PennEast Pipeline Company, LLC

PENNEAST PIPELINE PROJECT

L2 - ENVIRONMENTAL ASSESSMENT MODULE 2
RESOURCE IDENTIFICATION
LUZERNE COUNTY

REVISED OCTOBER 2019

Submitted by:
PennEast Pipeline Company, LLC

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TABLES

APPENDICES

ACRONYMS LIST

BO	Biological Opinion
CFR	Code of Federal Regulations
CWA	Clean Water Act
CWF	Cold Water Fishes
dbh	diameter at breast height
EA	Environmental Assessment
EA Form	Environmental Assessment Form
EV	Exceptional Value
FEMA	Federal Emergency Management Agency
FERC	Federal Energy Regulatory Commission
HDD	horizontal directional drill
HGM	hydrogeomorphic
HQ	High-Quality
JPA	Joint Permit Application
L2RAP	Level 2 Rapid Assessment Protocol
MF	Migratory Fishes
mi^2	square miles
MP	milepost
NCDWQ	North Carolina Division of Water Quality
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
PA	Pennsylvania
PADCNR	Pennsylvania Department of Conservation and Natural Resources
PADEP	Pennsylvania Department of Environmental Protection
PaGWIS	Pennsylvania Groundwater Information System
PEM	palustrine emergent
PennEast	PennEast Pipeline Company, LLC
PFBC	Pennsylvania Fish and Boat Commission
PFO	palustrine forested
PGC	Pennsylvania Game Commission
Plan	Upland Erosion Control, Revegetation, and Maintenance Plan
PNHP	Pennsylvania Natural Heritage Program
PNDI	Pennsylvania Natural Diversity Inventory
Procedures	Wetland and Waterbody Construction and Mitigation Procedures
Project	PennEast Pipeline Project
PSS	palustrine scrub-shrub
ROW	right-of-way
RQBTS	Recognized Qualified Bog Turtle Surveyor
SGL	State Game Lands
T&E	threatened and endangered
TGD	Technical Guidance Document
TSF	Trout Stocking Fishery
USACE	U.S. Army Corps of Engineers

USCA	U.S. Code Annotated
USFWS	U.S. Fish and Wildlife Service
WWF	Warmwater Fishes

Module S2: Resource Identification and Characterization

In accordance with the requirements contained within the Pennsylvania Department of Environmental Protection's (PADEP) Comprehensive Environmental Assessment of Proposed Project Impacts for Chapter 105 Water Obstruction and Encroachment Permit Applications Technical Guidance Document (TGD) (Document No. 310-2137-006) and the assessment criteria detailed in Module 2 of the Environmental Assessment (EA) Form (EA Form) Instructions (Document No. 3150-PM-BWEW0017, Revised 6/2017), PennEast Pipeline Company, LLC (PennEast) has provided a complete analysis and discussion of the aquatic habitat resources located within the right-of-way (ROW) workspace limits of the proposed PennEast Pipeline Project (Project) in Luzerne County, Pennsylvania. This document follows the sequence of the requirements presented in the EA Form Instructions Module S2 Section.

S2.A Standard Resource Identification

S2.A.1 Identification and Qualifications

The contact information and a summary of qualifications of the professional biologists who have identified resources present on the Project site are included in Table LU-L2-1. Resumes are provided in Appendix LU-L-2A.

Table LU-L2-1.
Resource Identification Information

Organization Name	Mailing Address	Staff	Email Address	Portions of Work Completed
AECOM Technical Services, Inc.	625West Ridge Pike Suite E100 Conshohocken, PA 19428	Sarah Binckley	sarah.binckley@aecom.com	Oversaw Aquatic Resource Identification and Permit Application (2015-2019)
AECOM Technical Services, Inc.	625West Ridge Pike Suite E100 Conshohocken, PA 19428	Bruce Bayne	bruce.bayne@aecom.com	Aquatic Resource Identification Technical Lead (2014-2018)
AECOM Technical Services, Inc	715 Washington Boulevard Williamsport, PA 17701	Shannon Haight	shannon.haight@aecom.com	Permit Application Technical Lead
AECOM Technical Services, Inc.	100 Sterling Parkway, Suite 205 Mechanicsburg, PA 17050	Will Anderson	william.anderson@aecom.com	Wetland and Watercourse Delineations, L2RAP[1] Field Work (2015-2018)

AECOM Technical Services, Inc.	625West Ridge Pike. Suite E100 Conshohocken, PA 19428	David Brightbill	david.brightbill@aecom.com	Wetland and Watercourse Delineations, L2RAP Field Work (2015-2019)
AECOM Technical Services, Inc.	625West Ridge Pike. Suite E100 Conshohocken, PA 19428	Carolyn Steinberg	carolyn.steinberg@aecom.com	Wetland and Watercourse Delineation and L2RAP data management (2014-2018)
AECOM Technical Services, Inc.	Foster Plaza 6, 681 Andersen Drive Suite 400 Pittsburgh, PA 15220	Mark Fox	mark.fox@aecom.com	L2RAP Desktop Analysis
AECOM Technical Services, Inc.	Foster Plaza 6, 681 Andersen Drive Suite 400 Pittsburgh, PA 15220	Colleen Ashbaugh	colleen.ashbaugh@aecom.com	Wetland and Watercourse Delineation Report and L2RAP data management (2017-2018)
AECOM Technical Services, Inc.	625West Ridge Pike. Suite E100 Conshohocken, PA 19428	Gavin McBrien	gavin.mcbrien@aecom.com	Wetland and Watercourse Delineations, L2RAP Field Work (2014-2017)
AECOM Technical Services, Inc.	Foster Plaza 6, 681 Andersen Drive Suite 400 Pittsburgh, PA 15220	Matt Kline	matthew.kline@aecom.com	Wetland and Watercourse Delineations, L2RAP Field Work (2015-2017)
AECOM Technical Services, Inc.	100 Sterling Parkway, Suite 205 Mechanicsburg, PA 17050	Bridger Thompson	bridger.thompson@aecom.com	Wetland and Watercourse Delineations, L2RAP Field Work (2015-2017)
AECOM Technical Services, Inc.	715 Washington Boulevard Williamsport, PA 17701	Mark Benfer	mark.benfer@aecom.com	Wetland and Watercourse Delineations, L2RAP Field Work (2017)

