours of discovery. Damaged culvert pipe includes: crushed ends, out of round pipe, separation, cracks and voids in the pipe.
Revegetated Areas	Weekly and After Runoff Events	Revegetated areas shall be inspected for bare spots, washouts, and healthy growth during the construction. Identified bare spots and washouts shall be repaired within 24 hours upon inspection, weather permitting. Revegetated areas will be maintained over the life of the project, or until a uniform 70% cover regrowth been has been achieved
Infiltration Trench	Weekly and After Runoff Events	Infiltration trench shall be maintained to full dimension and infiltration capacity for the life of the project requiring the PCSM BMP. If at any time the capacity of the infiltration trench has been reduced below design capacity, repairs will be conducted. See PCSM Plan Narrative and Detail Sheets for Maintenance.

Temporary Erosion and Sediment Controls - Inspection and Maintenance Schedule		
BMP	Inspection Frequency	Maintenance to be Performed
Interim Stabilization	Weekly and After Runoff Events	Upon temporary cessation of an earth disturbance activity or any stage or phase of an activity where a cessation of earth disturbance activities will exceed four days, the site shall be immediately seeded, mulched or otherwise protected from accelerated erosion and sedimentation pending future earth disturbance activities. For an earth disturbance activity or any stage or phase of an activity to be considered temporarily stabilized, the disturbed areas shall be covered with 1 of the following: a minimum uniform coverage of mulch and seed, with a density capable of resisting accelerated E&S, or an acceptable BMP which temporarily minimizes accelerated E&S. Temporary stabilization will not occur on active vehicular travel ways, stockpiles, and ditch spoil areas unless earth disturbance activities are ceased in areas for 4 days or more. Refer to Table 3 for temporary seeding specifications.
Notes: 1.Damaged BMPs will be repaired or replaced as soon as practicable, but no more than 72 hours after discovering the damage and a written report must be submitted to the compliance specialist with corrective action. 2.Inspection reports and punch list must be emailed to the compliance specialist at the end of the work day. 3.Logs of sediment control inspection must be kept with the inspectors' construction records and include date, time and condition of BMPs and any necessary maintenance. 4.Compliance Managers must contact County Conservation District to report any compliance issues.		

13.0 MATERIAL RECYCLING AND DISPOSAL

13.1 MATERIAL WASTE HANDLING AND RECYCLING

The contractor is required to remove construction wastes from the site and dispose per PADEP regulations. No earthen borrow or waste is anticipated with the exception of imported rock aggregate where required (e.g, rock construction entrances). Excess material brought into the site areas to facilitate construction access will be completely removed prior to rough grading and final surface stabilization. Expected construction wastes will consist of packaging material and sediment cleaned from BMPs. Packaging from the materials brought on site will be disposed of by a licensed hauler. Sediment removed from BMPs will either be spread in a protected area to dry and then recycled as fill material or disposed of off-site. Garbage must be properly disposed of at a permitted facility. The scrap material must be removed from the site and disposed of or recycled at a properly licensed/permitted facility. The Contractor shall be responsible to assure that all materials are handled and disposed of in accordance with applicable laws, rules, and regulations, including, but not limited to, those issued by the Environmental Protection Agency, PADEP, Local County Conservation District, and Occupational Safety and Health Administration (OSHA).

Off-site spoil and/or borrow sites greater than 1-acre must be operated under a current NPDES Permit.

A Preparedness, Prevention, and Contingency (PPC) Plan for Construction Activities has been created for this Project. See Appendix A of the ESCGP-3 Application.

14.0 NATURALLY OCCURRING GEOLOGIC FORMATIONS AND SOIL CONDITIONS

The project is situated within high volatile vituminous coal fields as indicated on Pennsylvania Bureau of Topographic and Geologic Survey Map 11 – Distribution of Pennsylvania Coals (2000). The project is situated within the Conemaugh Group in the Appalachian Plateau Province, which has the potential to produce acid drainage due to the presence of sulfide minerals as indicated in Pennsylvania Bureau of Topographic and Geologic Survey Open File Miscellaneous Investigation OFMI-05-01.1, revised March 7, 2006. The actual occurrence of acid mine drainage depends on numerous factors, including rock type, mineralogy, geochemistry, geologic structure (e.g., fractures, joints, and faults), changing the water table, surface and sub-surface hydrology, extent of geologic weathering, and depositional environments

According to the publication *Landslides in Pennsylvania,* the Project is located in a region that has a high to moderate landslide susceptibility (Delano and WIlshusen, 2001). These zones are defined as areas where landscapes have occurred in the past. Landslides in this part of Pennsylvania typically occur during times of heavy precipitation or after alteration of surface conditions by construction.

Mitigation of Potential Geologic Hazards: The primary mitigation of the above noted potential geologic hazard will be avoidance. The maximum depth of excavation for the proposed project is 15 feet below existing grade, with the majority of the proposed earth moving activities occurring at much shallower depths. At these relatively shallow depths, it is unlikely that the proposed construction activities will encounter the noted bedrock with potentially significant acid-producing sulfide minerals. If the coal layers or rocks with acid producing minerals are encountered during construction activities, it would be a small amount.

Enbridge project specifications will require on-site presence of an individual trained and knowledgeable in the identification of bedrock with potentially significant acid-producing sulfide minerals. In the event this material is encountered during excavation for the proposed facility, the following mitigation measures are to be followed:

1. Material with the potential to provide significant acid-producing sulfide minerals encountered during pad construction is not to be used as fill material on-site. This material shall be exported off-site and disposed of in the proper manner.
2. Material with the potential to provide significant acid-producing sulfide minerals exposed during pad construction is to be addressed through site specific analysis and design of appropriate mitigation measures. Possible mitigation measures for small quantities could be blending the materials with acid-neutralizing materials, such as limestone; covering the material with soil or glacial till and layering with lime or limestone.

15.0 THERMAL IMPACTS

The proposed project was analyzed for potential thermal impacts associated with the planned activities and how potential impacts could be avoided, minimized, or mitigated. Thermal impacts resulting from activities similar to the proposed project are primarily due to the negative impacts of increased impervious area and the disturbance of vegetative cover. Thermal impacts associated with this Project will be avoided to the maximum extent possible and minimal permanent changes in land cover are being proposed. The following provisions

related to thermal impacts are included in the E&SC Drawings:

- Use of BMPs to allow runoff from the Project area to be reintroduced as sheet flow.
- Immediate revegetation (or mulch in non-germinating season) when earth disturbing activities are complete and no disturbance within 50 feet of streams.
- Limit removal of vegetation, especially tree cover, to only that necessary for construction.
- Minimizing the LOD and the limit of tree clearing to the minimum area absolutely necessary to construct the necessary facilities will maintain existing vegetative cover and maintain the infiltration capacity of undisturbed areas to the maximum extent practicable.
- Minimizing impervious surfaces.
- Maximizing the use of vegetated areas to cool runoff prior to discharge.
- Maintaining canopy cover that limit ground surface exposure to direct sunlight.
- Use of HDD for the Conemaugh River crossing will limit vegetation disturbance and exposure of the ground surface to sunlight especially in riparian areas.
- The Project will have one permanent access road and graveled MLV. Runoff from the permanent gravel areas will be collected as part of the Post-Construction Stormwater Management (PCSM) Plan. Runoff will be routed to a Stormwater BMP to reduce potential thermal impacts downslope of the Project site.

The permanent pipeline right-of-way may be mowed periodically and woody vegetation may be trimmed to allow safe pipeline operation. Some tree cover may be permanently removed in wooded areas. In the long term, it is anticipated the canopy from adjacent woodlands will expand over the pipeline right-of-way to compensate for lost shade.

16.0 E&SCP AND PCSM/SR PLAN CONSISTENCY

Following completion of pipeline installation and trench backfilling, the area shall be returned to the general grade present prior to pipeline installation in order to maintain pre-construction drainage patterns. Temporarily disturbed areas shall be restored to a vegetated condition in the post-construction phase. Increased runoff from the permanent access road and gravel meter site will be mitigated by an infiltration trench to be placed as shown on Permit Drawings and according to the Standard Detail Sheets. Long-term maintenance of the areas to be restored is not expected; however, areas not achieving a minimum uniform 70 percent perennial vegetative cover will be corrected (i.e., additional amendments, reseeding, etc.) as needed within the permit period. Sediment collected by erosion controls during site restoration activities will be spread in a protected area, allowed to dry, and recycled on-site.

17.0 RIPARIAN FOREST BUFFERS

Riparian buffers are an area of permanent vegetation situated along any surface water(s). When this vegetation is predominantly native trees, shrubs, and forbs that are maintained in a natural state or sustainably managed to protect and enhance water quality, it is considered a riparian forest buffer. AECOM completed an

investigation of the project area to identify existing riparian forest buffers. No existing riparian buffers were identified within the proposed project area as the riparian area associated with this Project is within existing ROW.

18.0 ANTIDEGREDATION REQUIREMENTS

The Project is not located within a special protection watershed, as classified by PA Code Title 25 Chapter 93, therefore ABACT controls are not required. The Project is of a temporary nature, and the site will be fully restored to its preexisting condition during the term of the permit per Chapter 102.14 (d)(2)(iv)., with the exception of a permanent access road and MLV.

Appropriate E&SC BMPs are proposed to reduce point source discharges occurring during construction and through stabilization. The area being disturbed for the Project will be the minimum amount necessary to perform the construction of the pipeline. Pipeline construction will be completed in a staged approach in order to limit the extent and duration of disturbance.

19.1 EMERGENCY CONTACT INFORMATION

Pipeline and Operator Information and Phone Numbers	Key Emergency Phone Numbers
Pipeline Name: Penn-Jersey Pipeline System, Line 12 Pipeline Location: Begin Latitude: 40°27'17.50" N Begin Longitude: 79°18'8.28"W End Latitude: 40°27'26.52" N End Longitude: 79°17'40.52"W Operator: Texas Eastern Transmission, LP On-Site Drilling Specialist: TBD Primary: Leo Feist, Construction Manager Cell: Secondary: Office: Spill Response Contractor: Chief Inspector: TBD (Add phone number)	Note: Some cell phones do not support 911 calls. Phone should be tested on location prior to operations. Pennsylvania Department of Environmental Protection Regional Permit Coordination Office: 717-783-2300 USCG/National Response Center (NRC): 800-424-8802 Westmoreland County Emergency Management Agency: 570-296-1911 Indiana County Emergency Management Agency: 724-394-1428 Fire , Ambulance, Police: 9-1-1 The Pennsylvania Emergency Management Agency: 800-424-7362 or 717-651-2001 Pennsylvania Game Commission: 724-238-9523 Pennsylvania Fish and Boat Commission: 814-445-3497 Chemical Transport Emergency Center: 800-424-9300 Regional Poison Information Center: 800-222-1222

19.2 ENVIRONMENTAL INCIDENT REPORT

Location (Facility/Specific Location):	
Date Incident Occurred:	
Time Incident Occurred:	
Type of Incident (Check all that apply):	
☐ Contaminated Ground Water/Soil ☐ Fish Kill ☐ Hazardous Substance Spill/Release ☐ Migratory Bird ☐ Other _____	☐ Oil Spill ☐ PCB Spill ☐ Storage Tank (leak or other problem) ☐ Wildlife Concern
If Spill:	
Type of Substance:	
Origin of Substance:	
Amount (if known):	
Spill On (floor, ground, water):	
Oil Spill to Water or Storm Drain (If any selection is entered, written notice to EPA is due within 60 days)	☐ Spill greater than 1000 gallons ☐ Two spills > 42 gal. within a 12 month period Date of Previous Spill _____
Description of Incident (include cause, if known, specific location, amount, duration, and impact on environment)	

Immediate Action/Cleanup Procedures			
Action Taken or Planned to Prevent Recurrence			
Notifications Made			
	Name	Date	Time
Emergency Response Coordinator			
Other facility Personnel			
Environmental Services			
State Agency			
National Response Center			
Other (i.e., Local Agency)			
Regulatory Personnel on the Scene (Name and Agency)			
Site Contact for Additional Information (Name and Title)	**Telephone Number** (With Area Code)		
Incident Reported By (Name and Title)	**Telephone Number** (With Area Code)		

19.0 REFERENCES

Delano, H. L., and Wilshusen, J. P., 2001, Landslides in Pennsylvania: Pennsylvania Geological Survey, 4th ser., Edu-cational Series 9, 34 p. Accessed online at http://www.docs.dcnr.pa.gov/cs/groups/public/documents/document/dcnr_014592.pdf on May 8, 2020.

Pennsylvania Bureau of Topographic and Geologic Survey. *2000. Map 11 – Distribution of Pennsylvania Coals, 3rd Edition*. Accessed at http://www.dcnr.state.pa.us/cs/groups/public/documents/document/dcnr_016203.pdf on April 6, 2020.

Pennsylvania Bureau of Topographic and Geologic Survey. 2006. Open File Miscellaneous Investigation OFMI-05-01.1, revised March 7, 2006. Accessed at www.docs.dcnr.pa.gov/cs/groups/public/documents/document/dcnr_015857.zip on April 6, 2020.

Pennsylvania Department of Conservation and Natural Resources, Bureau of Topographic Geologic Survey. 2006. *PAMAP Program LIDAR Processing/Contour Enhancement Lines of Pennsylvania*. http://www.pasda.psu.edu/default.asp>.

Pennsylvania Department of Environmental Protection, Office of Water Management. 2012. *Erosion and Sediment Pollution Control Best Management Practices Manual*. Bureau of Watershed Management, Division of Waterways, Wetlands and Erosion Control. March 2012.

Pennsylvania Department of Environmental Protection (PADEP). 2000. *Avoiding Common Erosion and Sediment Control Plan Deficiencies, Pipeline and Utility Line Projects*. July 2000.

PADEP. 2001. *Underground Utility Line Construction, Typical Erosion and Sediment Controls*.

PADEP. 2018. *2018 Pennsylvania Integrated Water Quality Monitoring and Assessment Report*. Accessed at http://www.elibrary.dep.state.pa.us/dsweb/View/Collection-13014 on April 6, 2020.

PADEP. 2020. *Statewide Existing Use Classifications*. Last Revised January 13, 2020. http://files.dep.state.pa.us/Water/Drinking%20Water%20and%20Facility%20Regulation/WaterQualityPortalFiles/Existing%20Use/EU%20table%20list.pdf on April 6, 2020.

Pennsylvania Fish and Boat Commission. 2020a. *Adult Trout Stocking by County*. Accessed at http://fbweb.pa.gov/stocking/TroutStockingDetails_GIS.aspx on April 6, 2020.

PFBC. 2020b. *2020 Pennsylvania Fishing Summary: Summary of Fishing Regulations and Laws – Stocked Trout Waters*. Accessed at http://pfbc.pa.gov/fishpub/summaryad/2020summaryComplete.pdf on PFBC. April 6, 2020.

PFBC. 2020c. *Pennsylvania Wild Trout Waters (Natural Reproduction) – February 2020*. Accessed at http://www.fishandboat.com/Fish/PennsylvaniaFishes/Trout/Documents/trout_repro.pdf on April 6, 2020.

United States Department of Agriculture, National Resources Conservation Service, 2008. *Soil Survey Geographic (SSURGO) Database for Indiana County, Pennsylvania*. Available at http://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm.

United States Department of Agriculture, National Resources Conservation Service, 2008. *Soil Survey Geographic (SSURGO) Database for Westmoreland County, Pennsylvania*. Available at http://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm.

U.S. Fish and Wildlife Service (USFWS) 2018. National Wetlands Inventory website. U.S. Department of the Interior, Fish and Wildlife Service, Washington, D.C. Accessed at http://www.fws.gov/wetlands on April 6, 2020.

United States Geological Survey. 2020. Blairsville, Pennsylvania Topographic Quadrangle (7.5-Minute Series) (1:24,000).

TABLES

Table 1

SOIL SERIES AND LIMITATIONS

Soil Map Unit	Description	Erodible	Cut Banks Cave	Corrosive to Concrete or Steel	High Water Table	Low Strength	Piping	Poor Topsoil	Hydric
AhC	Allegheny silt loam, 8 to 15 percent slopes	X	X	C	-	X	X	X	X
GoF	Gilpin-Rock outcrop complex, 45 to 100 percent slopes	X	X	C	-	X	X	X	X
MoA	Monongahela silt loam, 0 to 3 percent slopes	X	X	C/S	X	X	X	-	X
MoB	Monongahela silt loam, 3 to 8 percent slopes	X	X	C/S	X	X	X	-	X
MoC	Monongahela silt loam, 8 to 15 percent slopes	X	X	C/S	X	X	X	-	X
W	Water	-	-	-	-	-	-	-	-
WeA	Weinbach silt loam, 0 to 2 percent slopes	X	X	C/S	X	X	X	X	X

Source: Appendix E, Table E-1, PADEP, *Erosions and Sediment Control Best Management Practice Manual*, Technical Guidance Number 363-2134-008.

Table 2

SEED MIXTURES AND MULCH FOR REVEGETATION

UPLAND AREAS

Lime 4.0 tons/acre
Fertilizer 1000 lbs./acre (10-20-20)
Mulch (Wheat Straw) 3.0 tons/acre

Upland Seed Mix	75 lbs./acre Pure Live Seed (PLS)
Kentucky Bluegrass	20%
Red Fescue[1]	20%
Kentucky 31 Tall Fescue 1 1	5%
Redtop	10%
Perennial ryegrass	20%
White clover	5%
Birdsfoot Trefoil (Minimum 20% hard seed)	10%

[1] Fescue must be endophyte-free.

Pasture Mix	20 lbs./acre PLS
(For use only in disturbed pasture areas with landowner's permission.)	
Kentucky Bluegrass	31%
Medium Red clover	26%
Norcen Trefoil	17%
Poly Perennial Rye	26%

Recommended Seeding Dates

(For the establishment of temporary or permanent vegetation.)

Spring: March 15 - May 30
Fall: August 1 - October 15

WINTER STABILIZATION

If restoration does not occur prior to October 15, seed the construction ROW with 1.5 bushels per acre of winter rye or similar variety of rye as requested by the landowner. Mulch the construction ROW at 3.0 tons per acre with wheat straw, including areas adjacent to streams and wetland crossings. Seed segregated topsoil piles with winter rye and mulch at a rate of 3.0 tons per acre.

WETLAND AREAS DO NOT USE LIME OR FERTILIZER !!!

Do not use fertilizer, lime, or mulch within wetlands unless required in writing by the appropriate federal or state agency (as identified in the Clearance Package/Permit Book). Mulch consists of weed-free straw, wood fiber hydromulch or some functional equivalent as approved by the EI and Chief Inspector. When used, apply mulch (wheat straw) at a rate of 3.0 tons/acre.

Wetland Seed Mix

Annual Ryegrass 40 lbs./acre PLS

Notes:

1 All seed is pure live seed (PLS).

Appendix D
Spill Prevention, Control, and Countermeasure Plan

Spill Prevention Control and Countermeasure (SPCC) Plan &

Preparedness, Prevention, and Contingency (PPC) Plan for Construction Projects

Project:

Revised October 2017

Environmental Construction Permitting
5400 Westheimer Court
Houston, Texas 77056-5310

TABLE OF CONTENTS

LIST OF APPENDICES

ABBREVIATIONS AND DEFINITIONS

CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CI	Chief Inspector (Company employee or Contractor Employee performing the duties of the onsite Construction Manager or Engineer)
Company	Enbridge, Inc.
Company SC	Company Spill Coordinator (The Environmental Inspector or the Chief Inspector)
Contractor	Third party service provider performing construction activities for the Company on property owned or under the control of the Company. This role may be filled by the Company on small projects constructed by Company personnel and equipment.
Contractor SC	Contractor Spill Coordinator
CWA	Clean Water Act
DOT	U. S. Department of Transportation
E&C	Engineering & Construction
ECP	Environmental Construction Permitting
EHS, EH&S	Environmental Health and Safety
EI	Environmental Inspector (Company employee or Contractor Employee performing the duties of onsite environmental specialist overseeing Contractor compliance with environmental permit conditions, laws and regulations)
E&SCP	Erosion & Sedimentation Control Plan
FERC	Federal Energy Regulatory Commission
FWPC	Federal Water Pollution Control Act
HDD	Horizontal Directional Drill
JSA	Job Safety Analysis
MSDS	Material Safety Data Sheets
ppm	Parts per Million
Environmental Lead	Environmental Construction Permitting Specialist assigned to the project
OPA	Oil Pollution Act
RCRA	Resource Conservation and Recovery Act
SPCC Plan or Plan	Spill Prevention, Control and Countermeasure Plan
TSCA	Toxic Substances Control Act

1.0 PURPOSE/PLAN OBJECTIVE

Enbridge, Inc. ("Company") has prepared this Spill Prevention, Control and Countermeasure ("SPCC") Plan ("Plan") for construction projects in the United States. The purpose of this Plan is to reduce the probability and risk of a potential spill or release of oil or hazardous materials by the Company or Contractor during construction-related activities, by providing training to the Company and Contractor and expediting spill response and cleanup. This plan is not intended to meet the requirements of existing facility operations.

The Plan's specific objectives are to identify and address:

- The type and quantity of material handled, stored, or used on site during construction;
- The measures to be taken for spill preparedness and prevention;
- Emergency response procedures;
- Spill incident reporting/notification procedures; and
- Local emergency response team arrangements.

This plan has been prepared to meet the requirements of the Federal Energy Regulatory Commission's ("FERC's") *Upland Erosion Control, Revegetation, and Maintenance Plan* (Plan) and *Wetland and Waterbody Construction and Mitigation Procedures* (Procedures), the Oil Pollution Act ("OPA"), the Federal Water Pollution Control Act ("FWPC"), the Comprehensive Environmental Response, Compensation and Liability Act ("CERCLA") of 1980, the Resource Conservation and Recovery Act ("RCRA"), the Toxic Substances Control Act ("TSCA") and the Clean Water Act ("CWA").

The Company Environmental Construction Permitting ("ECP") group is responsible for the development and maintenance of this Plan. The Plan will be distributed to the Company Engineering & Construction ("E&C") Department's teams and associated Company personnel and will be included in the construction contract. It is the responsibility of the E&C teams to distribute to any necessary Contractors for implementation.

This Plan outlines both Company and Contractor responsibilities by topic. The Contractor is responsible for implementation of the Plan. In the absence of a Contractor, the Company will be responsible for both Company and Contractor responsibilities as they are laid out in this Plan.

A copy of the Plan must be on site during active construction and should also be maintained at the closest construction field office.

2.0 TRAINING

The Company requires all Contractor and Company personnel engaged in any construction activity to receive training in the implementation of the Plan prior to the commencement of on-site construction related activities.

Site visitors are to be given a brief review of the Plan as part of their orientation on safety and emergency procedures prior to the start of any on-site activities.

Contractor Responsibility

The Contractor will be responsible for the following:

- Keep training records
- Perform training briefings through ongoing meetings like tailgates and the daily project Job Safety Analysis ("JSA") that include:
  - Precautionary measures to prevent spills;
  - Potential sources of spills, including equipment failure or malfunction;
  - Standard operating procedures in the event of a spill;
  - Applicable notification requirements;
  - Equipment, materials and supplies available for clean-up of a spill;
  - Hazardous waste identification procedures;
  - Generation and proper handling of all non-hazardous waste, hazardous waste, and other toxic substances;
  - Proper storage, labeling, transportation and disposal of non hazardous and hazardous waste; and
  - Sample collection procedures.

Company Responsibility

The Company Chief Inspector ("CI"), Environmental Inspector ("EI"), or their designate will perform the following:

- Teach awareness-level training at the initial project environmental training session;
- Ensure further training is available for other new project personnel; and
- Audit training records kept by the Contractor as necessary.

3.0 PRE-PLANNING - MATERIAL INVENTORY AND DOCUMENTATION

Contractor Responsibility

The Contractor will be responsible for the following **prior** to the start of construction:

- Develop an inventory of all oil/hazardous material stored or used during construction;
- Complete Tables I, II, IV, V and VI (see Appendix A);
- Obtain material safety data sheets ("MSDS") (Appendix B) for all hazardous and non-hazardous substances listed in Table I (see Appendix A);
- Prepare a basic facility diagram or sketch for any storage areas, including pipe yards and temporary storage areas. The diagram should include locations of oil-filled containers, direction of run-off, emergency evacuation routes and assembly areas (see Appendix E); and
- Submit the required Tables, MSDS, and signature pages to the ECP's Environmental Lead for review and approval.

Company Responsibility

- Complete Tables III (see Appendix A);
- Review the Tables, MSDS, and signature pages submitted by the Contractor for approval; and
- Distribute approved Tables, MSDS, and signature pages to include in Plan as Appendices A, B and D.
- Fill out any signature pages or forms (see Appendix D)
    - Management Approval and Cleanup Commitment
    - Certificate of Determination of Substantial Harm Criteria

4.0 SPILL AND LEAK PREPAREDNESS AND PREVENTION

4.1 Prevention and Preparedness

Contractor Responsibility

- Complete Appendix A, Table I, Material and Waste Storage Inventory, and Table VI, Areas for Potential Leaks and Spills, prior to construction;
- Provide spill prevention, containment, and clean up equipment, and keep it available on-site;
- Perform daily inspections of all equipment, storage tanks, and/or container storage areas;
- Repair all leaking equipment, machinery or tools immediately. If items cannot be repaired, remove them immediately from the project site;
- Maintain a minimal spill kit (absorbent diapers, plastic bags, gloves, etc.) for each piece of hydraulically operated equipment and personnel vehicles within the project area;
- Store materials as indicated in the storage facility diagram or sketch provided by the Contractor in Appendix E;
- Submit a secondary containment plan for any hazardous material storage within the project area to the Company for approval **prior** to storage; and
- Obtain written approval from the project CI or EI for hazardous material storage within 100 feet of a wetland or waterbody.

Company Responsibility

- Review any secondary containment or storage plans submitted by the Contractor for approval.

4.1.1 Secondary Containment

Contractor Responsibility

- PCB (50 parts per million (“ppm”) or greater) storage tanks shall be double-walled or have secondary containment that will hold 200 percent of the tank capacity;
- All containers with a storage capacity greater than 55 gallons shall have temporary containment (see Appendix A, Table I for type of temporary containment); and
- Pumps and other portable fuel burning equipment used within 100 feet of a jurisdictional wetland or waterbody will be placed and operated within appropriate secondary containment systems to prevent spills. Secondary containment will hold at least 110% of the tank capacity of the largest tank inside the containment area.

4.1.2 Storage/Inspection (Tanks/Containers)

Contractor Responsibility

- Operate only those tanks for fuel and material storage that meet the approval of the Company;
- Elevate tanks a maximum of two feet above grade;
- Inspect vehicle-mounted tanks to ensure all are equipped with flame/spark arrestors on all vents to prevent self-ignition;
- Locate tank storage in areas that are at least 100 feet from all waterbodies, wetlands, and designated municipal watershed areas, with certain exceptions as approved by ECP and listed in Appendix A, Table IV;
- Complete Appendix A, Table IV, Tank and Container Storage Exception Areas, and submit to the Company for approval prior to construction;
- Inspect all tanks daily for leaks and deterioration. The results of all inspections shall be made available to the Company upon request;
- Do not store incompatible materials in sequence in tanks prior to decontamination (A general list of potentially incompatible materials that may be used during construction are included in Appendix A, Table I);
- Store small cans of gasoline, diesel, solvents, etc., within the temporary secondary containment or within secured trailers or vehicles when not in use;
- Replace leaking and/or deteriorated containers as soon as the condition is first detected; and
- Ensure that all container storage and containment areas being used to store hazardous materials or wastes are in compliance with applicable local, state and federal requirements.

4.1.3 Loading/Unloading Areas

Contractor Responsibility

- Transfer liquids and refuel only in pre-designated and pre-approved locations that are at least 100 feet from all waterbodies and wetlands, with certain exceptions as approved by the EI and listed in Appendix A;
- Inspect the area beneath loading/unloading location for spills before and after each use;
- Utilize drip pans at all hose connections while loading/unloading liquids. If a leak or spill occurs, the loading/unloading operation will be stopped and the spill will be contained, cleaned up and collected prior to continuing the operation;
- Inspect all outlets of the tank trucks prior to leaving the loading and unloading area to prevent possible leakage from the truck while in transit;
- Equip any service vehicle used to transport lubricants and fuel with an emergency response spill kit. At a minimum, this kit must include:
  - 25 lbs of granular oil absorbent
  - 10, 48" x 3" oil socks

- 5, 17" x 17" oil pillows
- 1, 10" x 4" oil boom
- 20, 24" x 24" x 3/8" oil mats
- Garden size, 6 mil, polyethylene bags
- 10 pair of latex gloves
- 1, 55-gallon polyethylene open-head drum;

- Equip any service vehicle used to transport lubricants and fuel with a chemical response kit. At a minimum, this kit must include:
  - 1 bag of loose chemical pulp
  - 2 to 3, 17" x 17" chemical pillows
  - 2, 48" x 3" chemical socks
  - 5, 18" x 18" x 3/8" adsorbent mats
  - garden-size, 6 mil, polyethylene bags
  - 10 pair of latex gloves
  - 1, 30-gallon polyethylene open-head drum
  - hazardous waste labels

Company Responsibility

- Personnel shall be present during loading and unloading activities.

5.0 CONTINGENCY PLAN AND EMERGENCY PROCEDURES

All Company and Contractor personnel have responsibilities for spill prevention, control, and countermeasure.

Contractor Responsibility

- Maintain adequate manpower and equipment at the pipe yard or contractor ware yard necessary to divert any spill from reaching waterbodies and wetland areas; and
- Complete Appendix A, Table I, Emergency Response and Personal Protective Equipment, with a list of emergency equipment and storage location.

Company Responsibility

- Complete Appendix A, Table III, Key Emergency Contacts, prior to construction, and update as necessary.

First Responder Responsibility

The first responder is the person who first observes a spill or release of oil or other hazardous materials to the environment.

This person will take the following steps:

- Assess the situation to determine if the situation poses an immediate threat to human health or the environment;
- Identify hazardous material involved, if any;
- Report the spill to the Company Spill Coordinator ("Company SC") and Contractor Spill Coordinator ("Contractor SC") immediately; and
- Standby at a safe distance and keep others away.

Contractor SC Responsibility

- Coordinate the response to all spills which occur as a result of Contractor operations;
- Report the spill to the Company;
- Coordinate with the Company SC; and
- Conduct subsequent site investigations and associated incident reports unless otherwise directed by the Company.

The Contractor SC may be removed by the Company SC as spill response coordinator at the discretion of the Company.

The Contractor SC will direct Contractor personnel to:

- Shut off source of spill or leak as quickly as possible;
- Minimize affected area with appropriate containment or dike/berm;
- Assemble required spill response equipment as required (protective clothing, gear, heavy equipment, pumps, absorbent material, empty drums, etc.);
- Ensure that spilled material is placed in appropriate containers, in accordance with the best management practices and applicable laws and regulations;
- Properly label and store containers in accordance with applicable requirements; and
- Ensure that all spill response equipment is fully functional. Any equipment that cannot be reused shall be replaced.

Company SC Responsibility

The Company SC will be responsible for overseeing the Contractor SC's clean up of all spills of oil or hazardous materials.

Upon notification, the Company SC shall:

- Assess situation for potential threat to human health, environment and the neighboring community;
- Implement evacuation, if necessary;
- Activate emergency shutdown, if necessary;
- Control source as conditions warrant;
- Ensure that incompatible materials are kept away from the impacted area;
- Keep any potential ignition source away from the impact area, if spilled material is flammable;
- Coordinate sampling, disposal and equipment decontamination with Environmental Health and Safety ("EHS") in Houston, if necessary;
- For spills of PCBs, contact EHS for special spill response requirements related to PCB spills;
- Assist with the coordination of cleanup and disposal activities;
- If necessary, contact outside remediation services, in coordination with EHS, to assist with clean up;
- Notify EHS of all quantities and description of wastes to be handled by EHS;
- Complete the *EH&S Incident Investigation Form* (see Appendix C) and distribute accordingly;
- For unanticipated release of hydrostatic test waters, notify state contact if required by state permit, in accordance with timeframes required by state permit;
- Review permits to determine if immediate water sampling of test water is required and arrange if necessary; and
- Determine if local Right of Way agent will notify public officials (e.g. township manager and/or mayor).

6.0 SPILL CLEAN-UP/WASTE DISPOSAL PROCEDURES OF HYDROSTATIC TEST WATER

6.1 Oil/Fuel a;nd Hazardous Material Spills and Unanticipated Releases

Contractor Responsibility

- Ensure no immediate threat to surrounding landowners or environment;
- Identify/verify the material and quantity released;
- Review MSDS to determine the proper handling;
- Ensure that Personal Protective Equipment and containers are compatible with the substance;
- Remediate small spills and leaks as soon as feasible. Use adsorbent pads whenever possible to reduce the amount of contaminated articles;
- Restrict the spill by stopping or diverting flow to the oil/fuel tank;
- If the release exceeds the containment system capacity, immediately construct additional containment using sandbags or fill material. Every effort must be made to prevent the seepage of oil into soils, wetlands and surface waters;
- Block off drains and containment areas to limit the extent of the spill. For chemical spills, never wash down a spill with water;
- If a release occurs into a storm drain or stream, immediately pump any floating layer into drums. For high velocity streams, place oil booms or hay bales between the release area and the site boundary and downstream of affected area. As soon as possible, excavate contaminated soils and sediments within approved work areas;
- Collect and reclaim as much of the spill as possible using a hand pump or similar device. Containerize contaminated soils in an appropriate Department of Transportation ("DOT") container in accordance with applicable requirements. Never place incompatible materials in the same drum;
- For larger quantities of soils, construct temporary waste piles using plastic liners placing the contaminated soils on top of the plastic and covered by plastic. Plastic-lined roll-off bins should be leased for storing this material as soon as feasible;
- Properly label any drums, containers or storage piles in accordance with applicable requirements;
- Move drum to secure staging or storage area;
- Decontaminate all equipment in a contained area and collect fluids in drums;
- Document and report cleanup activities to the Company SC as soon as feasible; and
- If environmentally sensitive resources (wetlands, waterbodies) exist in the area, ensure that Best Management Practices as described in Company's Erosion &Sedimentation Control Plan ("E&SCP") are utilized to minimize impact to these resources.

Company Responsibility

- If necessary, arrange for sampling the substance for analysis and waste profiling, according to instructions from the Company Standard Operating Procedures, and/ or EHS;
- Document and report activities to EHS as soon as feasible.

6.2 Disposal of Contaminated Materials/Soils

For Company and Contractor protocol on the disposal of contaminated materials, soils, or any other waste materials, please see the Company Waste Management Plan.

6.3 Notification

Company Responsibility

- The Company SC shall notify the Emergency Spill Hotline at (800) 735-6364 and those listed in Appendix A, Table III, immediately for spills that meet any of the following criteria:
  - one pound or more of a solid material (excluding Horizontal Directional Drill ("HDD") mud) spilled on land;
  - five gallons or more of a liquid spilled on land;
  - creates a sheen on water; or
  - unanticipated release of hydrostatic test water.
- If necessary, notify the local fire department, law enforcement authority, or health authority as appropriate. The following information should be provided:
  - the name of the caller and callback number;
  - the exact location and nature of the incident;
  - the extent of personnel injuries and damage;
  - the extent of release; and
  - the material involved and appropriate safety information.
- An incident report form should be filled out following containment and cleanup of the spill or release. Incident data should be gathered using the *EH&S Incident Investigation Form* (see Appendix C) and should be sent to the appropriate ECP project manager for records retention and entry into the EPASS/ILP database.

7.0 HOUSEKEEPING PROGRAM

7.1 Construction Area

Contractor Responsibility

- Maintain construction area in neat and orderly manner; and
- Routinely collect and properly dispose of all trash off-site.

7.2 Contractor Yards/Ware Yards

Contractor Responsibility

- Produce a "site specific" plan to address storage, spill prevention and overall yard organization for all contractor yards and ware yards. Contractor yard "site specific" plans should include the following:
    - facility name;
    - physical address;
    - longitude and latitude coordinates;
    - directions to facility (including road names);
    - date of first oil and hazardous material storage;
    - location of oil and hazardous material containers greater than 55 gallons;
    - loading/unloading areas;
    - direction of drainage flow; and
    - primary and secondary evacuation routes.
- Provide adequate aisle spacing to allow unobstructed movement of personnel, fire protection equipment, spill control equipment, and decontamination equipment as necessary in storage areas;
- Ensure similar housekeeping practices enforced in construction areas are also implemented in storage areas; and
- Any facility with an aggregate aboveground oil storage capacity greater than 1,320 US gallons but less than 10,000 gallons must have the plan self-certified by the owner or operator of the qualified facility or a licensed Professional Engineer. Any facility with an aggregate aboveground oil storage capacity greater than 10,000 gallons must have the plan reviewed and certified by a licensed Professional Engineer.

7.3 Security

Contractor Responsibility

- Hazardous wastes and waste containing PCBs greater than 50 ppm will be stored in a secured location (i.e. fenced, locked, etc.). Fuel storage areas will be located to minimize, as much as possible, tampering by unauthorized personnel during non-operational hours.
- Complete Table V, Waste Storage Security Information, in Appendix A, prior to construction.

Company Responsibility

- Review Table V, Waste Storage Security Information in Appendix A, that has been prepared by the Contractor prior to construction.

Project Signatures:

Company Spill Coordinator:

Print Name

Signature Date

Contractor Spill Coordinator

Print Name

Signature Date

APPENDIX A - TABLES

TABLE I – MATERIAL AND WASTE INVENTORY

Oil and Fuel to be used or stored on site during construction:

STORAGE CAPACITY OF OIL FILLED-CONTAINERS

Container Number[a/]	Storage capacity (volume)	Location

[a/] The reference container numbers should correspond to the facility diagram in Appendix E.

Commercial Chemicals to be used or stored on site during construction:

Hazardous and Non-Hazardous Wastes to be used or stored on site during construction:

Incompatible Materials to be used or stored on site during construction:

Type of Temporary Containment containers to be used:

TABLE I TO BE COMPLETED BY CONTRACTOR Prior to the Start of Construction and updated as necessary

TABLE II – EMERGENCY RESPONSE AND PERSONAL PROTECTIVE EQUIPMENT

Spill Response:

Equipment	Quantity	Location

Fire Protection:

Equipment	Quantity	Location

Personnel Protection:

Equipment	Quantity	Location

TABLE II TO BE COMPLETED BY CONTRACTOR
Prior to the Start of Construction and updated as necessary

TABLE III – KEY EMERGENCY CONTACTS

The list of key personnel who will be contacted in the event of an emergency or spill incident include:

1. ***Company Emergency Contacts*** Contact Name Phone Number

Company Spill Coordinator & Environmental Inspector (within 15 minutes identifying of incident)

24-hour Emergency Spill Hotline -- 1-800-735-6364
(within 15 minutes of identifying incident)

Regional Environmental Coordinator
(within 15 minutes of identifying incident)

ECP's Project Environmental Lead / PM
(notify within 60 minutes of incident & submit Spill Report Form within 24 hours to ECP PM)

Company Project Manager

Company Environmental Coordinator

Field Construction
Company Construction Coordinator

2. ***Contractor Emergency Contact***

Contractor Spill Coordinator

3. ***Local Authorities*** – As necessary

Emergency contact for Police, Fire & Medical assistance ***Dial 911***

Non-Emergency Local Authorities or Contacts		
Location	**Contact**	**Phone Number**

4. ***Environmental Agencies***

Notification to be made by Regional Environmental Coordinator and ECP's PM

5. ***Potential Environmental Remedial Service Contractors***

Clean Harbors Environmental Services, Inc.	Howard Alexander	(800) 782-8805
Safety-Kleen (FS), Inc	Edward A. Mitchell	(281) 478-7700
U.S.A. Environment	Cesar Garcia	(713) 425-6925 or (832) 473-5354
WRS Infrastructure and Environment Inc	Steve Maxwell	(281) 731-0886

TABLE III TO BE COMPLETED BY COMPANY
Prior to the Start of Construction and updated as necessary

TABLE IV – TANK AND CONTAINER STORAGE EXCEPTION AREAS

Tank and container storage shall be located in areas that are at least 100 feet from all waterbodies and wetlands.

The below exceptions have been approved by ECP and EHS:

1.

2.

3.

4.

TABLE IV TO BE COMPLETED BY CONTRACTOR
Prior to the Start of Construction and updated as necessary

TABLE V – WASTE STORAGE SECURITY INFORMATION

TABLE V TO BE COMPLETED BY CONTRACTOR
Prior to the Start of Construction and updated as necessary

TABLE VI–AREAS FOR POTENTIAL LEAKS AND SPILLS

1.

2.

3.

4.

TABLE VI TO BE COMPLETED BY CONTRACTOR Prior to the Start of Construction and updated as necessary

APPENDIX B - MSDS

APPENDIX C – EH&S INCIDENT INVESTIGATION FORM

HSF-004 1/1/2011
AVAILABLE ELECTRONICALLY

Enbridge, Inc.

EHS Incident Investigation/Data Collection Form

This form replaces: C-23 Occupational Injury and Illness Report, 19-06 Field Spill Report, 19-20 Outside Agency Inspection, 19-21 Natural Gas Release Record, and 19-25 Contamination Encounter Report

(Must Be Completed)

BUSINESS UNIT	REGION (Circle One)	AREA	LOCATION (Entity)
US	Northeast / Southeast / Corporate		

Complete each section and field as applicable for the Incident Type you are entering. *All required fields **(bold)** are EPASS ILP system required and must be completed.*

Common fields applicable to all types of incidents.

Incident Type: ☐ Injury / Illness ☐ Vehicle ☐ Environmental ☐ Complaint ☐ Near Miss
(Check multiple incident types as appropriate)

Category: ☐ Incident with Loss ☐ Incident without Loss Initiating Event: _____

Status: Open ☐ **Do not include in rates and counts:** ☐ Note: (Pertains to all incidents without loss.)

Date Reported: _____ **Date Occurred:** _____ Time Occurred: _____ AM ☐ PM ☐

Describe exactly how the incident occurred. Be very specific in details without reference to individual(s) names.

Employee Name: _____ **Incident Owner (Supervisor) Name:** _____

Contractor Incident: ☐ Yes ☐ No **Dependent** ☐ **Independent** ☐

Contract Employee Name: _____ **Phone Number:** _____

Contractor Contact Name: _____ **Contractor Company Name:** _____

Contractor Address, City, State, Zip code _____

Time Work Began: _____ AM ☐ PM ☐ **Time work began cannot be confirmed:** ☐

Response Agency Involved: ☐ Police ☐ Fire ☐ Ambulance ☐ HazMat ☐ Insurance ☐ External Response Support

Emergency Response Coordination: ☐ Internal ☐ External **Third Party Damage:** _____

Description of Immediate Response: (Note: This information is included in the ILP e-mail initial incident notification.)

Section A

Injury / Illness Incident Detail **SRS TeleClaim Contact #: 1-866-880-1777** Enbridge, Inc. Account #: 57568

Classification: ☐ First Aid ☐ Medical Treatment ☐ Modified / Restricted Work ☐ Lost Time ☐ Fatality

NOTE: Contact Human Resources to determine if Certificate of Disability is appropriate.

Event/Exposure (i.e. fall, slip/trip, strain) _____ **Injury source (i.e. tool, chemicals)** _____

Body Part (i.e. R/L leg, hand, back) _____ **Nature of Injury (i.e. cut, bruise, burn)** _____

Reported to Case Manager / SRS : ☐ Yes ☐ No **OSHA Log Injury Type(i.e. injury, illness, hearing loss)** _____

OSHA Log Injury Short Description: _____

Section B

Vehicle Incident Detail Driver **MUST CALL** PHH @ 800-446-7052 and provide vehicle unit #.
For any other claims, contact SRS Teleclaim @ 866-880-1777 w/Enbridge, Inc. Account #: 57568

Vehicle Type: (i.e. car, pickup) _____ **Ownership (i.e. company, rental)** _____

Activity (i.e. turning, passing, backing): _____ **Location:(i.e. urban, ROW, highway):** _____

Collision Location (i.e. ROW, parking lot, intersection) _____ **Road Type (i.e. concrete, dirt)** _____

Contributing Factors (i.e. failure to yield, keep safe distance): _____

Traffic Controls (i.e. stop sign, traffic signal, railroad crossing): _____

Collision Type i.e. backing, turning, rear ended) _____ **Collision Object (i.e. vehicle, animal, object)** _____

Road Conditions (i.e. dry, wet, ice, snow) _____ **Weather Conditions (i.e. rain, snow, clear)** _____

Journey Purpose (i.e. Business, Personal, T/F Work) _____ Lighting (i.e. dawn, day, night): _____

Third Party Name _____ Address: _____

Environmental Incident Detail

Section C

Spill/release Source: _____ **Reportable:** ☐ Yes ☐ No **Unplanned Release:** ☐ Yes ☐ No

Unexpected Contaminated Soil Encountered: ☐ Yes ☐ No

Medium: ☐ Air ☐ Containment ☐ Ground ☐ Treatment System ☐ Water

Units: ☐ Gallons ☐ Pounds ☐ mmscf (millions) ☐ mcf (thousands) **Spill / Release Amount:** _____

Material (i.e. natural gas, oil, pipeline condensate, glycol) _____ Occur near wetlands: ☐

Environmental Impact: _____ Wind: Direction: _____ Speed: _____ Temperature: _____

Line Size: _____ Line Pressure: _____ Start Time: _____ End Time: _____

Section D

Transportation Incident Detail

Type of Shipment:

☐ Hazardous Material Shipment ☐ Undeclared shipment with no release ☐ Specification cargo tank

Type of Report: ☐ Initial Report ☐ Follow-up Report

Mode of Transportation: ☐ Air ☐ Highway/Roadway ☐ Rail ☐ Water

Spill Occurred: ☐ In transit ☐ Loading ☐ Unloading ☐ In Transit Storage

Carrier: _____ **Shipper:** _____

Spill Location - Address, City, State, Zip code: _____

Hazardous Material: _____ **Quantity:** _____ **Units (i.e. gallons)** _____

Comments: _____

Section E

Regulatory Information / Notification / Outside Agency Inspection Detail

Regulatory Notification: ☐ **Date:** _____ **Routine Inspection:** ☐ **Tests conducted:** ☐ **Explain:** _____

Regulatory Agency: _____ **Officer Name:** _____

Warning Issued: ☐ **Fine Issued:** ☐ **Amount:** _____ **Order / NOV Issued:** ☐ **Date:** _____

Reference #: _____ **Extension:** ☐ **Date:** _____ **Rescind:** ☐ **Date:** _____

Found During Inspection: ☐ **Suspect Soil:** ☐ **Sampling Required:** ☐ **Permit Exceedance:**

Accompanied by (name): _____ **Comments:** _____

Section F

EHS Complaint Detail

Complaint type (i.e. noise, odor, property damage): _____ ☐ New ☐ Ongoing

Parameters of Concern: _____

Attach any additional doctor injury status, police or agency reports as appropriate for the incident.

FAX OR EMAIL THIS DOCUMENT TO YOUR REGION EHS SPECIALIST for data entry into ILP within 24 hours of an environmental or safety incident AND fax a copy to Houston EHS at 713-386-4249.

Reported by: _____ Signature: _____ Phone: _____

Causal Factors (TapRoot®) and Corrective Actions*

(Contact Region EHS Specialist for help in completing this section.)
(EHS Specialist will utilize the most current version of the TapRoot® Root Cause Tree® Dictionary*)

Section G

ILP Incident #: _____ **Investigation End Date:** _____

It is essential to record the unique identifying number from the ILP database.

Risk Rank: ☐ 1 ☐ 2 ☐ 3 ☐ 4 (Check only one box.)
(See Risk Matrix)

TapRoot® Cause Outcome*

Causal Factor: A problem or issue that, if corrected, could have prevented and incident from occurring or significantly reduced the incident's consequences.*

Effective Corrective Action is **SMART**, effective, and reviewed for unintended consequences.*
Specific
Measureable
Accountable
Reasonable
Timely

1. Identify causal factors - up to 4 cause codes. (Free form text.)
2. Select from the following menu. Note: the line number on this form relates to text on the drop down menu in the ILP database. The number is not found in ILP.

Section H

No. Cause Code Menu (Not inclusive of all TapRoot® Cause Codes*)

1	Human Performance Difficulty	Procedures	Not Used/Not Followed
2	Human Performance Difficulty	Procedures	Wrong
3	Human Performance Difficulty	Procedures	Followed Incorrectly
4	Human Performance Difficulty	Training	No Training
5	Human Performance Difficulty	Training	Understanding NI (Needs Improvement)
6	Human Performance Difficulty	Quality Control	No Inspection
7	Human Performance Difficulty	Quality Control	QC NI (Quality Control Needs Improvement)
8	Human Performance Difficulty	Communications	No Communication or Not Timely
9	Human Performance Difficulty	Communications	Turnover NI
10	Human Performance Difficulty	Communications	Misunderstood Verbal Communication
11	Human Performance Difficulty	Management System	SPAC NI (Standard Practices and Controls Need Improvement)
12	Human Performance Difficulty	Management System	SPAC Not Used (Standard Practices and Controls Not Used)
13	Human Performance Difficulty	Management System	Oversight/Employee Relations
14	Human Performance Difficulty	Management System	Corrective Action
15	Human Performance Difficulty	Human Engineering	Human/Machine Interface
16	Human Performance Difficulty	Human Engineering	Work Environment
17	Human Performance Difficulty	Human Engineering	Complex System
18	Human Performance Difficulty	Human Engineering	Non Fault Tolerant System
19	Human Performance Difficulty	Human Engineering	Preparation
20	Human Performance Difficulty	Work Direction	Selection of Worker
21	Human Performance Difficulty	Work Direction	Supervision During Work
22	Equipment Difficulty	Tolerable Failure	
23	Equipment Difficulty	Design	Design Specs
24	Equipment Difficulty	Design	Design Review
25	Equipment Difficulty	Design	Independent Review NI (Needs Improvement
26	Equipment Difficulty	Equipment/Parts Defective	Procurement
27	Equipment Difficulty	Equipment/Parts Defective	Manufacturing
28	Equipment Difficulty	Equipment/Parts Defective	Handling
29	Equipment Difficulty	Equipment/Parts Defective	Storage
30	Equipment Difficulty	Equipment/Parts Defective	Quality Control
31	Equipment Difficulty	Preventive/Predictive Maintenance	PM NI (Preventive Maintenance Needs Improvement)
32	Equipment Difficulty	Repeat Failure	Management System
33	Natural Disaster	Sabotage	
34	Other		

Complete the Causal Factors and Cause Code on page 4.

Causal Factors free form text box. Cause Code Number i.e. 1 through 34

Section H

Causal Factor 1: _____

- **Cause Code Number:** _____
- **Cause Code Number:** _____
- **Cause Code Number:** _____

Causal Factor 2: _____

- **Cause Code Number:** _____
- **Cause Code Number:** _____
- **Cause Code Number:** _____

Causal Factor 3: _____

- **Cause Code Number:** _____
- **Cause Code Number:** _____
- **Cause Code Number:** _____

Causal Factor 4: _____

- **Cause Code Number:** _____
- **Cause Code Number:** _____
- **Cause Code Number:** _____

Section I

Corrective Action Information:

Title: _____

Author: _____

Author Date: _____

Origin Cause: _____

Proposed Corrective Action: _____

Proposed Completion Date: _____

Assigned to: _____

Actual Corrective Action: _____

Actual Completion Date: _____

After the investigation is complete, and when a corrective action is developed, ensure the causal factors, codes and corrective action information in this document is sent to the person responsible for data entry into ILP i.e. Region EHS Specialist or Supervisor.

FAX OR EMAIL THIS DOCUMENT TO YOUR REGION EHS SPECIALIST for data entry into ILP AND fax a copy to Houston EHS at 713-386-4249.

Prepared by: _____ Signature: _____ Phone: _____

DISTRIBUTION:

Original - Station ENV File 9.2 or 10.0
Original - S&H File # 22.1, 22.2, or 22.5 as appropriate per H&S SOP
Copy - Region EHS
Copy - Houston EHS - fax 713-386-4249
Copy - Houston Fleet Services

RETENTION:

Original - See SOP 3 or 5 years
Original - See EHS Retention Rule
Copy - As needed
Copy - Permanent
Copy - As needed

ENBRIDGE, INC. EHS RISK MATRIX

Frequency	Likelihood *(facility, region, major project)*	Likelihood Category		C1	C2	C3	C4	C5
> 1/yr	Expected to occur more than once per year at a facility/project		L5	III	II	II	I	I
>1/10yrs	Expected to occur several times in facility/project lifetime		L4	III	III	II	II	I
>1/100yrs	Expected to occur once in the facility/project lifetime		L3	IV	III	III	II	II
>1/1,000 yrs	May occur in the facility/project lifetime		L2	IV	IV	III	III	II
>1/10,000 yrs	Remote chance of happening		L1	IV	IV	IV	III	III
				Consequence Category →				
Consequence			**Injury Outcome**	First Aid or Minor Illness	Medical Aid / OSHA Recordable Restricted Work.	Lost Time Injury	Permanent Disability	Fatality
			Environment	Insignificant onsite / localized impact	Negligible onsite or offsite impact below	Environmental impact resulting in regulatory	Significant impact leading to enforcement	Catastrophic impact, long-term liability,
			Financial	<$1K	$1-10K	$10-100K	$100K-$1M	>$1M
			Reputation	Individual concern, no media attention	Community concern with local media attention	State / Provincial concern with regional media attention	Response causing impact on share price	Response causing major impact on share price

Risk Ranking	Guideline Interpretation
I	It is recommended that no activity be permitted without immediate mitigation taken to lower the risk rank.
II	Further risk controls should be considered to lower either the probability or consequence of the risk.
III	Some risk controls may be required.
IV	No further reduction in risk is required.

APPENDIX D – REQUIRED SIGNATURE FORMS

Management Approval and Cleanup Commitment
40 CFR §112.7

This Spill Prevention, Control and Countermeasures Plan (Plan), including the Spill Procedures Chart and Supplemental Document, which has been prepared in accordance with 40 CFR 112, has been reviewed and approved by the Project Manager. The Project Manager has the level of authority to commit the necessary resources to fully implement this Plan and to contain and clean up any oil discharged at this facility. By signing below, the **Project Manager** also **authorizes station supervisors to expediently commit manpower, equipment, and materials necessary to contain and remove any harmful quantity of oil discharged from this facility** (40 CFR §112.7). **This commitment includes the authority to use company and/or contract personnel and equipment.**

Facility Name: _____

Location: _____

Signature: _____

Name: _____

Date: _____

Title: _____

ENBRIDGE

CERTIFICATE OF DETERMINATION OF SUBSTANTIAL HARM CRITERIA

Facility Name: _____

Location: _____

Does the facility transfer oil over water to or from vessels and does the facility have a total oil storage capacity greater than or equal to 42,000 gallons? Yes___ No ___

Does the facility have a total oil storage capacity greater than or equal to 1 million gallons and does the facility lack secondary containment that is large enough to contain the capacity of the largest aboveground oil storage tank plus sufficient freeboard to allow for precipitation within any aboveground oil storage tank area?
Yes___ No ___

Does the facility have a total oil storage capacity greater than or equal to 1 million gallons and is the facility located at a distance (as calculated using the appropriate formula in rule 40 CFR 112 Attachment C-III or a comparable formula) such that a discharge from the facility could cause injury to fish and wildlife and sensitive environments? For further description of fish and wildlife and sensitive environments, see Appendices I, II, and III to DOC/NOAA's "Guidance for Facility and Vessel Response Plans: Fish and Wildlife and Sensitive Environments" (see Appendix E to this Part, Section 13, for availability) and the applicable Area Contingency Plan.

Yes___ No ___

Does the facility have a total oil storage capacity greater than or equal to 1 million gallons and is the facility located at a distance (as calculated using the appropriate formula in Attachment C-III to this appendix or a comparable formula) such that a discharge from the facility would shut down public drinking water intake? For the purpose of 40 CFR 112, public drinking water intakes are analogous to public water systems as described in 40 CFR 143.2(c)

Yes___ No ___

Does the facility have a total oil storage capacity greater than or equal to 1 million gallons and has the facility experienced a reportable oil discharge in an amount greater than or equal to 10,000 gallons within the last five years?

Yes___ No ___

Certification

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document, and that based on my inquiry of those individuals responsible for this information, I believe that the submitted information is true, accurate, and complete.

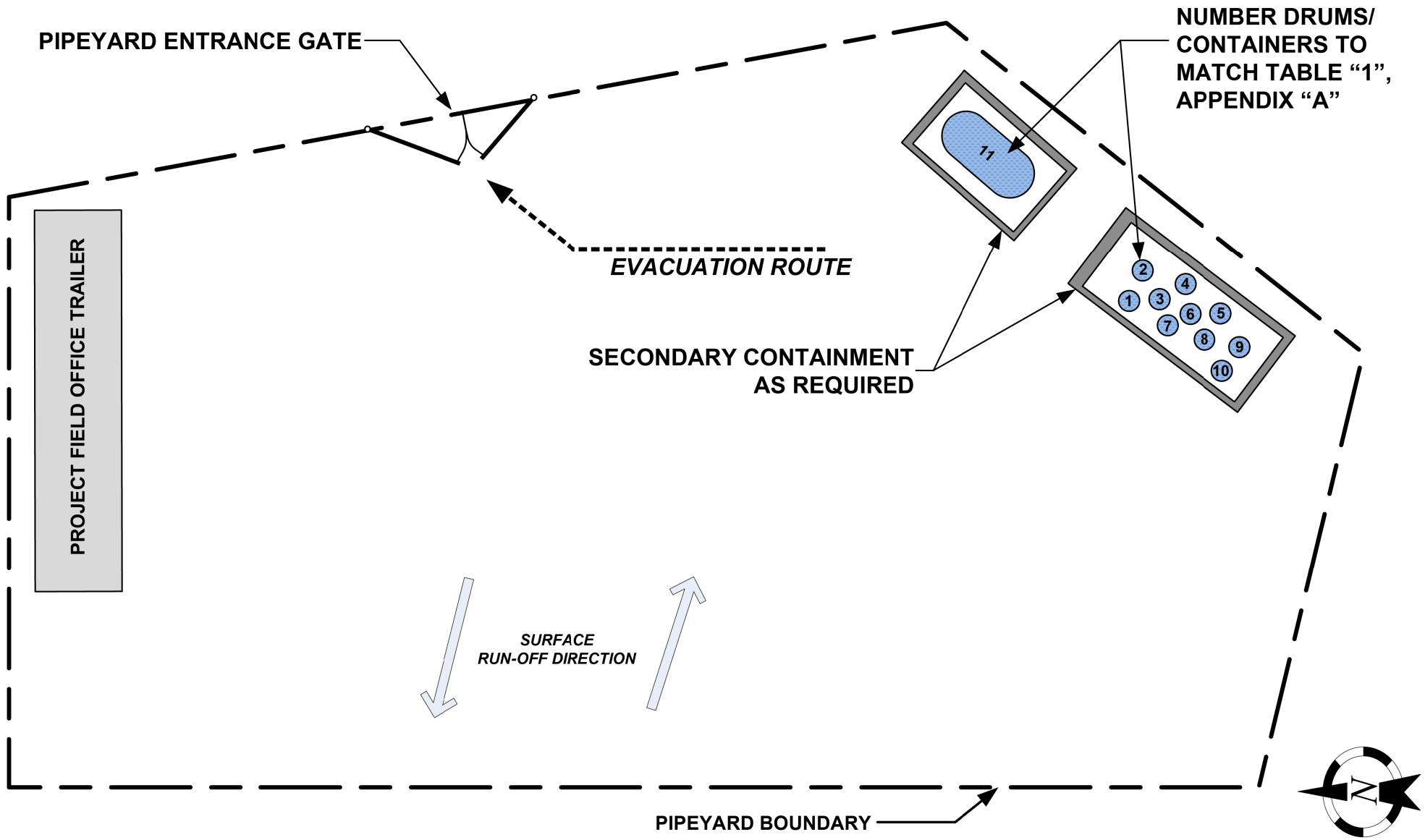
Signature: _____

Title: _____

Name (please type or print): _____

Date: _____

APPENDIX E – PIPEYARD / FACILITY STORAGE DRAWING



LEGEND

- PIPEYARD BOUNDARY
- STORAGE CONTAINERS
- OFFICE TRAILER

SAMPLE
PIPEYARD: FACILITY STORAGE DRAWING

REV.	REV. DATE		REV. APRVD.
CKD.BY	ENG.	DATE 1/6/2011	W.O.
DRN.BY J.M.F.	SCALE NONE	DWG.NO .	

ENBRIDGE

5400 Westheimer Ct.
Houston, TX. 77056-5310
713.627.5400

Appendix E
Wetland and Waterbody Report

AECOM
Foster Plaza 6
681 Andersen Drive, Suite 400
Pittsburgh, PA 15220-2749
www.aecom.com

412 503 4700 tel
412 503 4701 fax

May 5, 2020

William Brett
Texas Eastern Transmission, LP
890 Winter Street, Suite 300
Waltham, MA 02451

Re: Wetland and Watercourse Delineation Report
Conemaugh River Crossing Project
Blacklick Township, Indiana County, and Derry Township, Westmoreland County, Pennsylvania

Dear Mr. Brett:

AECOM has prepared this *Wetland and Watercourse Delineation Report* as part of the environmental investigation conducted for Texas Eastern Transmission, LP (Texas Eastern), a wholly-owned subsidiary of Enbridge Energy Company, Inc. (Enbridge) for their 2020 Integrity Program (Project). This report pertains to the Conemaugh River Crossing Project (Site). The limit of the Site investigation is defined by the Study Area, as shown on Figure 2. The following report summarizes this investigation.

BACKGROUND

The Site is located in Blacklick Township, Indiana County, and Derry Township, Westmoreland County Pennsylvania (PA) and can be located on the United States Geological Survey (USGS) Blairsville, PA 7.5-minute series topographical quadrangle (National Geographic Society, 2013) (Figure 1).

The Site is a natural gas pipeline ROW and temporary access road, and is surrounded by agricultural and forest land. The Site drains to the Conemaugh River, which is located in the Allegheny River basin.

The Conemaugh River has PA Code, Title 25, Chapter 93 designated protected aquatic life uses of *Warm Water Fishes* (*WWF*) (Commonwealth of PA, 2020a). The Pennsylvania Department of Environmental Protection (PADEP) does not list the Conemaugh River as having an Existing Use Classification (PADEP, 2020).

The Conemaugh River is not listed by the Pennsylvania Fish and Boat Commission (PFBC) as Stocked Trout Waters, nor is it listed by the PFBC as Wild Trout Waters (PFBC, 2020a, 2020b, and 2020c). According to the *2016 Pennsylvania Integrated Water Quality Monitoring and Assessment Report*, the Conmeaugh River is not listed as a siltation impaired waterbody (PADEP, 2020).

Three wetlands identified by the U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) are located within the Study Area. They are identified as follows:

- L1UBHh – lacustrine, limnetic, unconsolidated bottom, permanently flooded, diked/impounded wetland,
- L2USAh – lacustrine, littoral, unconsolidated shore, temporary flooded, diked/impounded wetland, and
- PFO1/USAh – palustrine, forested, broad-leaved deciduous, unconsolidated shore, temporary flooded, diked/impounded wetland (USFWS, 2018) (Figure 2).

Seven soil map units are located within the Study Area. Each soil map unit has been given a hydric soil rating by the Natural Resources Conservation Service (NRCS, 2018) (Table 1).

Table 1. Study Area Soil Map Units

Soil Map Unit	Description	Hydric Rating By Map Unit (%)
AhC	Allegheny silt loam, 8 to 15 percent slopes	0
GoF	Gilpin-Rock outcrop complex, 45 to 100 percent slopes	0
MoA	Monongahela silt loam, 0 to 3 percent slopes	5
MoB	Monongahela silt loam, 3 to 8 percent slopes	5
MoC	Monongahela silt loam, 8 to 15 percent slopes	5
W	Water	0
WeA	Weinbach silt loam, 0 to 2 percent slopes	5

METHODOLOGY

On June 23 and 24, 2016; August 19, 2016; and March 5, 2020, AECOM environmental scientists performed site investigations to identify and delineate wetlands and watercourses that may be regulated under the Pennsylvania Clean Streams Law and Dam Safety and Encroachments Act and the federal Clean Water Act (Commonwealth of PA, 2020a and 2020b; Clean Water Act of 1972).

To identify and delineate wetlands, AECOM performed an on-site routine wetland determination as described in the U.S. Army Corps of Engineers (USACE) *Wetland Delineation Manual*, *Technical Report Y-87-1* (Environmental Laboratory, 1987) using wetland criteria detailed in the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains Piedmont Region (Version 2.0)*

(USACE, 2012). If a wetland was delineated, a USACE Regional Supplement *Wetland Determination Data Form* was completed at each selected data point. Data on the composition of the vegetation community, soil profile characteristics, and hydrology were recorded on the data form. Wetlands were classified following *Classification of Wetlands and Deepwater Habitats of the United States (*Cowardin et al., 1979). The boundaries of each wetland were recorded with a high-precision, mapping-grade Global Positioning System (GPS) unit and photographs were taken of each resource. Additional upland data points were taken in areas where desktop evaluation indicated a potential resource signature or in areas where wetland characteristics were present, but one or more wetland indicators was absent and wetland criteria were not met.

To identify and delineate watercourses, AECOM performed an on-site evaluation based on typical watercourse characteristics such as defined streambed and streambanks, exclusion of terrestrial vegetation, hydrologically-sorted substrate material, and the presence of an ordinary high water mark. If a watercourse was delineated, information was collected for each resource based on the *Physical Characterization/Water Quality Field Data Sheet* found in the Environmental Protection Agency's (EPA) *Rapid Bioassessment Protocols for Use in Streams and Wadeable Rivers: Periphyton, Benthic Macroinvertebrates, and Fish* (Barbour et al., 1999). The extent of each watercourse was recorded with a GPS unit and photographs were taken of each resource.

RESULTS

Two palustrine emergent (PEM) wetlands, one PEM/palustrine scrub/shrub (PSS) wetland complex, one PEM/PSS/palustrine forested (PFO) wetland complex, and one perennial (PER) watercourse were identified and delineated within the Study Area (Figure 2). Two additional upland (UPL) data points were recorded in areas where visible wetland characteristics were present, but did not meet all wetland criteria. The field data forms and photographs are provided in Appendices A and B, respectively. Each resource is summarized below.

- **Wetland W-BJM-011 (PEM/PSS):** W-BJM-011 consisted of a PEM and PSS wetland complex. The complex was located in a slight depression within the existing pipeline ROW. The delineated PEM component of W-BJM-011 was 1.41 acre in size, was located within the northwestern portion of the complex, and extended outside the Study Area to the north and south. The primary indicators of hydrology observed were Surface Water (A1), High Water Table (A2), Saturation (A3), and Aquatic Fauna (B13). The dominant herbaceous vegetation species were *Juncus effusus, Scirpus cyperinus*, and *Typha angustifolia.* The soil texture at this location was silt loam underlain by silty clay loam and met the criteria for hydric soil field indicator Depleted Matrix (F3).

  The delineated PSS component of W-BJM-011 was 0.06 acre in size and was located within the southeastern portion of the complex. The primary indicators of hydrology observed were Surface

Water (A1), High Water Table (A2), and Saturation (A3). *Platanus occidentalis* dominated the tree stratum, while the dominant vegetation identified within the sapling/shrub stratum included *Cornus racemosa and Rubus occidentalis*. The dominant herbaceous vegetation included *Scirpus cyperinus* and *Dichanthelium clandestinum.* The soil texture at this location was silt loam underlain by silty clay loam and met the criteria for hydric soil indicator Depleted Matrix (F3).

- **Wetland W-BJM-010 (PEM/PSS/PFO):** W-BJM-010 consisted of a PEM, PSS, and PFO wetland complex. The complex was located west of a pipeline meter site within the ROW. The PEM component of W-BJM-010 was 0.47 acre in size and was located within the northwestern and southern portions of the complex. The primary indicators of hydrology observed were Surface Water (A1), High Water Table (A2), Saturation (A3), and Aquatic Fauna (B13). The dominant herbaceous vegetation included *Juncus effusus* and *Cyperus esculentus.* The soil texture at this location was silty clay loam and met the criteria for hydric soil field indicator Depleted Matrix (F3).

  The delineated PSS component of W-BJM-010 was 0.04 acre in size, was located within the southeastern portion of the complex, and extended outside the Study Area to the north. The primary indicators of hydrology observed were High Water Table (A2), Saturation (A3), and Oxidized Rhizospheres along Living Roots (C3). The tree stratum was dominated by *Fraxinus pennsylvanica*, and the dominant vegetation identified within the sapling/shrub stratum included *Acer rubrum* and *Rosa multiflora*. The dominant herbaceous vegetation included *Dichanthelium clandestinum* and *Solidago rugosa.* The soil texture at this location was silt loam underlain by silty clay and met the criteria for hydric soil indicator Depleted Matrix (F3).

  The PFO component of W-BJM-010 was 0.12 acre in size and was located within the northern portion of the complex. The primary indicators of hydrology observed were Surface Water (A1), High Water Table (A2), Saturation (A3), and Water-Stained Leaves (B9). The dominant tree stratum species was Acer rubrum. Dominant vegetation identified within the sapling-sapling/shrub stratum included *Frangula alnus* and *Ulmus americana*. The dominant herbaceous vegetation was *Microstegium vimineum.* The soil texture at this location was silt loam underlain by silty clay and met the criteria for hydric soil indicator Depleted Matrix (F3).

- **Wetland W-CMS-016 (PEM):** This large PEM wetland was located within the floodplain of the Conemaugh River and extended outside of the Study Area to the north and south. The delineated portion of this resource was 3.40 acre in size. There were no primary indicators of hydrology observed; however, two secondary indicators of wetland hydrology were present in the forms of Drainage Patterns (B10) and Geomorphic Position (D2). The dominant herbaceous species were *Fallopia japonica* and *Chamaedaphne calyculata*. The soil texture at this location was clay loam and met the criteria for hydric soil field indicator Depleted Matrix (F3).

- **Wetland W-CMS-007 (PEM):** This PEM wetland originated on a hillside where several spring seeps emerged and extended outside of the Study Area to the southeast. The delineated portion of this resource was 0.13 acre in size. The primary indicators of hydrology observed were Surface Water (A1), High Water Table (A2), Saturation (A3), and Oxidized Rhizospheres along Living Roots (C3). The dominant herbaceous species were *Fallopia japonica, Juncus tenuis,* and *Carex crinita*. The soil texture at this location was loamy clay and met the criteria for hydric soil field indicator Loamy Gleyed Matrix (F2).

- **Watercourse S-JLK-037 (PER):** This PER watercourse was identified as the Conemaugh River and flowed adjacent to wetland W-CMS-016. The watercourse had a top width and overall channel depth of approximately 185 feet and ten feet, respectively. The morphology of watercourse S-JLK-037 consisted entirely of a pool feature. A qualitative review of the substrate for benthic macroinvertebrates was conducted and Ephemeroptera, Plecoptera, and Trichoptera taxa were observed.

SUMMARY

AECOM conducted a wetland and watercourse investigation on June 23 and 24, 2016; August 19, 2016; and March 5, 2020 for Texas Eastern Transmission, LP for the Conemaugh River Project within Blacklick Township, Indiana County, and Derry Township, Westmoreland County, Pennsylvania. Two PEM wetlands, one PEM/PSS wetland complex, one PEM/PSS/PFO wetland complex, and one PER watercourse were identified within the Study Area.

STATEMENT OF LIMITATIONS

- This investigation was limited to the Study Area shown herein. AECOM did not examine areas outside of the Study Area thus no information is provided regarding the presence or absence of regulated wetlands and watercourses outside of the Study Area.
- This investigation was conducted on the date(s) indicated herein. Human-induced or natural changes at the site may occur after this date which may cause changes in the presence and extent of regulated wetlands and watercourses.
- The findings of the site investigation completed by AECOM were limited to the date(s) contained herein and this report reflects the conditions at that time. In circumstances where a site has been developed prior to the site investigation, the presence or absence of pre-construction wetlands or watercourses and their estimated extents within the Study Area is beyond the scope of this report.

SIGNATURES

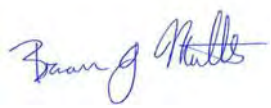
This report was prepared by:

AECOM

Josh Singleton
Environmental Scientist

And reviewed by:

AECOM



Brian J. Miller
Senior Ecologist

REFERENCES

Barbour, M.T., J. Gerritsen, B.D. Snyder, and J.B. Stribling. 1999. *Rapid Bioassessment Protocols for Use in Streams and Wadeable Rivers: Periphyton, Benthic Macroinvertebrates and Fish, Second Edition*. EPA 841-B-99-002. U.S. Environmental Protection Agency, Office of Water, Washington District of Columbia.

Clean Water Act of 1972, 33 U.S.C. § 1251 et seq. (2002). Accessed at https://www.epa.gov/sites/production/files/2017-08/documents/federal-water-pollution-control-act-508full.pdf on April 6, 2020.

Commonwealth of Pennsylvania. 2020a. The Pennsylvania Code, Title 25: Environmental Protection, Chapter 93: Water Quality Standards, Section 93.9: Designated Water Uses and Water Quality Criteria. Accessed at http://www.pacode.com/secure/browse.asp on April 6, 2020.

Commonwealth of Pennsylvania. 2020b. The Pennsylvania Code, Title 25: Environmental Protection, Chapter 105: Dam Safety and Waterway Management. Accessed at http://www.pacode.com/secure/browse.asp on April 6, 2020.

Cowardin, L.M., Carter, V., Golet, F.C., LaRoe, E.T. 1979. *Classification of Wetlands and Deepwater Habitats of the United States*, Report No. FWS/OBL-97/31. U. S. Department of the Interior, Fish and Wildlife Service, Washington, District of Columbia.

Environmental Laboratory. 1987. *Corps of Engineers Wetlands Delineation Manual*, Technical Report Y-87-1. U.S. Army Engineer Waterways Experiment Station, Vicksburg, Mississippi.

Kollmorgen Instruments Corporation. 1994. *Munsell Soil Color Charts*. Macbeth Division, New Windsor, New York.

National Geographic Society. 2013. Seamless Layer 2013 (Topo Source: Seamless Digital Raster Graphic-N.P.S. Natural Physical Map & U.S.G.S. Topographic Map i-cubed USGS Quad: Blairsville, PA).

Natural Resources Conservation Service (NRCS). 2018. Soil Survey Geographic (SSURGO) Databases for Indiana and Westmoreland Counties, Pennsylvania. Accessed at http://websoilsurvey.nrcs.usda.gov/app/HomePage.htm on April 6, 2020.

Pennsylvania Department of Environmental Protection (PADEP). 2016. *2016 Pennsylvania Integrated Water Quality Monitoring and Assessment Report*. Accessed at http://www.elibrary.dep.state.pa.us/dsweb/View/Collection-13014 on April 6, 2020.

PADEP. 2020. *Statewide Existing Use Classifications*. Last Revised January 13, 2020. http://files.dep.state.pa.us/Water/Drinking%20Water%20and%20Facility%20Regulation/WaterQualityPortalFiles/Existing%20Use/EU%20table%20list.pdf on April 6, 2020.

Pennsylvania Fish and Boat Commission. 2020a. *Adult Trout Stocking by County*. Accessed at http://fbweb.pa.gov/stocking/TroutStockingDetails_GIS.aspx on April 6, 2020.

PFBC. 2020b. *2020 Pennsylvania Fishing Summary: Summary of Fishing Regulations and Laws – Stocked Trout Waters*. Accessed at http://pfbc.pa.gov/fishpub/summaryad/2020summaryComplete.pdf on PFBC. April 6, 2020.

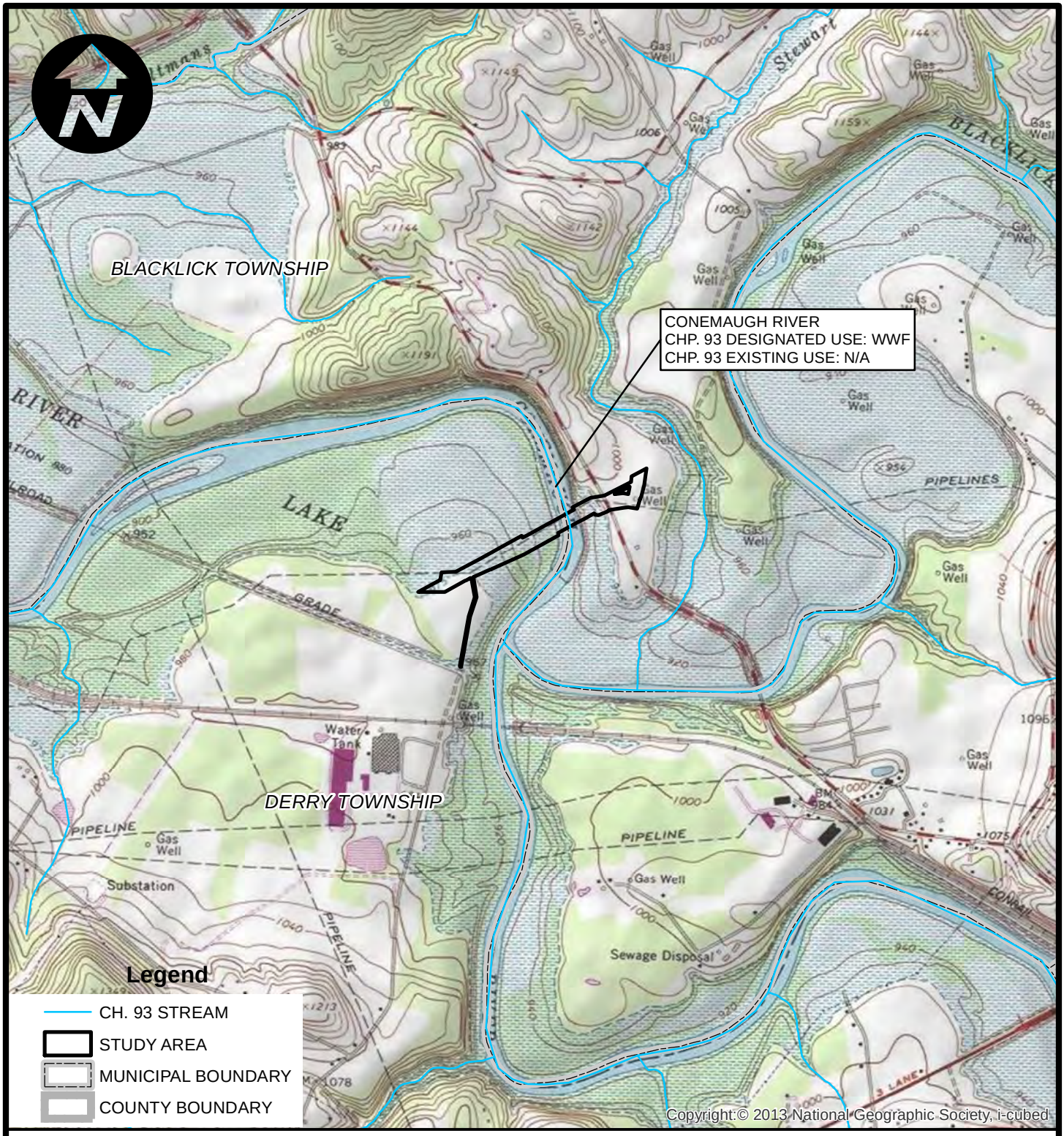
PFBC. 2020c. *Pennsylvania Wild Trout Waters (Natural Reproduction)* – February 2020 Accessed at http://www.fishandboat.com/Fish/PennsylvaniaFishes/Trout/Documents/trout_repro.pdf on April 6, 2020.

United States Army Corps of Engineers (USACE). 2012. *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont Region Version 2.0*, ed. J. F. Berkowitz, J. S. Wakeley, R. W. Lichvar, C. V. Noble. ERDC/EL TR-12-9. U.S. Army Engineer Research and Development Center, Vicksburg, Mississippi.

U.S. Fish and Wildlife Service (USFWS) 2018. National Wetlands Inventory website. U.S. Department of the Interior, Fish and Wildlife Service, Washington, D.C. Accessed at http://www.fws.gov/wetlands on April 6, 2020.

AECOM

FIGURES



USGS QUAD NAME: BLAIRSVILLE, PA
BLACKLICK TOWNSHIP, INDIANA COUNTY AND DERRY TOWNSHIP, WESTMORELAND COUNTY, PA
SITE CENTER: 40° 27' 21.15" N AND 79° 17' 57.81" W

TOPO SOURCE: SEAMLESS DIGITAL RASTER GRAPHIC-N.P.S. NATURAL PHYSICAL MAP & U.S.G.S. TOPOGRAPHIC MAP 2013, NATIONAL GEOGRAPHIC SOCIETY, ICUBED

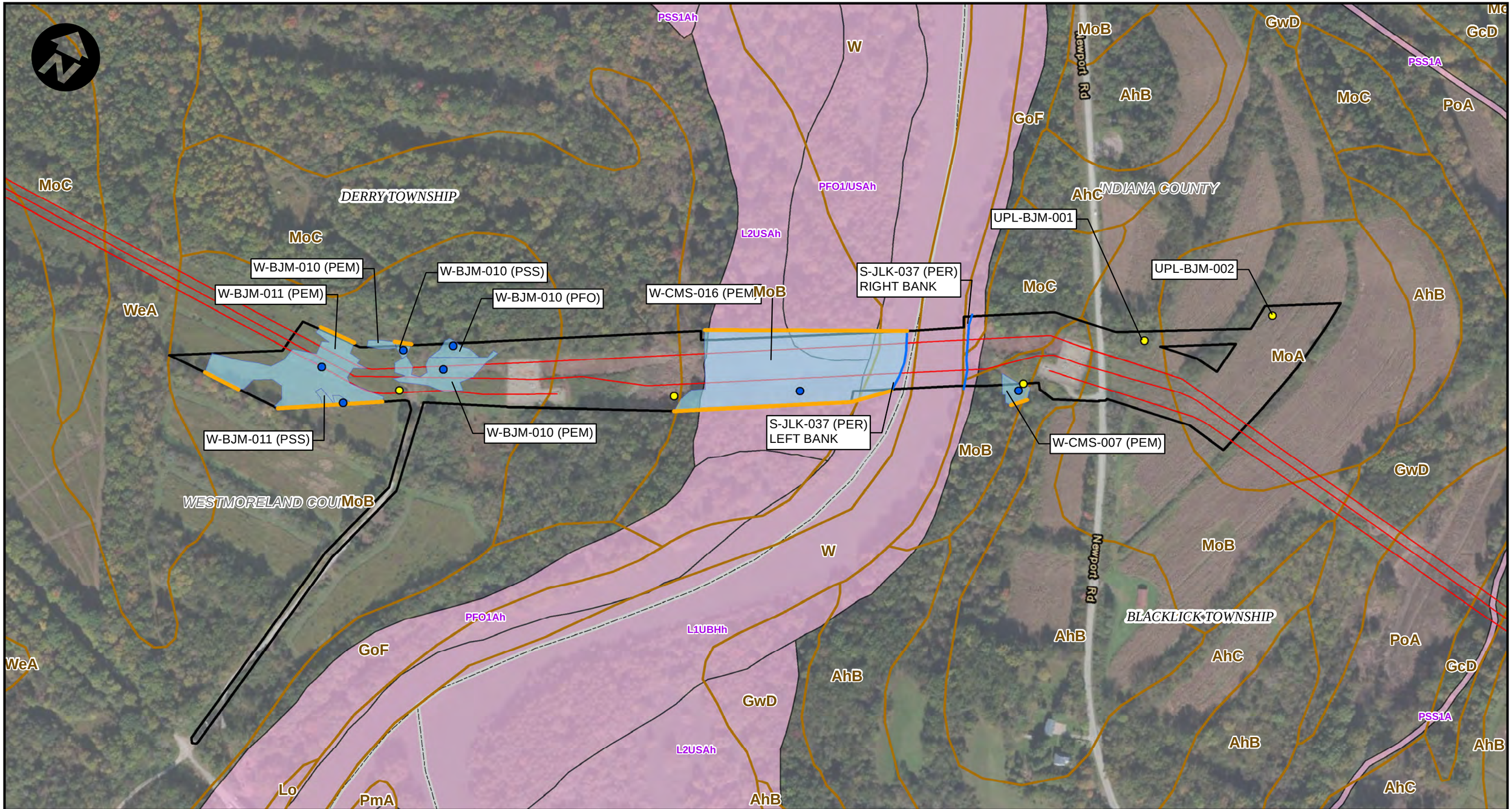
AECOM
FOSTER PLAZA 6
681 ANDERSEN DRIVE, SUITE 120
PITTSBURGH, PA 15220

ENBRIDGE

TEXAS EASTERN TRANSMISSION, LP

PREPARED BY:	CHECKED BY:	APPROVED BY:
JAS	MAB	SLH

DATE:	SCALE:	DRAWING NO.
5/5/2020	1 " = 2,000 '	**FIGURE 1**
	PROJECT NO.	LOCATION MAP
Page 1 of 1	60594173	2020 INTEGRITY PROGRAM
		CONEMAUGH RIVER CROSSING PROJECT
		INDIANA AND WESTMORELAND COUNTIES, PENNSYLVANIA



BASE MAP SOURCES:
AERIAL IMAGERY: ESRI, HERE, GARMIN, (C) OPENSTREETMAP CONTRIBUTORS
SOURCE: ESRI, DIGITALGLOBE, GEOEYE, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, USDA, USGS, AEROGRID, IGN, AND THE GIS USER COMMUNITY

NWI WETLAND: USFWS, NATIONAL WETLANDS INVENTORY FOR PA, POLYGON, 10/15/2018

SOIL MAP UNIT: USDA-NRCS, SOIL SURVEY GEOGRAPHIC DATABASE FOR WESTMORELAND AND INDIANA COUNTIES, PA, 9/2018

Legend

- STUDY AREA
- SOIL MAP UNIT
- NWI WETLAND
- WETLAND
- PIPELINE
- OPEN-ENDED WETLAND
- WATERCOURSE
- UPLAND DATA POINT
- WETLAND DATA POINT

0 125 250 500 750 1,000 Feet

ENBRIDGE

FIGURE 2
PLAN VIEW

AECOM

CONEMAUGH RIVER CROSSING PROJECT

40° 27' 21.15" N AND 79° 17' 57.81" W
BLACKLICK TOWNSHIP, INDIANA COUNTY
AND DERRY TOWNSHIP, WESTMORELAND COUNTY, PA

Prepared by: JAS	CHECKED BY: MLN	DATE: 5/5/2020	PAGE 1 OF 1

APPENDIX A –
FIELD DATA FORMS

WETLAND DETERMINATION DATA FORM - Eastern Mountains and Piedmont Region

Project/Site: Conemaugh River Crossing Project **City/County:** Westmoreland **Sampling Date:** 05-Mar-20

Applicant/Owner: Enbridge **State:** PA **Sampling Point:** **W-BJM-011 PEM**

Investigator(s): Brian Miller & Jessica Gumbert **Section, Township, Range: S** **T** Derry **R**

Landform (hillslope, terrace, etc.): Flat **Local relief (concave, convex, none):** concave **Slope:** 2.0% / 1.1 °

Subregion (LRR or MLRA): LRR N **Lat.:** 40.454165 **Long.:** -79.30405 **Datum:** NAD83

Soil Map Unit Name: Monongahela silt loam, 3 to 8 percent slopes (MoB) **NWI classification:** NA

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 ○	
Hydric Soil Present?	Yes ◉	No ○	**Is the Sampled Area within a Wetland?** Yes ◉ No ○
Wetland Hydrology Present?	Yes ◉	No ○	

Remarks:
The PEM portion of the PEM/PSS wetland complex identified within the existing pipeline right-of-way that continues outside of the survey area to the north and south. The boundary of the PEM portion of the wetland complex was identified by the dominance of Scirpus cyperinus, Juncus effusus, Typha angustifolia, and a Panicum species located within a slightly depressed area. Based on site conditions and review of previous aerial imagery, it appears the wetland complex drains from the north to the southern tree line. Within the tree line, non-continuous rivets were observed that drained hydrology to the west and could have a potential connection to S-WRA-001.

Hydrology

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ Microtopographic Relief (D4)
- ☑ FAC-neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ◉	No ○	Depth (inches): 2	
Water Table Present?	Yes ◉	No ○	Depth (inches): 0	**Wetland Hydrology Present?** Yes ◉ No ○
Saturation Present? (includes capillary fringe)	Yes ◉	No ○	Depth (inches): 0	

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

NA

Remarks:

Hydrology of this system may have been significantly altered due to the active construction practices within the existing pipeline right-of-way that caused the compaction of soils. ***Frogs and eggs were identified within the surface water of the PEM portion of the wetland located within existing pipeline right-of-way.

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

Sampling Point: W-BJM-011 PEM

	Absolute % Cover	Dominant Species?	Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size: None)				
1.	0	☐	0.0%	
2.	0	☐	0.0%	
3.	0	☐	0.0%	
4.	0	☐	0.0%	
5.	0	☐	0.0%	
6.	0	☐	0.0%	
7.	0	☐	0.0%	
8.	0	☐	0.0%	
	0	= Total Cover		
Sapling-Sapling/Shrub Stratum (Plot size: None)				
1.	0	☐	0.0%	
2.	0	☐	0.0%	
3.	0	☐	0.0%	
4.	0	☐	0.0%	
5.	0	☐	0.0%	
6.	0	☐	0.0%	
7.	0	☐	0.0%	
8.	0	☐	0.0%	
9.	0	☐	0.0%	
10.	0	☐	0.0%	
	0	= Total Cover		
Shrub Stratum (Plot size: None)				
1.	0	☐	0.0%	
2.	0	☐	0.0%	
3.	0	☐	0.0%	
4.	0	☐	0.0%	
5.	0	☐	0.0%	
6.	0	☐	0.0%	
7.	0	☐	0.0%	
	0	= Total Cover		
Herb Stratum (Plot size: 5' radius)				
1. *Juncus effusus*	30	☑	31.6%	FACW
2. *Scirpus cyperinus*	25	☑	26.3%	FACW
3. *Typha angustifolia*	20	☑	21.1%	OBL
4. *Andropogon virginicus*	10	☐	10.5%	FACU
5. *Juncus tenuis*	10	☐	10.5%	FAC
6.	0	☐	0.0%	
7.	0	☐	0.0%	
8.	0	☐	0.0%	
9.	0	☐	0.0%	
10.	0	☐	0.0%	
11.	0	☐	0.0%	
12.	0	☐	0.0%	
	95	= Total Cover		
Woody Vine Stratum (Plot size: None)				
1.	0	☐	0.0%	
2.	0	☐	0.0%	
3.	0	☐	0.0%	
4.	0	☐	0.0%	
5.	0	☐	0.0%	
6.	0	☐	0.0%	
	0	= Total Cover		

Dominance Test worksheet:

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

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

Percent of dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

	Total % Cover of:		Multiply by:	
OBL species	20	x 1 =	20	
FACW species	55	x 2 =	110	
FAC species	10	x 3 =	30	
FACU species	10	x 4 =	40	
UPL species	0	x 5 =	0	
Column Totals:	95	(A)	200	(B)

Prevalence Index = B/A = 2.105

Hydrophytic Vegetation Indicators:

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

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

Definition of Vegetation Strata:

Four Vegetation Strata:

Tree stratum – Consists of woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub stratum – Consists of woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb stratum – Consists of all herbaceous (non-woody) plants, regardless of size, and all other plants less than 3.28 ft tall.