Notes:
[1] Level 2 Rapid Assessment Protocol (L2RAP) includes PA Riverine Condition, PA Wetland Condition, and PA Lacustrine Condition protocols.

S2.A.2 Wetland Delineation Report

A Wetland and Watercourse Delineation Report is provided in Appendix LU-L-2B.

S2.A.3 Watercourse Report

A Wetland and Watercourse Delineation Report is provided in Appendix LU-L-2B.

S2.A.4 Location Map

A Project Location Map specific to Luzerne County that identifies regulated waters of the Commonwealth, natural areas, wildlife sanctuaries, natural landmarks, political boundaries, publicly available service areas for public water supplies, and historic landmarks within 1 mile of the Project and, State Forests, State Parks, State Game Lands, and prime farmland within 100 feet of the Project is included in JPA Section I. There are no National Parks, Forests, or Recreation Areas within 100 feet of the Project. As indicated in Table LU-L2-2 below, there are no National Wildlife Refuges, or Federal, State, Local, or Private Wildlife or Plant Sanctuaries, Public Water Supply sources, Natural Wild or Scenic Rivers, Commonwealth's Scenic Rivers, or Designated Federal Wilderness Areas within 100 feet of the Project in Luzerne County.

S2.A.5 Areas of Special Interest

A portion of the Project in Luzerne County crosses State Parks, State Forests, State Game Lands, and areas identified as prime farmland, as summarized in Table LU-L2-2. Where areas of special interest will be crossed, a description of these areas is provided below.

Table LU-L2-2
Areas of Special Interest crossed by the Project in Luzerne County

Area of Special Interest	Yes	No
National, State or Local Park, Forest or Recreation Areas	X	
National Natural Landmarks		X
National Wildlife Refuge, or Federal, State, Local, or Private Wildlife or Plant Sanctuaries		X
State Game Lands	X	
Areas Identified as Prime Farmland	X	
Source for a Public Water Supply		X[1]
Natural Wild or Scenic River or the Commonwealth's Scenic Rivers System		X
Designated Federal Wilderness Areas		X

Area of Special Interest	Yes	No

Notes:
[1] No public water supplies have been identified to date.

National, State or Local Park, Forest or Recreation Areas

Within Luzerne County, the Project crosses the Francis E. Walter Reservoir, Frances Slocum State Park, and Pinchot State Forest.

Francis E. Walter Reservoir

Federally managed properties crossed by the Project in Luzerne County include the crossing of a reservoir and recreational area associated with the Francis E. Walter Reservoir between mileposts (MPs) 23.0 and 23.1 for an approximate crossing length of 0.1 miles where the Project intersects the Lehigh River. Within Luzerne County, approximately 0.8 acres of lands associated with Francis E. Walter Reservoir will be affected by the construction of the Project and 0.3 acres will be located in the permanent ROW. The primary purpose of the F.E. Walter Dam is flood control, and recreation is a secondary mission; whitewater and fishery releases are planned every year (USACE, 2017a). All facilities are operated and maintained by the U.S. Army Corps of Engineers (USACE, 2017a). Public use areas include two boat launches, four picnic areas, one disc golf course, and many other improved and managed areas for public recreation. An extensive recreational and fisheries program is also in place at the Francis E. Walter Reservoir area. Recreation along the reservoir is typical of that which is available along any major waterway including fishing and boating. There are no existing roads leading to the area where the Project crosses the reservoir. The Lehigh River, at this location, is not used by beach goers, and there are no boat launches in the immediate vicinity of the proposed crossing. The crossing location was chosen such that it is situated farther than 2 miles from the dam itself, and away from recreational access points and facilities, such as boat launches.

Pursuant to Section 14 of the Rivers and Harbors Act and codified in U.S. Code Title 33 Section 408, PennEast has consulted with the USACE regarding the proposed modifications to the Francis E. Walter Reservoir and is seeking Section 408 approval. Consultation with the USACE regarding the Section 408 approval was initiated in October 2014. Coordination continued for several months and included a pre-application meeting in 2015 and the submission of a Section 408 application and an Application for Transportation and Utility Systems and Facilities on Federal Land in February 2016. The USACE issued a public notice in April 2016 that informed the public of PennEast's application (USACE, 2016). In April 2017, PennEast submitted an applicant-prepared EA for the Francis E. Walter Reservoir crossing, which the USACE published in June 2017 (USACE, 2017b). On November 27, 2018, the USACE issued its Section 408 approval and a Finding of No Significant Impact. Impacts associated with this resource are discussed in Module 3.