Woody vines – Consists of all woody vines greater than 3.28 ft in height.

Five Vegetation Strata:

Tree - Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling stratum – Consists of woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub stratum – Consists of woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb stratum – Consists of all herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody species, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vines – Consists of all woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes ◉ No ○

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

*Vegetation was naturally problematic and significantly disturbed due to winter conditions and pipeline construction, respectively. Approximately 5 percent of the total cover was open water/soil. Outside of the existing right-of-way, the PEM wetland complex was mostly dominated by Dichanthelium clandestinum, Scirpus cyperinus, Panicum species, Onoclea sensibilis, and Microstegium vimineum.

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: W-BJM-011 PEM

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type [1]	Loc[2]	Texture	Remarks
0-8	10YR	5/2	95	10YR	5/6	5	C	M	Silty Loam	
8-16	10YR	5/6	60	10YR	5/2	20	D	M	Silty Clay Loam	
				10YR	5/4	10	C	M		
				10YR	2/2	5	C	M		
				10YR	6/1	5	D	M		

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

Hydric Soil Indicators:

- ☐ 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 Muck Mineral (S1) (LRR N, MLRA 147, 148)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7)
- ☐ Polyvalue Below Surface (S8) (MLRA 147,148)
- ☐ Thin 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)
- ☐ Umbric Surface (F13) (MLRA 136, 122)
- ☐ Piedmont Floodplain Soils (F19) (MLRA 148)
- ☐ Red Parent Material (F21) (MLRA 127, 147)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10) (MLRA 147)
- ☐ Coast Prairie Redox (A16) (MLRA 147,148)
- ☐ Piedmont Floodplain Soils (F19) (MLRA 136, 147)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3] Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ◉ No ○

Remarks:

The soil profile was identified as being disturbed by previous construction practicies for pipeline installation.

WETLAND DETERMINATION DATA FORM - Eastern Mountains and Piedmont Region

Project/Site: Conemaugh River Crossing Project **City/County:** Westmoreland **Sampling Date:** 05-Mar-20

Applicant/Owner: Enbridge **State:** PA **Sampling Point:** **W-BJM-011 PSS**

Investigator(s): Brian Miller & Jessica Gumbert **Section, Township, Range: S** **T** Derry **R**

Landform (hillslope, terrace, etc.): Flat **Local relief (concave, convex, none):** concave **Slope:** 2.0% / 1.1 °

Subregion (LRR or MLRA): LRR N **Lat.:** 40.453972 **Long.:** -79.303652 **Datum:** NAD83

Soil Map Unit Name: Monongahela silt loam, 3 to 8 percent slopes (MoB) **NWI classification:** NA

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 ○	
Hydric Soil Present?	Yes ◉	No ○	**Is the Sampled Area within a Wetland?** Yes ◉ No ○
Wetland Hydrology Present?	Yes ◉	No ○	

Remarks:
The PSS portion of the PEM/PSS wetland complex was identified in a wet meadow located south of an existing pipeline right-of-way. The boundary of the PSS portion of the wetland complex was identified by the dominance within the tree/sapling layer of Platanus occidentalis, Cornus alba, and Rubus occidentalis with herbaceous layer dominated by Scirpus cyperinus and a Dichanthelium clandestinum. The PSS wetland complex continues to the edge of an existing mowed lane located outside of the survey area to the south and continues along the grass mowed lane as a PEM habitat into the tree line.

Hydrology

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ Microtopographic Relief (D4)
- ☑ FAC-neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ◉	No ○	Depth (inches): 1	
Water Table Present?	Yes ◉	No ○	Depth (inches): 0	
Saturation Present? (includes capillary fringe)	Yes ◉	No ○	Depth (inches): 0	**Wetland Hydrology Present?** Yes ◉ No ○

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

NA

Remarks:

The source of hydrology was identified as precipitation and runoff from the existing right-of-way.

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

Sampling Point: W-BJM-011 PSS

	Absolute % Cover	Dominant Species?	Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size: 30' radius)				
1. *Platanus occidentalis*	15	☑	100.0%	FACW
2.	0	☐	0.0%	
3.	0	☐	0.0%	
4.	0	☐	0.0%	
5.	0	☐	0.0%	
6.	0	☐	0.0%	
7.	0	☐	0.0%	
8.	0	☐	0.0%	
	15	= Total Cover		
Sapling-Sapling/Shrub Stratum (Plot size: 15' radius)				
1. *Cornus racemosa*	15	☑	60.0%	FAC
2. *Platanus occidentalis*	10	☑	40.0%	FACW
3.	0	☐	0.0%	
4.	0	☐	0.0%	
5.	0	☐	0.0%	
6.	0	☐	0.0%	
7.	0	☐	0.0%	
8.	0	☐	0.0%	
9.	0	☐	0.0%	
10.	0	☐	0.0%	
	25	= Total Cover		
Shrub Stratum (Plot size: 15' radius)				
1. *Rubus occidentalis*	15	☑	60.0%	UPL
2. *Rosa multiflora*	10	☑	40.0%	FACU
3.	0	☐	0.0%	
4.	0	☐	0.0%	
5.	0	☐	0.0%	
6.	0	☐	0.0%	
7.	0	☐	0.0%	
	25	= Total Cover		
Herb Stratum (Plot size: 5' radius)				
1. *Scirpus cyperinus*	30	☑	31.6%	FACW
2. *Dichanthelium clandestinum*	25	☑	26.3%	FAC
3. *Panicum virgatum*	15	☐	15.8%	FAC
4. *Solidago rugosa*	15	☐	15.8%	FAC
5. *Juncus effusus*	10	☐	10.5%	FACW
6.	0	☐	0.0%	
7.	0	☐	0.0%	
8.	0	☐	0.0%	
9.	0	☐	0.0%	
10.	0	☐	0.0%	
11.	0	☐	0.0%	
12.	0	☐	0.0%	
	95	= Total Cover		
Woody Vine Stratum (Plot size: None)				
1.	0	☐	0.0%	
2.	0	☐	0.0%	
3.	0	☐	0.0%	
4.	0	☐	0.0%	
5.	0	☐	0.0%	
6.	0	☐	0.0%	
	0	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of dominant Species That Are OBL, FACW, or FAC: 71.4% (A/B)

Prevalence Index worksheet:

	Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0	
FACW species	65	x 2 =	130	
FAC species	70	x 3 =	210	
FACU species	10	x 4 =	40	
UPL species	15	x 5 =	75	
Column Totals:	160	(A)	455	(B)

Prevalence Index = B/A = 2.844

Hydrophytic Vegetation Indicators:

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

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

Definition of Vegetation Strata:

Four Vegetation Strata:

Tree stratum – Consists of woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub stratum – Consists of woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb stratum – Consists of all herbaceous (non-woody) plants, regardless of size, and all other plants less than 3.28 ft tall.

Woody vines – Consists of all woody vines greater than 3.28 ft in height.

Five Vegetation Strata:

Tree - Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling stratum – Consists of woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub stratum – Consists of woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb stratum – Consists of all herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody species, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vines – Consists of all woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes ◉ No ○

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

*Vegetation was naturally problematic due to winter conditions.

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: W-BJM-011 PSS

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type [1]	Loc²	Texture	Remarks
0-8	2.5YR	4/1	90	7.5YR	5/4	10	C	M	Silty Loam	
8-16	10YR	5/6	100						Silty Clay Loam	

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

Hydric Soil Indicators:

- ☐ 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 Muck Mineral (S1) (LRR N, MLRA 147, 148)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7)
- ☐ Polyvalue Below Surface (S8) (MLRA 147,148)
- ☐ Thin 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)
- ☐ Umbric Surface (F13) (MLRA 136, 122)
- ☐ Piedmont Floodplain Soils (F19) (MLRA 148)
- ☐ Red Parent Material (F21) (MLRA 127, 147)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10) (MLRA 147)
- ☐ Coast Prairie Redox (A16) (MLRA 147,148)
- ☐ Piedmont Floodplain Soils (F19) (MLRA 136, 147)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3] Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ◉ No ○

Remarks:

WETLAND DETERMINATION DATA FORM - Eastern Mountains and Piedmont Region

Project/Site: Conemaugh River Crossing Project **City/County:** Westmoreland **Sampling Date:** 05-Mar-20

Applicant/Owner: Enbridge **State:** PA **Sampling Point:** **W-BJM-010 PEM**

Investigator(s): Brian Miller & Jessica Gumbert **Section, Township, Range: S** **T** Derry **R**

Landform (hillslope, terrace, etc.): Flat **Local relief (concave, convex, none):** concave **Slope:** 2.0% / 1.1 °

Subregion (LRR or MLRA): LRR N **Lat.:** 40.454622 **Long.:** -79.302811 **Datum:** NAD83

Soil Map Unit Name: Monongahela silt loam, 3 to 8 percent slopes (MoB) **NWI classification:** NA

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 ○	
Hydric Soil Present?	Yes ◉	No ○	**Is the Sampled Area within a Wetland?** Yes ◉ No ○
Wetland Hydrology Present?	Yes ◉	No ○	

Remarks:
The PEM portion of the PEM/PSS/PFO wetland complex identified within the existing pipeline right-of-way and west of a gravel meter site. The boundary of the wetland complex was identified by the presence of surface water with the dominance of hydrophytic vegetation including Juncus effuses, Scirupus cyperinus, and Tyhpa angustifolia. The boundary of the wetland complex is also located within a slightly concave area that has been previously disturbed by various construction activities. The PEM boundary was extended across a dirt road due to the presence of surface water and similar vegetation being present on both sides. The boundary of the PSS portion of the wetland is open-ended to the north.

Hydrology

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ Microtopographic Relief (D4)
- ☑ FAC-neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ◉	No ○	Depth (inches): 5	
Water Table Present?	Yes ◉	No ○	Depth (inches): 0	**Wetland Hydrology Present?** Yes ◉ No ○
Saturation Present? (includes capillary fringe)	Yes ◉	No ○	Depth (inches): 0	

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

NA

Remarks:

Hydrology of this system may have been significantly altered due to the active construction practices within the existing pipeline right-of-way that caused the compaction of soils. ***Frogs and eggs were identified within the surface water of the wetland.

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

Sampling Point: W-BJM-010 PEM

	Absolute % Cover	Dominant Species?	Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size: None)				
1.	0	☐	0.0%	
2.	0	☐	0.0%	
3.	0	☐	0.0%	
4.	0	☐	0.0%	
5.	0	☐	0.0%	
6.	0	☐	0.0%	
7.	0	☐	0.0%	
8.	0	☐	0.0%	
	0	= Total Cover		
Sapling-Sapling/Shrub Stratum (Plot size: None)				
1.	0	☐	0.0%	
2.	0	☐	0.0%	
3.	0	☐	0.0%	
4.	0	☐	0.0%	
5.	0	☐	0.0%	
6.	0	☐	0.0%	
7.	0	☐	0.0%	
8.	0	☐	0.0%	
9.	0	☐	0.0%	
10.	0	☐	0.0%	
	0	= Total Cover		
Shrub Stratum (Plot size: None)				
1.	0	☐	0.0%	
2.	0	☐	0.0%	
3.	0	☐	0.0%	
4.	0	☐	0.0%	
5.	0	☐	0.0%	
6.	0	☐	0.0%	
7.	0	☐	0.0%	
	0	= Total Cover		
Herb Stratum (Plot size: 5' radius)				
1. *Juncus effusus*	45	☑	52.9%	FACW
2. *Cyperus esculentus*	25	☑	29.4%	FACW
3. *Typha angustifolia*	15	☐	17.6%	OBL
4.	0	☐	0.0%	
5.	0	☐	0.0%	
6.	0	☐	0.0%	
7.	0	☐	0.0%	
8.	0	☐	0.0%	
9.	0	☐	0.0%	
10.	0	☐	0.0%	
11.	0	☐	0.0%	
12.	0	☐	0.0%	
	85	= Total Cover		
Woody Vine Stratum (Plot size: None)				
1.	0	☐	0.0%	
2.	0	☐	0.0%	
3.	0	☐	0.0%	
4.	0	☐	0.0%	
5.	0	☐	0.0%	
6.	0	☐	0.0%	
	0	= Total Cover		

Dominance Test worksheet:

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

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

Percent of dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

	Total % Cover of:		Multiply by:	
OBL species	15	x 1 =	15	
FACW species	70	x 2 =	140	
FAC species	0	x 3 =	0	
FACU species	0	x 4 =	0	
UPL species	0	x 5 =	0	
Column Totals:	85	(A)	155	(B)

Prevalence Index = B/A = 1.824

Hydrophytic Vegetation Indicators:

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

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

Definition of Vegetation Strata:

Four Vegetation Strata:

Tree stratum – Consists of woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub stratum – Consists of woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb stratum – Consists of all herbaceous (non-woody) plants, regardless of size, and all other plants less than 3.28 ft tall.

Woody vines – Consists of all woody vines greater than 3.28 ft in height.

Five Vegetation Strata:

Tree - Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling stratum – Consists of woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub stratum – Consists of woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb stratum – Consists of all herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody species, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vines – Consists of all woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes ◉ No ○

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

*Vegetation was naturally problematic due to winter conditions. Approximately 15 percent of the total cover was open water/soil.

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: W-BJM-010 PEM

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type [1]	Loc²	Texture	Remarks
0-10	10YR	4/1	90	7.5YR	4/6	10	C	M	Silty Clay Loam	

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

Hydric Soil Indicators:

- ☐ 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 Muck Mineral (S1) (LRR N, MLRA 147, 148)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7)
- ☐ Polyvalue Below Surface (S8) (MLRA 147,148)
- ☐ Thin 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)
- ☐ Umbric Surface (F13) (MLRA 136, 122)
- ☐ Piedmont Floodplain Soils (F19) (MLRA 148)
- ☐ Red Parent Material (F21) (MLRA 127, 147)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10) (MLRA 147)
- ☐ Coast Prairie Redox (A16) (MLRA 147,148)
- ☐ Piedmont Floodplain Soils (F19) (MLRA 136, 147)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3] Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ◉ No ○

Remarks:

The soil profile was identified as being disturbed by previous construction practicies and shovel refusal was at 10" due to the presence of rock and/or a compacted clay layer.

WETLAND DETERMINATION DATA FORM - Eastern Mountains and Piedmont Region

Project/Site: Conemaugh River Crossing Project **City/County:** Westmoreland **Sampling Date:** 05-Mar-20

Applicant/Owner: Enbridge **State:** PA **Sampling Point:** **W-BJM-010 PSS**

Investigator(s): Brian Miller & Jessica Gumbert **Section, Township, Range: S** **T** Derry **R**

Landform (hillslope, terrace, etc.): Flat **Local relief (concave, convex, none):** concave **Slope:** 2.0% / 1.1 °

Subregion (LRR or MLRA): LRR N **Lat.:** 40.454618 **Long.:** -79.303314 **Datum:** NAD83

Soil Map Unit Name: Monongahela silt loam, 3 to 8 percent slopes (MoB) **NWI classification:** NA

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 ○	
Hydric Soil Present?	Yes ◉	No ○	**Is the Sampled Area within a Wetland?** Yes ◉ No ○
Wetland Hydrology Present?	Yes ◉	No ○	

Remarks:
The PSS portion of the PEM/PSS/PFO wetland complex identified north of the existing pipeline right-of-way that continues to the north and outside of the survey area. The boundary of the PSS portion of the wetland complex was identified by the dominance of Dichanthelium clandestinum with Acer rubrum and Fraxinus pennsylvanica within the shrub/tree layers.

Hydrology

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ Microtopographic Relief (D4)
- ☑ FAC-neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ○	No ◉	Depth (inches):	0	
Water Table Present?	Yes ◉	No ○	Depth (inches):	6	**Wetland Hydrology Present?** Yes ◉ No ○
Saturation Present? (includes capillary fringe)	Yes ◉	No ○	Depth (inches):	0	

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

NA

Remarks:

The source of hydrology was identified as precipitation and runoff from the existing right-of-way.

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

Sampling Point: W-BJM-010 PSS

	Absolute % Cover	Dominant Species?	Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size: 30' radius)				
1. *Fraxinus pennsylvanica*	5	☑	100.0%	FACW
2.	0	☐	0.0%	
3.	0	☐	0.0%	
4.	0	☐	0.0%	
5.	0	☐	0.0%	
6.	0	☐	0.0%	
7.	0	☐	0.0%	
8.	0	☐	0.0%	
	5	= Total Cover		
Sapling-Sapling/Shrub Stratum (Plot size: 15' radius)				
1. *Fraxinus pennsylvanica*	15	☑	60.0%	FACW
2. *Acer rubrum*	10	☑	40.0%	FAC
3.	0	☐	0.0%	
4.	0	☐	0.0%	
5.	0	☐	0.0%	
6.	0	☐	0.0%	
7.	0	☐	0.0%	
8.	0	☐	0.0%	
9.	0	☐	0.0%	
10.	0	☐	0.0%	
	25	= Total Cover		
Shrub Stratum (Plot size: 15' radius)				
1. *Rosa multiflora*	15	☑	100.0%	FACU
2.	0	☐	0.0%	
3.	0	☐	0.0%	
4.	0	☐	0.0%	
5.	0	☐	0.0%	
6.	0	☐	0.0%	
7.	0	☐	0.0%	
	15	= Total Cover		
Herb Stratum (Plot size: 5' radius)				
1. *Dichanthelium clandestinum*	55	☑	55.0%	FAC
2. *Solidago rugosa*	20	☑	20.0%	FAC
3. *Agrimonia parviflora*	15	☐	15.0%	FACW
4. *Microstegium vimineum*	10	☐	10.0%	FAC
5.	0	☐	0.0%	
6.	0	☐	0.0%	
7.	0	☐	0.0%	
8.	0	☐	0.0%	
9.	0	☐	0.0%	
10.	0	☐	0.0%	
11.	0	☐	0.0%	
12.	0	☐	0.0%	
	100	= Total Cover		
Woody Vine Stratum (Plot size: None)				
1.	0	☐	0.0%	
2.	0	☐	0.0%	
3.	0	☐	0.0%	
4.	0	☐	0.0%	
5.	0	☐	0.0%	
6.	0	☐	0.0%	
	0	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of dominant Species That Are OBL, FACW, or FAC: 83.3% (A/B)

Prevalence Index worksheet:

	Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0	
FACW species	35	x 2 =	70	
FAC species	95	x 3 =	285	
FACU species	15	x 4 =	60	
UPL species	0	x 5 =	0	
Column Totals:	145	(A)	415	(B)

Prevalence Index = B/A = 2.862

Hydrophytic Vegetation Indicators:

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

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

Definition of Vegetation Strata:

Four Vegetation Strata:

Tree stratum – Consists of woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub stratum – Consists of woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb stratum – Consists of all herbaceous (non-woody) plants, regardless of size, and all other plants less than 3.28 ft tall.

Woody vines – Consists of all woody vines greater than 3.28 ft in height.

Five Vegetation Strata:

Tree - Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling stratum – Consists of woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub stratum – Consists of woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb stratum – Consists of all herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody species, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vines – Consists of all woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes ◉ No ○

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

*Vegetation was naturally problematic due to winter conditions.

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: W-BJM-010 PSS

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type [1]	Loc²	Texture	Remarks
0-2	10YR	4/1	90	7.5YR	4/6	10	C	PL	Silty Loam	
2-10	10YR	4/2	100						Silty Clay	

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

Hydric Soil Indicators:

- ☐ 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 Muck Mineral (S1) (LRR N, MLRA 147, 148)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7)
- ☐ Polyvalue Below Surface (S8) (MLRA 147,148)
- ☐ Thin 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)
- ☐ Umbric Surface (F13) (MLRA 136, 122)
- ☐ Piedmont Floodplain Soils (F19) (MLRA 148)
- ☐ Red Parent Material (F21) (MLRA 127, 147)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10) (MLRA 147)
- ☐ Coast Prairie Redox (A16) (MLRA 147,148)
- ☐ Piedmont Floodplain Soils (F19) (MLRA 136, 147)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3] Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ◉ No ○

Remarks:

WETLAND DETERMINATION DATA FORM - Eastern Mountains and Piedmont Region

Project/Site: Conemaugh River Crossing Project **City/County:** Westmoreland **Sampling Date:** 05-Mar-20

Applicant/Owner: Enbridge **State:** PA **Sampling Point:** **W-BJM-010 PFO**

Investigator(s): Brian Miller & Jessica Gumbert **Section, Township, Range:** S T Derry R

Landform (hillslope, terrace, etc.): Flat **Local relief (concave, convex, none):** concave **Slope:** 2.0% / 1.1 °

Subregion (LRR or MLRA): LRR N **Lat.:** 40.454845 **Long.:** -79.302833 **Datum:** NAD83

Soil Map Unit Name: Monongahela silt loam, 3 to 8 percent slopes (MoB) **NWI classification:** NA

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 ○	
Hydric Soil Present?	Yes ◉	No ○	**Is the Sampled Area within a Wetland?** Yes ◉ No ○
Wetland Hydrology Present?	Yes ◉	No ○	

Remarks:
The PFO portion of the PEM/PSS/PFO wetland complex identified along the north of the existing pipeline right-of-way within a slightly concave area along the edge of a mixed deciduous forest. The boundary of the PFO portion of the wetland complex was identified by the presence of water stained leaves, surface water, and concave depressional area.

Hydrology

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ Microtopographic Relief (D4)
- ☑ FAC-neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ◉	No ○	Depth (inches): 2	
Water Table Present?	Yes ◉	No ○	Depth (inches): 0	
Saturation Present? (includes capillary fringe)	Yes ◉	No ○	Depth (inches): 0	**Wetland Hydrology Present?** Yes ◉ No ○

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

NA

Remarks:

Hydrology of this system may have been significantly altered due to the active construction practices within the existing pipeline right-of-way that caused the compaction of soils. The construction activity within the ROW could attributed to the inundation of the wetland area within and immediately adjacent to the existing ROW.

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

Sampling Point: W-BJM-010 PFO

	Absolute % Cover	Dominant Species?	Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size: 30' radius)				
1. *Acer rubrum*	35	☑	100.0%	FAC
2.	0	☐	0.0%	
3.	0	☐	0.0%	
4.	0	☐	0.0%	
5.	0	☐	0.0%	
6.	0	☐	0.0%	
7.	0	☐	0.0%	
8.	0	☐	0.0%	
	35	= Total Cover		
Sapling-Sapling/Shrub Stratum (Plot size: 15' radius)				
1. *Frangula alnus*	10	☑	66.7%	FAC
2. *Ulmus americana*	5	☑	33.3%	FACW
3.	0	☐	0.0%	
4.	0	☐	0.0%	
5.	0	☐	0.0%	
6.	0	☐	0.0%	
7.	0	☐	0.0%	
8.	0	☐	0.0%	
9.	0	☐	0.0%	
10.	0	☐	0.0%	
	15	= Total Cover		
Shrub Stratum (Plot size: None)				
1.	0	☐	0.0%	
2.	0	☐	0.0%	
3.	0	☐	0.0%	
4.	0	☐	0.0%	
5.	0	☐	0.0%	
6.	0	☐	0.0%	
7.	0	☐	0.0%	
	0	= Total Cover		
Herb Stratum (Plot size: 5' radius)				
1. *Microstegium vimineum*	15	☑	100.0%	FAC
2.	0	☐	0.0%	
3.	0	☐	0.0%	
4.	0	☐	0.0%	
5.	0	☐	0.0%	
6.	0	☐	0.0%	
7.	0	☐	0.0%	
8.	0	☐	0.0%	
9.	0	☐	0.0%	
10.	0	☐	0.0%	
11.	0	☐	0.0%	
12.	0	☐	0.0%	
	15	= Total Cover		
Woody Vine Stratum (Plot size: None)				
1.	0	☐	0.0%	
2.	0	☐	0.0%	
3.	0	☐	0.0%	
4.	0	☐	0.0%	
5.	0	☐	0.0%	
6.	0	☐	0.0%	
	0	= Total Cover		

Dominance Test worksheet:

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: 100.0% (A/B)

Prevalence Index worksheet:

	Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0	
FACW species	5	x 2 =	10	
FAC species	60	x 3 =	180	
FACU species	0	x 4 =	0	
UPL species	0	x 5 =	0	
Column Totals:	65	(A)	190	(B)

Prevalence Index = B/A = 2.923

Hydrophytic Vegetation Indicators:

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

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

Definition of Vegetation Strata:

Four Vegetation Strata:

Tree stratum – Consists of woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub stratum – Consists of woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb stratum – Consists of all herbaceous (non-woody) plants, regardless of size, and all other plants less than 3.28 ft tall.

Woody vines – Consists of all woody vines greater than 3.28 ft in height.

Five Vegetation Strata:

Tree - Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling stratum – Consists of woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub stratum – Consists of woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb stratum – Consists of all herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody species, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vines – Consists of all woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes ◉ No ○

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

*Vegetation was naturally problematic due to winter conditions. Approximately 85 percent of the absolute cover within the PFO wetland habitat was exposed soil/ground.

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: W-BJM-010 PFO

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type [1]	Loc[2]	Texture	Remarks
0-8	10YR	4/2	100						Silty Loam	
8-18	10YR	5/2	95	10YR	5/6	5	C	M	Silty Clay	

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

Hydric Soil Indicators:

- ☐ 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 Muck Mineral (S1) (LRR N, MLRA 147, 148)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7)
- ☐ Polyvalue Below Surface (S8) (MLRA 147,148)
- ☐ Thin 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)
- ☐ Umbric Surface (F13) (MLRA 136, 122)
- ☐ Piedmont Floodplain Soils (F19) (MLRA 148)
- ☐ Red Parent Material (F21) (MLRA 127, 147)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10) (MLRA 147)
- ☐ Coast Prairie Redox (A16) (MLRA 147,148)
- ☐ Piedmont Floodplain Soils (F19) (MLRA 136, 147)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3] Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ◉ No ○

Remarks:

WETLAND DETERMINATION DATA FORM - Eastern Mountains and Piedmont Region

Project/Site: Conemaugh River Crossing Project **City/County:** Westmoreland **Sampling Date:** 05-Mar-20

Applicant/Owner: Enbridge **State:** PA **Sampling Point:** **W-BJM-010/011 UPL**

Investigator(s): Brian Miller & Jessica Gumbert **Section, Township, Range: S** **T** Derry **R**

Landform (hillslope, terrace, etc.): Flat **Local relief (concave, convex, none):** concave **Slope:** 2.0% / 1.1 °

Subregion (LRR or MLRA): LRR N **Lat.:** 40.45429 **Long.:** -79.303149 **Datum:** NAD83

Soil Map Unit Name: Monongahela silt loam, 3 to 8 percent slopes (MoB) **NWI classification:** NA

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 ◉	
Hydric Soil Present?	Yes ◉	No ○	**Is the Sampled Area within a Wetland?** Yes ○ No ◉
Wetland Hydrology Present?	Yes ○	No ◉	

Remarks:
Upland reference to W-BJM-010 and W-BJM-011 located within an existing pipeline right-of-way between and situated between both wetland complexes.

Hydrology

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ Microtopographic Relief (D4)
- ☐ 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 ◉
Saturation Present? (includes capillary fringe)	Yes ○	No ◉	Depth (inches):	

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

NA

Remarks:

No sources of hydrology were observed.

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

Sampling Point: W-BJM-010/011 UPL

	Absolute % Cover	Dominant Species?	Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size: None)				
1.	0	☐	0.0%	
2.	0	☐	0.0%	
3.	0	☐	0.0%	
4.	0	☐	0.0%	
5.	0	☐	0.0%	
6.	0	☐	0.0%	
7.	0	☐	0.0%	
8.	0	☐	0.0%	
	0	= Total Cover		
Sapling-Sapling/Shrub Stratum (Plot size: None)				
1.	0	☐	0.0%	
2.	0	☐	0.0%	
3.	0	☐	0.0%	
4.	0	☐	0.0%	
5.	0	☐	0.0%	
6.	0	☐	0.0%	
7.	0	☐	0.0%	
8.	0	☐	0.0%	
9.	0	☐	0.0%	
10.	0	☐	0.0%	
	0	= Total Cover		
Shrub Stratum (Plot size: None)				
1.	0	☐	0.0%	
2.	0	☐	0.0%	
3.	0	☐	0.0%	
4.	0	☐	0.0%	
5.	0	☐	0.0%	
6.	0	☐	0.0%	
7.	0	☐	0.0%	
	0	= Total Cover		
Herb Stratum (Plot size: 5' radius)				
1. *Trifolium repens*	35	☑	35.0%	FACU
2. *Trifolium pratense*	25	☑	25.0%	FACU
3. *Plantago lanceolata*	15	☐	15.0%	UPL
4. *Phleum pratense*	15	☐	15.0%	FACU
5. *Dactylis glomerata*	10	☐	10.0%	FACU
6.	0	☐	0.0%	
7.	0	☐	0.0%	
8.	0	☐	0.0%	
9.	0	☐	0.0%	
10.	0	☐	0.0%	
11.	0	☐	0.0%	
12.	0	☐	0.0%	
	100	= Total Cover		
Woody Vine Stratum (Plot size: None)				
1.	0	☐	0.0%	
2.	0	☐	0.0%	
3.	0	☐	0.0%	
4.	0	☐	0.0%	
5.	0	☐	0.0%	
6.	0	☐	0.0%	
	0	= Total Cover		

Dominance Test worksheet:

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

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

Percent of dominant Species That Are OBL, FACW, or FAC: 0.0% (A/B)

Prevalence Index worksheet:

	Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0	
FACW species	0	x 2 =	0	
FAC species	0	x 3 =	0	
FACU species	85	x 4 =	340	
UPL species	15	x 5 =	75	
Column Totals:	100	(A)	415	(B)

Prevalence Index = B/A = 4.150

Hydrophytic Vegetation Indicators:

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

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

Definition of Vegetation Strata:

Four Vegetation Strata:

Tree stratum – Consists of woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub stratum – Consists of woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb stratum – Consists of all herbaceous (non-woody) plants, regardless of size, and all other plants less than 3.28 ft tall.

Woody vines – Consists of all woody vines greater than 3.28 ft in height.

Five Vegetation Strata:

Tree - Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling stratum – Consists of woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub stratum – Consists of woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb stratum – Consists of all herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody species, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vines – Consists of all woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes ○ No ◉

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

*Vegetation was naturally problematic and significantly disturbed due to winter conditions and pipeline construction activities, respectively.

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: W-BJM-010/011 UPL

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type [1]	Loc²	Texture	Remarks
0-14	10YR 4/3	100					Silty Loam	

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

Hydric Soil Indicators:

- ☐ 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 Muck Mineral (S1) (LRR N, MLRA 147, 148)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7)
- ☐ Polyvalue Below Surface (S8) (MLRA 147,148)
- ☐ Thin 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)
- ☐ Umbric Surface (F13) (MLRA 136, 122)
- ☐ Piedmont Floodplain Soils (F19) (MLRA 148)
- ☐ Red Parent Material (F21) (MLRA 127, 147)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10) (MLRA 147)
- ☐ Coast Prairie Redox (A16) (MLRA 147,148)
- ☐ Piedmont Floodplain Soils (F19) (MLRA 136, 147)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3] Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ◉ No ○

Remarks:

The soil profile was identified as being disturbed by previous pipeline instllation and shovel refusal at 14" was due to compact soils/rock layer.

WETLAND DETERMINATION DATA FORM - Eastern Mountains and Piedmont Region

Project/Site: Conemaugh River Crossing Project **City/County:** Westmoreland **Sampling Date:** 24-Jun-16

Applicant/Owner: Spectra Energy **State:** PA **Sampling Point:** W-CMS-016 PEM

Investigator(s): CMS, CMG **Section, Township, Range: S** **T** Derry **R**

Landform (hillslope, terrace, etc.): Toeslope/Floodplain **Local relief (concave, convex, none):** none **Slope:** 2.0% / 1.1 °

Subregion (LRR or MLRA): LRR N **Lat.:** 40.455857 **Long.:** -79.299096 **Datum:** NAD83

Soil Map Unit Name: MoB - Monongahela silt loam, 3 to 8 percent slopes **NWI classification:** L2USAh

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 ○	
Hydric Soil Present?	Yes ◉	No ○	**Is the Sampled Area within a Wetland?** Yes ◉ No ○
Wetland Hydrology Present?	Yes ◉	No ○	

Remarks:
PEM wetland located at the toe-of-slope and within the floodplain of the Conemaugh River. Feature is depicted as an NWI and extends south and north outside of the study area and to the River. Boundary follows vegetative community dominated by Fallopia japonica and Chamaedaphne calyculata, drainage patterns, and low chroma, mottled soils. Vegetation is disturbed by pipeline construction and mowing. Portions of the system are planted with Secale cereale and also contain Elymus repens.

Hydrology

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☑ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☑ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ Microtopographic Relief (D4)
- ☐ 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 ○
Saturation Present? (includes capillary fringe)	Yes ○	No ◉	Depth (inches):	

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

Remarks:

Primary source of hydrology: surface water runoff collection and flood flow from Conemaugh River

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

Sampling Point: W-CMS-016 PEM

	Absolute % Cover	Dominant Species?	Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size:)				
1.	0	☐	0.0%	
2.	0	☐	0.0%	
3.	0	☐	0.0%	
4.	0	☐	0.0%	
5.	0	☐	0.0%	
6.	0	☐	0.0%	
7.	0	☐	0.0%	
8.	0	☐	0.0%	
	0	= Total Cover		
Sapling-Sapling/Shrub Stratum (Plot size:)				
1.	0	☐	0.0%	
2.	0	☐	0.0%	
3.	0	☐	0.0%	
4.	0	☐	0.0%	
5.	0	☐	0.0%	
6.	0	☐	0.0%	
7.	0	☐	0.0%	
8.	0	☐	0.0%	
9.	0	☐	0.0%	
10.	0	☐	0.0%	
	0	= Total Cover		
Shrub Stratum (Plot size:)				
1.	0	☐	0.0%	
2.	0	☐	0.0%	
3.	0	☐	0.0%	
4.	0	☐	0.0%	
5.	0	☐	0.0%	
6.	0	☐	0.0%	
7.	0	☐	0.0%	
	0	= Total Cover		
Herb Stratum (Plot size: 5 ft. Radius)				
1. *Fallopia japonica*	30	☑	44.8%	FACU
2. *Chamaedaphne calyculata*	20	☑	29.9%	OBL
3. *Pilea pumila*	5	☐	7.5%	FACW
4. *Phleum pratense*	3	☐	4.5%	FACU
5. *Carex vulpinoidea*	3	☐	4.5%	OBL
6. *Brassica nigra*	3	☐	4.5%	UPL
7. *Solidago canadensis*	3	☐	4.5%	FACU
8.	0	☐	0.0%	
9.	0	☐	0.0%	
10.	0	☐	0.0%	
11.	0	☐	0.0%	
12.	0	☐	0.0%	
	67	= Total Cover		
Woody Vine Stratum (Plot size:)				
1.	0	☐	0.0%	
2.	0	☐	0.0%	
3.	0	☐	0.0%	
4.	0	☐	0.0%	
5.	0	☐	0.0%	
6.	0	☐	0.0%	
	0	= Total Cover		

Dominance Test worksheet:

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

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

Percent of dominant Species That Are OBL, FACW, or FAC: 50.0% (A/B)

Prevalence Index worksheet:

	Total % Cover of:		Multiply by:	
OBL species	23	x 1 =	23	
FACW species	5	x 2 =	10	
FAC species	0	x 3 =	0	
FACU species	36	x 4 =	144	
UPL species	3	x 5 =	15	
Column Totals:	67	(A)	192	(B)

Prevalence Index = B/A = 2.866

Hydrophytic Vegetation Indicators:

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

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

Definition of Vegetation Strata:

Four Vegetation Strata:

Tree stratum – Consists of woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub stratum – Consists of woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb stratum – Consists of all herbaceous (non-woody) plants, regardless of size, and all other plants less than 3.28 ft tall.

Woody vines – Consists of all woody vines greater than 3.28 ft in height.

Five Vegetation Strata:

Tree - Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling stratum – Consists of woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub stratum – Consists of woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb stratum – Consists of all herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody species, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vines – Consists of all woody vines, regardless of height.

Hydrophytic Vegetation Present? **Yes** ◉ **No** ○

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

Vegetation disturbed by mowing and pipeline construction. Portions of system planted with rye (Secale cereale) and also contain quackgrass (Elymus repens).

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: W-CMS-016 PEM

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type [1]	Loc²	Texture	Remarks
0-4	10YR	4/2	90	10YR	5/8	10	C	M	Clay Loam	
4-18	10YR	5/2	80	10YR	5/6	20	C	M	Clay Loam	

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

Hydric Soil Indicators:

- ☐ 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 Muck Mineral (S1) (LRR N, MLRA 147, 148)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7)
- ☐ Polyvalue Below Surface (S8) (MLRA 147,148)
- ☐ Thin 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)
- ☐ Umbric Surface (F13) (MLRA 136, 122)
- ☐ Piedmont Floodplain Soils (F19) (MLRA 148)
- ☐ Red Parent Material (F21) (MLRA 127, 147)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10) (MLRA 147)
- ☐ Coast Prairie Redox (A16) (MLRA 147,148)
- ☐ Piedmont Floodplain Soils (F19) (MLRA 136, 147)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3] Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ◉ No ○

Remarks:

WETLAND DETERMINATION DATA FORM - Eastern Mountains and Piedmont Region

Project/Site: Conemaugh River Crossing Project **City/County:** Westmoreland **Sampling Date:** 24-Jun-16

Applicant/Owner: Spectra Energy **State:** PA **Sampling Point:** **W-CMS-016 UPL**

Investigator(s): CMS, CMG **Section, Township, Range: S** **T** Derry **R**

Landform (hillslope, terrace, etc.): Hillslope **Local relief (concave, convex, none):** none **Slope:** 5.0% / 2.9 °

Subregion (LRR or MLRA): LRR N **Lat.:** 40.455322 **Long.:** -79.300344 **Datum:** NAD83

Soil Map Unit Name: MoC - Monongahela silt loam, 8 to 15 percent slopes **NWI classification:** N/A

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 ◉	
Hydric Soil Present?	Yes ○	No ◉	**Is the Sampled Area within a Wetland?** Yes ○ No ◉
Wetland Hydrology Present?	Yes ○	No ◉	

Remarks:
Upland area located on a hillslope east of a compressor station. Vegetation disturbed by mowing and pipeline construction.

Hydrology

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ Microtopographic Relief (D4)
- ☐ 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 ◉
Saturation Present? (includes capillary fringe)	Yes ○	No ◉	Depth (inches):	

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

Remarks:

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

Sampling Point: W-CMS-016 UPL

	Absolute % Cover	Dominant Species?	Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size:)				
1.	0	☐	0.0%	
2.	0	☐	0.0%	
3.	0	☐	0.0%	
4.	0	☐	0.0%	
5.	0	☐	0.0%	
6.	0	☐	0.0%	
7.	0	☐	0.0%	
8.	0	☐	0.0%	
	0	= Total Cover		
Sapling-Sapling/Shrub Stratum (Plot size:)				
1.	0	☐	0.0%	
2.	0	☐	0.0%	
3.	0	☐	0.0%	
4.	0	☐	0.0%	
5.	0	☐	0.0%	
6.	0	☐	0.0%	
7.	0	☐	0.0%	
8.	0	☐	0.0%	
9.	0	☐	0.0%	
10.	0	☐	0.0%	
	0	= Total Cover		
Shrub Stratum (Plot size:)				
1.	0	☐	0.0%	
2.	0	☐	0.0%	
3.	0	☐	0.0%	
4.	0	☐	0.0%	
5.	0	☐	0.0%	
6.	0	☐	0.0%	
7.	0	☐	0.0%	
	0	= Total Cover		
Herb Stratum (Plot size: 5 ft. Radius)				
1. *Solidago nemoralis*	35	☑	36.5%	UPL
2. *Apocynum cannabinum*	15	☑	15.6%	FACU
3. *Solidago canadensis*	10	☐	10.4%	FACU
4. *Toxicodendron radicans*	7	☐	7.3%	FAC
5. *Oxalis stricta*	7	☐	7.3%	FACU
6. *Rumex crispus*	5	☐	5.2%	FAC
7. *Chamaedaphne calyculata*	5	☐	5.2%	OBL
8. *Juncus tenuis*	3	☐	3.1%	FAC
9. *Rubus allegheniensis*	3	☐	3.1%	FACU
10. *Taraxacum officinale*	3	☐	3.1%	FACU
11. *Fallopia japonica*	3	☐	3.1%	FACU
12.	0	☐	0.0%	
	96	= Total Cover		
Woody Vine Stratum (Plot size:)				
1.	0	☐	0.0%	
2.	0	☐	0.0%	
3.	0	☐	0.0%	
4.	0	☐	0.0%	
5.	0	☐	0.0%	
6.	0	☐	0.0%	
	0	= Total Cover		

Dominance Test worksheet:

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

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

Percent of dominant Species That Are OBL, FACW, or FAC: 0.0% (A/B)

Prevalence Index worksheet:

	Total % Cover of:		Multiply by:	
OBL species	5	x 1 =	5	
FACW species	0	x 2 =	0	
FAC species	15	x 3 =	45	
FACU species	41	x 4 =	164	
UPL species	35	x 5 =	175	
Column Totals:	96	(A)	389	(B)

Prevalence Index = B/A = 4.052

Hydrophytic Vegetation Indicators:

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

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

Definition of Vegetation Strata:

Four Vegetation Strata:

Tree stratum – Consists of woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub stratum – Consists of woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb stratum – Consists of all herbaceous (non-woody) plants, regardless of size, and all other plants less than 3.28 ft tall.

Woody vines – Consists of all woody vines greater than 3.28 ft in height.

Five Vegetation Strata:

Tree - Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling stratum – Consists of woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub stratum – Consists of woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb stratum – Consists of all herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody species, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vines – Consists of all woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes ○ No ◉

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

Vegetation disturbed by mowing and pipeline construction.

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: W-CMS-016 UPL

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type [1]	Loc²	Texture	Remarks
0-8	10YR	4/3	100						Clay Loam	
8-16	10YR	5/6	70	10YR	4/3	30	D	M	Clay Loam	

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

Hydric Soil Indicators:

- ☐ 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 Muck Mineral (S1) (LRR N, MLRA 147, 148)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7)
- ☐ Polyvalue Below Surface (S8) (MLRA 147,148)
- ☐ Thin 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)
- ☐ Umbric Surface (F13) (MLRA 136, 122)
- ☐ Piedmont Floodplain Soils (F19) (MLRA 148)
- ☐ Red Parent Material (F21) (MLRA 127, 147)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10) (MLRA 147)
- ☐ Coast Prairie Redox (A16) (MLRA 147,148)
- ☐ Piedmont Floodplain Soils (F19) (MLRA 136, 147)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3] Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ○ No ◉

Remarks:

Gravel refusal at 16"

WETLAND DETERMINATION DATA FORM - Eastern Mountains and Piedmont Region

Project/Site: Conemaugh River Crossing Project **City/County:** Indiana **Sampling Date:** 23-Jun-16

Applicant/Owner: Spectra Energy **State:** PA **Sampling Point:** W-CMS-007-PEM

Investigator(s): CMG, CMS **Section, Township, Range:** S T Blacklick R

Landform (hillslope, terrace, etc.): Hillslope **Local relief (concave, convex, none):** none **Slope:** 2.5% / 1.4 °

Subregion (LRR or MLRA): LRR N **Lat.:** 40.456716 **Long.:** -79.296892 **Datum:** NAD83

Soil Map Unit Name: MoB - Monongahela silt loam, 2 to 6 percent slopes **NWI classification:** N/A

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 ○	
Hydric Soil Present?	Yes ◉	No ○	**Is the Sampled Area within a Wetland?** Yes ◉ No ○
Wetland Hydrology Present?	Yes ◉	No ○	

Remarks:
Hillslope PEM wetland that originates from a groundwater seep. Boundary follows drainage patterns, low chroma mottled soils, and a vegetative community dominated by Fallopia japonica, Juncus tenuis, and Carex crinita. Surrounding hillside also exhibited a Fallopia japonica community, but lacked prevalence of other hydrophytic species, indicators of hydrology, and gley soils.

Hydrology

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☑ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ Microtopographic Relief (D4)
- ☐ FAC-neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ◉	No ○	Depth (inches):	0.25	
Water Table Present?	Yes ◉	No ○	Depth (inches):	8	**Wetland Hydrology Present?** Yes ◉ No ○
Saturation Present? (includes capillary fringe)	Yes ◉	No ○	Depth (inches):	0	

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

Remarks:
Primary source of hydrology: Groundwater seep and surface water runoff collection

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

Sampling Point: W-CMS-007-PEM

	Absolute % Cover	Dominant Species?	Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size:)				
1.	0	☐	0.0%	
2.	0	☐	0.0%	
3.	0	☐	0.0%	
4.	0	☐	0.0%	
5.	0	☐	0.0%	
6.	0	☐	0.0%	
7.	0	☐	0.0%	
8.	0	☐	0.0%	
	0	= Total Cover		
Sapling-Sapling/Shrub Stratum (Plot size:)				
1.	0	☐	0.0%	
2.	0	☐	0.0%	
3.	0	☐	0.0%	
4.	0	☐	0.0%	
5.	0	☐	0.0%	
6.	0	☐	0.0%	
7.	0	☐	0.0%	
8.	0	☐	0.0%	
9.	0	☐	0.0%	
10.	0	☐	0.0%	
	0	= Total Cover		
Shrub Stratum (Plot size:)				
1.	0	☐	0.0%	
2.	0	☐	0.0%	
3.	0	☐	0.0%	
4.	0	☐	0.0%	
5.	0	☐	0.0%	
6.	0	☐	0.0%	
7.	0	☐	0.0%	
	0	= Total Cover		
Herb Stratum (Plot size: 5 ft. Radius)				
1. *Fallopia japonica*	40	☑	24.7%	FACU
2. *Juncus tenuis*	25	☑	15.4%	FAC
3. *Carex crinita*	25	☑	15.4%	OBL
4. *Juncus effusus*	20	☐	12.3%	FACW
5. *Phalaris arundinacea*	15	☐	9.3%	FACW
6. *Impatiens capensis*	10	☐	6.2%	FACW
7. *Solidago latissimifolia*	10	☐	6.2%	OBL
8. *Mentha arvensis*	5	☐	3.1%	FACW
9. *Toxicodendron radicans*	5	☐	3.1%	FAC
10. *Eupatorium perfoliatum*	5	☐	3.1%	FACW
11. *Persicaria hydropiper*	2	☐	1.2%	OBL
12.	0	☐	0.0%	
	162	= Total Cover		
Woody Vine Stratum (Plot size:)				
1.	0	☐	0.0%	
2.	0	☐	0.0%	
3.	0	☐	0.0%	
4.	0	☐	0.0%	
5.	0	☐	0.0%	
6.	0	☐	0.0%	
	0	= Total Cover		

Dominance Test worksheet:

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

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

Percent of dominant Species That Are OBL, FACW, or FAC: 66.7% (A/B)

Prevalence Index worksheet:

	Total % Cover of:		Multiply by:	
OBL species	37	x 1 =	37	
FACW species	55	x 2 =	110	
FAC species	30	x 3 =	90	
FACU species	40	x 4 =	160	
UPL species	0	x 5 =	0	
Column Totals:	162	(A)	397	(B)

Prevalence Index = B/A = 2.451

Hydrophytic Vegetation Indicators:

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

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

Definition of Vegetation Strata:

Four Vegetation Strata:

Tree stratum – Consists of woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub stratum – Consists of woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb stratum – Consists of all herbaceous (non-woody) plants, regardless of size, and all other plants less than 3.28 ft tall.

Woody vines – Consists of all woody vines greater than 3.28 ft in height.

Five Vegetation Strata:

Tree - Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling stratum – Consists of woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub stratum – Consists of woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb stratum – Consists of all herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody species, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vines – Consists of all woody vines, regardless of height.

Hydrophytic Vegetation Present? **Yes** ◉ **No** ○

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

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: W-CMS-007-PEM

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type [1]	Loc²	Texture	Remarks
0-14	5GY	4/1	75	10YR	5/8	25	C	M	Loamy Clay	Gley 1

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

Hydric Soil Indicators:

- ☐ 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 Muck Mineral (S1) (LRR N, MLRA 147, 148)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7)
- ☐ Polyvalue Below Surface (S8) (MLRA 147,148)
- ☐ Thin 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)
- ☐ Umbric Surface (F13) (MLRA 136, 122)
- ☐ Piedmont Floodplain Soils (F19) (MLRA 148)
- ☐ Red Parent Material (F21) (MLRA 127, 147)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10) (MLRA 147)
- ☐ Coast Prairie Redox (A16) (MLRA 147,148)
- ☐ Piedmont Floodplain Soils (F19) (MLRA 136, 147)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3] Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ◉ No ○

Remarks:

Highly saturated. Shovel refusal at 14" due to gravel.

WETLAND DETERMINATION DATA FORM - Eastern Mountains and Piedmont Region

Project/Site: Conemaugh River Crossing Project **City/County:** Indiana **Sampling Date:** 23-Jun-16

Applicant/Owner: Spectra Energy **State:** PA **Sampling Point:** W-CMS-007-UPL

Investigator(s): CMG, CMS **Section, Township, Range: S** **T** Blacklick **R**

Landform (hillslope, terrace, etc.): Hillslope **Local relief (concave, convex, none):** none **Slope:** 2.5% / 1.4 °

Subregion (LRR or MLRA): LRR N **Lat.:** 40.456789 **Long.:** -79.296876 **Datum:** NAD83

Soil Map Unit Name: MoB - Monongahela silt loam, 2 to 6 percent slopes **NWI classification:** N/A

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 ◉	
Hydric Soil Present?	Yes ◉	No ○	**Is the Sampled Area within a Wetland?** Yes ○ No ◉
Wetland Hydrology Present?	Yes ○	No ◉	

Remarks:
Upland data point located on a hillslope dominated by Fallopia japonica. Hydric soils are present; area appears to have been disturbed by construction in the recent past.

Hydrology

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ Microtopographic Relief (D4)
- ☐ 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 ◉
Saturation Present? (includes capillary fringe)	Yes ○	No ◉	Depth (inches):	

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

Remarks:

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

Sampling Point: W-CMS-007-UPL

	Absolute % Cover	Dominant Species?	Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size:)				
1.	0	☐	0.0%	
2.	0	☐	0.0%	
3.	0	☐	0.0%	
4.	0	☐	0.0%	
5.	0	☐	0.0%	
6.	0	☐	0.0%	
7.	0	☐	0.0%	
8.	0	☐	0.0%	
	0	= Total Cover		
Sapling-Sapling/Shrub Stratum (Plot size:)				
1.	0	☐	0.0%	
2.	0	☐	0.0%	
3.	0	☐	0.0%	
4.	0	☐	0.0%	
5.	0	☐	0.0%	
6.	0	☐	0.0%	
7.	0	☐	0.0%	
8.	0	☐	0.0%	
9.	0	☐	0.0%	
10.	0	☐	0.0%	
	0	= Total Cover		
Shrub Stratum (Plot size:)				
1.	0	☐	0.0%	
2.	0	☐	0.0%	
3.	0	☐	0.0%	
4.	0	☐	0.0%	
5.	0	☐	0.0%	
6.	0	☐	0.0%	
7.	0	☐	0.0%	
	0	= Total Cover		
Herb Stratum (Plot size: 5 ft. Radius)				
1. *Fallopia japonica*	60	☑	48.0%	FACU
2. *Poa annua*	25	☑	20.0%	FACU
3. *Solidago nemoralis*	15	☐	12.0%	UPL
4. *Rosa multiflora*	15	☐	12.0%	FACU
5. *Acorus calamus*	5	☐	4.0%	OBL
6. *Fallopia convolvulus*	5	☐	4.0%	FACU
7.	0	☐	0.0%	
8.	0	☐	0.0%	
9.	0	☐	0.0%	
10.	0	☐	0.0%	
11.	0	☐	0.0%	
12.	0	☐	0.0%	
	125	= Total Cover		
Woody Vine Stratum (Plot size:)				
1.	0	☐	0.0%	
2.	0	☐	0.0%	
3.	0	☐	0.0%	
4.	0	☐	0.0%	
5.	0	☐	0.0%	
6.	0	☐	0.0%	
	0	= Total Cover		

Dominance Test worksheet:

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

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

Percent of dominant Species That Are OBL, FACW, or FAC: 0.0% (A/B)

Prevalence Index worksheet:

	Total % Cover of:		Multiply by:	
OBL species	5	x 1 =	5	
FACW species	0	x 2 =	0	
FAC species	0	x 3 =	0	
FACU species	105	x 4 =	420	
UPL species	15	x 5 =	75	
Column Totals:	125	(A)	500	(B)

Prevalence Index = B/A = 4.000

Hydrophytic Vegetation Indicators:

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

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

Definition of Vegetation Strata:

Four Vegetation Strata:

Tree stratum – Consists of woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub stratum – Consists of woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb stratum – Consists of all herbaceous (non-woody) plants, regardless of size, and all other plants less than 3.28 ft tall.

Woody vines – Consists of all woody vines greater than 3.28 ft in height.

Five Vegetation Strata:

Tree - Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling stratum – Consists of woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub stratum – Consists of woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb stratum – Consists of all herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody species, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vines – Consists of all woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes ○ No ◉

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

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: W-CMS-007-UPL

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type [1]	Loc²	Texture	Remarks
0-2	10YR	4/3	100						Clay Loam	
2-6	10YR	4/2	98	10YR	5/6	2	C	M	Clay Loam	

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

Hydric Soil Indicators:

- ☐ 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 Muck Mineral (S1) (LRR N, MLRA 147, 148)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7)
- ☐ Polyvalue Below Surface (S8) (MLRA 147,148)
- ☐ Thin 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)
- ☐ Umbric Surface (F13) (MLRA 136, 122)
- ☐ Piedmont Floodplain Soils (F19) (MLRA 148)
- ☐ Red Parent Material (F21) (MLRA 127, 147)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10) (MLRA 147)
- ☐ Coast Prairie Redox (A16) (MLRA 147,148)
- ☐ Piedmont Floodplain Soils (F19) (MLRA 136, 147)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3] Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ◉ No ○

Remarks:

Shovel refusal at 6" due to gravel

WETLAND DETERMINATION DATA FORM - Eastern Mountains and Piedmont Region

Project/Site: Conemaugh River Crossing Project **City/County:** Indiana **Sampling Date:** 05-Mar-20

Applicant/Owner: Enbridge **State:** PA **Sampling Point:** **UPL-BJM-001**

Investigator(s): Brian Miller & Jessica Gumbert **Section, Township, Range: S** **T** Blacklick **R**

Landform (hillslope, terrace, etc.): Flat **Local relief (concave, convex, none):** concave **Slope:** 2.0% / 1.1 °

Subregion (LRR or MLRA): LRR N **Lat.:** 40.457595 **Long.:** -79.295877 **Datum:** NAD83

Soil Map Unit Name: Monongahela silt loam, 0 to 3 percent slopes (MoA) **NWI classification:** NA

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 ◉	
Hydric Soil Present?	Yes ◉	No ○	**Is the Sampled Area within a Wetland?** Yes ○ No ◉
Wetland Hydrology Present?	Yes ◉	No ○	

Remarks:
The sample point was collected within a depression area surrounded by mixed hardwood forest strip that adjoins monocultural corn fields. The depression area collects surface water from the adjacent farm fields that drains into a concave swale that discharges into this depression area that had the presence of surface water. Due to the lack of dominant hydrophytic vegetation, it was determined that the depression area within the survey boundary was associated with an upland community and the presence of hydrology was likely attributed to recent rainfall.

Hydrology

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☑ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☑ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ Microtopographic Relief (D4)
- ☐ FAC-neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ◉	No ○	Depth (inches):	4	
Water Table Present?	Yes ◉	No ○	Depth (inches):	0	**Wetland Hydrology Present?** Yes ◉ No ○
Saturation Present? (includes capillary fringe)	Yes ◉	No ○	Depth (inches):	0	

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

NA

Remarks:

According the AGCIS Wet Climatic Data (Bush Valley 0.5 SE,PA), over the past seven days the weather station recorded an accumulation of precipitation of approximately 0.56 inches. As a result and in-combination of lack of hydrophytic vegetation, the presence of surface water is likely attributed to recent rainfall events.

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

Sampling Point: UPL-BJM-001

	Absolute % Cover	Dominant Species?	Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size: None)				
1.	0	☐	0.0%	
2.	0	☐	0.0%	
3.	0	☐	0.0%	
4.	0	☐	0.0%	
5.	0	☐	0.0%	
6.	0	☐	0.0%	
7.	0	☐	0.0%	
8.	0	☐	0.0%	
	0	= Total Cover		
Sapling-Sapling/Shrub Stratum (Plot size: None)				
1.	0	☐	0.0%	
2.	0	☐	0.0%	
3.	0	☐	0.0%	
4.	0	☐	0.0%	
5.	0	☐	0.0%	
6.	0	☐	0.0%	
7.	0	☐	0.0%	
8.	0	☐	0.0%	
9.	0	☐	0.0%	
10.	0	☐	0.0%	
	0	= Total Cover		
Shrub Stratum (Plot size: None)				
1.	0	☐	0.0%	
2.	0	☐	0.0%	
3.	0	☐	0.0%	
4.	0	☐	0.0%	
5.	0	☐	0.0%	
6.	0	☐	0.0%	
7.	0	☐	0.0%	
	0	= Total Cover		
Herb Stratum (Plot size: 5' radius)				
1. *Stellaria media*	45	☑	75.0%	UPL
2. *Alliaria petiolata*	10	☐	16.7%	FACU
3. *Barbarea vulgaris*	5	☐	8.3%	FACU
4.	0	☐	0.0%	
5.	0	☐	0.0%	
6.	0	☐	0.0%	
7.	0	☐	0.0%	
8.	0	☐	0.0%	
9.	0	☐	0.0%	
10.	0	☐	0.0%	
11.	0	☐	0.0%	
12.	0	☐	0.0%	
	60	= Total Cover		
Woody Vine Stratum (Plot size: None)				
1.	0	☐	0.0%	
2.	0	☐	0.0%	
3.	0	☐	0.0%	
4.	0	☐	0.0%	
5.	0	☐	0.0%	
6.	0	☐	0.0%	
	0	= Total Cover		

Dominance Test worksheet:

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

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of dominant Species That Are OBL, FACW, or FAC: 0.0% (A/B)

Prevalence Index worksheet:

	Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0	
FACW species	0	x 2 =	0	
FAC species	0	x 3 =	0	
FACU species	15	x 4 =	60	
UPL species	45	x 5 =	225	
Column Totals:	60	(A)	285	(B)

Prevalence Index = B/A = 4.750

Hydrophytic Vegetation Indicators:

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

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

Definition of Vegetation Strata:

Four Vegetation Strata:

Tree stratum – Consists of woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub stratum – Consists of woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb stratum – Consists of all herbaceous (non-woody) plants, regardless of size, and all other plants less than 3.28 ft tall.

Woody vines – Consists of all woody vines greater than 3.28 ft in height.

Five Vegetation Strata:

Tree - Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling stratum – Consists of woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub stratum – Consists of woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb stratum – Consists of all herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody species, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vines – Consists of all woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes ○ No ◉

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

*Over 40 percent of sample area was bare/open ground. Vegetation was identified as naturally problematic due to winter conditions; however, the species within the sample area could be identified based on the visible characteristics.

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: UPL-BJM-001

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type [1]	Loc²	Texture	Remarks
0-4	10YR	4/1	85	10YR	4/4	15	C	M	Silty Loam	
4-8	10YR	4/2	90	7.5YR	4/4	10	C	M	Silty Loam	
8-18	10YR	5/3	80	10YR	4/1	20	D	M	Silty Clay Loam	

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

Hydric Soil Indicators:

- ☐ 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 Muck Mineral (S1) (LRR N, MLRA 147, 148)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7)
- ☐ Polyvalue Below Surface (S8) (MLRA 147,148)
- ☐ Thin 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)
- ☐ Umbric Surface (F13) (MLRA 136, 122)
- ☐ Piedmont Floodplain Soils (F19) (MLRA 148)
- ☐ Red Parent Material (F21) (MLRA 127, 147)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10) (MLRA 147)
- ☐ Coast Prairie Redox (A16) (MLRA 147,148)
- ☐ Piedmont Floodplain Soils (F19) (MLRA 136, 147)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3] Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ◉ No ○

Remarks:

WETLAND DETERMINATION DATA FORM - Eastern Mountains and Piedmont Region

Project/Site: Conemaugh River Crossing Project **City/County:** Indiana **Sampling Date:** 05-Mar-20

Applicant/Owner: Enbridge **State:** PA **Sampling Point:** **UPL-BJM-002**

Investigator(s): Brian Miller & Jessica Gumbert **Section, Township, Range: S** **T** Blacklick **R**

Landform (hillslope, terrace, etc.): Flat **Local relief (concave, convex, none):** concave **Slope:** 2.0% / 1.1 °

Subregion (LRR or MLRA): LRR N **Lat.:** 40.458291 **Long.:** -79.29471 **Datum:** NAD83

Soil Map Unit Name: Monongahela silt loam, 0 to 8 percent slopes (MoB) **NWI classification:** NA

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 ◉	
Hydric Soil Present?	Yes ○	No ◉	**Is the Sampled Area within a Wetland?** Yes ○ No ◉
Wetland Hydrology Present?	Yes ◉	No ○	

Remarks:
The sample point was collected within a slightly concave area of an monocultural corn field that displayed the presence of surface water during the site investigation. The density of the remaining corn stalks appeared to be less abundant than the areas that lacked the presence of surface water. Therefore, this sample point reflects the upland conditions due to the lack of hydrophytic vegetation and hydric soils.

Hydrology

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☑ Stunted or Stressed Plants (D1)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ Microtopographic Relief (D4)
- ☐ FAC-neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ◉	No ○	Depth (inches):	5	
Water Table Present?	Yes ◉	No ○	Depth (inches):	0	**Wetland Hydrology Present?** Yes ◉ No ○
Saturation Present? (includes capillary fringe)	Yes ◉	No ○	Depth (inches):	0	

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

NA

Remarks:

According the AGCIS Wet Climatic Data, over the past seven days there has been an accumulation of 0.56 inches of precipitation. As a result, the presence of surface water is likely attributed to recent rainfall events.

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

Sampling Point: UPL-BJM-002

	Absolute % Cover	Dominant Species?	Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size: None)				
1.	0	☐	0.0%	
2.	0	☐	0.0%	
3.	0	☐	0.0%	
4.	0	☐	0.0%	
5.	0	☐	0.0%	
6.	0	☐	0.0%	
7.	0	☐	0.0%	
8.	0	☐	0.0%	
	0	= Total Cover		
Sapling-Sapling/Shrub Stratum (Plot size: None)				
1.	0	☐	0.0%	
2.	0	☐	0.0%	
3.	0	☐	0.0%	
4.	0	☐	0.0%	
5.	0	☐	0.0%	
6.	0	☐	0.0%	
7.	0	☐	0.0%	
8.	0	☐	0.0%	
9.	0	☐	0.0%	
10.	0	☐	0.0%	
	0	= Total Cover		
Shrub Stratum (Plot size: None)				
1.	0	☐	0.0%	
2.	0	☐	0.0%	
3.	0	☐	0.0%	
4.	0	☐	0.0%	
5.	0	☐	0.0%	
6.	0	☐	0.0%	
7.	0	☐	0.0%	
	0	= Total Cover		
Herb Stratum (Plot size: 5' radius)				
1. *Setaria faberi*	25	☑	45.5%	UPL
2. *Aster sp.*	5	☐	9.1%	
3. *Panicum virgatum*	25	☑	45.5%	FAC
4.	0	☐	0.0%	
5.	0	☐	0.0%	
6.	0	☐	0.0%	
7.	0	☐	0.0%	
8.	0	☐	0.0%	
9.	0	☐	0.0%	
10.	0	☐	0.0%	
11.	0	☐	0.0%	
12.	0	☐	0.0%	
	55	= Total Cover		
Woody Vine Stratum (Plot size: None)				
1.	0	☐	0.0%	
2.	0	☐	0.0%	
3.	0	☐	0.0%	
4.	0	☐	0.0%	
5.	0	☐	0.0%	
6.	0	☐	0.0%	
	0	= Total Cover		

Dominance Test worksheet:

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

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

Percent of dominant Species That Are OBL, FACW, or FAC: 50.0% (A/B)

Prevalence Index worksheet:

	Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0	
FACW species	0	x 2 =	0	
FAC species	25	x 3 =	75	
FACU species	0	x 4 =	0	
UPL species	25	x 5 =	125	
Column Totals:	50	(A)	200	(B)

Prevalence Index = B/A = 4.000

Hydrophytic Vegetation Indicators:

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

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

Definition of Vegetation Strata:

Four Vegetation Strata:

Tree stratum – Consists of woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub stratum – Consists of woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb stratum – Consists of all herbaceous (non-woody) plants, regardless of size, and all other plants less than 3.28 ft tall.

Woody vines – Consists of all woody vines greater than 3.28 ft in height.

Five Vegetation Strata:

Tree - Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling stratum – Consists of woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub stratum – Consists of woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb stratum – Consists of all herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody species, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vines – Consists of all woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes ○ No ◉

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

*Vegetation was significantly disturbed by agricultural practices and winter conditions. Therefore, identification of Aster sp was not possible. The remaining 45 total cover of the sample plot was bare soil and/or corn.

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: UPL-BJM-002

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type [1]	Loc²	Texture	Remarks
0-8	2.5YR 4/2	100					Silty Loam	
8-18	2.5YR 5/6	100					Silty Loam	

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

Hydric Soil Indicators:

- ☐ 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 Muck Mineral (S1) (LRR N, MLRA 147, 148)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7)
- ☐ Polyvalue Below Surface (S8) (MLRA 147,148)
- ☐ Thin 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)
- ☐ Umbric Surface (F13) (MLRA 136, 122)
- ☐ Piedmont Floodplain Soils (F19) (MLRA 148)
- ☐ Red Parent Material (F21) (MLRA 127, 147)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10) (MLRA 147)
- ☐ Coast Prairie Redox (A16) (MLRA 147,148)
- ☐ Piedmont Floodplain Soils (F19) (MLRA 136, 147)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3] Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ○ No ◉

Remarks:

The soil profile was identified as being disturbed by agricultural practices.

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET

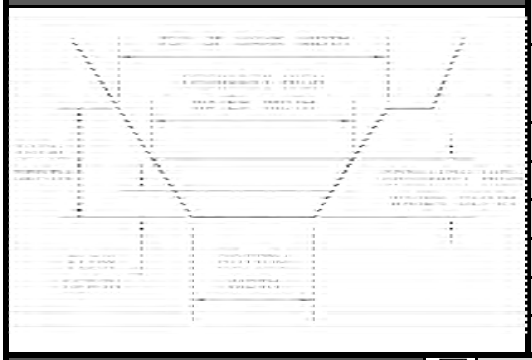
Project/Site:	Conemaugh River Crossing	Stream ID:	S-JLK-037 PER
Applicant/Owner:	Enbridge	State:	Pennsylvania
Investigator(s):	JLK, EMD	City/County:	Indiana, Westmoreland
Sampling Date:	8/19/2016	Township:	Blacklick, Derry
Stream Name:	Conemaugh River	Latitude:	40.456604
Drainage Area (mi^2):	>100	Longitude:	-79.297884
Slope Category:	(1) Low Gradient	Open-Ended?	☑ Upstream ☑ Downstream
FERC Designation:	N/A	Delineation Type:	☐ Centerline ☑ R/L Banks

Stream Description:

Conemaugh River.

Stream Subsystem		Stream Origin		Predominant Surrounding Landuse			
☑	Perennial	☐	Culvert Discharge	☑	Forest	☐	Commercial
☐	Ephemeral	☐	Pond Discharge	☐	Field/Pasture	☐	Industrial
☐	Intermittent	☐	Swamp, Bog or Wetland	☑	Agricultural	☐	Residential
☐	Tidal	☐	Spring Fed	☑	Other	Pipeline ROW	
☐		☑	Mixture of Origins	Heavy rain in the last 7 days?		☑ Yes	☐ No
Other:		☐	Surface Water Runoff	Turbidity?	☑ Clear	Other:	
Flow Present?	☑ Yes	☐ No		Flow Direction:	North		

For linear projects, provide dimensions at centerline of stream crossing



Right bank/Left bank facing downstream				Stream Morphology		
Right Bank (Do not include flow depth)	Horiz.	20.00	Ft.	☐	Riffle %	
	Vert.	10.00	Ft.	☑	Pool %	100
Left Bank (Do not include flow depth)	Horiz.	25.00	Ft.	☐	Run %	
	Vert.	5.00	Ft.	Canopy Cover		
Water/Flow Depth		5.00	Ft.	☑	Open	
Bottom of Channel Width		150.00	Ft.	☐	Partly Open	
Ordinary High Water Depth		5.00	Ft.	☐	Shaded	
Top of Bank Width		185.00	Ft.	Is Channel Naturalized?		
Ordinary High Water Width		185.00	Ft.	☑	Yes	☐ No
Total Depth		10.00	Ft.	Fin Fish Present?		
				☑	Yes	☐ No

Macroinvertebrates Present?	☑ Yes	☐ No					
☑	Ephemeroptera	☑	Plecoptera	☑	Trichpotera	☐	Other:

Aquatic Vegetation - Indicate Dominant Cover Type

☑	N/A	☐	Rooted Emergent	☐	Rooted Floating	☐	Attached Algae
		☐	Rooted Submergent	☐	Floating Algae	☐	Free Floating

Portion of Stream with Aquatic Vegetation (%):

Riparian Buffer Veg. (60 Ft.) - Indicate Dominant Cover Type And Species

☑	Trees:	*Platanus occidentalis*	☐	Grasses:	
☐	Shrubs:		☑	Herbaceous:	*Fallopia japonica*

Inorganic Substrate Components (Add to 100%)			Organic Substrate Components (May be <100)		
Type	**Diameter**	**Composition %**	**Type**	**Characteristics**	**Composition %**
Bedrock	-		Detritus	Sticks, Wood, Coarse Plant Material	5
Boulder	10" +	20			
Cobble	2.5" - 10"	10			
Gravel	0.1" - 2.5"	45	Muck-Mud	Black, Very Fine Organic Material	
Sand	0.06-2 mm	15			
Silt	0.004-0.06 mm	10	Marl	Grey, Shell Fragments	
Clay	<0.004 mm				

AECOM

APPENDIX B – PHOTOGRAPHS

Photograph:	Date:
1	03/05/2020
Feature ID: W-BJM-011	
Direction: East	
Description: Wetland W-BJM-011 PEM	

Photograph:	Date:
2	03/05/2020
Feature ID: W-BJM-011	
Direction: South	
Description: Wetland W-BJM-011 PSS	

Photograph:	Date:
3	03/05/2020
Feature ID: W-BJM-010	
Direction: West	
Description: Wetland W-BJM-010 PEM	

Photograph:	Date:
4	03/05/2020
Feature ID: W-BJM-010	
Direction: South	
Description: Wetland W-BJM-010 PSS	

Photograph:	Date:
5	03/05/2020
Feature ID: W-BJM-010	
Direction: East	
Description: Wetland W-BJM-010 PFO	

Photograph:	Date:
6	06/24/2016
Feature ID: W-CMS-016	
Direction: West	
Description: Wetland W-CMS-016 PEM	

Photograph:	Date:
7	06/23/2016
Feature ID: W-CMS-007	
Direction: West	
Description: Wetland W-CMS-007 PEM	

Photograph:	Date:
8	03/05/2020
Feature ID: UPL-BJM-001	
Direction: Southeast	
Description: Upland UPL-BJM-001 UPL	

Photograph:	Date:
9	03/05/2020
Feature ID: UPL-BJM-002	
Direction: South	
Description: Upland UPL-BJM-002 UPL	

Photograph:	Date:
10	03/05/2020
Feature ID: S-JLK-037	
Direction: Downstream	
Description: Watercourse S-JLK-037 PER	

Appendix F
Pennsylvania Natural Heritage Program Review Receipt

1. PROJECT INFORMATION

Project Name: **Conemaugh River Crossing**
Date of Review: **2/24/2020 02:30:31 PM**
Project Category: **Energy Storage, Production, and Transfer, Energy Transfer, Pipeline (gas, oil) - service, replace existing line**
Project Area: **34.74 acres**
County(s): **Indiana; Westmoreland**
Township/Municipality(s): **BLACKLICK; DERRY**
ZIP Code: **15717; 15725**
Quadrangle Name(s): **BLAIRSVILLE**
Watersheds HUC 8: **Conemaugh**
Watersheds HUC 12: **Backlick Creek-Conemaugh River; Conemaugh River-Kiskiminetas River**
Decimal Degrees: **40.456304, -79.298776**
Degrees Minutes Seconds: **40° 27' 22.6946" N, 79° 17' 55.5938" W**

2. SEARCH RESULTS

Agency	Results	Response
PA Game Commission	No Known Impact	No Further Review Required
PA Department of Conservation and Natural Resources	No Known Impact	No Further Review Required
PA Fish and Boat Commission	No Known Impact	No Further Review Required
U.S. Fish and Wildlife Service	No Known Impact	No Further Review Required

As summarized above, Pennsylvania Natural Diversity Inventory (PNDI) records indicate no known impacts to threatened and endangered species and/or special concern species and resources within the project area. Therefore, based on the information you provided, no further coordination is required with the jurisdictional agencies. This response does not reflect potential agency concerns regarding impacts to other ecological resources, such as wetlands.

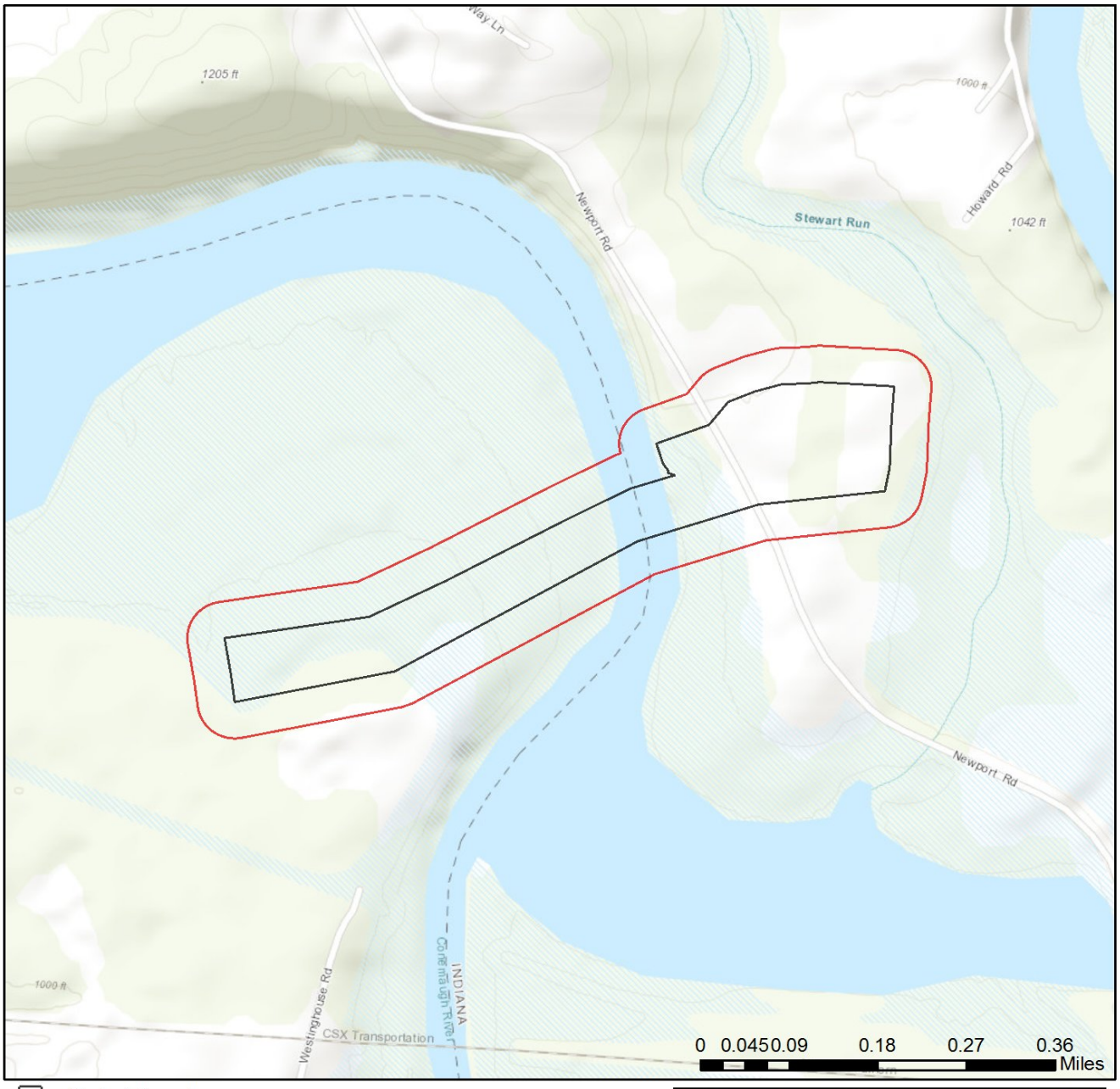
Conemaugh River Crossing

Project Boundary

Buffered Project Boundary

Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user community

Conemaugh River Crossing



Project Boundary

Buffered Project Boundary

Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS,

3. AGENCY COMMENTS

Regardless of whether a DEP permit is necessary for this proposed project, any potential impacts to threatened and endangered species and/or special concern species and resources must be resolved with the appropriate jurisdictional agency. In some cases, a permit or authorization from the jurisdictional agency may be needed if adverse impacts to these species and habitats cannot be avoided.

These agency determinations and responses are **valid for two years** (from the date of the review), and are based on the project information that was provided, including the exact project location; the project type, description, and features; and any responses to questions that were generated during this search. If any of the following change: 1) project location, 2) project size or configuration, 3) project type, or 4) responses to the questions that were asked during the online review, the results of this review are not valid, and the review must be searched again via the PNDI Environmental Review Tool and resubmitted to the jurisdictional agencies. The PNDI tool is a primary screening tool, and a desktop review may reveal more or fewer impacts than what is listed on this PNDI receipt. The jursidictional agencies **strongly advise against** conducting surveys for the species listed on the receipt prior to consultation with the agencies.

PA Game Commission

RESPONSE:

No Impact is anticipated to threatened and endangered species and/or special concern species and resources.

PA Department of Conservation and Natural Resources

RESPONSE:

No Impact is anticipated to threatened and endangered species and/or special concern species and resources.

PA Fish and Boat Commission

RESPONSE:

No Impact is anticipated to threatened and endangered species and/or special concern species and resources.

U.S. Fish and Wildlife Service

RESPONSE:

No impacts to **federally** listed or proposed species are anticipated. Therefore, no further consultation/coordination under the Endangered Species Act (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq. is required. Because no take of federally listed species is anticipated, none is authorized. This response does not reflect potential Fish and Wildlife Service concerns under the Fish and Wildlife Coordination Act or other authorities.

4. DEP INFORMATION

The Pa Department of Environmental Protection (DEP) requires that a signed copy of this receipt, along with any required documentation from jurisdictional agencies concerning resolution of potential impacts, be submitted with applications for permits requiring PNDI review. Two review options are available to permit applicants for handling PNDI coordination in conjunction with DEP's permit review process involving either T&E Species or species of special concern. Under sequential review, the permit applicant performs a PNDI screening and completes all coordination with the appropriate jurisdictional agencies prior to submitting the permit application. The applicant will include with its application, both a PNDI receipt and/or a clearance letter from the jurisdictional agency if the PNDI Receipt shows a Potential Impact to a species or the applicant chooses to obtain letters directly from the jurisdictional agencies. Under concurrent review, DEP, where feasible, will allow technical review of the permit to occur concurrently with the T&E species consultation with the jurisdictional agency. The applicant must still supply a copy of the PNDI Receipt with its permit application. The PNDI Receipt should also be submitted to the appropriate agency according to directions on the PNDI Receipt. The applicant and the jurisdictional agency will work together to resolve the potential impact(s). See the DEP PNDI policy at https://conservationexplorer.dcnr.pa.gov/content/resources.

5. ADDITIONAL INFORMATION

The PNDI environmental review website is a preliminary screening tool. There are often delays in updating species status classifications. Because the proposed status represents the best available information regarding the conservation status of the species, state jurisdictional agency staff give the proposed statuses at least the same consideration as the current legal status. If surveys or further information reveal that a threatened and endangered and/or special concern species and resources exist in your project area, contact the appropriate jurisdictional agency/agencies immediately to identify and resolve any impacts.

For a list of species known to occur in the county where your project is located, please see the species lists by county found on the PA Natural Heritage Program (PNHP) home page (www.naturalheritage.state.pa.us). Also note that the PNDI Environmental Review Tool only contains information about species occurrences that have actually been reported to the PNHP.

6. AGENCY CONTACT INFORMATION

PA Department of Conservation and Natural Resources
Bureau of Forestry, Ecological Services Section
400 Market Street, PO Box 8552
Harrisburg, PA 17105-8552
Email: RA-HeritageReview@pa.gov

U.S. Fish and Wildlife Service
Pennsylvania Field Office
Endangered Species Section
110 Radnor Rd; Suite 101
State College, PA 16801
NO Faxes Please

PA Fish and Boat Commission
Division of Environmental Services
595 E. Rolling Ridge Dr., Bellefonte, PA 16823
Email: RA-FBPACENOTIFY@pa.gov

PA Game Commission
Bureau of Wildlife Habitat Management
Division of Environmental Planning and Habitat Protection
2001 Elmerton Avenue, Harrisburg, PA 17110-9797
Email: RA-PGC_PNDI@pa.gov
NO Faxes Please

7. PROJECT CONTACT INFORMATION

Name: Eileen Banach
Company/Business Name: AECOM
Address: 10 Orms Street
City, State, Zip: Providence, RI 02904
Phone: (401) 854-2802 Fax: ( )
Email: eileen.banach@aecom.com

8. CERTIFICATION

I certify that ALL of the project information contained in this receipt (including project location, project size/configuration, project type, answers to questions) is true, accurate and complete. In addition, if the project type, location, size or configuration changes, or if the answers to any questions that were asked during this online review change, I agree to re-do the online environmental review.

Eileen Banach 2/24/2020

applicant/project proponent signature date

Appendix G
Chapter 105 Environmental Assessment Form, Modules, and Attachments

Requirement L

Environmental Assessment Form and Wetland Report

Environmental Assessment Form

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATERWAYS ENGINEERING AND WETLANDS

CHAPTER 105 ENVIRONMENTAL ASSESSMENT FORM

			Included	Item Location
Note: The Department may waive a specific information requirement in writing, at the request of the Applicant, during the pre-application review process if the Department determines the information is not necessary to complete the review.				
Module S1: Project Summary				
This module is intended to organize information in order to present an overall summary of the project scope, certain key information requirements and when applicable, a comprehensive view of the overall project and related projects.				
A. Provide an overall project description and If the answer to the question below is **YES**, address CEA requirements; otherwise proceed to **S1.B** Comprehensive Environmental Assessment (CEA) when applicable. Answer the following question:			☒	S1.A
Does the "overall" project require more than one Ch. 105 permit in more than one county or will the project be completed in more than one phase?	☐ Yes	☒ No		
B. Provide information related to the project purpose, need, water dependency and summarize the amount and type of resources present and the temporary and permanent impacts proposed to those resources.			☒	S1.B
Module S2: Resource Identification and Characterization				
This module is intended to organize information related to the identification of the resources present on the project site and to characterize those resources that may be affected by the proposed project.				
A. Provide the standard resource identification information, location map, wetland determination or delineation reports; watercourse reports; identification and qualifications of preparers; location map, and answer the related questions.			☒	S2.A
Is the site located within or adjacent to any of the following; or within 100 feet of items vii or viii?				
i. National, state or local park, forest or recreation area	☐ Yes	☒ No		S2.A
ii. National natural landmark	☐ Yes	☒ No		S2.A
iii. National wildlife refuge, or Federal, state, local or private wildlife or plant sanctuaries	☐ Yes	☒ No		S2.A
iv. State Game Lands	☒ Yes	☐ No		S2.A
v. Areas identified as prime farmland	☒ Yes	☐ No		Tbl S2-2
vi. Source for a public water supply	☐ Yes	☒ No		S2.A
vii. A National Wild or Scenic River or the Commonwealth's Scenic Rivers System	☐ Yes	☒ No		S2.A
viii. Designated Federal wilderness area	☐ Yes	☒ No		S2.A
B. Identify all aquatic resources present on the project site and provide an identifier, the resource type; size of the resource(s); fishery designations, Ch. 93 uses and special protection status; and Exceptional Value (EV) wetland analysis.			☒	S2.A/B
C. Provide the following information related to habitat for Federal threatened and endangered (T&E) plant and animal species or State T&E species or species of special concern - copies of search forms or search receipts; identification of avoidance and minimization efforts taken to resolve identified conflicts.			☒	S2.C
Did the PNDI search or agency coordination identify any potential conflicts?	☐ Yes	☒ No		S2.C
If the above is answered **YES**; answer the following two questions related to PNDI Coordination:				
a. *Is the applicant utilizing a sequential review of the PNDI coordination?*	☐ Yes	☐ No		
b. *Is the applicant utilizing a concurrent review of the PNDI coordination?*	☐ Yes	☐ No		
D. Characterize the aquatic resources: riverine, wetland and lacustrine present on the project site that are proposed to be directly or indirectly affected by the project. Including but not limited to the following, resource classification information, Level 2 rapid condition assessment results, discussion of resource functions, characterization of riparian properties and any other relevant information or studies conducted.			☒	S2.D/ S3.C
Module S3: Identification and Description of Potential Project Impacts				
*This module is intended to organize and present information concerning the potential impacts or effects of the proposed project **in this** application. Impacts related to the "over all" project that are proposed under related but separate application(s) should be addressed as part of the CEA Policy response under **S1.A**.*				
A. Provide a summary table of the proposed temporary and permanent direct and indirect impacts for each effected resource category (e.g. riverine, wetlands and lacustrine resources).			☒	S3.A
B. If any questions from **S2.A** Standard Information Response questions were answered YES, discuss in detail any potential impacts to those resource(s).			☒	S3.B
IMPORTANT NOTE: If either item vii or viii from S2.A is answered YES, the project is not eligible as a "Small Project Application" type. Complete all applicable sections of the EA form for the standard application type unless an item was otherwise waived by the Department in writing (see previous Note on waiving of information requirements).				

	Included	Item Location
C. Provide a table(s) of all proposed water obstruction(s), encroachment activities and dams (e.g. subfacility codes) and provide an identifier, the subfacility code and description, resource identifier from **S2.B**, latitude and longitude, the proposed temporary and permanent direct and indirect impacts and subfacility details.	☒	S3.C
D. Provide a discussion of how the proposed subfacility(ies) individually and in combination directly and/or indirectly impact the identified resource(s) and the effects on the applicable resource functions: hydrologic, biogeochemical, habitat, recreation, any other environmental impacts and the effects on the property or riparian rights of owners upstream, downstream or adjacent to the project.	☒	S3.D
E. **Antidegradation Analysis** - The applicant should demonstrate consistency with State antidegradation requirements as described in the Water Quality Antidegradation Implementation Guidance Policy Document Number 391-0300-002. Project application information provided below in **S3.F, G and H** may be cross-referenced.	☒	S3.E
F. **Alternatives Analysis** - The scope and extent of this analysis should be commensurate with the size and scope of the proposed project impacts *in this* application, information provided in **S4.A** below, related to avoidance and minimization efforts, may be cross-referenced.	☒	S3.F
G. **Potential Secondary Impact Evaluation** - Identify and describe environmental impacts on adjacent land and water resources associated with but not that direct result of the project.	☒	S3.G
H. Identify and evaluate the potential cumulative environmental impacts of this project and other potential or existing projects like it, and the impacts that may result through numerous piecemeal changes to the wetland resource.	☒	S3.H
Module S4: Mitigation Plan		
*This module is intended to organize and present information concerning actions undertaken in accordance with the definition of **Mitigation** in Title 25 Pa. Code Chapter 105 - §105.1, 105.16, 105.18a(a)(3), 105.18a(b)(7), 105.20a, and 105.21 as related to the potential impacts or effects of the proposed project **in this** application.*		
A. Identify and discuss any measures taken that resulted in avoiding or minimizing unavoidable resource impacts, provide detailed responses for individual proposed impact area(s) **and** the project as a whole.	☒	S4.A
B. Identify and discuss any repair, rehabilitation or restorative actions taken to rectify an impacted resource, provide detailed responses for individual proposed impact area(s) and the project as a whole. Identify and discuss any proposed preservation and maintenance operations that will be taken to reduce or eliminate an impact during the life of the project.	☒	S4.B
C. Identify and discuss any actions undertaken to provide compensatory mitigation including the purchase of credits from an approved provider, a detailed discussion of proposed compensation actions and how they will offset the lost resource functions. Provide detailed plans including performance standards and success criteria.	☒	S4.C
Answer the following question. If the answer to the question is **YES**, provide the information regarding the mitigation credit provider; otherwise provide a detailed mitigation plan. If the application proposes to utilize both mitigation bank credits and conduct permittee responsible mitigation; both the credit provider and mitigation plan information shall be submitted.	☒	
Does the applicant propose to utilize an approved mitigation bank to provide all or a portion of the compensation? ☒ Yes ☐ No		S4.C
D. When applicable, provide a plan to monitor the identified actions proposed in **S4.B** and/or **S4.C** compensatory mitigation area. Applicants should utilize the Department's Design Criteria and the USACE's RGL 08-03 -(http://www.usace.army.mil/Portals/2/docs/civilworks/RGLS/rgl08_03.pdf) to develop monitoring plans for compensatory mitigation proposals. The plan should include performance standards/success criteria, duration and timeframes of monitoring, monitoring report template, and template remedial action or adaptive management plan.	☒	S4.D
Note: All or portions of this Module may apply to "Small Project" type applications under case specific circumstances and should be discussed during any pre-application meetings or prior to application submittal.		
CERTIFICATION		
I certify that the above statements, attachments including those labeled and identified as Enclosures, and all conclusions are true, correct, and based upon current environmental principles and science, to the best of my knowledge and belief.		
Signature: Erik Burke — Date: 5/26/2020		

Module S1

Project Summary

MODULE S1
PROJECT SUMMARY

S1.A Project Description

Texas Eastern is seeking authorization from the Pennsylvania Department of Environmental Protection (PADEP) to mitigate for the aquatic resource impacts associated with replacement of a segment of existing natural gas pipeline located in Blacklick Township, Indiana County and Derry Township, Westmoreland County, Pennsylvania (PA). The location of the Project is depicted on the Location Map (Requirement I).

The Project is located entirely within an existing pipeline right-of-way (ROW) with limited area adjacent to the ROW needed for temporary workspace and new easement and is surrounded by agricultural and forest land. The Project area drains to Conemaugh River. Conemaugh River watershed is located within the Allegheny River basin.

The Conemaugh River has PA Code, Title 25, Chapter 93 designated protected aquatic life uses of *Warm Water Fishes* (*WWF*) (Commonwealth of PA, 2020a). PADEP does not list the Conemaugh River as having an Existing Use Classification (PADEP, 2020b). The Conemaugh River is not listed by the Pennsylvania Fish and Boat Commission (PFBC) as Stocked Trout Waters nor is it listed by the PFBC as Wild Trout Waters (PFBC, 2020c).