Frances Slocum State Park

Management of state parks in Pennsylvania is implemented by the Pennsylvania Department of Conservation and Natural Resources (PADCNR). Frances Slocum State Park in Luzerne County is a 1,035-acre park which contains a 165-acre lake that is popular for boating and fishing, and home to many

species of wildlife. Recreational opportunities at the park include hiking, mountain biking, picnicking, swimming, boating, fishing, hunting, ice fishing and camping. The park is host to 13 miles of hiking trails and the Patrick J. Solano Environmental Education Center (PADCNR, 2018a). The Project crosses Frances Slocum State Park between MPs 2.1 and 2.4 along the westernmost boundary of the State Park for an approximate crossing length of 0.3 miles in Luzerne County. Approximately 3.3 acres of lands associated with Frances Slocum State Park will be affected by the construction of the Project and 1.2 acres will be located in the permanent ROW. Impacts associated with this resource are discussed in Module 3.

PennEast initiated consultation with PADCNR in November 2014 and submitted a formal request for right-of-way (ROW) on December 9, 2014. An official Pre-Survey Meeting was held on March 18, 2015. State Forest Environmental Review applications were submitted on March 4, 2016. PennEast has continued to coordinate with PADCNR since the application submittals, responding to PADCNR requests to avoid, minimize, and mitigate impacts to State Parks and State Forests. PennEast anticipates that a Post-Survey Meeting will be held in February 2019 to resolve any outstanding issues regarding the request for ROW.

Pinchot State Forest

State forests in Pennsylvania are managed by the Bureau of Forestry, which is a subdivision of PADCNR. Pinchot State Forest is comprised of tracts in Lackawanna, Luzerne, Wyoming, Susquehanna, and Wayne counties which total 44,743 acres (PADCNR, 2018b). PennEast crosses a tract of Pinchot State Forest, from MPs 11.4R2 to 12.3R2, for an approximate crossing length of 1 mile. Approximately 11.5 acres of lands associated with Pinchot State Forest will be affected by the construction of the Project and 3.8 acres will be located in the permanent ROW. In 2014, when PennEast initially sited the pipeline route through Plains Township in Luzerne County, the parcel that is now incorporated into Pinchot State Forest was privately owned and not part of the State Forest system. Both parcels were conveyed from private owners to the PADCNR on March 25, 2015. The proposed route was sited through this part of Plains Township to (1) co-locate PennEast's ROW with the existing Transco pipeline and to (2) align for a crossing of I-476 at the safest location approximately 0.5 mile southeast of the State Forest parcel. Impacts associated with this resource are discussed in Module 3.

As described above, PennEast submitted a formal request for ROW on December 9, 2014. Applications were submitted in March 2016, and PennEast has continued to coordinate with PADCNR to avoid, minimize, and mitigate impacts to state-owned and state-managed properties.

State Game Lands

Pennsylvania's State Game Lands (SGL) are managed by the Pennsylvania Game Commission (PGC). Within Luzerne County, the Project's crosses SGL 91 for approximately 4.1 miles between MP 15.9 and MP 18.6 and between MP 21.5 and MP 23.0. Approximately 74.4 acres of lands associated with SGL 91 will be affected by the construction of the Project and 14.8 acres will be located in the permanent ROW. SGL 91 is located in both Lackawanna and Luzerne Counties and consists of 21,137 acres of mostly forested land. Impacts associated with this resource are discussed in Module 3.

Consultation between PennEast and representatives from PGC began in September 2015, and ROW applications were submitted in 2017. The PGC issued license agreements for the Project on December 5, 2018.

Areas Identified as Prime Farmland

Based on soil units, 88.0 acres of area classified as prime farmland or farmland of statewide importance is located within the construction work space in Luzerne County. This acreage includes 56.5 acres in the temporary ROW and 31.5 acres within the permanent ROW. The prime farmland and farmland of statewide importance locations are listed by MP, soil map unit, and classification in Appendix LU-L-2C.

Source for a Water Supplies

PennEast used several data sources including public sources, consultations with public water suppliers, desktop assessments, and landowner outreach to identify public and private water supplies near the Project area. The data collection methods are described below.

Water Supply Search Radii

In accordance with its Well Monitoring Plan and Federal Energy Regulatory Commission (FERC) Certificate conditions (FERC, 2018), PennEast will monitor all water supply wells within 150 feet of the Project workspace [500 feet in karst areas and surrounding horizontal directional drills (HDDs)]. Monitoring will require the approval of the landowner and will include both public and private water supplies.

In its July 3, 2019 Technical Deficiency letter, PADEP requested that PennEast identify private water supplies within 450 feet of HDDs (1,000 feet in karst areas) and public water supply wells within 0.5 mile of HDD alignments. Within Luzerne County, PennEast proposes one HDD, the SR315/Interstate-81 HDD which is not in an area of karst terrain.

Public Data Sources

PennEast reviewed the PADCNR Pennsylvania Groundwater Information System (PaGWIS) to identify groundwater wells within 150 feet of the Project workspace, 500 feet of Project workspace in areas of karst terrain, and 0.5 mile of the proposed HDDs, (PaGWIS, 2019).

Public Water Supply Consultations

PennEast reviewed PADEP's Public Water Supplier's (PWS) Service Areas to identify PWS areas with surface water sources within 1 mile upstream or 10 miles downstream of Project workspace and PWS areas with groundwater sources within 0.5 mile of proposed HDD alignments (PADEP, 2019a). The results of this screening were used for direct consultation with public water suppliers. Within Luzerne County, PennEast consulted with Aqua Pennsylvania, Suez Water Pennsylvania, and PA American Water Company. Initial consultation letters were mailed on April 23, 2018, to which three public water suppliers responded (Appendix LU-L-2H). A second consultation letter was mailed to Suez Water Pennsylvania on June 21,

2018. Aqua Pennsylvania, Suez Water, and PA American Water Company do not have groundwater wells within 500 feet of the Project's workspace. In response to PADEP's July 3, 2019 Technical Deficiency Letter, PennEast contacted the PA American Water Company on July 31, 2019. The company responded on August 20, 2019, confirming that the PA American Water Company does not have any wells within the 0.5-mile buffer. Neither Aqua Pennsylvania nor Suez Water were contacted in 2019, as their PWS service areas are not near HDDs.

Desktop Assessment

PennEast used aerial photography to assess the potential for private and public water wells to exist in parcels within the distances specified above. If homes, businesses, or other buildings were observed on aerial photography within the buffers, PennEast noted whether it was probable for water supply wells to exist on the property. Although all property owners within 450 feet of the SR315/Interstate-81 HDD were contacted to request information about well presence or absence on their properties, only parcels with commercial, industrial, or multiple buildings on a single parcel within 0.5 mile of the HDD were contacted to request information about public water supply wells.

Landowner Outreach

PennEast's land agents contacted landowners with potential private and public water supply wells within the search radii described above. Landowners with potential private water supply wells were asked to complete questionnaires that included questions about the presence/absence of wells, springs, and septic systems on their property, the status of any wells (abandoned, sealed, currently in use), what the water is used for (human consumption, irrigation, livestock, business/commercial use), and any known information about when wells were installed, well depths, and treatment systems. Landowners with potential public water supply wells were asked to complete questionnaires that included questions related to water use, the community the well services (community water supply, school, hospital, office building, factory, campground, gas station), and any known information about when the wells were installed, depth and diameter of the well and casing, production rate, static water level, and aquifer transmissivity. Landowners were also asked to describe the location of the well and mark the location on a map. When granted permission by the landowner(s), land agents would collect well location information.

Water Supply Investigation Results

In Luzerne County, 29 private water supply wells have been identified within the well monitoring buffer; no public wells have been identified within the well monitoring buffer. Within the PADEP-specified buffers at HDD locations, PennEast has not identified any private or public water supply wells within 450 feet or 0.5 mile of the SR315/Interstate-81 HDD, respectively.

The locations of private wells within the PADEP-specified buffers at HDD locations are shown on figures in Appendix LU-L-2I. Water supply location information should be treated as privileged information that should not be released.

S2.B Aquatic Resource Identification

Aquatic habitats identified in the general Project area include watercourses (i.e., lakes, ponds, reservoirs, ephemeral, intermittent and perennial watercourses) and wetlands. Watercourses and wetlands within Luzerne County were field delineated by AECOM in accordance with USACE requirements between 2014 and 2019. The identification of regulated wetland and watercourse boundaries occurred within a 400-foot-wide survey corridor centered over the proposed pipeline (i.e., 200-feet on either side of the pipe centerline). Other areas in the survey scope included aboveground facilities, pipe yards, construction staging areas, and access road areas required to facilitate Project construction and operation.

Results of the field surveys determined construction of the Project in Luzerne County would require crossing 75 watercourses and 56 wetlands. Tables LU-L2-3 and LU-L2-4 below list the unique resource identifier, location, type, size, state designation, and fisheries classifications (where applicable) for watercourses and wetlands, respectively. Proposed impacts are presented in Module 3.

Watercourses

Watercourse flow type classifications for surface waters located within the survey corridor were assigned in accordance with the criteria found in the Pennsylvania Code 025 §93, as well as by determination of watercourse flow using geomorphic, hydrological and biological indicators, utilizing the North Carolina Division of Water Quality (NCDWQ), Identification Methods for the Origins of Intermittent and Perennial Streams (NCDWQ, 2005 per PADEP, 2012). Of the 101 watercourses surveyed within the 400-foot-wide survey corridor in Luzerne County, 28 were classified as ephemeral, 34 were classified as intermittent and 39 were classified as perennial. Only 75 of the surveyed watercourses will be impacted by the Project. A summary of the total top-of-bank crossing widths for all watercourses crossed in Luzerne County consists of the following:

- 53 watercourse crossings have top-of-bank crossing width equal to or less than 10 feet;
- 17 watercourse crossings have top-of-bank crossing width between 11 and 100 feet; and
- 5 watercourse crossings have top-of-bank crossing width greater than 100 feet (including each channel of the Susquehanna River crossing for both the pipeline and proposed diversion dam discussed in JPA Section L-3).