According to the *2018 Final Pennsylvania Integrated Water Quality Monitoring and Assessment Report*, none of the receiving waters are listed as a siltation impaired waterbody (PADEP, 2018).

Construction of the Project will result in a total of approximately 21,792 square feet (0.60 acres) of temporary impact and 4,472 square feet (0.10) of permanent/conversion impact to wetland W-BJM-010, and 59,116 square feet (1.36 acres) of temporary impact to wetland W-BJM-011. The horizontal directional drill (HDD) avoids surface disturbance to wetland W-CMS-016 and watercourse S-JLK-037. The entire Project area on the west side of the Conemaugh River and a portion of the Project area on the east side of the Conemaugh River is within Federal Emergency Management Agency (FEMA)-delineated floodplain, as depicted on the Site Plan in Requirement H. Additional information regarding mitigation and restoration of the impacted wetlands is detailed in Requirement T.

The construction of this Project will not cause or contribute to pollution of groundwater, surface waters, or diminution of resources sufficient to interfere with their uses. A summary of specific measures undertaken or that will be taken to mitigate the overall Project impacts are summarized

in Requirement T and in Module S4. Module S3.E of this Environmental Assessment contains detailed information pertaining to the Project's overall consistency with the PADEP antidegradation requirements. More detailed information pertaining to antidegradation requirements pertaining to this Project can be found in the Erosion and Sediment Control Plan (E&SCP) contained within Requirement M.

The overall Project will be completed in a single phase and but is located in more than one county. Consequently, a Comprehensive Environmental Assessment (CEA) that complies with the requirements described in the *Comprehensive Environmental Assessment of Proposed Project Impacts for Chapter 105 Water Obstruction and Encroachment Permit Application* is required in this Environmental Assessment (PADEP, 2017).

For additional Project information, please refer to Requirement J (Project Narrative) of the Joint Permit Application.

S1.B Additional Information

S1.B.1 Project Purpose and Need

The purpose of the Project is for Texas Eastern to replacement of a segment of their existing Line 12 pipeline adjacent to and beneath the Conemaugh River. Additional information pertaining to the Project can be found in the Project Narrative located in Requirement J.

S1.B.2 Statement of Water Dependency

Due to the nature of this project, avoidance of all aquatic resources was not feasible. The Project is considered water dependent because it requires access or proximity to or siting within water to fulfill the basic purposes of this project.

S1.B.3 Resource Summary

Table S1-1 below provides a quantitative summary of amount and types of delineated resources identified within the Project Study Area, which are depicted in Attachment S-1 and listed in Module S2.B. For additional information on delineated resources associated with this Project, please refer to Attachment S-1 for the *Wetland and Watercourse Delineation Report*.

Table S1-1. Summary of Resource Systems Present Within and Adjacent to Project Area

Resource Type	Classification[1]	Quantity	Delineated Size (acres)[3]	Delineated Size (linear feet)
Wetland	PEM	1	3.40	-
	PEM/PSS	1	1.47	-
	PEM/PSS/PFO	1	0.63	-
	Total	**3**	**5.50**	**-**
Watercourse	PER	1	-	195
	Total	**1**	**-**	**195**

[1] PEM= Palustrine Emergent, PSS= Palustrine Scrub-shrub, PFO= Palustrine Forested, PER= Perennial

S1.B.4 Impact Summary

Table S1-2 at the end of this section provides a summary of the permanent and temporary direct and indirect impacts within the proposed limit-of-disturbance (LOD) and described in Module S3.A. At the time of this permit application, there are no additional impacts anticipated to occur in the future beyond those contained within this permit application.

Aboveground Facilities

A new 100-foot by 100-foot valve site along with a permanent access road will be constructed at the eastern end of the Project.

Access Roads

One permanent access road is proposed for this Project. The proposed access road consists of approximately 375 linear feet, with an average width of approximately 20 feet.

Permanent Impacts

For the purposes of the Project, permanent impacts listed in Table S1-2 are the impacts that will occur from the placement or construction of a water obstruction or encroachment, and the area necessary for operation and maintenance. Permanent impacts associated with this Project are those locations where a Utility Line Crossing is required for the installation of the pipeline and where wetland cover types will be converted within Texas Eastern's ROW. These Utility Line Crossing impacts are located within the permanent ROW of the proposed Project and are all considered to be **permanent indirect** impacts as there is no net loss of resource acreage. The **permanent direct** impacts will remain following construction by conversion of a resource to another aquatic resource type.

Temporary Impacts

Temporary direct impacts listed in Table S1-2 are associated with impacts to resources during construction that constitute a temporary loss of a resource that is restored upon completion of construction. These temporary impacts will not be maintained as a result of the operation and maintenance of the Project. Temporary impacts associated with this Project are those locations where a Temporary Road Crossing is required to access the ROW and construct through the Utility Line Crossings, or where timber mats are used to cross a stream, wetland or floodway. These impacts are all considered to be temporary direct impacts because the temporary loss of the resource is restored following construction, thus there is no net loss of resource acreage. There are no proposed **temporary indirect** impacts associated with this Project.

These impacts correspond to the *Aquatic Resource Impact Table* located within Requirement J. Please note that for proposed Project, the permanent and temporary impact areas contained within the *Aquatic Resource Impact Table* and this Environmental Assessment may be greater than the actual impact due to overlap between the permanent and temporary impact areas. Specifically, at resource crossings where both open-cut pipeline installation (Utility Line Crossing) and timber matting (Temporary Road Crossing) activities are proposed, the permanent impact area for the pipeline installation is calculated based off of the width of the entire permanent ROW, which includes the area within which the timber matting will be placed. The impact area for the timber matting is then calculated independently and based off of a typical maximum timber mat width of 16 feet. As a result, such crossings will include proposed permanent and temporary impacts that, when combined, could result in a total impact area greater than the delineated size of the resource.

For more detailed information pertaining to the proposed Project permanent and temporary direct and indirect impacts of these resources please refer to Module S3.A.

Table S1-2. Summary of Proposed Impacts

Resource Type	Classification	Permanent[2]				Temporary[2]			
		Direct		Indirect		Direct		Indirect	
		Impact Area (square feet)	Impact Area (acres)	Impact Area (square feet)	Impact Area (acres)	Impact Area (square feet)	Impact Area (acres)	Impact Area (square feet)	Impact Area (acres)
Wetland[1]	PEM/PSS/PFO	5,448	0.12	1,275	0.03	85,380	1.96	-	-
Watercourse/Floodway	WWF	-	-	486	0.02	**-**	**-**	**-**	**-**
Total		**5,448**	**0.12**	**1,761**	**0.05**	**85,380**	**1.96**	**-**	**-**

[1] PEM= Palustrine Emergent, PSS=Palustrine Scrub/shrub, PFO-Palustrine Forested
[2] These impacts correspond to the *Aquatic Resource Impact Table* located within Requirement J.

Module S2

Resource Identification and Characterization

MODULE S2
RESOURCE IDENTIFICATION AND CHARACTERIZATION

S2.A Standard Resource Identification Information

On June 23 and 24, 2016; August 19, 2016; and March 5, 2020, AECOM environmental scientists performed site investigations to identify and delineate wetlands and watercourses that may be regulated under the Pennsylvania Clean Streams Law and Dam Safety and Encroachments Act and the federal Clean Water Act (Commonwealth of Pennsylvania (PA), 2020a and 2020b; Clean Water Act of 1972). The limit of the site investigation was defined by the easement limits of Texas Eastern's existing pipeline ROW and temporary workspace outside the existing ROW. During the site investigations, four (4) wetlands and one (1) watercourse were delineated within the Project area.

The *Wetland and Watercourse Delineation Report* located within Attachment S-1 contains information pertaining to the delineation process utilized to identify and delineate the wetlands found within the Study Area. This report also contains wetland and watercourse data forms and photos of the identified resources.

The AECOM scientists listed within Table S2-1 performed the aquatic resource delineations, and prepared permit application materials. Copies of the AECOM scientist resumes containing their qualifications are provided in Attachment S-2.

TABLE S2.1
SCIENTIST INFORMATION

Scientist Name	AECOM Mailing Address	E-mail Address	Portions of Work Completed
Jesse Killosky	No longer at AECOM	--	Resource Delineation
Brian Miller	681 Andersen Drive Pittsburgh, PA 15220	brian.miller1@aecom.com	Resource Delineation
Charlotte Stallone	564 White Pond Drive Akron, OH 44320	Charlotte.stallone@aecom.com	Resource Delineation
Eileen Banach	10 Orms Street Providence RI 02904	eileen.banach@aecom.com	Permit Application
Mark Benfer	715 Washington Boulevard Williamsport, PA 17701	mark.benfer@aecom.com	Permit Application

Scientist Name	AECOM Mailing Address	E-mail Address	Portions of Work Completed
Josh Singleton	715 Washington Boulevard Williamsport, PA 17701	josh.singleton@aecom.com	Delineation Report
Angela Chmiel	10 Orms Street Providence RI 02904	angela.chmiel@aecom.com	Permit Application

The Site Plan located within Requirement H and Figure 2 – Plan View located within the *Wetland and Watercourse Delineation Report* (Attachment S-1), both at a scale of 1:2,400 depict all of the wetlands and watercourses delineated within the Study Area as well as within the LOD for the Project. These features are all labeled with unique identifiers and their classifications.

The Location Map contained within Requirement I shows the overall Project area with all receiving waters and political boundaries labeled on the United States Geological Survey 7.5-minute series Blairsville, PA topographical quadrangles (National Geographic Society, 2013) at a scale of 1:24,000. Based on available data, no natural areas, wildlife sanctuaries, natural landmarks and other geographical or physical features including cultural, archaeological and historical landmarks were identified within 1 mile of the Project area. Therefore, these features are not shown on the enclosed Location Map.

The Project is not located in or within 100 feet of a national or local park, forest, or recreation area. The Project is located within a United States Army Corps of Engineers (USACE) flood control zone and USACE-owned land on the east side of the Conemaugh River, which is leased to the PA Game Commission (PGC). The Project is not located in or within 100 feet of a national natural landmark, national wildlife refuge, or federal or local or private wildlife or plant sanctuaries. It is also not located in or within 100 feet of a national wild or scenic river, the Commonwealth's Scenic Rivers System, or any areas designated as a Federal Wilderness Area. According to the PADEP's eMapPA Internet application, the Project is not located along any private or public water supply (PADEP, 2020).

Two prime farmland soil map units listed by the Natural Resource Conservation Service (NRCS) were identified within the Project area.

Table S2-2: Prime Farmland Soils

Map Unit Symbol	Description	Acreage within Limit-of-Disturbance
MoA	Monongahela silt loam, 0 to 3 percent slopes	3.2
MoB	Monongahela silt loam, 3 to 8 percent slopes	6.0
Total Acres:		**9.2**

The Project area is occupied by an existing natural gas ROW and is surrounded by agricultural and forest land. The Project area drains to the Conemaugh River, which is located in the Allegheny River basin.

The Conemaugh River has PA Code, Title 25, Chapter 93 designated protected aquatic life uses of *Warm water Fishes* (*WWF*) (Commonwealth of PA, 2020a). The Conemaugh River is not listed by the PFBC as Stocked Trout Waters, nor is it listed as Stocked Trout Waters (PFBC, 2020a and 2020b). The entire Project area on the west side of the Conemaugh River and a portion of the Project area on the east side of the Conemaugh River is within Federal Emergency Management Agency (FEMA)-delineated floodplain, as depicted on the Site Plan in Requirement H.

According to the 2018 *Final Pennsylvania Integrated Water Quality Monitoring and Assessment Report*, none of the receiving waters are listed as a siltation impaired waterbody (PADEP, 2018).

S2.B Aquatic Resources That May Be Affected

Table S2-3 lists the wetlands located within the Project Study Area that have the potential to be affected by the Project. The identified wetlands contain a project-specific resource identifier ("W").

The sizes of the existing resources listed in Tables S2-3 contains information pertaining to whether any of the wetlands delineated within the Study Area are EV according to PA Code, Title 25, Chapter 105 [105.17 (iii)].

Table S2-3. Wetland Summary

Wetland ID[1]	Classification[2]	Delineated Size (acres)	Chapter 105 Wetland Classification	Hydrogeomorphic Classification (HGM)[4]	Palustrine Community Classification[5]
W-BJM-010	PEM/PSS/PFO	0.63[3]	-	Flat mineral soil	Mixed Forb – Graminoid Wet Meadow
W-BJM-011	PEM/PSS	1.47[3]	-	Flat mineral soil	Mixed Forb – Graminoid Wet Meadow
W-CMS-007	PEM	0.13	-	Flat mineral soil	Mixed Forb – Graminoid Wet Meadow
W-CMS-016	PEM	3.40[3]	-	Flat mineral soil	Mixed Forb – Graminoid Wet Meadow

Notes:
[1] Wetland ID is an AECOM designation for a wetland.
[2] PEM= Palustrine Emergent, PSS= Palustrine Scrub-Shrub, PFO= Palustrine Forested
[3] The wetland area is open-ended and continues outside of the Study Area. Acreage included within table represents the delineated acreage within the Project Study Area.
[4] HGM classifications were assigned from *Hydrogeomorphic Classification. HGM classification for wetlands of the Mid-Atlantic Region, USA* (Brooks).
[5] PCC classifications were assigned from *Terrestrial and Palustrine Plant Communities of Pennsylvania, 2nd Edition* (Zimmerman et al., 2012).

S2.C Threatened and Endangered Species and Species of Special Concern

A signed copy of the Pennsylvania Natural Diversity Inventory (PNDI) Project Environmental Review Receipt is provided within Requirement G of this permit application. The PNDI review resulted in "No Known Impacts" for threatened and/or endangered species under the jurisdiction of the PA Department of Conservation and Natural Resources (PA DCNR), PGC, US Fish and Wildlife Service (USFWS) and PA Fish and Boat Commission (PFBC).

S2.D Aquatic Resource Characterization

Table S2-3 above contains all the resources potentially affected by the Project. The *Wetland and Watercourse Delineation Report* contained within Attachment S-1 contains data sheets, resource mapping and photos of all delineated resources. In some instances, these resources extended outside of the Project Study Area and are depicted in the report as being open-ended.

The impacted wetlands and Conemaugh River were evaluated using the PA Wetland Condition Level 2 Rapid Assessment Protocol (L2RAP) (PADEP, 2016). The overall score for the Conemaugh River is 0.76; the overall score for wetland W-BJM-010 is 0.90; the overall score for wetland W-BJM-011 is 0.89; and the overall score for wetland W-CMS-016 is 0.96. Mapping and data sheets related to the L2RAP are provided in Attachment S-3.

S2.D.1 Riverine Resources

The Conemaugh River was the only riverine resource delineated within the Project area. This resource will be crossed using a horizontal directional drill (HDD) bore and there will be no impact to riverbanks or bed.

S2.D.2 Wetland Resources

Table S2-3 above provides the following information for each delineated wetland: Hydrogeomorphic (HGM) classification, Cowardin vegetation class, and Palustrine Community Classification (PCC) (Brooks; Zimmerman et al., 2012).

The following section contains information pertaining to the wetland HGM types and conditions as they relate to their inherent functions including, but not limited to, those associated with hydrologic, biogeochemical and habitat attributes as well as any applicable recreational uses.

Habitat Attributes

As shown in Table S2-3, the wetlands within the Study Area were identified as wetland HGM code flat mineral soil. Additionally, wetlands were classified as PEM, PEM/PSS/PFO, and PEM/PSS wetland type. Wetland PCC classification identified was: Mixed Forb – Graminoid Wet Meadow. The most common dominant herbaceous plant species observed were *Juncus effusus, Microstegium vimineum, Chamaedaphne calyculata, Fallopia japonica, Juncus tenuis*, and *Carex crinita*. The most common Sapling-Sapling/Shrub species were *Frangula alnus*, *Ulmus Americana*, *Fraxinus pennsylvanica*, *Acer rubrum*, *Cornus racemosa, Platanus occidentalis*. The most common tree species were *Platanus occidentalis*, *Fraxinus pennsylvanica*, and *Acer rubrum*,

The primary indicators of hydrology were Surface Water (A1), High Water Table (A2), Saturation (A3), Water-Stained Leaves (B9), Aquatic Fauna (B13), and Oxidized Rhizospheres on Living Roots (C3). Wetland soils matrix hues were 10YR, 2.5YR, and 5GY with low chroma (≤2). Soils met the criteria for hydric soil indicators Depleted Matrix (F3). The soil texture was silty loam or clay loam.

Hydrologic Patterns

The landform/geomorphic setting of identified wetlands was identified as hillsides, and groundwater primarily provides hydrology to the hillside wetlands.

Biogeochemical

No obvious sources of pollution were observed within the Project area.

Recreational Uses

Hunting is a major recreational activity in the region; however, the Project area is located within privately-owned land that is bisected by two roads, which does not offer opportunities for public hunting, hiking or observation of wildlife. Game species present in the general vicinity may include wild turkey (*Meleagris gallopavo*), white-tailed deer (*Odocoileus virginianus*), gray squirrel (*Sciurus carolinensis*), eastern cottontail rabbit (*Sylvilagus floridanus*), black bear (*Ursus americanus*), red fox (*Vulpes vulpes*), gray fox (*Urocyon cinereoargenteus*), coyote (*Canus latrans*), and ruffed grouse (*Bonasa umbellus*), amongst others. Non-game species present in the general vicinity may include red-tailed hawk (*Buteo jamaicensis*), eastern screech owl (*Otus asio*), American kestrel (*Falco sparverius*), turkey vulture (*Cathartes aura*), eastern chipmunk (*Tamias striatus*), striped skunk (*Mephitis mephitis*), and resident and neo-tropical songbirds.

S2.D.3 Lacustrine Resources

There are no lacustrine resources delineated within the Project area.

S2.D.4 Other Environmental Factors

Other environmental factors, special studies, macroinvertebrate studies, or substitute methods were not conducted for the proposed Project; therefore, discussion of such methods is not provided.

Module S3

Identification and Description of Potential Project Impacts

MODULE S3
IDENTIFICATION AND DESCRIPTION OF POTENTIAL PROJECT IMPACTS

S3.A Impact Summary

Construction of the Project will result in a total of approximately 1,761 square feet (0.05 acres) of permanent impact to wetland W-CMS-016 and stream/floodway S-JLK-037, and 85,380 square feet (1.96 acres) of temporary impact to wetlands W-BJM-010 and W-BJM-011. Impacts will result from temporary workspaces and HDD operations. The entire Project area on the west side of the Conemaugh River and a portion of the Project area on the east side of the Conemaugh River is within Federal Emergency Management Agency (FEMA)-delineated floodplain, as depicted on the Site Plan in Requirement H. No lacustrine resources were identified within the Project area; therefore discussion of impacts to these resources is not applicable to this Module. Table S1-2 in Module S1 contains a summary of the proposed permanent and temporary direct and indirect impacts.

S3.B Standard Information Responses

The Project is not located in or within 100 feet of a national or local park, forest, or recreation area; nor is it located in or within 100 feet of a national natural landmark, national wildlife refuge, or federal or local or private wildlife or plant sanctuaries. It is also not located in or within 100 feet of a national wild or scenic river, the Commonwealth's Scenic Rivers System, or any areas designated as a Federal Wilderness Area. The Project is not located along any private or public water supply (PADEP, 2020a and PaGWIS, 2020).

United States Army Corps of Engineers (USACE)-owned land on the east side of the Conemaugh River is leased to the PA Game Commission (PGC), which maintains the leased property as active farmland. Approximately 9.2 acres within the LOD are mapped as prime farmland soils by the NRCS (NRCS, 2018). These prime farmland soils are located in active farmland which will continue to be farmed following construction of the pipeline, with the exception of the new mainline valve (MLV) and access road. The USACE and PGC are both amenable to this project and the minor loss of farmland in the interest of safe maintenance and operation of the pipeline system.

S3.C Subfacility Details

Please see Table S3-1 for all subfacility details including the affected resources, coordinates, location, permanent direct and indirect impacts, and temporary direct and indirect impacts.

TABLE S3-1– Subfacility Details

Resource Crossing Number	County	Municipality	Latitude (DD, NAD83)	Longitude (DD, NAD83)	Resource / Subfacility ID[1]	Feature Type	Resource Type [2]	Regulatory Classification[3]	Impact Type	Impact Area (feet^2)	Impact Area (acres)	Crossed By	Subfacility Code(s)	Crossing Type and Product Code(s)
1	Westmoreland	Derry	40.454157	-79.304047	W-BJM-011	Wetland	Palustrine Emergent (PEM)	N/A	Temporary Direct		56,552	Temporary Workspace	TMPWI	TRNC, PETRO
2	Westmoreland	Derry	40.453907	-79.30384	W-BJM-011	Wetland	Palustrine Scrub-shrub (PSS)	N/A	Temporary Direct		2,564	Temporary Workspace	TMPWI	TRNC, PETRO
3	Westmoreland	Derry	40.454614	-79.302808	W-BJM-010	Wetland	Palustrine Emergent (PEM)	N/A	Temporary Direct		20,816	Temporary Workspace	TMPWI	TRNC, PETRO
4	Westmoreland	Derry	40.454602	-79.303316	W-BJM-010	Wetland	Palustrine Scrub-shrub (PSS)	N/A	Temporary Direct		976	Temporary Workspace	TMPWI	TRNC, PETRO
5	Westmoreland	Derry	40.454602	-79.303316	W-BJM-010	Wetland	Palustrine Scrub-shrub (PSS)	N/A	Permanent Direct		976	Wetland Conversion	WTDIM	TRNC, PETRO
6	Westmoreland	Derry	40.454802	-79.302755	W-BJM-010	Wetland	Palustrine Forested (PFO)	N/A	Temporary Direct		4,472	Temporary Workspace	TMPWI	TRNC, PETRO
7	Westmoreland	Derry	40.454802	-79.302755	W-BJM-010	Wetland	Palustrine Forested (PFO)	N/A	Permanent Direct		4,472	Wetland Conversion	WTDIM	TRNC, PETRO
8	Westmoreland	Derry	40.455699	-79.300104	W-CMS-016	Wetland	Palustrine Emergent (PEM)	N/A	Permanent Indirect		1,275	Bore	WTIIM	TRNC, PETRO
9	Westmoreland/ Indiana	Derry/ Blacklick	40.456669	-79.297892	S-JLK-037	River	Perennial (PER)	WWF	Permanent Indirect		486	Bore	WTIIM	TRNC, PETRO

[1] AECOM Designation

[2] Classification based upon field observation by AECOM

[3] As defined by PA Code, Title 25, Chapter 106.1

S3.D Resource Function Effects

The wetland impacts proposed for the Project are summarized and tabulated on the Aquatic Resource Impact Table which is attached in Requirement J. Watercourse S-JLK-037 and its associated floodway will be impacted by this Project through having a pipeline HDD bored under the watercourse and floodway. Four (4) wetlands were delineated during the watercourse and wetland investigation. Three wetlands will be impacted by the Project. W-BJM-011 and W-BJM-010 will be temporary impacted by the temporary workspace, and W-CMS-016 will be permanently impacted by the pipeline that will be bored under the wetland.

Hydrologic Impacts

The Project is not anticipated to adversely affect the natural drainage patterns, groundwater discharge, natural recharge areas, or storm and floodwater storage and control or have a significant impact to the water quality characteristics provided by the wetlands within the Project area. Impacts to the watercourse flushing characteristics, stream gradient, or sensitive waterbodies will be minimal due to HDD methodology being used to install a new section of pipeline. The Erosion and Sediment Control Plan (E&SCP) (see Requirement M) is consistent with the standard design criteria from the Pennsylvania Stormwater Best Management Practices Manual (BMP Manual) to protect water quality.

An approved E&SCP and appropriate BMPs will be implemented and utilized as necessary to reduce any temporary effect on water quality and resources during restoration efforts.

Habitat Impacts

Texas Eastern plans to restore all impacted areas to pre-construction conditions following the completion of construction activities, with the exception of the permanently converted portions of PFO and PSS wetland and the new mainline valve (MLV) and access road. Texas Eastern intends to purchase mitigation credits to offset the wetland conversions. The mainline valve and access road will be placed within active farmland and represents minimal habitat loss.

Biogeochemical Impacts

Minimal temporary impacts to food chain production may occur during construction. No processes or communities that are important ecologically to food chain production would be impacted for longer than the duration of construction. Additionally, wetland and upland disturbed areas will be restored to original condition once construction activities are

complete, with the exception of the permanently converted portions of PFO and PSS wetland and the new MLV and access road. Texas Eastern intends to purchase mitigation credits to offset the wetland conversions. The mainline valve and access road will be placed within active farmland and represents minimal loss to food chain production.

Recreation

As mentioned previously, public recreational activities such as hunting, or fishing are unlikely to occur in the Project area which is located within privately-owned land surrounded by forested land. As such, impact on recreational activates is not likely to occur.

Properties upstream and downstream of the Project area include existing roadway, forest land, and pipeline ROW. These land uses should not have any further impact on the aquatic habitat within the Project area. The areas that are to be impacted during construction will be restored as depicted on the E&SC Plans within Requirement M. The proposed construction activities will not permanently restrict the property rights of landowners upstream or downstream of the proposed Project as the area will be returned to pre-construction conditions.

Environmental impacts on other adjacent land are expected to be minimal. These impacts are anticipated to consist of increased noise levels from machinery and dusty conditions. To minimize these impacts, an approved E&SCP will be implemented and utilized during construction activities.

S3.E Antidegradation Analysis

The proposed construction activities have been evaluated for non-discharge alternatives for compliance with the PADEP's antidegradation requirements in PA Code, §102.4(b)(6). Non-discharge alternatives are defined as environmentally sound and cost effective BMPs that individually or collectively eliminate the net change in stormwater volume, rate and quality for storm events up to and including the 2-year design storm when compared to the stormwater rate, volume and quality prior to the earth disturbance activities.

Various BMPs identified as non-discharge alternatives in the *Erosion and Sediment Pollution Control Program Manual* (PADEP, 2012) were considered and evaluated for implementation as part of the proposed activities. These alternatives were evaluated individually, and in various

combinations, for their ability to minimize accelerated erosion and sedimentation during the earth disturbance activity in order to achieve no net change from pre-development to post-development volume, rate and concentration of pollutants in stormwater runoff. The primary non-discharge alternatives/BMPs considered for construction activities are limiting the disturbed area and limiting extent and duration of the disturbance.

The LOD to be utilized for construction has been established to restrict construction activities to occur within the existing pipeline ROW. Since the Project area will be restored to pre-construction conditions, there is no negative affect on land use anticipated. The Project area will only incur temporary land disturbance until vegetation is established.

Texas Eastern will limit the extent and duration of the earth disturbance during construction. The duration and extent of earth disturbances will be limited to the minimal timeframe necessary to complete activities. Temporary or permanent stabilization is to occur as soon as possible upon completion. This BMP is very effective at reducing the concentration of pollutants in stormwater runoff and reducing the impact of sediment runoff volume and rate.

As demonstrated in the previous paragraphs, due to the nature of the Project, the proposed activities are not expected to have an impact on the volume, rate and concentration of pollutants in stormwater runoff up to, and including, the 2-year/24-hour storm. Antidegradation Best Available Combination of Technologies (ABACT) BMPs are not required as the Project is not located in a high-quality or exceptional value watershed. The E&SCP contained within Requirement M of this permit application depicts the locations of all planned BMPs and details for construction.

The proposed Project will create a small amount of new impervious cover, which is of concern for stormwater management. Minimizing the LOD to the minimum area necessary to install the replacement segment and minimizing tree clearing will maintain existing vegetative cover, where feasible and maintain the infiltration capacity of undisturbed areas to the maximum extent practicable.

It is not anticipated that the cumulative effect of this construction will have a major impairment on the Commonwealth's wetland resources because reclamation involves restoring the temporarily impacted wetland area. Furthermore, the wetlands impacted and surrounding upland areas will be restored to original contours and conditions following the completion of all construction activities.

S3.F Alternatives Analysis

An alternative analysis has been provided within Requirement S.

S3.G Potential Secondary Impact Evaluation

In addition to the resources impacted during original pipeline construction, there are adjacent wetlands that will be avoided during construction. Wetlands W-BJM-011 and W-BJM-010 extend outside the LOD and a secondary impact is possible to the off-site portions of these wetlands. Wetland W-CMS-016 and the Conemaugh River (S-JLK-037) will not be impacted by construction workspace but the HDD bore path will travel below both resources. Wetland W-CMS-007 is proposed to be avoided but is located adjacent to construction workspace. These resources are described in Table S3-2 and additional information pertaining to this resource is located within the *Wetland and Watercourse Delineation Report* within Attachment S-1.

Table S3-2. Potential Secondary Impacted Resources

Resource Type	Resource ID[1]	Classification[2]	Chapter 93 Designation[3]	Stocked Trout Waters	Wild Trout Waters	Special Protection Status
Wetland	W-BJM-011	PEM/PSS	-	-	-	-
Wetland	W-BJM-010	PEM/PSS/PFO	-	-	-	-
Wetland	W-CMS-016	PEM	-	-	-	-
River	S-JLK-037	PER	WWF	-	-	-
Wetland	W-CMS-007	PEM	-	-	-	-

Notes:

[1] Resource ID is an AECOM designation

[2] PEM= Palustrine Emergent , PSS=Palustrine Scrub/shrub, PFO=Palustrine Forested, PER=Perennial

[3] PA Code, Title 25, Chapter 93 Designated Use or Existing Use Designation, whichever is more protective

The nature of this Project is not anticipated to cause any direct or indirect secondary impacts on adjacent land or resources. The Project will not permanently restrict the property rights of landowners upstream or downstream. There are no dams, water obstructions, or encroachments necessary to fulfill this Project purpose.

S3.H Cumulative Impacts

The CEA Policy states that when a temporary wetland impact is proposed to be properly restored, the applicant does not need to identify the temporary impact as an adverse cumulative impact.

Texas Eastern intends to restore the temporarily impacted wetlands immediately following construction with the exception of the permanently converted portions of PFO and PSS wetland. Texas Eastern intends to purchase mitigation credits to offset the wetland conversions. It is anticipated that this Project will have 0.05 acres of permanent wetland and stream impact due to the pipeline bored under wetland W-CMS-016 and watercourse S-JLK-037 along with its associated floodway. The pipeline will be installed via HDD bore and is unlikely will have any adverse effects on the local watershed. The wetland surface and watercourse riverbanks and bed will not be disturbed during construction activities, so all vegetation will remain intact and minimal impact to underground hydrology will not occur.

Texas Eastern will continue to evaluate the integrity of its pipelines using in-line inspection tools in accordance with the mandates and guidance of United States Department of Transportation (USDOT) Pipeline and Hazardous Materials Safety Administration's (PHMSA) 49 CFR 192 Subpart O, and future inspections may indicate the need for additional anomaly repairs to the pipelines in the Project area. However, if future anomaly repair is required, and impacts to wetlands within the Project area are required to address the anomaly, those impacts would similarly be temporary and restored to pre-construction conditions immediately following construction activities.

To address the Chapter 105 cumulative impacts requirements, PADEP recommends that the applicant identify and consider other existing and potential project permanent impacts for each wetland resource. The Project area was reviewed using the PADEP eMapPa interactive mapper, eFacts websites, and existing utilities surveyed during AECOM investigations to identify additional and/or cumulative wetland impacts that would occur as a result of existing or new potential projects. No current or future projects other than the anomaly investigations were identified within or adjacent to the Project area; however, an anomaly identified and repaired in 2020 was identified in eFacts. That anomaly was located was located outside of the Project area.

Module S4

Mitigation Plan

MODULE S4
MITIGATION PLAN

S4.A Avoidance and Minimization Measures

As described in the Alternatives Analysis (see Requirement S), the Project purpose and need cannot be accomplished without temporary impacts to wetlands and floodway and permanent impacts to wetlands, a river, and floodway; Texas Eastern will implement appropriate construction measures to minimize these unavoidable impacts. Construction workspace requirements are a function of pipe diameter, equipment size, topography, and geological rock formations. All construction activities are restricted to the limit of disturbance (LOD) on the Erosion and Sediment Control Plan (E&SCP) drawings. The construction workspace includes the bore entry and exit pit, temporary workspace to stage and weld the replacement pipeline, areas for soil stockpiling, and areas that construction equipment will utilize to complete the required repairs. Texas Eastern must provide sufficient workspace to permit the safe operation of construction equipment at the Project site.

The E&SCP best management practices (BMPs) for this earth disturbance activity have been planned to minimize the extent and duration of the proposed earth disturbance, maximize protection of existing drainage features and vegetation, reduce soil compaction, and employ measures and controls that reduce the generation of increased runoff. Specific BMPs have been selected for this site in order to achieve these broad goals. The location of proposed BMPs are shown on the E&SCP drawings.

Timber mats and equipment will not contain free-standing soil and vegetative materials prior to arrival on-site. This minimizes potential impacts from invasive plants, contaminants, biological diseases, etc.

S4.B Impact Repair, Rehabilitation, Restoration, Preservation and Maintenance

Restoration and revegetation of the construction workspace will immediately occur upon completion of construction activities. In conjunction with restoration operations, any woody material and construction debris will be removed from the construction workspace. Permanent water bars will be reinstalled using compacted soil and maintained in accordance with the E&SCP at the existing locations. Permanent water bars will be installed to match pre-existing water bars on pipeline ROW.

Revegetation will be completed in accordance with permit requirements and written recommendations on seeding mixes, rates, and dates obtained from the local soil conservation

authority or other duly authorized agency and in accordance with the E&SCP. Alternative seed mixes specifically requested by the landowner or agencies may be used. Any soil disturbance that occurs outside the permanent seeding season or any bare soil left unstabilized by vegetation will be mulched in accordance with the E&SCP.

Regarding preservation and maintenance, no vehicular traffic will be permitted across wetlands without the aid of temporary timber matting, or approved equal, at any time during construction in an effort to reduce the impact across resources.

S4.C Compensatory Mitigation

As described in the Alternatives Analysis (see Requirement S), Texas Eastern has incorporated all practicable measures to avoid and minimize environmental impacts associated with the Project. Texas Eastern's construction procedures have also been developed to minimize unavoidable impacts to wetlands. During Project construction, a Palustrine Emergent (PEM) wetland and the Conemaugh River will be crossed via horizontal directional drill (HDD). Two additional wetlands, one PEM/Palustrine Shrub/shrub (PSS) and one PEM/PSS/Palustrine Forested (PFO), will be crossed via temporary matting. Construction of the Project will result in a total of approximately 4,472 square feet (0.10 acres) of permanent/conversion impact to the PFO portion and 976 square feet (0.02 acres) to the PSS portion of one wetland. To mitigate for the wetland conversion, Texas Eastern intends to purchase off-site mitigation credits. Further information concerning mitigation is provided in Requirement T. Construction will be in accordance with the Project Description (see Requirement J) and Texas Eastern's E&SCP to minimize the potential for adverse effects to wetlands and floodway.

The construction procedures used to cross unsaturated wetlands are similar to those used on dry land. Stable temporary work surfaces may be required in wetlands where soils are saturated and unstable. Installing construction mats in the equipment travel lane is a typical method of site stabilization that Texas Eastern will employ, as necessary. During site preparation activities, vegetation will be cut to ground level within the wetland. Original topographic conditions and contours will be restored as close to pre-construction as possible after completion of the repair work.

S4.D Monitoring Plans

Texas Eastern will complete vegetation and site monitoring through final stabilization of the impacted areas as defined in the E&SCP and as required by state or federal agencies.

References

REFERENCES

Brooks, Robert P. Pennsylvania State University. Riparia, Department of Geography. *Hydrogeomorphic Wetland Classification. HGM classification for wetlands of the Mid-Atlantic Region, USA*.

Clean Water Act of 1972, 33 U.S.C. § 1251 et seq. (2002). Accessed at https://www.epa.gov/sites/production/files/2017-08/documents/federal-water-pollution-control-act-508full.pdf on April 10, 2020.

Commonwealth of Pennsylvania. 2020a. The Pennsylvania Code, Title 25: Environmental Protection, Chapter 93: Water Quality Standards. Accessed at https://www.pacode.com/secure/data/025/chapter93/chap93toc.html on April 10, 2020.

Commonwealth of Pennsylvania. 2020b. The Pennsylvania Code, Title 25: Environmental Protection, Chapter 102: Erosion and Sediment Control: §102.2 Scope and purpose. Accessed at http://www.pacode.com/secure/data/025/chapter102/s102.2.html on April 10, 2020.

Commonwealth of Pennsylvania. 2020c. The Pennsylvania Code, Title 25: Environmental Protection, Chapter 105: Dam Safety and Waterway Management. Accessed at https://www.pacode.com/secure/data/025/chapter105/chap105toc.html on April 10, 2020.

National Geographic Society. 2013. Seamless Layer 2013 (Topo Source: Seamless Digital Raster Graphic-N.P.S. Natural Physical Map & U.S.G.S. Topographic Map i-cubed USGS Quadrangles: Blairsville, PA).

Natural Resources Conservation Service (NRCS). 2018. Soil Survey Geographic (SSURGO) Database for Westmoreland and Indiana Counties, PA. Accessed at https://websoilsurvey.sc.egov.usda.gov/app/HomePage.htm on April 10, 2020.

PADEP. 2012. *Erosion and Sediment Pollution Control Program Manual.* Technical Guidance Number 363-2134-008. March 2012.

PADEP. 2014. *Pennsylvania Function Based Compensation Protocol*. *Draft Version 1.0*. Document Number 310-2137-001. Effective Date: May 2, 2014 (Pa Bulletin Document Number 14-922).

PADEP. 2016. *Pennsylvania Wetland Condition Level 2 Rapid Assessment Protocol*, Document No. 310-2137-002. Bureau of Waterways Engineering and Wetlands, Division of Wetlands, Encroachments and Training, Harrisburg, PA.

PADEP. 2017 *Comprehensive Environmental Assessment of Proposed Project Impacts for Chapter 105 Water Obstruction and Encroachment Permit Applications*. Technical Guidance Number 310-2137-006. Accessed at http://www.elibrary.dep.state.pa.us/dsweb/Get/Document-117546/310-2137-006.pdf on April 10, 2020.

PADEP. 2018. *Final Pennsylvania Integrated Water Quality Monitoring and Assessment Report*. Accessed at https://www.dep.pa.gov/Business/Water/CleanWater/WaterQuality/IntegratedWatersReport/Pages/2018-Integrated-Water-Quality-Report.aspx on April 10, 2020.

PADEP. 2020a. eMapPA. Accessed at http://www.depgis.state.pa.us/emappa April 10, 2020.

PADEP. 2020b. *Statewide Existing Use Classifications*. Last Revised January 13, 2020. Accessed at http://files.dep.state.pa.us/Water/Drinking%20Water%20and%20Facility%20Regulation/WaterQualityPortalFiles/Existing%20Use/EU%20table%20list.pdf on April 10, 2020.

Pennsylvania Fish and Boat Commission (PFBC). 2020a. *Adult Trout Stocking by County*. Accessed at http://fbweb.pa.gov/stocking/TroutStockingDetails_GIS.aspx on April 10, 2020.

PFBC. 2020b. 2020 *Pennsylvania Fishing Laws and Regulations – Stocked Trout Waters*. Accessed at http://pfbc.pa.gov/fishpub/summaryad/troutwaters.html on April 10, 2020.

PFBC. 2020c. *Pennsylvania Wild Trout Waters (Natural Reproduction) – Agust 2019*. Accessed at http://www.fishandboat.com/Fish/PennsylvaniaFishes/Trout/Documents/trout_repro.pdf on April 10, 2020.

Pennsylvania Groundwater Information System (PaGWIS). 2020. PaGWIS Multiple Criteria Search. Accessed at https://www.dcnr.pa.gov/Conservation/Water/Groundwater/PAGroundwaterInformationSystem/Pages/default.aspx on April 10, 2020.

Zimmerman, E., T. Davis, G. Podniesinski, M. Furedi, J. McPherson, S. Seymour, B. Eichelberger, N. Dewar, J. Wagner, and J. Fike (editors). 2012. *Terrestrial and Palustrine Plant Communities of Pennsylvania, 2nd Edition.* Pennsylvania Natural Heritage Program, Pennsylvania Department of Conservation and Natural Resources, Harrisburg, Pennsylvania.

Attachment S-1

Wetland and Watercourse Delineation Report

See Appendix E of Section 401 Water Quality Certificate Application

Attachment S-2

Scientist Resumes

AECOM

Mark Benfer
Environmental Scientist

Education
BS/Environmental Resource Management/2008/ Penn State University

Years of Experience
11

Training
38 hour USACE Wetland Delineation Training Program
Hydric Soil Indicators-Field Seminar

Summary
Mr. Benfer's experience includes environmental conservation and wetlands consulting. His expertise in the Marcellus Shale develop includes natural resources and industry compliance. He has managed a field crew to successfully complete conservation projects. More recently, Mr. Benfer has worked in the environmental consulting field, leading watercourse and wetland delineations of resources located on proposed pipeline, well pads, and similar oil and gas improvement projects. His areas of expertise also includes stream and wetland delineation, infiltration testing, erosion and sedimentation inspection, prairie restoration, timber stand improvement, invasive species removal, and portage construction.

Project Experience

Field Lead- Natural Gas Well Pads, Shell Appalachia, Multiple Counties, PA
Conducted wetland and watercourse delineations of proposed well sites to determine the best location for the well pad. Other responsibilities included evaluating the site for constructability, well pad staking, and preparing the wetland report for the ESCGP2 permit application.

Field Lead- Natural Gas Pipeline Wetland and Watercourse Investigation, Howard Energy Partners
Conducted a wetland and watercourse delineations for approximately 20 miles of proposed natural gas pipeline right-of-ways in Bradford and Tioga Counties, PA

Field Lead- Infiltration Testing, Multiple Counties, PA, Shell Appalachia:
Evaluated the rate of infiltration by conducting Falling Head infiltration tests located throughout the proposed natural gas well pad sites and other similar natural gas project sites. Duties also included completing a soil description and submitting an infiltration report in accordance with DEP regulations.

Field Lead I-80 Culvert Replacement Project Drums, PA, PennDot
Assessed approximately 12 miles of I-80 for wetlands and watercourses located within the project area.

Field Lead- I-84 Bridge Replacement Project, Scranton, PA, PennDot
Conducted a wetland and watercourse delineation for approximately 100 acres of proposed project area. Prepared wetland and watercourse data forms as well as Function and Values form for each wetland that was delineated.

Field Lead-Wetland Mitigation Bank Project, Wayne County, PA, RES
Conducted a wetland delineation and watercourse assessment of approximately 31 acres of a conservation easement to be used as a wetland mitigation site.

Field Lead- Natural Gas Pipeline, Multiple Counties, PA, UGI Energy, LLC. Pennsylvania
Conducted a wetland and watercourse delineation for approximately 40 miles of proposed natural gas pipeline right-of-ways.

Field Lead- Project Confidential, Multiple Counties, PA
Ongoing post construction investigation of wetlands and watercourses for post construction impact assessments.

Field Lead- Natural Gas Well Pads, Cabot Oil and Gas, Susquehanna County, PA
Staked out the well pad locations by evaluating the proposed well site for constructability and conducted a wetland and watercourse delineation of the site.

Field Lead- Natural Gas Pipeline: Post-Construction Resource Monitoring, Susquehanna County, PA, Williams Midstream Services, LLC.
Performed post-construction monitoring for wetlands and streams along Williams pipeline projects to determine if pre-construction conditions were restored. Monitoring was conducted at 30 days and one year after the pipeline construction was completed. Completed wetland and stream data forms for each resource within the right of way. Made suggestions for the restoration of resources not meeting pre-construction conditions

T&E Species- Northern Harrier Survey, Tioga Discharge CPF#2, Tioga County, PA, Howard Energy Partners
Assisted in completing a Presence/Absence survey to determine if there are Northern Harriers nesting near the proposed pipeline route. The project included surveying for the harriers twice a day for eight weeks.

Field Lead- Natural Gas Pipeline Wetland and

Watercourse Investigation, Angelina Gathering Company
Conducted a wetland and watercourse delineations for approximately 35 miles of proposed natural gas pipeline right-of-ways in Bradford and Susquehanna Counties, PA and Marshall County, WV.

Erosion and Sedimentation Inspections, Susquehanna County, PA, Cabot Oil and Gas:
Conducted evaluations of reclaimed natural gas pipeline areas. Developed and implemented solutions to erosion problems that were detected. Inspection duties included walking each right-of-way and ensuring all the best management practices are in place and completed inspection reports in accordance with DEP regulations.

Experience with a previous employer

Field Lead- National Parks, IA, MN, NE: Projects involved removing invasive plant species from the parks by either treating with chemicals or physically removing the invasive to encourage native vegetation to grow. Over 100 acres of invasive plants were removed. Invasive species removal projects lead to an increase in native vegetation.

Field Lead- Iowa DNR, Multiple Counties, IA:
Installed signage along Iowa's major dams warning paddlers of the danger ahead. Constructed take-outs and portages to allow paddlers an easy route around the dam. Managed a crew in the design and development of a campground for paddlers at Lake Red Rock. The campground has provided recreational opportunities for paddlers visiting the area. Created over 5 miles of new hand-carved trails within the state park system.

Field Lead- County Conservation Boards, Multiple Counties, IA: Restored over 200 acres of prairie and oak savanna land through the removal of invasive plant species and prescribed burns. These methods encouraged native plant species to recolonize the area. Used selective cutting methods to improve timber stands. The result of this project was improved habitat for wildlife and healthier trees.

Field Lead- USFWS, Savanna, IL: Protected a population of approximately 30 ornate box turtles by constructing a one square mile enclosure on a wildlife refuge. Removed invasive tree species to encourage the growth of native plant species on sand prairies. Painted and assembled deer blinds for handicapped youth hunt to control the deer population within the wildlife refuge.