Major watercourse crossings (i.e., total crossing widths that are 100-feet or larger) within Luzerne County consist of the following:

- Susquehanna River (Watercourse ID 102315_WA_1001_P_MA)
- Lehigh River [Watercourse ID 052115_JC_1001_P_MA (crossing is located in both Luzerne and Carbon counties – impacts are accounted for in the Luzerne County JPA)]

Designated/Existing Uses and High Quality/Exceptional Value Waters

The Commonwealth of Pennsylvania has established Water Quality Standards that classify surface waters in Pennsylvania according to their use. These standards were established to implement Pennsylvania's

Clean Streams Law that protects existing and designated surface water uses from degradation and negative change to the water's use. Uses include those associated with aquatic life, water supply, recreation and fish consumption, special protection, and navigation. The water use classification system and criteria are established for Pennsylvania Code Title 25, Chapter 93 and include the following designations related to fisheries:

- Warmwater Fishes (WWF) - Maintenance and propagation of fish species and additional flora and fauna which are indigenous to a warm water habitat;
- Cold Water Fishes (CWF) - Maintenance and/or propagation of fish species including the family Salmonidae and additional flora and fauna which are indigenous to cold water habitat;
- Migratory Fishes (MF) - Passage, maintenance, and propagation of anadromous and catadromous fishes and other fishes that move to or from flowing waters to complete their life cycle in other waters; and
- Trout Stocking Fishery (TSF) Maintenance of stocked trout from February 15 to July 31, and maintenance and propagation of fish species and additional flora and fauna which are indigenous to a warm water habitat.

In addition, watercourses may be classified as special protection waters, including Exceptional Value (EV) and High-Quality (HQ) based on a variety of criteria. HQ waters are those surface waters with water quality that exceed levels necessary to support propagation of fish, shellfish, and wildlife, and recreation in and on the water by satisfying Pennsylvania Code 025 §93.4b(a). EV waters include high quality surface waters that satisfy Pennsylvania Code 025 §93.4b(b). The water quality of all HQ and EV watercourses must be maintained and protected in accordance with antidegradation requirements (Pennsylvania Code 025 §93.4a). The Pennsylvania Fish and Boat Commission (PFBC) further defines watercourses based upon their status with regard to their ability to support the propagation of trout, wild or otherwise. Stocked Trout Waters include watercourses that have significant portions that are open to public fishing and are stocked with trout by the PFBC. Wild Trout Waters are sections of watercourses that support naturally reproduction populations of trout. Class A Wild Trout Streams are wild trout watercourses that have a population that is of sufficient size and abundance to support a long-term sport fishery. Table LU-L2-3 below provides an overview of the fishery resource classifications based on review of appropriate drainage lists found in Pennsylvania Code, Title 25, Chapter 93, §93.9 and the trout water classification lists published by the PFBC.

Floodways

As defined by the PADEP under Pennsylvania Code 025 §105.1, the floodway of a watercourse is identified as the channel of the watercourse and portions of the adjoining floodplains which are reasonably required to carry and discharge the 100-year frequency flood. Unless otherwise specified, the boundary of the floodway is as indicated on maps and flood insurance studies provided by the Federal Emergency Management Agency (FEMA). In an area where no FEMA maps or studies have defined the boundary of the 100-year frequency floodway, it is assumed, absent evidence to the contrary, that the floodway extends 50-feet from the top of the bank of the watercourse.

PennEast assessed the Flood Insurance Rate Maps issued by FEMA to identify mapped Regulatory Floodways. Where no mapped floodway exists, PennEast assumed that a 50-foot wide buffer on each

watercourse, measured landward from the top of bank of both the left and the right bank of the watercourse, represents the floodway. Table LU-L2-3 provides information about the floodway size within the study corridor for each floodway that will be impacted by the Project. Figures contained within Joint Permit Application (JPA) Section H-2 show the FEMA 100-year floodways and the presumed 50-foot PADEP floodways within Luzerne County. Impacts are presented in Module 3.

Table LU-L2-3
Size and Designations of Impacted Watercourses in Luzerne County[1]

Milepost[2]	Watercourse ID[3,4]	Watercourse Name	Resource Type[5]	Watercourse Type[6]	Delineated Channel Length within the Study Corridor (feet)	Average Delineated Width (feet)	Floodway Acreage within the Study Corridor (acre)	PFBC Wild Trout Water[7]	PFBC Trout Stocked Water[8]	Chapter 93 Existing or Designated Use[9]
PennEast Mainline Pipeline										
0.6	092414_GO_1001_P_IM	Trout Brook	Watercourse-channel and watercourse floodway	Perennial	576	15	0.770	III	-	CWF, MF
1.4	032818_WA_1000_P_IN	UNT to Trout Brook	Watercourse-channel and watercourse floodway	Perennial	489	12	0.473	III	-	CWF, MF
2.1	050416_DB_1001_I_MI	UNT to Abrahams Creek	Watercourse-channel and watercourse floodway	Intermittent	135	3	0.422	-	-	CWF, MF
2.6	011815_JC_1000_I_MI	UNT to Abrahams Creek	Watercourse-channel and watercourse floodway	Intermittent	508	7	1.208	-	-	CWF, MF
3.1	011815_JC_1001_P_MI	UNT to Toby Creek	Watercourse-channel and watercourse floodway	Perennial	460	6	1.153	III	-	CWF, MF
3.1	011815_JC_1002_I_MI	UNT to Toby Creek	Watercourse-channel and watercourse floodway	Intermittent	137	5	0.182	III	-	CWF, MF
3.5	101717_AB_1001_I_MI	UNT to Toby Creek	Watercourse-channel and watercourse floodway	Intermittent	425	5	1.016	III	-	CWF, MF
4.3R2	020916_BT_1001_I_MI	UNT to Abrahams Creek	Watercourse-channel and watercourse floodway	Intermittent	431	1	1.188	III	-	CWF, MF
4.3R2	020916_BT_1003_P_MI	UNT to Abrahams Creek	Watercourse-channel and watercourse floodway	Perennial	255	3	0.939	III	-	CWF, MF
4.9R3	020916_BT_1004_I_MI	UNT to Abrahams Creek	Watercourse floodway	Intermittent	-	-	1.119	III	-	CWF, MF
5.1	020916_BT_1006_I_MI	UNT to Abrahams Creek	Watercourse-channel and watercourse floodway	Intermittent	114	3	0.156	III	-	CWF, MF
5.1	020916_BT_1007_I_MI	UNT to Abrahams Creek	Watercourse-channel and watercourse floodway	Intermittent	519	6	1.148	III	-	CWF, MF
6	092314_GO_1001_I_MI	UNT to Abrahams Creek	Watercourse-channel and watercourse floodway	Intermittent	413	2	0.118	-	-	CWF, MF
6.1	092414_GO_1002_I_IN	Abrahams Creek	Watercourse-channel and watercourse floodway	Intermittent	250	17	0.629	-	-	CWF, MF
6.2R2	092414_GO_1003_P_IM	UNT to Susquehanna River	Watercourse-channel and watercourse floodway	Perennial	2,495	15	2.673	-	-	CWF, MF
6.9	102315_WA_1001_P_MA (1) - 1	Susquehanna River	Watercourse-channel and watercourse floodway	Perennial	400	520	49.586	-	-	WWF, MF
7.2	102315_WA_1001_P_MA (1) - 2	Susquehanna River	Watercourse-channel and watercourse floodway	Perennial	400	520	-	-	-	WWF, MF
7	102315_WA_1001_P_MA (2) - 1	Susquehanna River (Diversion Dam)	Watercourse-channel and watercourse floodway	Perennial	250	475	-	-	-	WWF, MF
7.1	102315_WA_1001_P_MA (2) - 2	Susquehanna River (Diversion Dam)	Watercourse-channel and watercourse floodway	Perennial	250	475	-	-	-	WWF, MF

Milepost[2]	Watercourse ID[3,4]	Watercourse Name	Resource Type[5]	Watercourse Type[6]	Delineated Channel Length within the Study Corridor (feet)	Average Delineated Width (feet)	Floodway Acreage within the Study Corridor (acre)	PFBC Wild Trout Water[7]	PFBC Trout Stocked Water[8]	Chapter 93 Existing or Designated Use[9]
9.7R2	071416_GM_1001_P_IN	Gardner Creek	Watercourse-channel and watercourse floodway	Perennial	458	25	0.622	-	-	CWF, MF
10.1R2	050416_DB_1002_I_MI	UNT to Mill Creek	Watercourse-channel and watercourse floodway	Intermittent	622	3	1.516	III	-	CWF, MF
10.8R2	110514_JC_1002_P_IM	Mill Creek	Watercourse-channel and watercourse floodway	Perennial	769	30	0.926	III	-	CWF, MF
11.5R2	121614_JC_1000_P_MI	Deep Creek	Watercourse-channel and watercourse floodway	Perennial	746	8	0.721	III	-	CWF, MF
11.5R2	121614_JC_1001_E_MI	UNT to Deep Creek	Watercourse-channel and watercourse floodway	Ephemeral	443	3	1.070	III	-	CWF, MF
12.4R2	121514_JC_1001_E_MI	UNT to Mill Creek	Watercourse-channel and watercourse floodway	Ephemeral	439	3	1.015	III	-	CWF, MF
13	121814_JC_1010_P_MI	UNT to Mill Creek	Watercourse-channel and watercourse floodway	Perennial	597	8	1.264	III	-	CWF, MF
13.1	121814_JC_1011_P_MI	UNT to Mill Creek	Watercourse-channel and watercourse floodway	Perennial	450	8	0.984	III	-	CWF, MF
13.2	121814_JC_1013_E_MI	UNT to Mill Creek	Watercourse-channel and watercourse floodway	Ephemeral	227	5	0.688	-	-	CWF, MF
13.2	121814_JC_1012_E_MI	UNT to Mill Creek	Watercourse-channel and watercourse floodway	Ephemeral	412	2	0.984	III	-	CWF, MF
13.3	121814_JC_1007_E_MI	UNT to Mill Creek	Watercourse-channel and watercourse floodway	Ephemeral	403	10	0.985	III	-	CWF, MF
13.3	121814_JC_1008_P_MI - 1	UNT to Mill Creek	Watercourse-channel and watercourse floodway	Perennial	422	3	1.003	III	-	CWF, MF
13.6	121814_JC_1005_P_MI	UNT to Mill Creek	Watercourse-channel and watercourse floodway	Perennial	445	6	1.054	III	-	CWF, MF
13.6	121814_JC_1006_I_MI	UNT to Mill Creek	Watercourse-channel and watercourse floodway	Intermittent	215	4	0.251	III	-	CWF, MF
13.7	121814_JC_1004_I_MI	UNT to Mill Creek	Watercourse-channel and watercourse floodway	Intermittent	404	4	1.032	III	-	CWF, MF
13.8	121814_JC_1003_I_MI	UNT to Mill Creek	Watercourse-channel and watercourse floodway	Intermittent	291	6	0.709	III	-	CWF, MF
13.9	121814_JC_1002_P_MI	UNT to Mill Creek	Watercourse-channel and watercourse floodway	Perennial	639	6	1.494	III	-	CWF, MF
13.9	121814_JC_1001_P_MI	UNT to Mill Creek	Watercourse-channel and watercourse floodway	Perennial	931	6	1.884	III	-	CWF, MF
14	121814_JC_1000_I_MI	UNT to Mill Creek	Watercourse floodway	Intermittent	-	-	0.703	III	-	CWF, MF
14.1	111014_JC_1001_E_MI	UNT to Mill Creek	Watercourse-channel and watercourse floodway	Ephemeral	190	3	0.546	III	-	CWF, MF
14.7	041017_NJ_1002_I_MI	UNT to Little Bear Creek	Watercourse-channel and watercourse floodway	Intermittent	638	2	1.356	III	-	HQ-CWF, MF
15	043015_JC_1001_I_MI	UNT to Little Bear Creek	Watercourse-channel and watercourse floodway	Intermittent	197	7	0.515	III	-	HQ-CWF, MF