Chronology

07/2011 to Present: AECOM, Williamsport, PA
02/2009 to 12/2010: Conservation Corp Iowa, Ames, IA
09/2007 to 05/2008: Weed Ecology Lab, University Park, PA
09/2005 to 05/2007: Dr. Robert Shannon, University Park, PA

Angela J. Chmiel
Environmental Scientist

Education

BS, Environmental Biology, Millersville University, 2005

Professional Affiliations

Society of Women Environmental Professionals
Society of Conservation Biology

Technical Specialties

Environmental Permitting
Wetland Delineations
Threatened and Endangered Species Surveys
Aquatic Macroinvertebrate Surveys

Ms. Chmiel is an environmental scientist with 13 years of experience working with AECOM in the environmental consulting field. She specializes in wetland delineations and permitting, rare, threatened, and endangered species surveys, and aquatic macroinvertebrate surveys. Ms. Chmiel has nationwide experience in wetland delineations and invasive species surveys. Her specific regulatory expertise includes biological assessments, consultations pursuant to Section 7 of the Endangered Species Act and is experienced in the preparation of a variety of environmental reports/applications including United States Army Corps (Clean Water Act Section 404), various state water quality certificates (Clean Water Act Section 401), and Federal Energy Regulatory Commission (FERC). She also has experience using and correcting global positioning system (GPS) for field and mapping purposes.

Experience

Tennessee Gas Pipeline Company, 300 Line Project, New Jersey and Pennsylvania. Wetland biologist and assistant biologist for field surveys of proposed centerline rights-of-way, temporary workspace, meter stations, and access road surveys to complete environmental permitting. Surveys included wetland delineations, water body assessments, T&E species, vernal pool identification and other species of concern habitat assessments, and significant land use types.

Tennessee Gas Pipeline Company, Northeast Upgrade Project, New Jersey and Pennsylvania. Wetland biologist and assistant biologist for field surveys of proposed centerline rights-of-way, temporary workspace, meter stations, and access road surveys to complete environmental permitting. Surveys included wetland delineations, water body assessments, T&E species, vernal pool identification and other species of concern habitat assessments, and significant land use types.

El Paso Gas Corporation, Northeast Expansion, Various Locations, Pennsylvania. Conducted wetland delineations and identified sensitive wildlife habitats in Adams, Berks, Franklin, Lancaster, Northhampton, and York Counties.

Norfolk Southern Railway, Wye Track Railroad, Jersey City, New Jersey. Assisted with field wetland delineations and wetland delineation report preparation. Used a Trimble GPS unit to survey wetland boundaries. Assisted with annual wetland mitigation monitoring.

Sealy (Formerly Stearns & Foster Bedding Co.), Oakeys Brook Mitigation Monitoring, Monmouth County, New Jersey. Conducted surveys to document restoration of wetland vegetation, hydrology, and hydric soils within Oakeys Brook restoration site after first through fourth growing season. Drafted mitigation monitoring reports for years 1 - 4 monitoring. Replanted trees and shrubs lost to deer browse.

Williams Companies, Bay Expansion, Downingtown, Pennsylvania. Authored Resource Report 11 for the Federal Energy Regulatory Commission submittal.

Dominion Resources Inc., Dominion Monroe to Cornwell, Various Locations, West Virginia. Assisted with field wetland delineations and writing the wetland delineation report. Utilized a Trimble GPS unit to survey wetland boundaries. Authored Resource Reports 2 and 3 for the Federal Energy Regulatory Commission submittal.

Liberty Utilities, 2014 Port Ambrose Deepwater Port License Application Support, Various Locations, New York. Team leader/wetland biologist for field surveys of proposed centerline rights of way, temporary workspace, meter stations, plant sites, plant laterals, pipe storage yard, and access road surveys through northeastern New Jersey to complete environmental permitting for the project. Surveys included wetland delineations, water body assessments, threatened and endangered species and other species of concern habitat assessments, and significant land use types. Also, acted as assistant project manager for the Federal Energy Regulatory Commission and US Coast Guard applications.

Williams Companies Inc., Sentinel Expansion, Pennsylvania. Conducted field surveys of proposed and existing linear pipelines throughout southeastern Pennsylvania and north-central New Jersey. Surveys included wetland delineations, waterbody assessments, threatened and endangered and other species of concern habitat assessments, significant land use observations, macroinvertebrate sampling, and invasive species surveys. Assisted with the permitting process.

Williams Companies Inc, Constitution Pipeline Environmental Support, Various Locations, Pennsylvania and New York. Team leader/wetland biologist for field surveys of proposed and existing linear pipelines through Pennsylvania and New York. Surveys included wetland delineations, water body assessments, threatened and endangered and other species of concern habitat assessments, and significant land use observations. Responsible for compiling Pennsylvania joint permit application.

Tennessee Gas Pipeline, Northeast Energy Direct Pipeline - Environmental Assessment and Permitting Servi, Chelmsford, New Hampshire; New York; Massachusetts; Pennsylvania; Connecticut. Assisted with field wetland delineations and writing the wetland delineation report. Utilized a Trimble GPS unit to survey wetland boundaries. Authored Resource Report 2 for the Federal Energy Regulatory Commission submittal. Acted as the liaison between AECOM's resource report writers and the engineers on the project.

Williams Companies, Garden State Expansion Project, Trenton, New Jersey. Assisted with field wetland delineations and writing the wetland delineation report. Utilized a Trimble GPS unit to survey wetland boundaries. Authored Resource Report 3 for the Federal Energy Regulatory Commission submittal.

AECOM

Brian Miller
Senior Ecologist

Education
BS / Environmental Studies / Washington & Jefferson College

Years of Experience
With AECOM / URS: 1 year and 11 months
With other firms: 8 years

Professional History
05/2010 - 05/2012, GAI Consultants, Inc. Lead Environmental Scientist

05/2012 - 05/2013, Rettew Associates, Inc. Environmental Scientist II

05/2013 - 05/2018, GAI Consultants, Inc. Project Environmental Specialist

05/2018 - Present, AECOM Senior Ecologist

Specialized Training
Wetland delineation certified

Safeland certified

Summary
Mr. Miller has almost 10 years of experience as an environmental scientists/consultant for energy related Projects including natural gas pipelines, electric overhead/underground lines, well pads, impoundments, wind farms, temporary above ground and permanent below ground waterlines located within the Northeast and Southeast Regions of the U.S.

During the past eight years, Mr. Miller has provided his assistance on several energy related projects involving environmental permitting (Section 401/404 Clean Water Act, Section 10 Rivers and Harbors Act) and rare species consultation with various agencies in Pennsylvania (PA), West Virginia (WV), Ohio (OH), and Maryland (MD). Additional regulatory assistance on related energy projects included Federal Energy Regulatory Commission (FERC) wetland monitoring and comprehensive environmental reviews.

Furthermore, Mr. Miller also is proficient in completing wetland delineations in accordance to the 1987 USACE Wetland Delineation Manual and Regional Supplements. Over the past several years, he has lead multiple field teams on small to large energy related Projects located in Pennsylvania, Ohio, Virginia, West Virginia, Maryland, and Texas. Additional field experience includes completion of various rapid assessment methodologies (PA Level 2 Rapid Assessments and OH-ORAMS, HEEI, and QHEI), problematic delineations for atypical situations (i.e. undocumented fills), monitoring projects (PASPG-5/USACE and FERC requirements), environmental routing, and habitat assessments / presence and absence surveys for rare plants and animals. A summary of work experiences and projects completed with current project work and experience with previous employers has been provided below.

Current Experience with AECOM
During the past several months with AECOM, Mr. Miller has provided his assistance on several Projects in Pennsylvania and West Virginia. A summary of these project have been provided below.

Lead Ecologist, Electric Utility Projects in Various Counties, OH. Task manager of all ecological activities including field delineation of wetland and stream assessments; Section 404 and Section 401 authorizations; Section 10 requests; as well as threatened and endangered species consultation.

Permitting Lead, Biologist, Permanent Water Intake in Brooke County, WV USACE Permitting assistance for Section 404 and Section 10 authorization; Rare species consultation with USFWS and WVDNR; and Office of Land and Stream (OLS) Application.

Wetland Delineation, Biologist, Delineation for Pipeline Insertion Project in Greene County, PA. Wetland delineation for replacement of existing pipeline and facilities via insertion. Mr.Miller was responsible for completing the wetland delineation report and mapping and coordination.

Permitting Lead, Biologist, for water lines, gas pipelines, and intake facilities in Tioga and Potter Counties, PA. Mr. Miller conducted wetland and stream investigations for a permanent waterline facility located within Tioga and Potter County. Upon completion, Mr. Miller was responsible for the completion of the section 401/404 report authorization under a Joint Permit Application and/or General Permit 5 and 8. Furthermore, Mr. Miller was responsible for managing and updating the project's Geographic Information System (GIS) data.

Wetland Delineation, Biologist, Delineation for Electrical Transmission Line in Portage County, OH. Mr. Miller conducted wetland and stream investigations for an electrical transmission line and substation in Portage County. Upon completion of the environmental survey, Mr. Miller completed a review of the wetland delineation report and findings.

Wetland Delineation, Biologist, Delineation for Electrical Transmission Line in Cambridge, OH. Mr. Miller conducted wetland and stream investigations for an electrical transmission line project in Portage County.

Wetland Delineation, Biologist, Delineation for Electrical Transmission Line in Carrollton, OH. Mr. Miller conducted wetland and stream investigations for an electrical transmission line project in Portage County.

Project Experience with Previous Employers

Mr. Miller has assisted as an environmental consultant for several natural gas pipeline projects located in various counties in PA, WV, OH, and MD. Task associated with these energy related projects include section 401/404 agency consultation and permitting, pipeline/utility line/electric transmission line routing with field and desktop analysis with identifying environmental and constructability constraints. Mr. Miller also coordinated and completed endangered species consultation, wetland delineation and stream identification, and site visits with regulatory agencies for jurisdictional determinations. A summary of previous projects have been provided below.

Pennsylvania

Greene and Washington Counties, PA – Natural Gas Pipeline Projects

Task/Permitting/Field Lead for General Permit Authorizations (GP-5, GP-8, and GP-11) for three individual natural gas pipelines projects submitted to Greene and Washington Counties Conservation Districts and USACE for consultation under Section 401/404 of the Clean Water Act. Additional consultation for rare, threaten, and endangered species was required with Pennsylvania Game Commission (PGC) and United States Fish and Wildlife Service (USFWS) for Indiana Bat and Northern Long Eared Bat. As per USACE conditions, additional monitoring and reporting services were provided for these projects as result of temporary impacts to wetlands.

Allegheny, Washington, Westmoreland, and Greene Counties, PA – Electrical Overhead Line

Permitting/Field Lead for General Permit Authorizations (GP-5 and GP-8) for multiple overhead electrical utility lines and temporary access road submitted to Allegheny County Conservation District with USACE approval for Section 404 as well as Section 10 authorizations. Additional consultation was required for PADEP as result of several projects requiring a Submerged Land Licenses Agreement (SLLA) and several agencies (PGC, USFWS, PA Fish and Boat [PFBC], and PA Department of Conservation and Natural Resources [PADCNR] regarding rare, threaten, and endangered species.

Various Counties, PA – Electrical Overhead Line

Routing/Field Lead associated with the preliminary development of an electrical overhead line as part of a large network to repair, rebuild, and enhance existing utilities lines located near Grove City, PA. Mr. Miller along with representatives from the electric company and construction provided in-field adjustments and suggestions to avoid environmental sensitive areas including wetlands, watercourses, and rare species.

Allegheny, Westmoreland, Greene, and Washington Counties, PA – Natural Gas Pipeline Project

Task/Field lead for Federal Energy Regulatory Commission (FERC) wetland monitoring and reporting for a 110-mile natural gas pipeline (extends into WV). Responsibilities included yearly monitoring and reporting to FERC with designing and managing re-seeding events for impacted wetlands; agency coordination; and invasive species presence/absence surveys.

Cambria County, PA – Natural Gas Pipeline Project

Task/Permitting/Field lead for a Joint Permit Authorization (JPA) of a natural gas pipeline located in Gallitzin State Forest in Cambria County, PA. The Project resulted in an incidental inadvertent return and required additional emergency permitting for an additional access road (GP-8) as well as mitigation for the wild trout stream under a General Permit 1 (GP-1; Fish Habitat Enhancement Structures). Additional services required consultation for State Forest Right of Entry Application resulting in additional environmental survey for invasive species and timber rattle snake habitats within Gallitzin State Forest.

Clarion County, PA – Natural Gas Pipeline and Well Pad Projects

Task/Permitting/Field Lead for General Permit (GP-5 and GP-8) authorization of a natural gas project composed of pipelines, well pads, temporary water lines and intakes, and well pads and impoundments in Clarion County, PA. Services included routing for environmental and constructability constraints with field and desktop reviews; agency coordination including site visits, phone calls, and pre-application meetings with the PaDEP and USACE; and agency consultation for rare, threaten, and endangered species.

Butler County, PA – Natural Gas Pipeline Project

Permitting/Field Lead for General Permit (GP-5 and GP-8) authorization of a natural gas project composed of pipelines and well pads. Environmental services included preparation of permit application, site visits for identification of Eastern Massasauga Rattlesnake habitat with PFBC representative, and field delineations for wetland and streams.

Butler County, PA – Natural Gas Pipeline Project

Public Utility Commission (PUC) / FERC filing Project required Section 401 individual authorization for impacts associated with wetland and streams. Environmental services for this project included wetland and stream delineations, PA level 2 rapid

assessments for riverine and wetland resources, development of environmental assessment report, and preparation of a JPA.

Centre County, PA – Natural Gas Pipeline Project
Task Manger for monitoring and design services for a created wetland that involved coordination and field visits with PA Department of Environmental Protection (PaDEP) and United States Army Core of Engineers (USACE). Project required yearly reporting of monitoring results of wetland creation and establishment of invasive species.

Various Counties, PA – Natural Gas Pipelines, Well Pads, Temporary Waterlines, and Impoundments
Field Lead for wetland and waterbodies delineations and environmental router for avoidance of environmental sensitive areas including wetlands, streams, and rare species habitats. Also provided construction environmental inspector support on multiple temporary waterlines.

Ohio and West Virginia

Marshall, Wetzel, and Kanawha Counties, WV – Natural Gas Pipeline Project
Task/Field lead for Federal Energy Regulatory Commission (FERC) wetland monitoring and reporting for a 110-mile natural gas pipeline (extends into PA). Responsibilities included yearly monitoring and reporting to FERC with designing and managing re-seeding events for impacted wetlands; agency coordination; and invasive species presence/absence surveys.

Marshall and Wetzel Counties, WV – Natural Gas Pipeline Project
Permit/Field lead for a 60-mile pipeline authorized under Pre-Construction Notification (PCN) Nationwide Permit Authorization (NWP) under NWP-12 (utility lines). Environmental services included desktop and field routing for environmental sensitive areas, rare species consultation, and environmental permitting.

Various Counties in Ohio – Natural Gas Pipeline Projects

Performed several wetland and stream investigations associated with natural gas network in various counties in Ohio. Additionally tasks included preparation of Section 404 and 401 authorizations, Section 10 approvals, and Endangered Species Consultation with the United States Fish and Wildlife Service (USFWS) and Ohio Division of Natural Resources (ODNR).

Various Counties in WV and OH – Temporary Water Line Projects associated with Gas Well Developments – Field/Routing Lead for temporary water lines permitted under the USACE Nationwide Permit Authorization Process in Ohio and West Virginia.

Various Counties in WV and OH – Electric Overhead Transmission Projects – Field/Routing Lead for preliminary site assessments and engineering designs of access road, staging areas, and towers locations associated with replacement of overhead electric lines. Additional task included consultation for Section 401 and 404 authorizations, desktop analysis, and rare species consultation.

Electrical Substation Projects in WV and OH – Performed as an environmental lead for wetland and stream investigations, section 401/404 authorizations, and rare species consultation for various counties in WV and Ohio.

Other States

Houston, Texas – Gas Impoundment Site – Field assistant for a wetland delineation and stream identification of a 40-acre gas development site located in the coastal plain area of Texas. Delineations methodology included mosaic classifications of wetland and upland communities

Fairfax, Virginia – Water Quality Assessments - Field technician for water quality sampling and reporting of discharges associated with a confidential coal ash impoundment and energy facility in Virginia.

Various Counties, Virginia – Electric Overhead Line – Field lead for wetland and waterbody delineations for a replacement of an electric transmission line and towers.

Various Counties, Virginia – Natural Gas Pipeline - Field lead f or wetland and waterbody delineations for a pipeline replacement project.

AECOM
10 Orms Street, Suite 405
Providence, Rhode Island 02904

401.274.5685 tel
401.521.2730 fax

Eileen Banach Piskura
Biologist

Professional History

Education

MS, Biology, Louisiana State University Shreveport
BS, Biology, Fordham University
Graduate Level coursework in Ecology and Natural History, Drexel University,

Years of Experience

With AECOM 13

Technical Specialties

Major Capital Projects Permitting
Wetland Permitting
Wetland Mitigation
Environmental Impact Assessment & Statements
Threatened & Endangered Species Consultation

Training

Hazardous Waste Operations and Emergency Response (HAZWOPER)

Ms. Piskura has 13 years of technical experience in the environmental consulting field with an emphasis on linear permitting, habitat assessment, threatened & endangered species consultation and erosion and sediment control plans. Ms. Piskura has experience in filings required for utility project permit applications in Massachusetts, Connecticut, Rhode Island, New York, and Pennsylvania. She has also conducted regulatory compliance activities, including environmental monitoring on numerous maintenance, improvement, and new installation projects for natural gas and electrical transmission lines.

Ms. Piskura has experience in the preparation of a variety of environmental permit applications and reports on a wide range of projects requiring an understanding of the environmental permitting process using federal, state, and local criteria. Ms. Piskura's work on utility projects includes preparation of applications for the Federal Energy Regulatory Commission, U.S. Army Corps of Engineers, Pennsylvania Department of Environmental Protection, Connecticut Siting Council, Connecticut Department of Energy and Environmental Protection, Rhode Island Energy Facilities Siting Board, Rhode Island Department of Environmental Management, Massachusetts Wetlands Protection Act, Storm Water Pollution Prevention Plans, and Rhode Island Pollution Discharge Elimination System.

Experience

Enbridge, Inc. Penn Jersey Integrity Project, Pennsylvania. 2016-Present. Ms. Piskura is Deputy Project Manager for the Penn Jersey Integrity Project. Responsibilities include tracking anomaly investigations, desktop review, evaluating and coordinating field survey, evaluating and completing environmental permitting needs, threatened and endangered species coordination, providing site-specific mapping to Environmental Inspection personnel, and close coordination with Enbridge environmental and construction staff. Since the initiation of the Project, Ms. Piskura has reviewed and completed necessary tasks for approximately 1,300 anomaly investigations along Enbridge's right-of-way under the Pennsylvania Programmatic General Permit.

Enbridge, Inc. Seconded Employee in Enbridge's Environmental Projects US Group. 2019-Present. Ms. Piskura is currently a part of Enbridge's Environmental Projects US Group, supporting the Penn Jersey Integrity Program as well as other related maintenance and replacement projects. In addition to tracking and

AECOM
10 Orms Street, Suite 405
Providence, Rhode Island 02904

401.274.5685 tel
401.521.2730 fax

evaluating anomaly investigations, Ms. Piskura is assigned as the environmental manager within Enbridge's Environmental Construction Permits Database and is responsible for processing new projects within the Database in coordination with Enbridge Project staff and for providing final Construction Clearance authorization.

Enbridge Inc. Conemaugh River Crossing Project. 2019-Present. Ms. Piskura is currently acting as Deputy Project Manager for the Conemaugh River Crossing Project, which will replace a section of Enbridge's existing Line 12 across the Conemaugh River in Pennsylvania. Ms. Piskura is responsible for US Army Corps of Engineers and Pennsylvania Department of Environmental Protection permit preparation, agency coordination, threatened and endangered species consultation, and Enbridge project team coordination.

Enbridge Inc. EAGL-LAMT DOT 2020 Project. 2019-Present. Ms. Piskura is currently acting as Deputy Project Manager for the EAGL-LAMT DOT 2020 Project, which will replace a section of Enbridge's existing Line 2 in Chester County, Pennsylvania. Ms. Piskura is responsible permit preparation, agency coordination, threatened and endangered species consultation, and Enbridge project team coordination.

Enbridge Inc. Line 19 Kulps Road Project. 2019-2020. Ms. Piskura acted as the Deputy Project Manager for the Line 19 Kulps Road Project, which involved two anomaly repairs requiring enhanced permitting due to impacts to threatened and endangered species habitat. Ms. Piskura ws responsible for US Army Corps of Engineers and Pennsylvania Department of Environmental Protection permit preparation, agency coordination, threatened and endangered species consultation, and Enbridge project team coordination.

Tennessee Gas Pipeline Company, LLC Northeast Energy Direct Project, Pennsylvania, New York, Massachusetts, New Hampshire, and Connecticut. Ms. Piskura managed environmental report preparation and permitting under the Federal Energy Regulatory Commission. Responsible for overall data collection and assimilation for delivery of all resource reports and supporting documents. The project consisted of the construction of approximately 420 miles of pipeline and supporting facilities originating in Pennsylvania and traversing New York, Massachusetts, New Hampshire, and Connecticut.

Tennessee Gas Pipeline Company, LLC Connecticut Expansion Project, New York, Massachusetts, and Connecticut. Ms. Piskura managed environmental report preparation and permitting under the Federal Energy Regulatory Commission, and was the principal author of several resource reports. Supported permitting needs for state wetland applications, and Section 401 Water Quality Certification application. The project consists of approximately 13 miles of new 24 and 36-inch pipeline along existing rights-of ways in New York, Massachusetts, and Connecticut.

Iroquois Gas Transmission System Wright Transfer Compressor Project, New York. Ms. Piskura managed environmental report preparation and permitting under the Federal Energy Regulatory Commission, and was the principal author of several resource reports. The project consists of construction of a new compressor, natural gas cooling and metering facilities in New York.

Constitution Pipeline Company, LLC Constitution Pipeline Project, Pennsylvania and New York. Ms. Piskura served as a project technical specialist for environmental report preparation and permitting under the Federal Energy Regulatory Commission. The project consists of the construction of approximately 123 miles of 30-inch pipeline along green field right-of-way in Pennsylvania and New York.

Tennessee Gas Pipeline Company Northeast Upgrade Project, Pennsylvania and New Jersey. Ms. Piskura was responsible for field investigations and supporting documentation related to wetlands and habitat assessments under the Federal Energy Regulatory Commission as well as state and local municipal review

AECOM
10 Orms Street, Suite 405
Providence, Rhode Island 02904

401.274.5685 tel
401.521.2730 fax

processes. The project consists of the construction of approximately 40 miles of 30-inch pipeline in Pennsylvania and New Jersey.

Josh Singleton
Environmental Scientist

Key skills
Wetland Delineation, Avian Surveying, Post-construction Monitoring for Solar and Wind

Years of experience
8+

Years with AECOM
3

Education
Associate of Science in Wildlife Science and Technology from Penn State University

Mr. Singleton has over 8 years of experience as a staff biologist in environmental and related fields. Experience includes:

- Wetland delineations; Prepare reports summarizing the findings of investigations for submittal to clients and the Pennsylvania Department of Environmental Protection (PADEP);
- Avian migration surveys, bird use counts, breeding bird surveys, raptor nest monitoring;
- Bird and bat mist-netting surveys;
- Post-construction mortality monitoring on active wind and solar facilities;

Professional history

2010 – 2015 Western Ecosystems Technology, Inc (WEST).

2015 – Present AECOM

Selected project experience

Post-Construction Mortality Monitoring, NextEra Energy
Conducted standardized searches for bird and bat fatalities on an operating wind farm. North Sky River, Kern County, CA.

Golden Eagle Radar Project, Next Era Energy
Conducted radar ground-truthing to detect Golden Eagles. North Sky River, Kern County, CA.

Northern Harrier Presence/Absence Survey, HEP Pennsylvania Gathering, LLC
Assisted with field surveys. Tioga CPF#2 Discharge, Lycoming and Tioga Counties, PA, HEP Pennsylvania Gathering, LLC.

Northern Harrier and Short Eared Owl Presence/Absence Survey, Shell Appalachia
Assisted with field surveys. Falcon Ethane Pipeline, Allegheny County, PA, Shell Appalachia, LLC.

Avian Migration Surveys, Next Era Energy
Conducted spring and fall migration surveys in proximity to IBAs and operating wind farms. North Sky River, Kern County, CA.

Bias and Removal Trials, Pattern Energy
Carried out searcher efficiency trials and conducted experiments to determine scavenging rates. Ocotillo Wind Project, Imperial County, CA.

Wetland and Watercourse Investigation, Shell Appalachia
Conduct wetland watercourse delineations at proposed and existing well sites in Elk and Tioga Counties, PA. Shell Appalachia, LLC.

Invasive Species Control and Removal, Panther Swamp, Columbia Gas Corporation
Support the ongoing control/removal of *Phragmites australis* from a wetland mitigation site Pike County, PA.

Phase II Bog Turtle Surveys, Quaker Mitigation Project
Assist with habitat assessment and population survey using survey protocols established by the U.S Fish and Wildlife Service and Pennsylvania Fish and Boat Commission for the Quaker Mitigation Project. Berks County, PA

Bat Mist-Netting and Telemetry, Iberdrola Renewables
Conducted mist-netting surveys for sensitive bat species and radio telemetry on radio-tagged bats. Blue Creek Wind Farm, Van Wert and Paulding Counties, OH.

Post-Construction Monitoring, NextEra Energy
Carried out several duties involved with post-construction monitoring on an active solar farm, including Searcher Efficiency Trials, Carcass Removal Trials, Species Relocation, Avian Surveys and Erosion Control. Desert Sunlight Solar Farm, Riverside County, CA.

Attachment S-3

PA Riverine L2RAP Data Sheets and Mapping

Riverine Assessment Form 1

Pennsylvania Riverine Condition Level 2 Rapid Assessment Protocol (Document No. 310-2137-003)

Pennsylvania Department of Environmental Protection

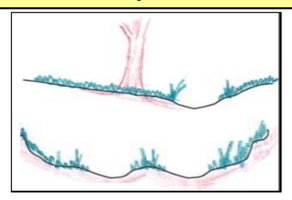
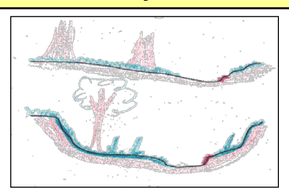
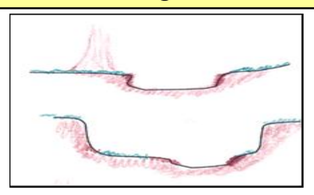
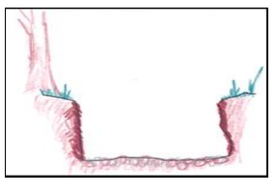
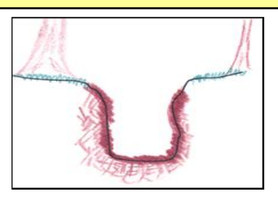
For use in intermittent or perennial watercourses with drainage areas ≤ 2,000 square mile drainage areas.

Project #	Project Name	Locality	Date	Ch 93 Classification		AA Id	Length
				Designated:	Existing:		
60624893	Line 12 Conemaugh River Crossing Project	Westmoreland and Indiana Counties	3/5/2020	WWF	-	S-JLK-037	195'

Latitude	Longitude	FGM Level 1 Channel Classification	
40.456669	-79.298122	B	

Evaluator(s)	Stream Name and Information	Notes:
B. Miller	S-JLK-037 PER	

1. CHANNEL/FLOODPLAIN: Assess the cross-section of the stream and prevailing conditions along the AA.

	Condition Category									
	Optimal		**Suboptimal**		**Marginal**		**Poor**		**Severe**	
Channel / Floodplain	 **Channel Geometry:** These channels show very little incision or widening and little or no evidence of active erosion. Anastomosing channels may be present. **Channel Stability:** Visual indicators include: 1) the banks are not eroding along greater than 5% of the reach; 2) natural vegetative or rock stability features are present along greater than 80% of the banks; 2) stable point bars and bankfull benches may be present; 3) mid-channel bars and transverse bars are rare and if transient channel sediment deposition is present, it covers less than or equal to 10% of the stream bottom; 4) baseflow is connected to the rooting depths of vegetation in the active floodplain. **Active Floodplain Connection:** The bankfull stream flows have frequent access to the active floodplain and fully developed point bars or bankfull benches that are accessed at most flows greater than baseflow.	 **Channel Geometry:** These channels are slightly incised or overwidened and contain a few areas of active erosion. **Channel Stability:** Visual indicators include: 1) the banks are actively eroding along less than 25% of the reach; 2) depositional features such as point bars and bankfull benches are present and stable during high flows and occur along greater than 50% of the reach; 3) natural bank protection like vegetation or rock is providing stability along greater than 50% of the reach; 4) baseflow is connected to vegetated point bars and bankfull benches. **Active Floodplain Connection:** The bankfull stream flows frequently access bankfull benches, or point bars along portions of the reach and may frequently inundate the active floodplain.	 **Channel Geometry:** These channels are over-widened or incised, but to a lesser degree than the Severe and Poor channel conditions. **Channel Stability:** Visual indicators include: 1) the banks are eroding or severely undercut along greater than 25% and less than or equal to 50% of the reach; 2) depositional features like point bars or bankfull benches occur along greater than 25% and less than or equal to 50% of the reach; 3) the stream banks may consist of some vertical or undercut banks or nick points associated with head cuts; **Active Floodplain Connection:** The bankfull stream flows have infrequent connection to the active floodplain.	 **Channel Geometry:** These channels are over-widened or incised and eroding vertically and/or laterally. **Channel Stability:** Visual indicators include: 1) the banks are eroding or severely undercut along greater than 50% of the reach; 2) active or recent bank sloughing is present along greater than 50% of the reach; 3) natural bank protection like vegetation is not preventing bank erosion along the reach; 4) depositional features, such as point bars and bank full benches, are absent from the reach or newly developing along less than 25% of the reach; 5) bank full benches and point bars frequently scour during high flows; 6) baseflow is disconnected from plant rooting depths and the active floodplain. **Active Floodplain Connection:** The bankfull stream flows are not connected to the active floodplain.	 **Channel Geometry:** These channels are deeply incised and actively eroding vertically and/or laterally. Over widened channels may contain sections of unstable braided channels from aggradation. **Channel Stability:** Visual indicators include: 1) the banks are actively eroding or being undercut along greater than 80% of the reach; 2) active or recent bank sloughing is occurring along greater than 80% of the reach; 3) natural bank protection like vegetation is not preventing bank erosion or sloughing; 4) depositional features such as point bars and bankfull benches are absent; 5) flood flows are disconnected from the active floodplain. **Active Floodplain Connection:** The bankfull stream flows are never connected to the active floodplain.
SCORE	20 19 18 17	16 15 14 13	12 11 10 9	8 7 6 5	4 3 2 1					

Comments:

CI = (Score)/20		CI
SCORE:	12	0.60

2. RIPARIAN VEGETATION: Assess the floodplain along the entire AA (Visual estimates of areal coverage from aerial photos with field verification acceptable).

Condition Category				
Optimal	**Suboptimal**	**Marginal**	**Poor**	
Riparian area vegetation consists of a tree stratum present (diameter at breast height (dbh) > 3 inches) with greater than or equal to 60% tree canopy cover. Areas comprised of stream channels, wetlands (regardless of classification or condition) and lacustrine resources ≥ 10 acres are scored as optimal.	**High Suboptimal:** Riparian area vegetation consists of a tree stratum (dbh > 3 inches) present, with greater than or equal to 30% and less than 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	**High Marginal:** Riparian area vegetation consists of non-maintained, dense herbaceous vegetation with either a shrub layer or a tree stratum (dbh > 3 inches) present, with less than 30% tree canopy cover.	**High Poor:** Riparian area vegetation consists of lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, pervious trails, recently seeded and stabilized, or other comparable condition.	
	Low Suboptimal: Riparian area vegetation consists of a tree stratum (dbh > 3 inches) present, with greater than or equal to 30% and less than 60% tree canopy cover with a maintained understory.	**Low Marginal:** Riparian area vegetation consists of non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, areas of hay production, and ponds or open water areas (< 10 acres). If trees are present, tree stratum (dbh > 3 inches) present, with less than 30% tree canopy cover with maintained understory.	**Low Poor:** Riparian area consists of impervious surfaces; mine spoil lands, denuded surfaces, row crops, active feed lots, impervious trails, or other comparable conditions.	
	High	**High**	**High**	**Low**
20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1	

Comments:

1. Identify Condition Category areas along the floodplain using the descriptors above.
2. Estimate the % area within each condition category.
3. Enter the % Riparian Area in in decimal form (0.00) and Score for each category in the blocks below. Ensure the sum of the % Riparian Area Blocks equal 100

	Condition Category	Optimal	High Suboptimal	Low Suboptimal	High Marginal	Low Marginal	High Poor	Low Poor	Side Sub-Index	
Right Side	% Riparian Area:	96%	0%	0%	0%	0%	0%	4%	**0.87**	**Side Sub-Index = SUM(%Areas*Scores)/20**
	Score:	18	0	0	0	0	0	2		
	Total Sub-score:	**17.33**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.07**		
	Condition Category	**Optimal**	**High Suboptimal**	**Low Suboptimal**	**High Marginal**	**Low Marginal**	**High Poor**	**Low Poor**		
Left Side	% Riparian Area:	98%	0%	0%	0%	0%	0%	2%	**0.88**	**CI = (Left Side CI + Right Side CI)/2**
	Score:	18	0	0	0	0	0	2		
	Total Sub-score:	**17.58**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.05**		

CI
0.88

Riverine Assessment Form 1 - Page 2

2/4/2017

3. RIPARIAN ZONE OF INFLUENCE: Assess land cover along both sides, 100 feet from edge of floodplain into the upland along the entire AA. (rough measurements of length & width may be acceptable)

	Condition Category						Comments:
	Optimal	**Suboptimal**		**Marginal**		**Poor**	
Riparian ZOI	Riparian ZOI area vegetation consists of a tree stratum present (diameter at breast height (dbh) > 3 inches) with greater than or equal to 60% tree canopy cover. Areas comprised of stream channels, wetlands (regardless of classification or condition) and lacustrine resources ≥ 10 acres are scored as optimal.	**High Suboptimal:** Riparian ZOI area vegetation consists of a tree stratum (dbh > 3 inches) present, with greater than or equal to 30% and less than 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	**Low Suboptimal:** Riparian ZOI area vegetation consists of a tree stratum (dbh > 3 inches) present, with greater than or equal to 30% and less than 60% tree canopy cover with a maintained understory.	**High Marginal:** Riparian ZOI area vegetation consists of non-maintained, dense herbaceous vegetation with either a shrub layer or a tree stratum (dbh > 3 inches) present, with less than 30% tree canopy cover.	**Low Marginal:** Riparian ZOI area vegetation consists of non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, areas of hay production, and ponds or open water areas (< 10 acres). If trees are present, tree stratum (dbh > 3 inches) present, with less than 30% tree canopy cover with maintained understory.	**High Poor:** Riparian ZOI area vegetation consists of lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, pervious trails, recently seeded and stabilized, or other comparable condition.	**Low Poor:** Riparian ZOI area consists of impervious surfaces; mine spoil lands, denuded surfaces, row crops, active feed lots, impervious trails, or other comparable conditions.	
		High	**Low**	**High**	**Low**	**High**	**Low**	
SCORE	**20 19 18 17 16**	**15 14 13**	**12 11**	**10 9 8**	**7 6**	**5 4 3**	**2 1**	

1. Identify Condition Category areas along the floodplain using the descriptors above.
2. Estimate the % area within each condition category.
3. Enter the % Riparian Area in decimal form (0.00) and Score for each category in the blocks below. Ensure the sums of % Riparian ZOI Blocks equal 100

	Condition Category	Optimal	High Suboptimal	Low Suboptimal	High Marginal	Low Marginal	High Poor	Low Poor	Side Sub-Index	
Right Side	% Riparian Area:	79%	0%	0%	0%	8%	0%	13%	**0.75**	**Side Sub-Index = SUM(%Areas*Scores)/20**
	Score:	18	0	0	0	7	0	2		
	Total Sub-score:	**14.24**	**0.00**	**0.00**	**0.00**	**0.56**	**0.00**	**0.26**		
	Condition Category	**Optimal**	**High Suboptimal**	**Low Suboptimal**	**High Marginal**	**Low Marginal**	**High Poor**	**Low Poor**		
Left Side	% Riparian Area:	58%	0%	0%	0%	26%	0%	16%	**0.63**	**CI = (Left Side CI + Right Side CI)/2**
	Score:	18	0	0	0	7	0	2		**CI**
	Total Sub-score:	**10.52**	**0.00**	**0.00**	**0.00**	**1.80**	**0.00**	**0.32**		**0.69**

4. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths, woody and leafy debris, stable substrate, low embeddedness, shade, undercut banks, root mats, SAV, macrophytes, emergent vegetation, riffle-pool complexes, stable features.

	Condition Category				Comments:		
	Optimal	**Suboptimal**	**Marginal**	**Poor**			
Instream Habitat/ Available Cover	Physical Elements that enhance a stream's ability to support aquatic organisms are present in greater than or equal to 50% of the reach. Substrate is favorable for colonization by a diverse and abundant epifaunal community, and there are many suitable areas for epifaunal colonization and/or fish cover.	Physical Elements that enhance a stream's ability to support aquatic organisms are present in greater than or equal to 30% and less than 50% of the reach. Conditions are mostly desirable and are generally suitable for full colonization by a moderately diverse and abundant epifaunal community.	Physical Elements that enhance a stream's ability to support aquatic organisms are present in greater than or equal to 10% and less than 30% of the reach. Conditions are generally suitable for partial colonization by epifaunal and/or fish communities.	Physical Elements that enhance a stream's ability to support aquatic organisms are present in less than 10% of the reach. Conditions are generally unsuitable for colonization by epifaunal and/or fish communities. The reach.	**CI = (Score)/20**		**CI**
SCORE	**20 19 18 17 16**	**15 14 13 12 11**	**10 9 8 7 6**	**5 4 3 2 1**	**SCORE:**	13	**0.65**

5. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel/channelization, embankments, spoil piles, constrictions, etc.

	Condition Category					Comments:		
	Negligible	**Minor**		**Moderate**		**Severe**		
Channel Alteration	Channel alterations listed above are absent in the SAR. The stream has unaltered pattern or has normalized.	**Minor High:** Less than or equal to 20% of the stream reach is disrupted by any of the channel alterations listed above. Alteration or channelization present, usually adjacent to structures, (such as bridge abutments or culverts); evidence of past alteration, (i.e., channelization) may be present, but stream pattern and stability have recovered; recent alteration is not present.	**Minor Low:** Greater than 20% and less than or equal to 40% of the stream reach is disrupted by any of the channel alterations listed above. Alteration or channelization present, usually adjacent to structures, (such as bridge abutments or culverts); evidence of past alteration, (i.e., channelization) may be present, but stream pattern and stability have recovered; recent alteration is not present.	**Moderate High:** Greater than 40% and less than or equal to 60% of reach is disrupted by any of the channel alterations listed above. If the stream has been channelized, normal stable stream meander pattern has not recovered.	**Moderate Low:** Greater than 60% and less than or equal to 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If the stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 80% of reach is disrupted by any of the channel alterations listed above. Greater than 80% of banks shored with gabion, riprap, or concrete.		
		High	**Low**	**High**	**Low**		**CI = (Score)/20**	**CI**
SCORE	**20 19 18 17 16**	**15 14 13**	**12 11**	**10 9 8**	**7 6**	**5 4 3 2 1**	**SCORE:** 20	**1.00**

RIVERINE CONDITION INDEX (RCI)	**RCI**
NOTE: **The CIs and RCI should be rounded to 2 decimal places.**	**RCI = (Sum of all CI's)/5 or Ephemeral/Intermittent RCI = (Sum non instream CI's)/4** → **0.76**

If a CI is not applicable (e.g. due to use on intermittent watercourse or >100 sq. mile drainage area) in order to utilize the auto calculator feature the user will need to modify the RCI formula or enter the maximum score for that CI to achieve a CI of 1.0 which will offset the divisor difference.