Milepost[2]	Watercourse ID[3,4]	Watercourse Name	Resource Type[5]	Watercourse Type[6]	Delineated Channel Length within the Study Corridor (feet)	Average Delineated Width (feet)	Floodway Acreage within the Study Corridor (acre)	PFBC Wild Trout Water[7]	PFBC Trout Stocked Water[8]	Chapter 93 Existing or Designated Use[9]
16.2	112114_JC_1003_P_IM - 1	UNT to Bear Creek	Watercourse-channel and watercourse floodway	Perennial	595	43	1.532	-	-	HQ-CWF, MF
16.2	112114_JC_1002_P_MI	Bear Creek	Watercourse-channel and watercourse floodway	Perennial	417	10	0.845	-	-	HQ-CWF, MF
16.4	112114_JC_1001_P_MI - 1	UNT to Bear Creek	Watercourse-channel and watercourse floodway	Perennial	591	5	1.298	-	-	HQ-CWF, MF
16.7	112014_JC_1003_P_IM - 1	Meadow Run	Watercourse-channel and watercourse floodway	Perennial	440	41	0.477	-	-	HQ-CWF, MF
16.9	112014_JC_1002_P_MI	UNT Meadow Run	Watercourse-channel and watercourse floodway	Perennial	248	2	0.672	-	-	HQ-CWF, MF
17.7	112014_JC_1001_P_MI	UNT to Little Shades Creek	Watercourse-channel and watercourse floodway	Perennial	203	4	0.543	III	-	HQ-CWF, MF
18.3	111914_JC_1002_P_IM	Little Shades Creek	Watercourse-channel and watercourse floodway	Perennial	447	40	1.526	III	-	HQ-CWF, MF
18.4	111914_JC_1001_P_IM	UNT to Little Shades Creek	Watercourse-channel and watercourse floodway	Perennial	210	15	0.487	III	-	HQ-CWF, MF
19	121814_JC_1014_E_MI	UNT to Little Shades Creek	Watercourse floodway	Ephemeral	-	-	0.424	III	-	HQ-CWF, MF
19	121814_JC_1014_I_MI	UNT to Little Shades Creek	Watercourse floodway	Intermittent	-	-	0.785	III	-	HQ-CWF, MF
19.6	121614_JC_1009_P_IM	Shades Creek	Watercourse-channel and watercourse floodway	Perennial	727	25	1.373	I, III	-	HQ-CWF, MF
20	121714_JC_1001_E_MI	UNT to Shades Creek	Watercourse-channel and watercourse floodway	Ephemeral	138	7	0.206	I, III	-	HQ-CWF, MF
20	121614_JC_1007_P_MI	UNT to Shades Creek	Watercourse floodway	Perennial	-	-	0.543	I, III	-	HQ-CWF, MF
20.1	121614_JC_1006_P_MI	UNT to Shades Creek	Watercourse-channel and watercourse floodway	Perennial	810	7	1.831	I, III	-	HQ-CWF, MF
21.2	121614_JC_1004_I_MI	UNT to Stony Run	Watercourse-channel and watercourse floodway	Intermittent	266	4	0.575	III	-	HQ-CWF, MF
22.5	102115_WA_002_E_MI	UNT Stony Run	Watercourse floodway	Ephemeral	-	-	0.216	III	-	HQ-CWF, MF
22.6	102115_WA_001_E_MI	UNT Stony Run	Watercourse floodway	Ephemeral	-	-	0.735	III	-	HQ-CWF, MF
22.7	050615_JC_1001_P_IM	Stony Run	Watercourse-channel and watercourse floodway	Perennial	992	36	1.050	III	-	HQ-CWF, MF
22.7	102115_WA_001_I_MI	UNT Stony Run	Watercourse floodway	Intermittent	-	-	0.235	III	-	HQ-CWF, MF
23	052115_JC_1001_P_MA	Lehigh River	Lacustrine	Perennial	2,103	460	5.143	III	-	HQ-CWF, MF
Access Roads										
13.3	121814_JC_1008_P_MI - 2	UNT to Mill Creek	Watercourse-channel and watercourse floodway	Perennial	422	3	-	III	-	CWF, MF
13.3	081215_MK_013_I_MI	UNT to Mill Creek	Watercourse-channel and watercourse floodway	Intermittent	288	5	0.202	III	-	CWF, MF
13.3	081215_MK_014_P_IM	UNT to Mill Creek	Watercourse-channel and watercourse floodway	Perennial	63	13	0.033	III	-	CWF, MF