General Comments:

Riparian Vegetation Worksheet

Desktop Review

Condition Category	R Size (Ac)	R %	L Size (Ac)	L %
Optimal	172.18	96%	172.81	98%
High Suboptimal	0.00	0%	0.00	0%
Low Suboptimal	0.00	0%	0.00	0%
High Marginal	0.00	0%	0.00	0%
Low Marginal	0.00	0%	0.00	0%
High Poor	0.00	0%	0.00	0%
Low Poor	6.70	4%	4.11	2%
Calculated total area	178.88	100%	176.92	100%

Field View

Condition Category	R Size (Ac)	R %	L Size (Ac)	L %
Optimal	171417.66	96%	172.81	98%
High Suboptimal	0.00	0%	0.00	0%
Low Suboptimal	0.00	0%	0.00	0%
High Marginal	0.00	0%	0.00	0%
Low Marginal	0.00	0%	0.00	0%
High Poor	0.00	0%	0.00	0%
Low Poor	6670.34	4%	4.11	2%
Calculated total area	178088.00	100%	176.92	100%

Entered Total Area **178088.00** **176.92** From shape file for RV (zone)

Calculated total area and Entered Total Area must be equal

Riparian ZOI Worksheet

Desktop Review

Condition Category	R Size (Ac)	R %	L Size (Ac)	L %
Optimal	20.69	79%	6.49	58%
High Suboptimal	0.00	0%	0.00	0%
Low Suboptimal	0.00	0%	0.00	0%
High Marginal	0.00	0%	0.00	0%
Low Marginal	2.11	8%	2.85	26%
High Poor	0.00	0%	0.00	0%
Low Poor	3.36	13%	1.76	16%
Calculated total area	26.16	100%	11.10	100%

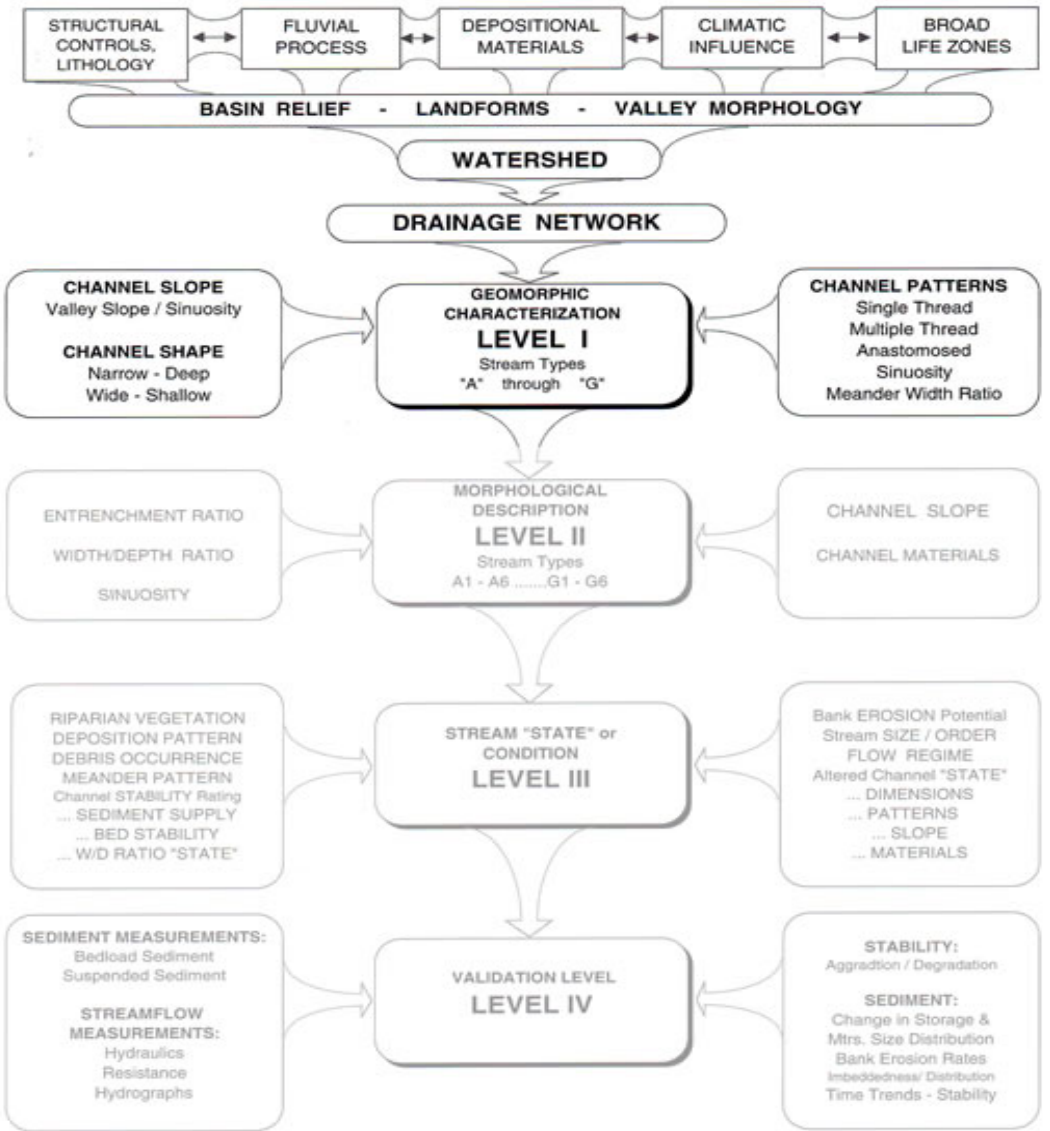
Field View

Condition Category	R Size (Ac)	R %	L Size (Ac)	L %
Optimal	20.69	79%	6.49	58%
High Suboptimal	0.00	0%	0.00	0%
Low Suboptimal	0.00	0%	0.00	0%
High Marginal	0.00	0%	0.00	0%
Low Marginal	2.11	8%	2.85	26%
High Poor	0.00	0%	0.00	0%
Low Poor	3.36	13%	1.76	16%
Calculated total area	26.16	100%	11.10	100%

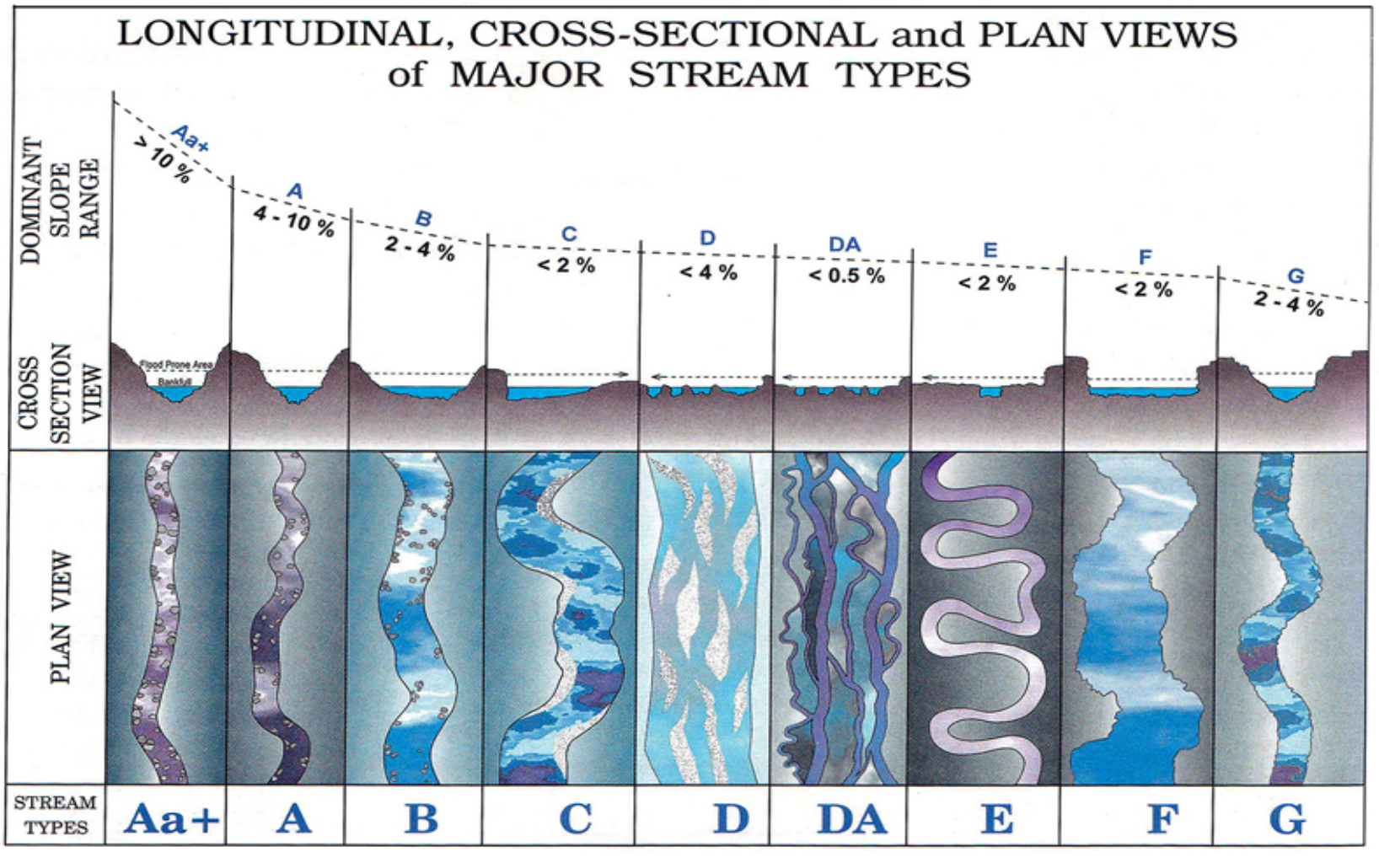
Entered Total Area **26.16** **11.10** From shape file for Riparian ZOI

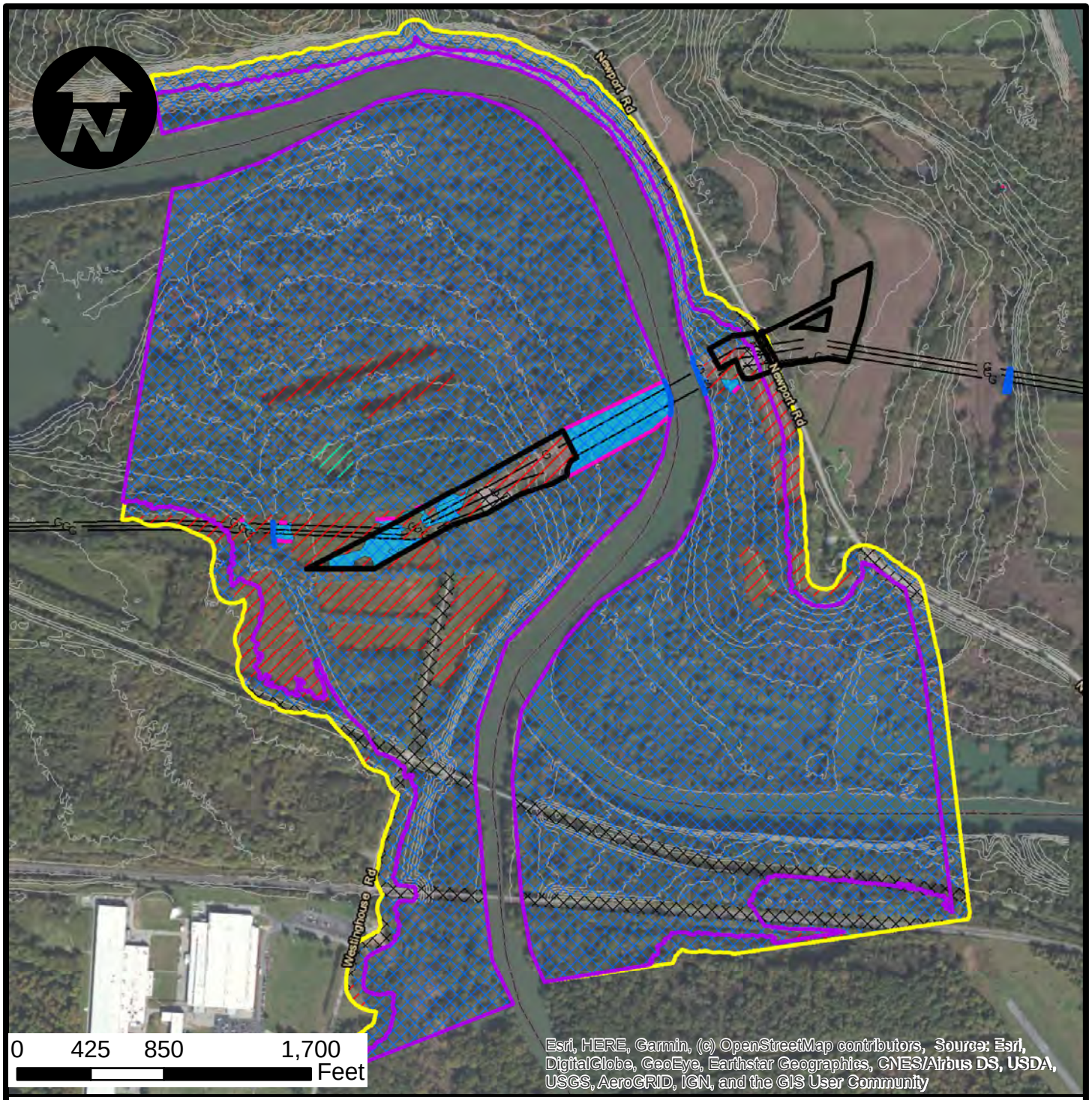
Calculated total area and Entered Total Area must be equal

http://www.fgmorph.com/fg_5_1.php (details for each classification start on page 15)



LONGITUDINAL, CROSS-SECTIONAL and PLAN VIEWS of MAJOR STREAM TYPES





LEGEND

- PROPOSED LOD
- EXISTING TETLP PIPELINE
- WATERCOURSE
- OPEN-END
- RIVERINE ZOI
- RIVERINE VEGETATION
- WETLAND
- WETLAND AA
- WETLAND 100-FT ZOI
- WETLAND 300-FT ZOI

CONDITION CATEGORY

- OPTIMAL
- HIGH MARGINAL
- MARGINAL
- POOR

AECOM
FOSTER PLAZA 6
681 ANDERSEN DRIVE, SUITE 120
PITTSBURGH, PA 15220

ENBRIDGE

TEXAS EASTERN TRANSMISSION, LP

PREPARED BY:	CHECKED BY:	APPROVED BY:
MLN	SLH	KJT

DATE:	SCALE:
5/19/2020	1 " = 833 feet
PAGE NO:	PROJECT NO.
Page 4 of 4	60612899

FIGURE 3
STREAM: S-JLK-037
LEVEL 2 RAPID ASSESSMENT PROTOCOL
CONEMAUGH RIVER CROSSING
PROPOSED 24" HDD PIPELINE

Attachment S-4

PA Wetland L2RAP Data Sheets and Mapping

Wetland Condition Assessment Form

Pennsylvania Wetland Condition Level 2 Rapid Assessment (Document No. 310-2137-002)

Pennsylvania Department of Environmental Protection

For use in all wetland classifications found within Pennsyvlania except those found within the banks of a watercourse.

Project #	Project Name	Date	Proposed Impact Size (acres)	AA #	AA Size (acres)
60624893	Line 12 Conemaugh River Crossing Project	3/5/20	0.6030	W-BJM-010	0.67

Name(s) of Evaluator(s)	Lat (dd)	Long (dd)	Resource Identifier:			
B. Miller	40.454614	-79.302808	Classification:	PEM/PSS/PFO	Delineated Area (acres):	0.672094

General Comments:

1. Wetland Zone of Influence Condition Index

	Condition Category											
	Optimal	Suboptimal		Marginal		Poor						
Wetland Zone of Influence (300 foot area around AA perimeter)	ZOI area vegetation consists of a tree stratum present (diameter at breast height (dbh) > 3 inches) with greater than or equal to 60% tree canopy cover. Areas comprised of stream channels, wetlands (regardless of classification or condition) and lacustrine resources ≥ 10 acres are scored as optimal.	**High Suboptimal:** ZOI area vegetation consists of a tree stratum (dbh > 3 inches) present, with greater than or equal to 30% and less than 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	**Low Suboptimal:** ZOI area vegetation consists of a tree stratum (dbh > 3 inches) present, with greater than or equal to 30% and less than 60% tree canopy cover with a maintained understory.	**High Marginal:** ZOI area vegetation consists of non-maintained, dense herbaceous vegetation with either a shrub layer or a tree stratum (dbh > 3 inches) present, with less than 30% tree canopy cover.	**Low Marginal:** ZOI area vegetation consists of non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, areas of hay production, and ponds or open water areas (< 10 acres). If trees are present, tree stratum (dbh > 3 inches) present, with less than 30% tree canopy cover with maintained understory.	**High Poor:** ZOI area vegetation consists of lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, pervious trails, recently seeded and stabilized, or other comparable condition.	**Low Poor:** ZOI area vegetation consists of impervious surfaces; mine spoil lands, denuded surfaces, row crops, active feed lots, impervious trails, or other comparable conditions.					**CI = Total Score/20**
SCORE	**20 19 18 17 16**	**15 14 13 12 11**		**10 9 8 7 6**		**5 4 3 2 1**						

1. Identify all applicable Condition Category areas within the wetland zone of influence using the descriptors above.
2. Estimate the % area within each condition category. Calculators are provided for you below.
3. Enter the % ZOI Area in decimal form (0.00) and Score for each category in the blocks below.

Total Score = SUM(%Areas*Scores)

	Condition Category:	Optimal	High Suboptimal	Low Suboptimal	High Marginal	Low Marginal	High Poor	Low Poor	Total Score:	CI
Scoring:	% ZOI Area:	**73%**	**0%**	**0%**	**0%**	**27%**	**0%**	**0%**		
	Score:	**18**	**0**	**0**	**0**	**7**	**0**	**0**		
	Total Sub-score:	13.15	0.00	0.00	0.00	1.89	0.00	0.00	**15.03**	**0.75**

Comments:

2. Roadbed Presence Index

	Condition Categories											
	Optimal		Suboptimal		Marginal		Poor					
a. Roadbed Presence (within 0 - 100 foot Wetland ZOI distance)	**High Optimal:** No roadbeds present within 100 feet of the AA boundary	**Low Optimal:** Roadbed presence score within 0-100 feet of the AA boundary equal to or less than 2.	**High Suboptimal**: Roadbed presence score within 0-100 foot distance of the AA boundary is greater than to 2 but equal to or less than 4.	**Low Suboptimal:** Roadbed presence score within 0-100 foot distance of the AA boundary is greater than to 4 but less than or equal to 6.	**High Marginal:** Roadbed presence score within 0-100 foot distance of the AA boundary is greater than to 6 but less than or equal to 8.	**Low Marginal:** Roadbed presence score within 0-100 foot distance of the AA boundary is greater than to 8 but less than or equal to 10.	**High Poor:** Roadbed presence score within 0-100 foot distance of the AA boundary is greater than 10 but less than or equal to 12.	**Low Poor:** Roadbed presence score within 0-100 foot distance of the AA boundary is greater than 12.					
SCORE	**20 19 18 17 16**		**15 14 13 12 11**		**10 9 8 7 6**		**5 4 3 2 1**					

Comments: Roadbed 0-100 Total score is 2

	Condition Categories											
	Optimal		Suboptimal		Marginal		Poor					
b. Roadbed Presence (within 100 - 300 foot Wetland ZOI distance)	**High Optimal:** No roadbeds present within 100 - 300 feet of the AA boundary	**Low Optimal:** Roadbed presence score within 100 - 300 feet of the AA boundary equal to or less than 2.	**High Suboptimal**: Roadbed presence score within 100 - 300 feet of the AA boundary is greater than to 2 but equal to or less than 4.	**Low Suboptimal:** Roadbed presence score within 100 - 300 feet AA boundary is greater than to 4 but less than or equal to 6.	**High Marginal:** Roadbed presence score within 100 - 300 feet of the AA boundary is greater than to 6 but less than or equal to 8.	**Low Marginal:** Roadbed presence score within 100 - 300 feet of the AA boundary is greater than to 8 but less than or equal to 10.	**High Poor:** Roadbed presence score within 100 - 300 feet of the AA boundary is greater than to 10 but less than or equal to 12.	**Low Poor:** Roadbed presence score within 100 - 300 feet of the AA boundary is greater than 12.					**CI = Total Score/20**
SCORE	**20 19 18 17 16**		**15 14 13 12 11**		**10 9 8 7 6**		**5 4 3 2 1**					

Comments: Roadbed 100-300 Total score is 2

	Condition Score	Weighting	Sub-Scores
a. Roadbed 0-100:	17	*** (0.67)**	11
b. Roadbed 100-300:	17	*** (0.33)**	6
		Total Score:	**17**

0.85

Comments:

Wetland Condition Assessment Form

Pennsylvania Wetland Condition Level 2 Rapid Assessment (Document No. 310-2137-002)

Pennsylvania Department of Environmental Protection

For use in all wetland classifications found within Pennsyvlania except those found within the banks of a watercourse.

3. Vegetation Condition Index

	Condition Category																			
	Optimal					**Suboptimal**					**Marginal**					**Poor**					
a. Invasive Species Presence	**High Optimal:** No invasives present.		**Low Optimal:** <5% of the total AA contains invasive species.			**High Suboptimal:** >5% but less than 10% of the total AA contains invasive species		**Low Suboptimal:** >10% but less than 20% of the total AA contains invasive species			**High Marginal:** >20% but less than 30% of the total AA contains invasive species		**Low Marginal:** >30% but less than 50% of the total AA contains invasive species			> 50% of the total AA contains invasive species.				
SCORE	**20**	**19**	**18**	**17**	**16**	**15**	**14**	**13**	**12**	**11**	**10**	**9**	**8**	**7**	**6**	**5**	**4**	**3**	**2**	**1**

Comments: Total % relative cover of all invasives, collectively on site is 15

	Condition Category																			
	Optimal					**Suboptimal**					**Marginal**					**Poor**					
b. Vegetation Stressor Presence	**High Optimal:** No vegetation stressors present within the AA boundary.		**Low Optimal:** One vegetation stressor present within the AA boundary.			**High Suboptimal:** Two vegetation stressors present within the AA boundary		**Low Suboptimal:** Three vegetation stressors present within the AA boundary			**High Marginal:** Four vegetation stressors present within the AA boundary		**Low Marginal:** Five vegetation stressors present within the AA boundary.			Greater than five vegetation stressors present within the AA boundary.				
SCORE	**20**	**19**	**18**	**17**	**16**	**15**	**14**	**13**	**12**	**11**	**10**	**9**	**8**	**7**	**6**	**5**	**4**	**3**	**2**	**1**

Comments: Total number of vegetation stressors present - 0

a. Invasive Sub-Score:	12	**Total Score:**	**CI = Total Score/40**
b. Vegetation Sub-Score:	20	**32**	**0.80**

4. Hydrologic Modification Index

	Condition Category																			
	Optimal					**Suboptimal**					**Marginal**					**Poor**					
Hydrologic Modification Stressor Presence	**High Optimal:** No hydrologic stressors present within the AA boundary.		**Low Optimal:** One hydrologic stressor present within the AA boundary.			**High Suboptimal:** Two hydrologic stressors present within the AA boundary.		**Low Suboptimal:** Three hydrologic stressors present within the AA boundary.			**High Marginal:** Four hydrologic stressors present within the AA boundary.		**Low Marginal:** Five hydrologic stressors present within the AA boundary.			Greater than five hydrologic stressors present within the AA boundary.				
SCORE	**20**	**19**	**18**	**17**	**16**	**15**	**14**	**13**	**12**	**11**	**10**	**9**	**8**	**7**	**6**	**5**	**4**	**3**	**2**	**1**

Comments: Total number of hydrologic modifications present - 0

		CI = Total Score/20
Score:	20	**1.00**

5. Sediment Stressor Index

	Condition Category																			
	Optimal					**Suboptimal**					**Marginal**					**Poor**					
Sediment Stressor Presence	**High Optimal:** No sediment stressors present within the AA boundary.		**Low Optimal:** One sediment stressor present within the AA boundary.			**High Suboptimal:** Two sediment stressors present within the AA boundary.		**Low Suboptimal:** Three sediment stressors present within the AA boundary.			**High Marginal:** Four sediment stressors present within the AA boundary.		**Low Marginal:** Five sediment stressors present within the AA boundary.			Greater than five sediment stressors present within the AA boundary.				
SCORE	**20**	**19**	**18**	**17**	**16**	**15**	**14**	**13**	**12**	**11**	**10**	**9**	**8**	**7**	**6**	**5**	**4**	**3**	**2**	**1**

Comments: Total number of sediment stressors present - 0

		CI = Total Score/20
Score:	20	**1.00**

6. Water Quality Stressor Index

	Condition Category																			
	Optimal					**Suboptimal**					**Marginal**					**Poor**					
a. Eutro- phication Stressor Presence	No eutrophication stressors present within the AA boundary.					One eutrophication stressors present within the AA boundary.					Two eutrophication stressors present within the AA boundary.					Three eutrophication stressors present within the AA boundary.				
SCORE	**20**	**19**	**18**	**17**	**16**	**15**	**14**	**13**	**12**	**11**	**10**	**9**	**8**	**7**	**6**	**5**	**4**	**3**	**2**	**1**

Comments: Total number of Eutrophication stressors present - 0

	Condition Category																			
	Optimal					**Suboptimal**					**Marginal**					**Poor**					
b. Contaminant / Toxicity Stressor Presence	No contaminant / toxicity stressors present within the AA boundary.					One contaminant / toxicitystressors present within the AA boundary.					Two contaminant / toxicity stressors present within the AA boundary.					Three contaminant / toxicity stressors present within the AA boundary.				
SCORE	**20**	**19**	**18**	**17**	**16**	**15**	**14**	**13**	**12**	**11**	**10**	**9**	**8**	**7**	**6**	**5**	**4**	**3**	**2**	**1**

Comments: Total number of Contaminant/Toxicity stressors present - 0

a. Eutrophication Score	20	**Total Score:**	**1.00**
b. Contaminant Score	20	**40**	

Overall Wetland Level 2 Condition Score: Sum all six of the Condition Indexes and divide by 6 to calculate the overall condition score.	**Overall Condition Index:**	**0.90**

Wetland ZOI Worksheet

Desktop Review

Condition Category	Size (Ac)	Percentage
Optimal	10.27	73%
High Suboptimal	0.00	0%
Low Suboptimal	0.00	0%
High Marginal	0.00	0%
Low Marginal	3.79	27%
High Poor	0.00	0%
Low Poor	0.00	0%
Calculated total area	14.06	100%

Field View

Condition Category	Size (Ac)	Percentage
Optimal	10.27	73%
High Suboptimal	0.00	0%
Low Suboptimal	0.00	0%
High Marginal	0.00	0%
Low Marginal	3.79	27%
High Poor	0.00	0%
Low Poor	0.00	0%
Calculated total area	14.06	100%

Enter Total Area 14.06 From ZOI shapefile

Calculated total area and Entered Total Area must be equal

Pennsylvania Wetland Condition Level 2 Rapid Assessment

(Document No. 310-2137-002)

Pennsylvania Department of Environmental Protection

Roadbed Worksheet

Project Name / Identifier		Date	Name(s) of Evaluator(s)
Line 12 Conemaugh River Crossing Project		3/5/2020	B. Miller
Resource Identifier / AA #	**Lat (dd)**	**Long (dd)**	**Notes:**
W-BJM-010	40.454614	-79.302808	#VALUE!

Roadbeds: Record the number of occurrences by roadbed type and distance category. Multiply the number of occurrences by the weighting factors for each roadbed type and distance category then sum the total score for each distance category. The total scores for each distance category are then compared to the condition category descriptions.

Roadbed Type	Distance	Occurrences	Weighting Factor	Score	Distance	Occurrences	Weighting Factor	Score
≥ 4 Lane Paved	0-100 ft.	0	4	0	100-300 ft.	0	4	0
2 Lane Paved	0-100 ft.	0	2	0	100-300 ft.	0	2	0
1 Lane Paved	0-100 ft.	0	1	0	100-300 ft.	0	1	0
Gravel Road	0-100 ft.	1	1	1	100-300 ft.	1	1	1
Dirt Road	0-100 ft.	0	2	0	100-300 ft.	0	2	0
Railroad	0-100 ft.	0	2	0	100-300 ft.	0	2	0
Other Roadbeds	0-100 ft.	1	1, 2 or 4	1	100-300 ft.	1	1, 2 or 4	1
Total Scores:	0-100 ft.	2			100-300 ft.	2		

Road Comments:

Pennsylvania Wetland Condition Level 2 Rapid Assessment
(Document No. 310-2137-002)
Pennsylvania Department of Environmental Protection

Invasive Species Presence Worksheet

Are invasive species (from list) present at the site in any layer? YES

If listed species present, enter the percent areal coverage for each species below:

Species Code	<5%	≥ 5-20%	≥ 20 - 50%	≥ 50%	*Species Code*	<5%	≥ 5-20%	≥ 20 - 50%	≥ 50%
tyan		X							

Total % relative cover of all invasives, collectively on site: 15 **%**

Comments:

Common Invasives/Aggressives List

Code	Common Name	*Scientific*	Status	Code	Common Name	*Scientific*	Status
aggi2	Redtop	*Agrostis gigantea*	FACW	luhe	Water primrose	*Ludwigia hexapetala*	OBLW
algl2	European Alder	*Alnus glutinosa*	FACW	lyvu	Garden loosestrife	*Lysimachia vulgaris*	OBLW
arhi3	Carpetgrass	*Arthraxon hispidus*	FAC-	lysa2	Purple loosestrife	*Lythrum salicaria*	FACW
beth	Japanese barberry	*Berberis thunbergii*	FACW	maqu	European waterclover	*Marsilea quadrifolia*	OBLW
bevu	European barberry	*Berberis vulgaris*	FACW	mivi	Japanese stiltgrass	*Microstegium vimineum*	FAC
butom	Flowering Rush	*Butomus umbellatus*	OBLW	nami2	Water cress	*Nasturtium officinale*	OBLW
calli6	Pond water-starwort	*Callitriche stagnalis*	OBLW	pelo	Low smartweed	*Persicaria longiseta*	FACW
egde	Brazilian waterweed	*Egeria densa*	OBLW	phar	Reed canary grass	*Phalaris arundinacea*	FACW
elan	Russian olive	*Elaeagnus angustifolia*	FACU	phau7	Common Reed	*Phragmites australis*	OBLW
elum	Autumn olive	*Elaeagnus umbellata*	FACU	potr	Rough bluegrass	*Poa trivialis*	FACW
ephi	Hairy willow-herb	*Epilobium hirsutum*	FACW	pocu6	Japanese knotweed	*Polygonum (Faloia) cuspidatum*	FAC-
eppa5	Willow-herb	*Epilobium parviflorum*	FACW	pgpf	Mile-a-minute	*Polygonum perfoliatum*	FAC-
fasa	Giant knotweed	*Fallopia sachalinensis*	OBLW	puera	Kudzu-vine	*Pueraria lobata*	FAC-
gldi	Mudmats	*Glossostigma diandrum*	OBLW	pysp1	Apple/crabapple/pear	*Pyrus sp.*	FAC?
hola	Velvetgrass	*Holcus lanatus*	FAC	rhfr	Glossy Buckthorn	*Rhamnus frangula*	FAC-
huja	Japanese Hops	*Humulus japonicus*	FACU	romu	Multiflora rose	*Rosa multiflora*	FACU
loja	Japanese honeysuckle	*Lonicera japonica*	FAC-	tyan	Cattail (hybrid)	*Typha angustifolia*	OBLW
lomo	Morrow's honeysuckle	*Lonicera morrowii*	NI	tygl	Hybrid cattail	*Typha x glauca*	OBLW
lota	Tartarian honeysuckle	*Lonicera tatarica*					

Pennsylvania Wetland Condition Level 2 Rapid Assessment

(Document No. 310-2137-002)

Pennsylvania Department of Environmental Protection

STRESSOR WORKSHEET

2/4/2017

	Occurrence in AA		
	Y	#'s	N
Vegetation Alteration			
Mowing			x
Moderate livestock grazing (within one year)			x
Crops (annual row crops, within one year)			x
Selective tree harvesting/cutting (>50% removal, within 5 years)			x
Right-of-way clearing (mechanical or chemical)			x
Clear cutting or Brush cutting (mechanized removal of shrubs and saplings)			x
Removal of woody debris			x
Aquatic weed control (mechanical or herbicide)			x
Excessive herbivory (deer, muskrat, nutria, carp, insects, etc.)			x
Plantation (conversion from typical natural tree species, including orchards)			x
Other:			x
Total Number:	**0**		
Hydrologic Modification			
Ditching, tile draining, or other dewatering methods			x
Dike/weir/dam			x
Filling/grading			x
Dredging/excavation			x
Stormwater inputs (culvert or similar concentrated urban runoff)			x
Microtopographic alterations (e.g., plowing, forestry bedding, skidder/ATV tracks)			x
Dead or dying trees (trunks still standing)*			x
Stream alteration (channelization or incision)			x
Other:			x
Total Number:	**0**		
Sedimentation			
Sediment deposits/plumes			x
Eroding banks/slopes			x
Active construction (earth disturbance for development)			x
Active plowing (plowing for crop planting in past year)			x
Intensive livestock grazing (in one year, ground is >50% bare)			x
Active selective forestry harvesting (within one year)			x
Active forest harvesting (within two years, includes roads, borrow areas, pads, etc.)			x
Turbidity (moderate concentration of suspended solids in the water column, obvious sediment discharges)			x
Other:			x
Total Number:	**0**		
Eutrophication			
Direct discharges from agricultural feedlots, manure pits, etc.			
Direct discharges from septic or sewage treatment plants, fish hatcheries, etc.			
Heavy or moderately heavy formation of algal mats			
Other:			
Total Number:	**0**		
Contaminant/Toxicity			
Severe vegetation stress (source unknown or suspected)			
Obvious spills, discharges, plumes, odors, etc.			
Acidic drainages (mined sites, quarries, road cuts)			
Point discharges from adjacent industrial facilities, landfills, railroad yards, or comparable sites			
Chemical defoliation (majority of herbaceous and woody plants affected, within one year)			
Fish or wildlife kills or obvious disease or abnormalities observed			
Excessive garbage/dumping			
Other:			
Total Number:	**0**		

**** Dead or dying trees attributed to beaver activity or emerald ash borer (or other identifiable insect infestation) should not be recorded as a stressor present. The assessor is responsible for recording observations in the comment section concerning presence of these conditions.***

Wetland Condition Assessment Form

Pennsylvania Wetland Condition Level 2 Rapid Assessment (Document No. 310-2137-002)

Pennsylvania Department of Environmental Protection

For use in all wetland classifications found within Pennsyvlania except those found within the banks of a watercourse.

Project #	Project Name	Date	Proposed Impact Size (acres)	AA #	AA Size (acres)
60624893	Line 12 Conemaugh River Crossing Project	3/5/20	1.3570	W-BJM-011	1.04

Name(s) of Evaluator(s)	Lat (dd)	Long (dd)	Resource Identifier:			
B. Miller	40.454092	-79.304022	Classification:	PEM/PSS	Delineated Area (acres):	1.0384

General Comments:

1. Wetland Zone of Influence Condition Index

	Condition Category					
	Optimal	Suboptimal		Marginal		Poor	
Wetland Zone of Influence (300 foot area around AA perimeter)	ZOI area vegetation consists of a tree stratum present (diameter at breast height (dbh) > 3 inches) with greater than or equal to 60% tree canopy cover. Areas comprised of stream channels, wetlands (regardless of classification or condition) and lacustrine resources ≥ 10 acres are scored as optimal.	**High Suboptimal:** ZOI area vegetation consists of a tree stratum (dbh > 3 inches) present, with greater than or equal to 30% and less than 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	**Low Suboptimal:** ZOI area vegetation consists of a tree stratum (dbh > 3 inches) present, with greater than or equal to 30% and less than 60% tree canopy cover with a maintained understory.	**High Marginal:** ZOI area vegetation consists of non-maintained, dense herbaceous vegetation with either a shrub layer or a tree stratum (dbh > 3 inches) present, with less than 30% tree canopy cover.	**Low Marginal:** ZOI area vegetation consists of non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, areas of hay production, and ponds or open water areas (< 10 acres). If trees are present, tree stratum (dbh > 3 inches) present, with less than 30% tree canopy cover with maintained understory.	**High Poor:** ZOI area vegetation consists of lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, pervious trails, recently seeded and stabilized, or other comparable condition.	**Low Poor:** ZOI area vegetation consists of impervious surfaces; mine spoil lands, denuded surfaces, row crops, active feed lots, impervious trails, or other comparable conditions.	**CI = Total Score/20**
SCORE	20 19 18 17 16	15 14 13 12 11		10 9 8 7 6		5 4 3 2 1		

1. Identify all applicable Condition Category areas within the wetland zone of influence using the descriptors above.
2. Estimate the % area within each condition category. Calculators are provided for you below.
3. Enter the % ZOI Area in decimal form (0.00) and Score for each category in the blocks below.

Total Score = SUM(%Areas*Scores)

	Condition Category:	Optimal	High Suboptimal	Low Suboptimal	High Marginal	Low Marginal	High Poor	Low Poor	Total Score:	CI
Scoring:	% ZOI Area:	**64%**	**0%**	**0%**	**0%**	**36%**	**0%**	**0%**		
	Score:	**18**	**0**	**0**	**0**	**7**	**0**	**0**		
	Total Sub-score:	11.45	0.00	0.00	0.00	2.55	0.00	0.00	**14.00**	**0.70**

Comments:

2. Roadbed Presence Index

	Condition Categories					
	Optimal	Suboptimal		Marginal		Poor	
a. Roadbed Presence (within 0 - 100 foot Wetland ZOI distance)	**High Optimal:** No roadbeds present within 100 feet of the AA boundary	**Low Optimal:** Roadbed presence score within 0-100 feet of the AA boundary equal to or less than 2.	**High Suboptimal**: Roadbed presence score within 0-100 foot distance of the AA boundary is greater than to 2 but equal to or less than 4.	**Low Suboptimal:** Roadbed presence score within 0-100 foot distance of the AA boundary is greater than to 4 but less than or equal to 6.	**High Marginal:** Roadbed presence score within 0-100 foot distance of the AA boundary is greater than to 6 but less than or equal to 8.	**Low Marginal:** Roadbed presence score within 0-100 foot distance of the AA boundary is greater than to 8 but less than or equal to 10.	**High Poor:** Roadbed presence score within 0-100 foot distance of the AA boundary is greater than 10 but less than or equal to 12.	**Low Poor:** Roadbed presence score within 0-100 foot distance of the AA boundary is greater than 12.	
SCORE	20 19 18 17 16	15 14 13 12 11		10 9 8 7 6		5 4 3 2 1			

Comments: Roadbed 0-100 Total score is 2

	Condition Categories					
	Optimal	Suboptimal		Marginal		Poor	
b. Roadbed Presence (within 100 - 300 foot Wetland ZOI distance)	**High Optimal:** No roadbeds present within 100 - 300 feet of the AA boundary	**Low Optimal:** Roadbed presence score within 100 - 300 feet of the AA boundary equal to or less than 2.	**High Suboptimal**: Roadbed presence score within 100 - 300 feet of the AA boundary is greater than to 2 but equal to or less than 4.	**Low Suboptimal:** Roadbed presence score within 100 - 300 feet AA boundary is greater than to 4 but less than or equal to 6.	**High Marginal:** Roadbed presence score within 100 - 300 feet of the AA boundary is greater than to 6 but less than or equal to 8.	**Low Marginal:** Roadbed presence score within 100 - 300 feet of the AA boundary is greater than to 8 but less than or equal to 10.	**High Poor:** Roadbed presence score within 100 - 300 feet of the AA boundary is greater than to 10 but less than or equal to 12.	**Low Poor:** Roadbed presence score within 100 - 300 feet of the AA boundary is greater than 12.	**CI = Total Score/20**
SCORE	20 19 18 17 16	15 14 13 12 11		10 9 8 7 6		5 4 3 2 1			

Comments: Roadbed 100-300 Total score is 2

	Condition Score	Weighting	Sub-Scores
a. Roadbed 0-100:	17	*** (0.67)**	11
b. Roadbed 100-300:	17	*** (0.33)**	6
		Total Score:	**17**

0.85

Comments:

Wetland Condition Assessment Form

Pennsylvania Wetland Condition Level 2 Rapid Assessment (Document No. 310-2137-002)

Pennsylvania Department of Environmental Protection

For use in all wetland classifications found within Pennsyvlania except those found within the banks of a watercourse.

3. Vegetation Condition Index

	Condition Category																			
a. Invasive Species Presence	**Optimal**					**Suboptimal**					**Marginal**					**Poor**				
	High Optimal: No invasives present.		**Low Optimal:** <5% of the total AA contains invasive species.			**High Suboptimal:** >5% but less than 10% of the total AA contains invasive species		**Low Suboptimal:** >10% but less than 20% of the total AA contains invasive species			**High Marginal:** >20% but less than 30% of the total AA contains invasive species		**Low Marginal:** >30% but less than 50% of the total AA contains invasive species			> 50% of the total AA contains invasive species.				
SCORE	**20**	**19**	**18**	**17**	**16**	**15**	**14**	**13**	**12**	**11**	**10**	**9**	**8**	**7**	**6**	**5**	**4**	**3**	**2**	**1**

Comments: Total % relative cover of all invasives, collectively on site is 20

	Condition Category																			
b. Vegetation Stressor Presence	**Optimal**					**Suboptimal**					**Marginal**					**Poor**				
	High Optimal: No vegetation stressors present within the AA boundary.		**Low Optimal:** One vegetation stressor present within the AA boundary.			**High Suboptimal:** Two vegetation stressors present within the AA boundary		**Low Suboptimal:** Three vegetation stressors present within the AA boundary			**High Marginal:** Four vegetation stressors present within the AA boundary		**Low Marginal:** Five vegetation stressors present within the AA boundary.			Greater than five vegetation stressors present within the AA boundary.				
SCORE	**20**	**19**	**18**	**17**	**16**	**15**	**14**	**13**	**12**	**11**	**10**	**9**	**8**	**7**	**6**	**5**	**4**	**3**	**2**	**1**

Comments: Total number of vegetation stressors present - 0

a. Invasive Sub-Score:	11	**Total Score:**	**CI = Total Score/40**
b. Vegetation Sub-Score:	20	**31**	**0.78**

4. Hydrologic Modification Index

	Condition Category																			
Hydrologic Modification Stressor Presence	**Optimal**					**Suboptimal**					**Marginal**					**Poor**				
	High Optimal: No hydrologic stressors present within the AA boundary.		**Low Optimal:** One hydrologic stressor present within the AA boundary.			**High Suboptimal:** Two hydrologic stressors present within the AA boundary.		**Low Suboptimal:** Three hydrologic stressors present within the AA boundary.			**High Marginal:** Four hydrologic stressors present within the AA boundary.		**Low Marginal:** Five hydrologic stressors present within the AA boundary.			Greater than five hydrologic stressors present within the AA boundary.				
SCORE	**20**	**19**	**18**	**17**	**16**	**15**	**14**	**13**	**12**	**11**	**10**	**9**	**8**	**7**	**6**	**5**	**4**	**3**	**2**	**1**

Comments: Total number of hydrologic modifications present - 0

Score:	20	**CI = Total Score/20**
		1.00

5. Sediment Stressor Index

	Condition Category																			
Sediment Stressor Presence	**Optimal**					**Suboptimal**					**Marginal**					**Poor**				
	High Optimal: No sediment stressors present within the AA boundary.		**Low Optimal:** One sediment stressor present within the AA boundary.			**High Suboptimal:** Two sediment stressors present within the AA boundary.		**Low Suboptimal:** Three sediment stressors present within the AA boundary.			**High Marginal:** Four sediment stressors present within the AA boundary.		**Low Marginal:** Five sediment stressors present within the AA boundary.			Greater than five sediment stressors present within the AA boundary.				
SCORE	**20**	**19**	**18**	**17**	**16**	**15**	**14**	**13**	**12**	**11**	**10**	**9**	**8**	**7**	**6**	**5**	**4**	**3**	**2**	**1**

Comments: Total number of sediment stressors present - 0

Score:	20	**CI = Total Score/20**
		1.00

6. Water Quality Stressor Index

	Condition Category																			
a. Eutro- phication Stressor Presence	**Optimal**					**Suboptimal**					**Marginal**					**Poor**				
	No eutrophication stressors present within the AA boundary.					One eutrophication stressors present within the AA boundary.					Two eutrophication stressors present within the AA boundary.					Three eutrophication stressors present within the AA boundary.				
SCORE	**20**	**19**	**18**	**17**	**16**	**15**	**14**	**13**	**12**	**11**	**10**	**9**	**8**	**7**	**6**	**5**	**4**	**3**	**2**	**1**

Comments: Total number of Eutrophication stressors present - 0

	Condition Category																			
b. Contaminant / Toxicity Stressor Presence	**Optimal**					**Suboptimal**					**Marginal**					**Poor**				
	No contaminant / toxicity stressors present within the AA boundary.					One contaminant / toxicitystressors present within the AA boundary.					Two contaminant / toxicity stressors present within the AA boundary.					Three contaminant / toxicity stressors present within the AA boundary.				
SCORE	**20**	**19**	**18**	**17**	**16**	**15**	**14**	**13**	**12**	**11**	**10**	**9**	**8**	**7**	**6**	**5**	**4**	**3**	**2**	**1**

Comments: Total number of Contaminant/Toxicity stressors present - 0

a. Eutrophication Score	20	**Total Score:**	**CI = Total Score/40**
b. Contaminant Score	20	**40**	**1.00**

Overall Wetland Level 2 Condition Score: Sum all six of the Condition Indexes and divide by 6 to calculate the overall condition score.	**Overall Condition Index:**	**0.89**

Wetland ZOI Worksheet					
Desktop Review			**Field View**		
Condition Category	Size (Ac)	Percentage	Condition Category	Size (Ac)	Percentage
Optimal	9.24	64%	Optimal	9.24	64%
High Suboptimal	0.00	0%	High Suboptimal	0.00	0%
Low Suboptimal	0.00	0%	Low Suboptimal	0.00	0%
High Marginal	0.00	0%	High Marginal	0.00	0%
Low Marginal	5.29	36%	Low Marginal	5.29	36%
High Poor	0.00	0%	High Poor	0.00	0%
Low Poor	0.00	0%	Low Poor	0.00	0%
Calculated total area	14.53	100%	Calculated total area	14.53	100%

Enter Total Area 14.53 From ZOI shapefile

Calculated total area and Entered Total Area must be equal

Pennsylvania Wetland Condition Level 2 Rapid Assessment

(Document No. 310-2137-002)

Pennsylvania Department of Environmental Protection

Roadbed Worksheet

Project Name / Identifier		Date	Name(s) of Evaluator(s)
Line 12 Conemaugh River Crossing Project		3/5/2020	B. Miller
Resource Identifier / AA #	**Lat (dd)**	**Long (dd)**	**Notes:**
W-BJM-011	40.454092	-79.304022	#VALUE!

Roadbeds: Record the number of occurrences by roadbed type and distance category. Multiply the number of occurrences by the weighting factors for each roadbed type and distance category then sum the total score for each distance category. The total scores for each distance category are then compared to the condition category descriptions.

Roadbed Type	Distance	Occurrences	Weighting Factor	Score	Distance	Occurrences	Weighting Factor	Score
≥ 4 Lane Paved	0-100 ft.	0	4	0	100-300 ft.	0	4	0
2 Lane Paved	0-100 ft.	0	2	0	100-300 ft.	0	2	0
1 Lane Paved	0-100 ft.	0	1	0	100-300 ft.	0	1	0
Gravel Road	0-100 ft.	1	1	1	100-300 ft.	1	1	1
Dirt Road	0-100 ft.	0	2	0	100-300 ft.	0	2	0
Railroad	0-100 ft.	0	2	0	100-300 ft.	0	2	0
Other Roadbeds	0-100 ft.	1	1, 2 or 4	1	100-300 ft.	1	1, 2 or 4	1
Total Scores:	0-100 ft.	2			100-300 ft.	2		

Road Comments:

Pennsylvania Wetland Condition Level 2 Rapid Assessment
(Document No. 310-2137-002)
Pennsylvania Department of Environmental Protection

Invasive Species Presence Worksheet

Are invasive species (from list) present at the site in any layer? **YES**

If listed species present, enter the percent areal coverage for each species below:

Species Code	<5%	≥ 5-20%	≥ 20 - 50%	≥ 50%	*Species Code*	<5%	≥ 5-20%	≥ 20 - 50%	≥ 50%
tyan			X						

Total % relative cover of all invasives, collectively on site: 20 **%**

Comments:

Common Invasives/Aggressives List

Code	Common Name	*Scientific*	Status	Code	Common Name	*Scientific*	Status
aggi2	Redtop	*Agrostis gigantea*	FACW	luhe	Water primrose	*Ludwigia hexapetala*	OBLW
algl2	European Alder	*Alnus glutinosa*	FACW	lyvu	Garden loosestrife	*Lysimachia vulgaris*	OBLW
arhi3	Carpetgrass	*Arthraxon hispidus*	FAC-	lysa2	Purple loosestrife	*Lythrum salicaria*	FACW
beth	Japanese barberry	*Berberis thunbergii*	FACW	maqu	European waterclover	*Marsilea quadrifolia*	OBLW
bevu	European barberry	*Berberis vulgaris*	FACW	mivi	Japanese stiltgrass	*Microstegium vimineum*	FAC
butom	Flowering Rush	*Butomus umbellatus*	OBLW	nami2	Water cress	*Nasturtium officinale*	OBLW
calli6	Pond water-starwort	*Callitriche stagnalis*	OBLW	pelo	Low smartweed	*Persicaria longiseta*	FACW
egde	Brazilian waterweed	*Egeria densa*	OBLW	phar	Reed canary grass	*Phalaris arundinacea*	FACW
elan	Russian olive	*Elaeagnus angustifolia*	FACU	phau7	Common Reed	*Phragmites australis*	OBLW
elum	Autumn olive	*Elaeagnus umbellata*	FACU	potr	Rough bluegrass	*Poa trivialis*	FACW
ephi	Hairy willow-herb	*Epilobium hirsutum*	FACW	pocu6	Japanese knotweed	*Polygonum (Faloia) cuspidatum*	FAC-
eppa5	Willow-herb	*Epilobium parviflorum*	FACW	pgpf	Mile-a-minute	*Polygonum perfoliatum*	FAC-
fasa	Giant knotweed	*Fallopia sachalinensis*	OBLW	puera	Kudzu-vine	*Pueraria lobata*	FAC-
gldi	Mudmats	*Glossostigma diandrum*	OBLW	pysp1	Apple/crabapple/pear	*Pyrus sp.*	FAC?
hola	Velvetgrass	*Holcus lanatus*	FAC	rhfr	Glossy Buckthorn	*Rhamnus frangula*	FAC-
huja	Japanese Hops	*Humulus japonicus*	FACU	romu	Multiflora rose	*Rosa multiflora*	FACU
loja	Japanese honeysuckle	*Lonicera japonica*	FAC-	tyan	Cattail (hybrid)	*Typha angustifolia*	OBLW
lomo	Morrow's honeysuckle	*Lonicera morrowii*	NI	tygl	Hybrid cattail	*Typha x glauca*	OBLW
lota	Tartarian honeysuckle	*Lonicera tatarica*					

Pennsylvania Wetland Condition Level 2 Rapid Assessment

(Document No. 310-2137-002)

Pennsylvania Department of Environmental Protection

STRESSOR WORKSHEET

2/4/2017

	Occurrence in AA		
	Y	#'s	N
Vegetation Alteration			
Mowing			x
Moderate livestock grazing (within one year)			x
Crops (annual row crops, within one year)			x
Selective tree harvesting/cutting (>50% removal, within 5 years)			x
Right-of-way clearing (mechanical or chemical)			x
Clear cutting or Brush cutting (mechanized removal of shrubs and saplings)			x
Removal of woody debris			x
Aquatic weed control (mechanical or herbicide)			x
Excessive herbivory (deer, muskrat, nutria, carp, insects, etc.)			x
Plantation (conversion from typical natural tree species, including orchards)			x
Other:			x
Total Number:	**0**		
Hydrologic Modification			
Ditching, tile draining, or other dewatering methods			x
Dike/weir/dam			x
Filling/grading			x
Dredging/excavation			x
Stormwater inputs (culvert or similar concentrated urban runoff)			x
Microtopographic alterations (e.g., plowing, forestry bedding, skidder/ATV tracks)			x
Dead or dying trees (trunks still standing)*			x
Stream alteration (channelization or incision)			x
Other:			x
Total Number:	**0**		
Sedimentation			
Sediment deposits/plumes			x
Eroding banks/slopes			x
Active construction (earth disturbance for development)			x
Active plowing (plowing for crop planting in past year)			x
Intensive livestock grazing (in one year, ground is >50% bare)			x
Active selective forestry harvesting (within one year)			x
Active forest harvesting (within two years, includes roads, borrow areas, pads, etc.)			x
Turbidity (moderate concentration of suspended solids in the water column, obvious sediment discharges)			x
Other:			x
Total Number:	**0**		
Eutrophication			
Direct discharges from agricultural feedlots, manure pits, etc.			x
Direct discharges from septic or sewage treatment plants, fish hatcheries, etc.			x
Heavy or moderately heavy formation of algal mats			x
Other:			x
Total Number:	**0**		
Contaminant/Toxicity			
Severe vegetation stress (source unknown or suspected)			
Obvious spills, discharges, plumes, odors, etc.			
Acidic drainages (mined sites, quarries, road cuts)			
Point discharges from adjacent industrial facilities, landfills, railroad yards, or comparable sites			
Chemical defoliation (majority of herbaceous and woody plants affected, within one year)			
Fish or wildlife kills or obvious disease or abnormalities observed			
Excessive garbage/dumping			
Other:			
Total Number:	**0**		

**** Dead or dying trees attributed to beaver activity or emerald ash borer (or other identifiable insect infestation) should not be recorded as a stressor present. The assessor is responsible for recording observations in the comment section concerning presence of these conditions.***

Wetland Condition Assessment Form

Pennsylvania Wetland Condition Level 2 Rapid Assessment (Document No. 310-2137-002)

Pennsylvania Department of Environmental Protection

For use in all wetland classifications found within Pennsyvlania except those found within the banks of a watercourse.

Project #	Project Name	Date	Proposed Impact Size (acres)	AA #	AA Size (acres)
60624893	Line 12 Conemaugh River Crossing Project	3/5/20	0.0290	W-CMS-016	0.96

Name(s) of Evaluator(s)	Lat (dd)	Long (dd)	Resource Identifier:			
B. Miller	40.455750	-79.300044	Classification:	PEM	Delineated Area (acres):	0.962934

General Comments:

1. Wetland Zone of Influence Condition Index

	Condition Category										
Wetland Zone of Influence (300 foot area around AA perimeter)	**Optimal**	**Suboptimal**		**Marginal**		**Poor**		**CI = Total Score/20**			
	ZOI area vegetation consists of a tree stratum present (diameter at breast height (dbh) > 3 inches) with greater than or equal to 60% tree canopy cover. Areas comprised of stream channels, wetlands (regardless of classification or condition) and lacustrine resources ≥ 10 acres are scored as optimal.	**High Suboptimal:** ZOI area vegetation consists of a tree stratum (dbh > 3 inches) present, with greater than or equal to 30% and less than 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	**Low Suboptimal:** ZOI area vegetation consists of a tree stratum (dbh > 3 inches) present, with greater than or equal to 30% and less than 60% tree canopy cover with a maintained understory.	**High Marginal:** ZOI area vegetation consists of non-maintained, dense herbaceous vegetation with either a shrub layer or a tree stratum (dbh > 3 inches) present, with less than 30% tree canopy cover.	**Low Marginal:** ZOI area vegetation consists of non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, areas of hay production, and ponds or open water areas (< 10 acres). If trees are present, tree stratum (dbh > 3 inches) present, with less than 30% tree canopy cover with maintained understory.	**High Poor:** ZOI area vegetation consists of lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, pervious trails, recently seeded and stabilized, or other comparable condition.	**Low Poor:** ZOI area vegetation consists of impervious surfaces; mine spoil lands, denuded surfaces, row crops, active feed lots, impervious trails, or other comparable conditions.				
SCORE	**20 19 18 17 16**	**15 14 13 12 11**		**10 9 8 7 6**		**5 4 3 2 1**					

1. Identify all applicable Condition Category areas within the wetland zone of influence using the descriptors above.
2. Estimate the % area within each condition category. Calculators are provided for you below.
3. Enter the % ZOI Area in decimal form (0.00) and Score for each category in the blocks below.

Total Score = SUM(%Areas*Scores)

	Condition Category:	Optimal	High Suboptimal	Low Suboptimal	High Marginal	Low Marginal	High Poor	Low Poor	Total Score:	CI
Scoring:	% ZOI Area:	**91%**	**0%**	**0%**	**0%**	**9%**	**0%**	**0%**		
	Score:	**18**	**0**	**0**	**0**	**7**	**0**	**0**		
	Total Sub-score:	16.38	0.00	0.00	0.00	0.63	0.00	0.00	**17.01**	**0.85**

Comments:

2. Roadbed Presence Index

	Condition Categories										
a. Roadbed Presence (within 0 - 100 foot Wetland ZOI distance)	**Optimal**		**Suboptimal**		**Marginal**		**Poor**		**CI = Total Score/20**		
	High Optimal: No roadbeds present within 100 feet of the AA boundary	**Low Optimal:** Roadbed presence score within 0-100 feet of the AA boundary equal to or less than 2.	**High Suboptimal**: Roadbed presence score within 0-100 foot distance of the AA boundary is greater than to 2 but equal to or less than 4.	**Low Suboptimal:** Roadbed presence score within 0-100 foot distance of the AA boundary is greater than to 4 but less than or equal to 6.	**High Marginal:** Roadbed presence score within 0-100 foot distance of the AA boundary is greater than to 6 but less than or equal to 8.	**Low Marginal:** Roadbed presence score within 0-100 foot distance of the AA boundary is greater than to 8 but less than or equal to 10.	**High Poor:** Roadbed presence score within 0-100 foot distance of the AA boundary is greater than 10 but less than or equal to 12.	**Low Poor:** Roadbed presence score within 0-100 foot distance of the AA boundary is greater than 12.				
SCORE	**20 19 18 17 16**		**15 14 13 12 11**		**10 9 8 7 6**		**5 4 3 2 1**				

Comments: Roadbed 0-100 Total score is 0

	Condition Categories										
b. Roadbed Presence (within 100 - 300 foot Wetland ZOI distance)	**Optimal**		**Suboptimal**		**Marginal**		**Poor**		**CI = Total Score/20**		
	High Optimal: No roadbeds present within 100 - 300 feet of the AA boundary	**Low Optimal:** Roadbed presence score within 100 - 300 feet of the AA boundary equal to or less than 2.	**High Suboptimal**: Roadbed presence score within 100 - 300 feet of the AA boundary is greater than to 2 but equal to or less than 4.	**Low Suboptimal:** Roadbed presence score within 100 - 300 feet AA boundary is greater than to 4 but less than or equal to 6.	**High Marginal:** Roadbed presence score within 100 - 300 feet of the AA boundary is greater than to 6 but less than or equal to 8.	**Low Marginal:** Roadbed presence score within 100 - 300 feet of the AA boundary is greater than to 8 but less than or equal to 10.	**High Poor:** Roadbed presence score within 100 - 300 feet of the AA boundary is greater than to 10 but less than or equal to 12.	**Low Poor:** Roadbed presence score within 100 - 300 feet of the AA boundary is greater than 12.				
SCORE	**20 19 18 17 16**		**15 14 13 12 11**		**10 9 8 7 6**		**5 4 3 2 1**				

Comments: Roadbed 100-300 Total score is 0

	Condition Score	Weighting	Sub-Scores	
a. Roadbed 0-100:	20	*** (0.67)**	13	
b. Roadbed 100-300:	20	*** (0.33)**	7	
		Total Score:	**20**	**1.00**

Comments:

Wetland Condition Assessment Form

Pennsylvania Wetland Condition Level 2 Rapid Assessment (Document No. 310-2137-002)

Pennsylvania Department of Environmental Protection

For use in all wetland classifications found within Pennsyvlania except those found within the banks of a watercourse.

3. Vegetation Condition Index

	Condition Category																				
	Optimal					Suboptimal					Marginal					Poor					
a. Invasive Species Presence	**High Optimal:** No invasives present.		**Low Optimal:** <5% of the total AA contains invasive species.			**High Suboptimal:** >5% but less than 10% of the total AA contains invasive species		**Low Suboptimal:** >10% but less than 20% of the total AA contains invasive species			**High Marginal:** >20% but less than 30% of the total AA contains invasive species		**Low Marginal:** >30% but less than 50% of the total AA contains invasive species			> 50% of the total AA contains invasive species.				
SCORE	**20**	**19**	**18**	**17**	**16**	**15**	**14**	**13**	**12**	**11**	**10**	**9**	**8**	**7**	**6**	**5**	**4**	**3**	**2**	**1**	

Comments: Total % relative cover of all invasives, collectively on site is 0

	Condition Category																				
	Optimal					Suboptimal					Marginal					Poor					
b. Vegetation Stressor Presence	**High Optimal:** No vegetation stressors present within the AA boundary.		**Low Optimal:** One vegetation stressor present within the AA boundary.			**High Suboptimal:** Two vegetation stressors present within the AA boundary		**Low Suboptimal:** Three vegetation stressors present within the AA boundary			**High Marginal:** Four vegetation stressors present within the AA boundary		**Low Marginal:** Five vegetation stressors present within the AA boundary.			Greater than five vegetation stressors present within the AA boundary.				
SCORE	**20**	**19**	**18**	**17**	**16**	**15**	**14**	**13**	**12**	**11**	**10**	**9**	**8**	**7**	**6**	**5**	**4**	**3**	**2**	**1**	

Comments: Total number of vegetation stressors present - 1

a. Invasive Sub-Score:	20	**Total Score:**	**CI = Total Score/40**
b. Vegetation Sub-Score:	17	**37**	**0.93**

4. Hydrologic Modification Index

	Condition Category																				
	Optimal					Suboptimal					Marginal					Poor					
Hydrologic Modification Stressor Presence	**High Optimal:** No hydrologic stressors present within the AA boundary.		**Low Optimal:** One hydrologic stressor present within the AA boundary.			**High Suboptimal:** Two hydrologic stressors present within the AA boundary.		**Low Suboptimal:** Three hydrologic stressors present within the AA boundary.			**High Marginal:** Four hydrologic stressors present within the AA boundary.		**Low Marginal:** Five hydrologic stressors present within the AA boundary.			Greater than five hydrologic stressors present within the AA boundary.				
SCORE	**20**	**19**	**18**	**17**	**16**	**15**	**14**	**13**	**12**	**11**	**10**	**9**	**8**	**7**	**6**	**5**	**4**	**3**	**2**	**1**	

Comments: Total number of hydrologic modifications present - 0

Score:	20	**CI = Total Score/20**
		1.00

5. Sediment Stressor Index

	Condition Category																				
	Optimal					Suboptimal					Marginal					Poor					
Sediment Stressor Presence	**High Optimal:** No sediment stressors present within the AA boundary.		**Low Optimal:** One sediment stressor present within the AA boundary.			**High Suboptimal:** Two sediment stressors present within the AA boundary.		**Low Suboptimal:** Three sediment stressors present within the AA boundary.			**High Marginal:** Four sediment stressors present within the AA boundary.		**Low Marginal:** Five sediment stressors present within the AA boundary.			Greater than five sediment stressors present within the AA boundary.				
SCORE	**20**	**19**	**18**	**17**	**16**	**15**	**14**	**13**	**12**	**11**	**10**	**9**	**8**	**7**	**6**	**5**	**4**	**3**	**2**	**1**	

Comments: Total number of sediment stressors present - 0

Score:	20	**CI = Total Score/20**
		1.00

6. Water Quality Stressor Index

	Condition Category																				
	Optimal					Suboptimal					Marginal					Poor					
a. Eutro- phication Stressor Presence	No eutrophication stressors present within the AA boundary.					One eutrophication stressors present within the AA boundary.					Two eutrophication stressors present within the AA boundary.					Three eutrophication stressors present within the AA boundary.					
SCORE	**20**	**19**	**18**	**17**	**16**	**15**	**14**	**13**	**12**	**11**	**10**	**9**	**8**	**7**	**6**	**5**	**4**	**3**	**2**	**1**	

Comments: Total number of Eutrophication stressors present - 0

	Condition Category																				
	Optimal					Suboptimal					Marginal					Poor					
b. Contaminant / Toxicity Stressor Presence	No contaminant / toxicity stressors present within the AA boundary.					One contaminant / toxicitystressors present within the AA boundary.					Two contaminant / toxicity stressors present within the AA boundary.					Three contaminant / toxicity stressors present within the AA boundary.					
SCORE	**20**	**19**	**18**	**17**	**16**	**15**	**14**	**13**	**12**	**11**	**10**	**9**	**8**	**7**	**6**	**5**	**4**	**3**	**2**	**1**	

Comments: Total number of Contaminant/Toxicity stressors present - 0

a. Eutrophication Score	20	**Total Score:**	**CI = Total Score/40**
b. Contaminant Score	20	**40**	**1.00**

Overall Wetland Level 2 Condition Score: Sum all six of the Condition Indexes and divide by 6 to calculate the overall condition score.	**Overall Condition Index:**	**0.96**

Wetland ZOI Worksheet

Desktop Review

Condition Category	Size (Ac)	Percentage
Optimal	15.46	91%
High Suboptimal	0.00	0%
Low Suboptimal	0.00	0%
High Marginal	0.00	0%
Low Marginal	1.53	9%
High Poor	0.00	0%
Low Poor	0.00	0%
Calculated total area	16.99	100%

Field View

Condition Category	Size (Ac)	Percentage
Optimal	15.46	91%
High Suboptimal	0.00	0%
Low Suboptimal	0.00	0%
High Marginal	0.00	0%
Low Marginal	1.53	9%
High Poor	0.00	0%
Low Poor	0.00	0%
Calculated total area	16.99	100%

Enter Total Area 16.99 From ZOI shapefile

Calculated total area and Entered Total Area must be equal

Pennsylvania Wetland Condition Level 2 Rapid Assessment

(Document No. 310-2137-002)

Pennsylvania Department of Environmental Protection

Invasive Species Presence Worksheet

Are invasive species (from list) present at the site in any layer? **NO**

If listed species present, enter the percent areal coverage for each species below:

Species Code	<5%	≥ 5-20%	≥ 20 - 50%	≥ 50%	*Species Code*	<5%	≥ 5-20%	≥ 20 - 50%	≥ 50%

Total % relative cover of all invasives, collectively on site: 0 **%**

Comments:

Common Invasives/Aggressives List

Code	Common Name	*Scientific*	Status	Code	Common Name	*Scientific*	Status
aggi2	Redtop	*Agrostis gigantea*	FACW	luhe	Water primrose	*Ludwigia hexapetala*	OBLW
algl2	European Alder	*Alnus glutinosa*	FACW	lyvu	Garden loosestrife	*Lysimachia vulgaris*	OBLW
arhi3	Carpetgrass	*Arthraxon hispidus*	FAC-	lysa2	Purple loosestrife	*Lythrum salicaria*	FACW
beth	Japanese barberry	*Berberis thunbergii*	FACW	maqu	European waterclover	*Marsilea quadrifolia*	OBLW
bevu	European barberry	*Berberis vulgaris*	FACW	mivi	Japanese stiltgrass	*Microstegium vimineum*	FAC
butom	Flowering Rush	*Butomus umbellatus*	OBLW	nami2	Water cress	*Nasturtium officinale*	OBLW
calli6	Pond water-starwort	*Callitriche stagnalis*	OBLW	pelo	Low smartweed	*Persicaria longiseta*	FACW
egde	Brazilian waterweed	*Egeria densa*	OBLW	phar	Reed canary grass	*Phalaris arundinacea*	FACW
elan	Russian olive	*Elaeagnus angustifolia*	FACU	phau7	Common Reed	*Phragmites australis*	OBLW
elum	Autumn olive	*Elaeagnus umbellata*	FACU	potr	Rough bluegrass	*Poa trivialis*	FACW
ephi	Hairy willow-herb	*Epilobium hirsutum*	FACW	pocu6	Japanese knotweed	*Polygonum (Faloia) cuspidatum*	FAC-
eppa5	Willow-herb	*Epilobium parviflorum*	FACW	pgpf	Mile-a-minute	*Polygonum perfoliatum*	FAC-
fasa	Giant knotweed	*Fallopia sachalinensis*	OBLW	puera	Kudzu-vine	*Pueraria lobata*	FAC-
gldi	Mudmats	*Glossostigma diandrum*	OBLW	pysp1	Apple/crabapple/pear	*Pyrus sp.*	FAC?
hola	Velvetgrass	*Holcus lanatus*	FAC	rhfr	Glossy Buckthorn	*Rhamnus frangula*	FAC-
huja	Japanese Hops	*Humulus japonicus*	FACU	romu	Multiflora rose	*Rosa multiflora*	FACU
loja	Japanese honeysuckle	*Lonicera japonica*	FAC-	tyan	Cattail (hybrid)	*Typha angustifolia*	OBLW
lomo	Morrow's honeysuckle	*Lonicera morrowii*	NI	tygl	Hybrid cattail	*Typha x glauca*	OBLW
lota	Tartarian honeysuckle	*Lonicera tatarica*					

Pennsylvania Wetland Condition Level 2 Rapid Assessment

(Document No. 310-2137-002)

Pennsylvania Department of Environmental Protection

STRESSOR WORKSHEET

2/4/2017

	Occurrence in AA		
	Y	#'s	N
Vegetation Alteration			
Mowing	X		x
Moderate livestock grazing (within one year)			x
Crops (annual row crops, within one year)			x
Selective tree harvesting/cutting (>50% removal, within 5 years)			x
Right-of-way clearing (mechanical or chemical)			x
Clear cutting or Brush cutting (mechanized removal of shrubs and saplings)			x
Removal of woody debris			x
Aquatic weed control (mechanical or herbicide)			x
Excessive herbivory (deer, muskrat, nutria, carp, insects, etc.)			x
Plantation (conversion from typical natural tree species, including orchards)			x
Other:			x
Total Number:	**1**		
Hydrologic Modification			
Ditching, tile draining, or other dewatering methods			x
Dike/weir/dam			x
Filling/grading			x
Dredging/excavation			x
Stormwater inputs (culvert or similar concentrated urban runoff)			x
Microtopographic alterations (e.g., plowing, forestry bedding, skidder/ATV tracks)			x
Dead or dying trees (trunks still standing)*			x
Stream alteration (channelization or incision)			x
Other:			x
Total Number:	**0**		
Sedimentation			
Sediment deposits/plumes			x
Eroding banks/slopes			x
Active construction (earth disturbance for development)			x
Active plowing (plowing for crop planting in past year)			x
Intensive livestock grazing (in one year, ground is >50% bare)			x
Active selective forestry harvesting (within one year)			x
Active forest harvesting (within two years, includes roads, borrow areas, pads, etc.)			x
Turbidity (moderate concentration of suspended solids in the water column, obvious sediment discharges)			x
Other:			x
Total Number:	**0**		
Eutrophication			
Direct discharges from agricultural feedlots, manure pits, etc.			x
Direct discharges from septic or sewage treatment plants, fish hatcheries, etc.			x
Heavy or moderately heavy formation of algal mats			x
Other:			x
Total Number:	**0**		
Contaminant/Toxicity			
Severe vegetation stress (source unknown or suspected)			x
Obvious spills, discharges, plumes, odors, etc.			x
Acidic drainages (mined sites, quarries, road cuts)			x
Point discharges from adjacent industrial facilities, landfills, railroad yards, or comparable sites			x
Chemical defoliation (majority of herbaceous and woody plants affected, within one year)			x
Fish or wildlife kills or obvious disease or abnormalities observed			x
Excessive garbage/dumping			x
Other:			x
Total Number:	**0**		

**** Dead or dying trees attributed to beaver activity or emerald ash borer (or other identifiable insect infestation) should not be recorded as a stressor present. The assessor is responsible for recording observations in the comment section concerning presence of these conditions.***

Pennsylvania Wetland Condition Level 2 Rapid Assessment

(Document No. 310-2137-002)

Pennsylvania Department of Environmental Protection

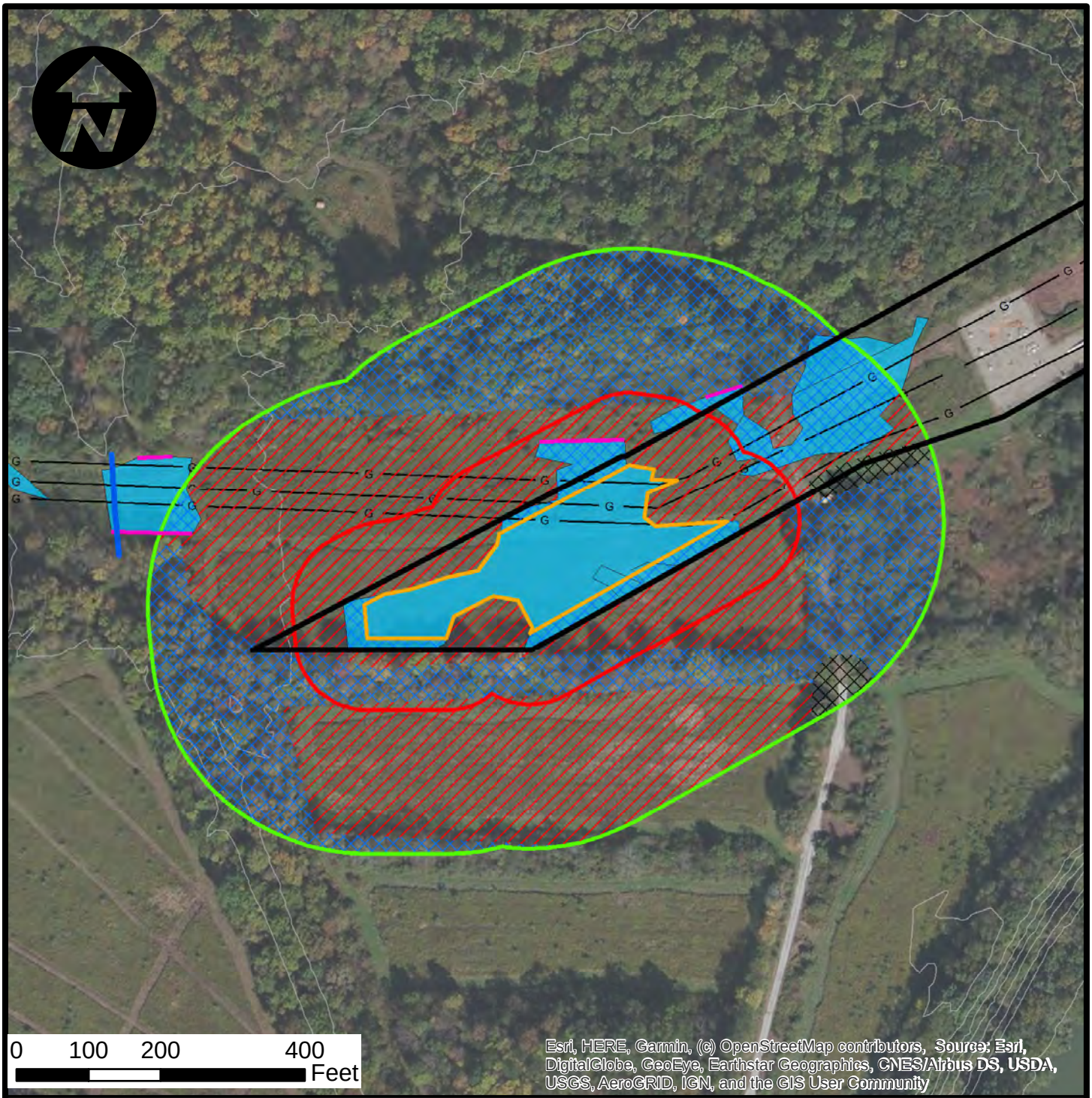
Roadbed Worksheet

Project Name / Identifier		Date	Name(s) of Evaluator(s)
Line 12 Conemaugh River Crossing Project		3/5/2020	B. Miller
Resource Identifier / AA #	**Lat (dd)**	**Long (dd)**	**Notes:**
W-CMS-016	40.455750	-79.300044	#VALUE!

Roadbeds: Record the number of occurrences by roadbed type and distance category. Multiply the number of occurrences by the weighting factors for each roadbed type and distance category then sum the total score for each distance category. The total scores for each distance category are then compared to the condition category descriptions.

Roadbed Type	Distance	Occurrences	Weighting Factor	Score	Distance	Occurrences	Weighting Factor	Score
≥ 4 Lane Paved	0-100 ft.	0	4	0	100-300 ft.	0	4	0
2 Lane Paved	0-100 ft.	0	2	0	100-300 ft.	0	2	0
1 Lane Paved	0-100 ft.	0	1	0	100-300 ft.	0	1	0
Gravel Road	0-100 ft.	0	1	0	100-300 ft.	0	1	0
Dirt Road	0-100 ft.	0	2	0	100-300 ft.	0	2	0
Railroad	0-100 ft.	0	2	0	100-300 ft.	0	2	0
Other Roadbeds	0-100 ft.	0	1, 2 or 4	0	100-300 ft.	0	1, 2 or 4	0
Total Scores:	0-100 ft.	0			100-300 ft.	0		

Road Comments:



LEGEND

- PROPOSED LOD
- EXISTING TETLP PIPELINE
- WATERCOURSE
- OPEN-END
- RIVERINE ZOI
- RIVERINE VEGETATION
- WETLAND
- WETLAND AA
- WETLAND 100-FT ZOI
- WETLAND 300-FT ZOI

CONDITION CATEGORY

- OPTIMAL
- HIGH MARGINAL
- MARGINAL
- POOR

AECOM
FOSTER PLAZA 6
681 ANDERSEN DRIVE, SUITE 120
PITTSBURGH, PA 15220

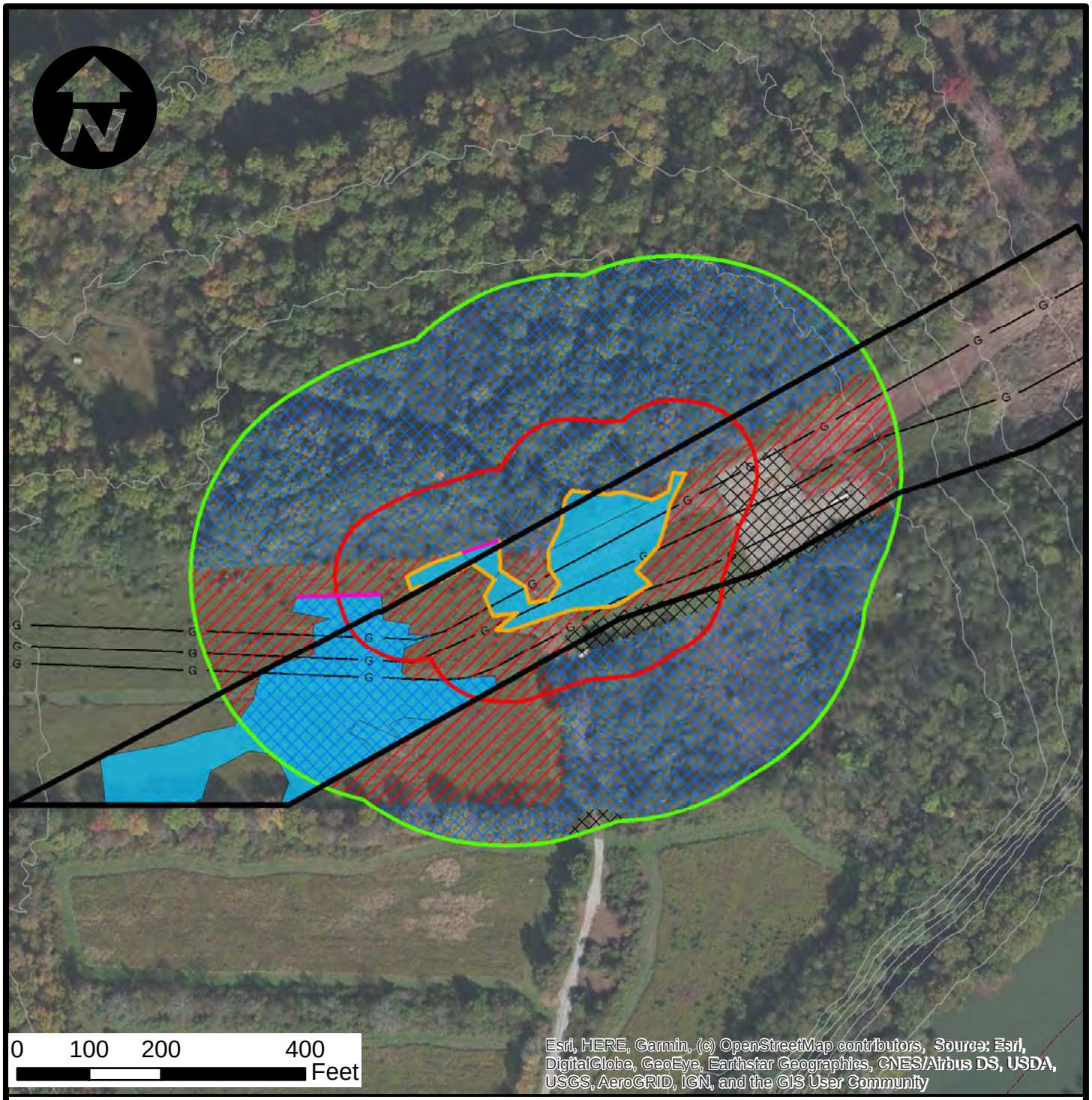
ENBRIDGE

TEXAS EASTERN TRANSMISSION, LP

PREPARED BY:	CHECKED BY:	APPROVED BY:
MLN	SLH	KJT

DATE:	SCALE:
5/19/2020	1 " = 200 feet
PAGE NO:	PROJECT NO.
Page 1 of 4	60612899

FIGURE 3
WETLAND: W-BJM-011
LEVEL 2 RAPID ASSESSMENT PROTOCOL
CONEMAUGH RIVER CROSSING
PROPOSED 24" HDD PIPELINE



LEGEND

- PROPOSED LOD
- EXISTING TETLP PIPELINE
- WATERCOURSE
- OPEN-END
- RIVERINE ZOI
- RIVERINE VEGETATION
- WETLAND
- WETLAND AA
- WETLAND 100-FT ZOI
- WETLAND 300-FT ZOI

CONDITION CATEGORY

- OPTIMAL
- HIGH MARGINAL
- MARGINAL
- POOR

AECOM
FOSTER PLAZA 6
681 ANDERSEN DRIVE, SUITE 120
PITTSBURGH, PA 15220

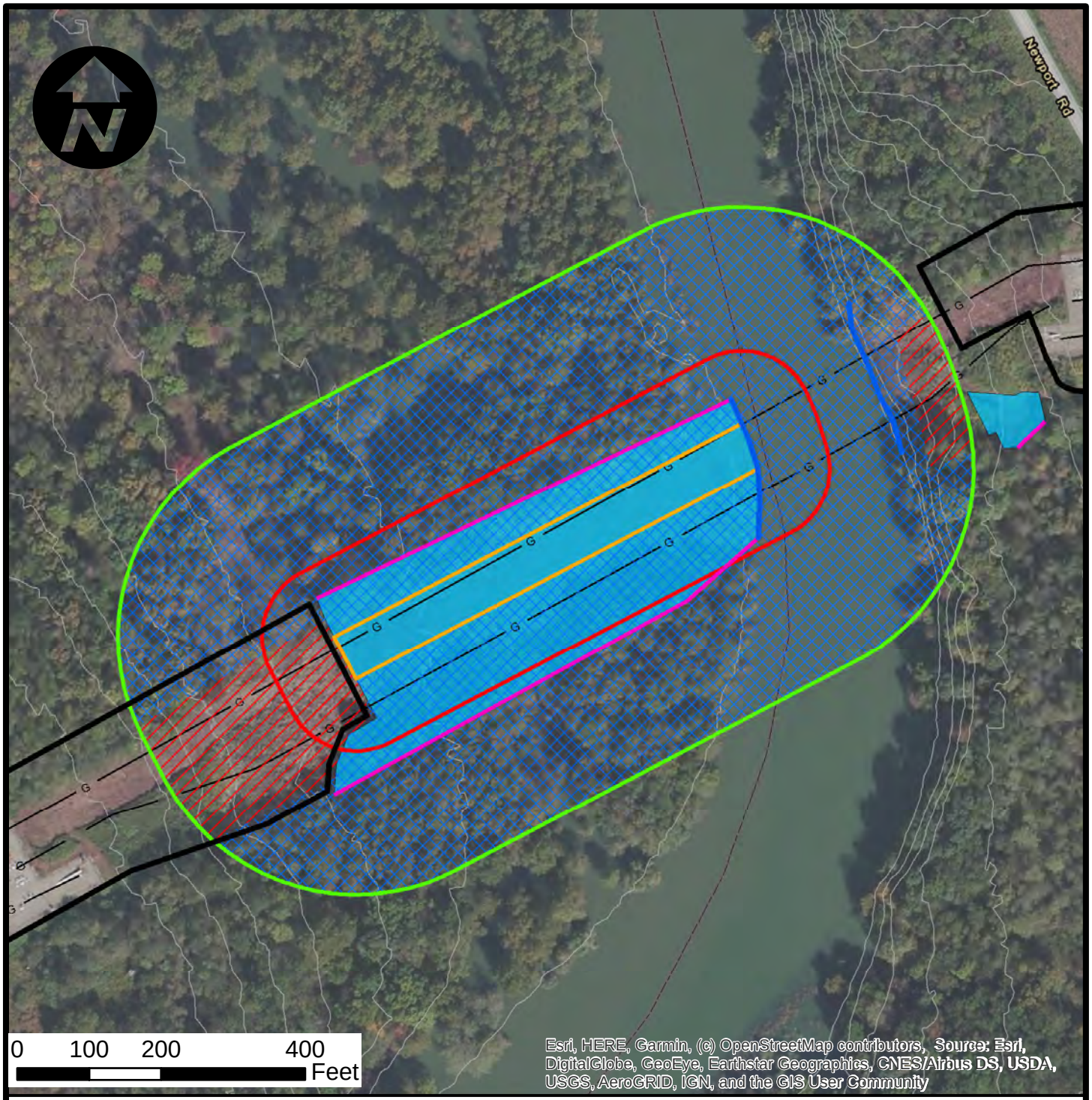
ENBRIDGE

TEXAS EASTERN TRANSMISSION, LP

PREPARED BY:	CHECKED BY:	APPROVED BY:
MLN	SLH	KJT

DATE:	SCALE:
5/19/2020	1 " = 200 feet
PAGE NO:	PROJECT NO.
Page 2 of 4	60612899

FIGURE 3
WETLAND: W-BJM-010
LEVEL 2 RAPID ASSESSMENT PROTOCOL
CONEMAUGH RIVER CROSSING
PROPOSED 24" HDD PIPELINE



LEGEND

- PROPOSED LOD
- EXISTING TETLP PIPELINE
- WATERCOURSE
- OPEN-END
- RIVERINE ZOI
- RIVERINE VEGETATION
- WETLAND
- WETLAND AA
- WETLAND 100-FT ZOI
- WETLAND 300-FT ZOI

CONDITION CATEGORY

- OPTIMAL
- HIGH MARGINAL
- MARGINAL
- POOR

AECOM
FOSTER PLAZA 6
681 ANDERSEN DRIVE, SUITE 120
PITTSBURGH, PA 15220

ENBRIDGE

TEXAS EASTERN TRANSMISSION, LP

PREPARED BY:	CHECKED BY:	APPROVED BY:
MLN	SLH	KJT

DATE:	SCALE:
5/19/2020	1 " = 200 feet
PAGE NO:	PROJECT NO.
Page 3 of 4	60612899

FIGURE 3
WETLAND: W-CMS-016
LEVEL 2 RAPID ASSESSMENT PROTOCOL
CONEMAUGH RIVER CROSSING
PROPOSED 24" HDD PIPELINE

Appendix H
Subfacility Details Impact Table

Subfacility Details

Resource Crossing Number	County	Municipality	Latitude (DD, NAD83)	Longitude (DD, NAD83)	Resource / Subfacility ID[1]	Feature Type	Resource Type [2]	Regulatory Classification[3]	Impact Type	Impact Area (feet^2)	Impact Area (acres)	Crossed By	Subfacility Code(s)	Crossing Type and Product Code(s)
1	Westmoreland	Derry	40.454157	-79.304047	W-BJM-011	Wetland	Palustrine Emergent (PEM)	N/A	Temporary Direct		56,552	Temporary Workspace	TMPWI	TRNC, PETRO
2	Westmoreland	Derry	40.453907	-79.30384	W-BJM-011	Wetland	Palustrine Scrub-shrub (PSS)	N/A	Temporary Direct		2,564	Temporary Workspace	TMPWI	TRNC, PETRO
3	Westmoreland	Derry	40.454614	-79.302808	W-BJM-010	Wetland	Palustrine Emergent (PEM)	N/A	Temporary Direct		20,816	Temporary Workspace	TMPWI	TRNC, PETRO
4	Westmoreland	Derry	40.454602	-79.303316	W-BJM-010	Wetland	Palustrine Scrub-shrub (PSS)	N/A	Temporary Direct		976	Temporary Workspace	TMPWI	TRNC, PETRO
5	Westmoreland	Derry	40.454602	-79.303316	W-BJM-010	Wetland	Palustrine Scrub-shrub (PSS)	N/A	Permanent Direct		976	Wetland Conversion	WTDIM	TRNC, PETRO
6	Westmoreland	Derry	40.454802	-79.302755	W-BJM-010	Wetland	Palustrine Forested (PFO)	N/A	Temporary Direct		4,472	Temporary Workspace	TMPWI	TRNC, PETRO
7	Westmoreland	Derry	40.454802	-79.302755	W-BJM-010	Wetland	Palustrine Forested (PFO)	N/A	Permanent Direct		4,472	Wetland Conversion	WTDIM	TRNC, PETRO
8	Westmoreland	Derry	40.455699	-79.300104	W-CMS-016	Wetland	Palustrine Emergent (PEM)	N/A	Permanent Indirect		1,275	Bore	WTIIM	TRNC, PETRO
9	Westmoreland/ Indiana	Derry/ Blacklick	40.456669	-79.297892	S-JLK-037	River	Perennial (PER)	WWF	Permanent Indirect		486	Bore	WTIIM	TRNC, PETRO

[1] AECOM Designation

[2] Classification based upon field observation by AECOM

[3] As defined by PA Code, Title 25, Chapter 106.1

Appendix I
Alternatives Analysis

ALTERNATIVES ANALYSIS

The following sections discuss the alternatives to the Project that were considered by Texas Eastern to avoid and minimize impacts to wetlands and watercourses.

The Project will result in temporary impacts to approximately 1.96 acres of wetlands within the existing previously disturbed pipeline right-of-way (ROW) as well as additional temporary workspace adjacent to the existing ROW. The horizontal directional drill (HDD) operation will install a new segment of Line 12 beneath one PEM wetland resulting in 0.03 acres of permanent impact, and beneath one perennial watercourse and its assumed floodway resulting 0.02 acres of permanent impact. There will be no net loss in resource area. Section 105.13(d)(1)(viii) of the Pennsylvania Code requires consideration of alternative locations, routings or designs that may potentially avoid or minimize adverse environmental impacts.

ALTERNATIVE 1: Repair Anomaly in Existing Line 12

As described previously in the Project Narrative in Section J, an anomaly was identified approximately 25 feet from the west bank of the Conemaugh River in Texas Eastern's existing Line 12, as a result of a routine in-line inspection in 2018. Texas Eastern received a General Permit 11 (GP116518226) from the Pennsylvania Department of Environmental Protection (PADEP) and U.S. Army Corps of Engineers (USACE) to cross and excavate wetland W-CMS-016 in order to repair the anomaly as part of their Integrity maintenance program. The General Permit authorized 0.98 acres of impact to cross and excavate the wetland to repair the anomaly. However, the existing Line 12 is approximately 30 feet below grade adjacent to the river, likely as a result of silt deposits from the river flooding. The Conemaugh River in the vicinity of the existing ROW is part of an USACE flood control area and as a result the river routinely overflows its western bank. Texas Eastern attempted during the construction season in 2018 and again in 2019 to repair the anomaly via conventional construction methods. The depth of the pipeline, the proximity of the anomaly to the riverbank, and the frequent flooding of the river, particularly with the record rainfalls received during those years, meant that it was not possible to dewater the trench box sufficiently to safely assess and repair the anomaly. After two years of attempts Texas Eastern concluded that repairing the anomaly via the previously permitted typical anomaly repair approach is not feasible. Therefore, this alternative was eliminated from consideration.

ALTERNATIVE 2: In-Situ Replacement of Line 12 Segment via Conventional Construction and Open-Cut of the Conemaugh River

Texas Eastern investigated in-situ replacement of the existing Line 12, from the existing mainline valve (MLV) on the west side of the river to the existing MLV on the east side of the river, through wetland W-CMS-016 and the Conemaugh River using conventional open-cut construction. The replacement would

involve approximately 1,700 feet of pipeline. This is the most common method for installing pipeline under aquatic resources. Both wet and dry crossings were evaluated for the open-cut crossing.

For the wet crossing use of a barge as a construction platform in the river was evaluated. Texas Eastern communicated with the USACE and there is no adequate boat launch in the immediate area. Therefore, this would necessitate the transport of the barge across upland area and through over 600 feet of wetland to the western bank of the river. Excavation of the bank for launching the barge, mooring of the barge, side casting of the spoil during construction into the channel or moving it through the wetland area to a temporary stockpile area were all evaluated. It was determined that the impacts to the wetland, riverbank and channel as well as potential risks associated with a flood event during construction made this alternative undesirable.

A dry crossing using a bladder dam, temporary sheet pile wall, dam and pump and other similar techniques was also evaluated. In the case of watercourse crossing, the water (if flowing) is diverted around the construction area creating a dry workspace. A trench is then excavated through the dry channel. The pipeline is installed at a predetermined depth, backfilled to original contours and completed by replacing the stockpiled substrate. For wetlands, a trench is created through the wetland, segregating the topsoil removed from the wetland surface. The pipeline is then installed at a predetermined depth, backfilled to original contours and completed by replacing the segregated topsoil. The Conemaugh River is considered a navigable water by the USACE so construction within the river would have to be coordinated with the dam operation downstream.

In order to replace the required segment of Line 12 using open-cut construction workspace approximately 100 feet wide would be required for the entire length of wetland W-CMS-016, approximately 640 feet, totaling 2.04 acres of impact. The Conemaugh River would also be open cut, impacting both riverbanks and river bed, totaling 0.29 acres of impact as well as the river's floodway, totalling 0.18 acres of impact. Construction within the Conemaugh River would incur the same safety issues as described in the previous alternative, namely the frequent flooding and water depth changes from high rainfall and flood control activities creates the possibility that the trench would need to be abandoned mid-construction.

Line 12 is the northernmost line on the existing ROW, but the extent of the permanent easement has not been maintained. In order to get the required 100-foot wide construction workspace, Texas Eastern would need to clear the extent of their easement and remove trees in the entire 640-foot length of forested wetland at the northern end of the easement.

While technically feasible, this alternative would require greater wetland impacts, direct impacts to the Conemaugh River, safety concerns, and greater forested wetland clearing. Therefore, this alternative was eliminated from consideration.

ALTERNATIVE 3 (Preferred Alternative): In-Situ Replacement of a Segment of Line 12 and HDD a New Segment of Line 12

A described above, Alternatives 1 and 2 were deemed infeasible or undesirable due to potential increased impacts and safety concerns. Alternative 3 would be to implement the Project as described throughout this application and take into consideration appropriate construction avoidance and minimization measures. There would be no direct impacts to the banks or channel of the Conemaugh River with an HDD. Impacts to the wetlands on the western side would be primarily limited to temporarily matted workspace within the maintained ROW and small areas of expansion necessary at the bore pit. Alternative 3 will accomplish the Project purpose and need safely and with less impacts.

Avoidance and Minimization

Reduce Workspace to Avoid/Minimize Impacts to Wetland Habitats

Construction workspace requirements are a function of construction method, equipment size, and topography. Where feasible, construction activities are restricted to the ROW limits identified on the construction drawings. Because the ROW changes direction west of the HDD entry point temporary workspace is required outside of the ROW for pipe pullback. The construction workspace includes area for HDD operations, the trench excavated around the pipeline, areas for soil stockpiling, and areas that construction equipment will utilize to complete required activities. Texas Eastern must provide sufficient workspace to permit the safe operation of construction equipment at the Project site. The construction workspace at the Project site is identified as the limit of disturbance or "LOD" on the Site Plan (Requirement H).