Milepost[2]	Watercourse ID[3,4]	Watercourse Name	Resource Type[5]	Watercourse Type[6]	Delineated Channel Length within the Study Corridor (feet)	Average Delineated Width (feet)	Floodway Acreage within the Study Corridor (acre)	PFBC Wild Trout Water[7]	PFBC Trout Stocked Water[8]	Chapter 93 Existing or Designated Use[9]
13.3	081215_MK_015_I_MI	UNT to Mill Creek	Watercourse-channel and watercourse floodway	Intermittent	76	3	0.146	III	-	CWF, MF
13.3	081215_MK_016_E_MI	UNT to Mill Creek	Watercourse-channel and watercourse floodway	Ephemeral	84	2	0.122	III	-	CWF, MF
13.3	081215_MK_017_P_IM	UNT to Mill Creek	Watercourse-channel and watercourse floodway	Perennial	78	11	0.394	III	-	CWF, MF
14	041717_WA_1001_E_MI	UNT to Mill Creek	Watercourse-channel and watercourse floodway	Ephemeral	26	1	0.098	III	-	CWF, MF
16.1	112114_JC_1003_P_IM - 2	UNT to Bear Creek	Watercourse-channel and watercourse floodway	Perennial	595	43	-	-	-	HQ-CWF, MF
16.4	112114_JC_1001_P_MI - 2	UNT to Bear Creek	Watercourse-channel and watercourse floodway	Perennial	591	5	-	-	-	HQ-CWF, MF
16.7	112014_JC_1003_P_IM - 2	Meadow Run	Watercourse-channel and watercourse floodway	Perennial	440	41	-	-	-	HQ-CWF, MF
22.5	042017_MK_1002_P_MI	UNT to Stony Run	Watercourse-channel and watercourse floodway	Intermittent	196	4	0.365	III	-	HQ-CWF, MF
22.5	042517_GM_1001_P_IN	Stony Run	Watercourse-channel and watercourse floodway	Perennial	128	15	0.096	III	-	HQ-CWF, MF
22.7	042517_GM_1002_I_MI	UNT to Stony Run	Watercourse-channel and watercourse floodway	Intermittent	153	4	0.148	III	-	HQ-CWF, MF
22.8	042517_GM_1003_P_MI	UNT to Lehigh River	Watercourse-channel and watercourse floodway	Perennial	199	3	0.191	III	-	HQ-CWF, MF

Notes:
1. Source: PennDOT Pennsylvania county boundaries, dated 7/2018. Available at www.pasda.psu.edu.
2. All route deviations implemented after the FERC Certificate Application are denoted with an "R" and indicate a MP equation. MPs with an "R1" indicate route deviations implemented and provided to FERC prior to the issuance of the DEIS. MPs with an "R2" indicate route deviations implemented as part of the September 2016 Route Update. MPs with an "R3 indicate route deviations implemented post-FERC Certificate issuance. All MPs without an "R" indicate that the route has not changed since the Certificate Application.
3. In instances where a watercourse is crossed by the proposed pipeline or workspace multiple times, crossing numbers (e.g. "-1", "-2") have been added to the Watercourse ID.
4. Watercourse ID: P = perennial, I = intermittent, E = ephemeral, MA = major, IN = intermediate, MI = minor, C = canal, D = ditch
5. Resource type is defined as watercourse channel (riverine) or watercourse floodway consistent with the classification presented in EA Instructions Section B.2.
6. Ditches identified within the Project area were included as ephemeral waterbody crossings. Canals and lakes identified with the Project area were included as perennial waterbody crossings.
7. Sources: PFBC Stream Sections that Support Wild Trout Production, dated 7/2019 and PFBC Class A Wild Trout Streams, dated 7/2019. Available at www.pasda.psu.edu. I = Class A Trout Water, II = Wilderness Trout Stream, III = Naturally Reproducing Trout Stream.
8. Sources: PASDA Stocked Trout Waters (Flowing Waters), dated 2019 and PASDA Trout Stocked Streams, dated 2019. Available at www.pasda.psu.edu.
9. Sources: PADEP Streams Chapter 93 Existing Use, dated 3/2019 and PADEP Streams Chapter 93 Designated Use, dated 3/2019. If a stream has an existing use, the designated use has been replaced with that value. Available at www.pasda.psu.edu.

Wetlands

As defined under Section 404 of the Clean Water Act (CWA; 33 Code of Federal Regulations [CFR] 328), wetlands are areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of wetland vegetation adapted for life in saturated soil conditions. PennEast identified, located, classified and delineated wetland resources within and adjacent to the Project area through field surveys conducted from 2014 to 2019. Jurisdictional wetlands crossed by the Project in Pennsylvania 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, 2011; 2012a-b).

The United States Fish and Wildlife Service (USFWS) wetland classification system described by Cowardin, et al. (1979) was used to classify the wetlands that would be affected by the Project. The wetlands in the Project area were identified as palustrine forested (PFO), palustrine scrub-shrub (PSS), palustrine emergent (PEM), or a combination of these three cover types. Construction of the proposed Project in Luzerne County will result in 56 wetland crossings.

Exceptional Value Wetlands

The State of Pennsylvania has two major classifications of wetlands – EV and Other. The designation of EV wetlands is based on specific characteristics or uses. EV Wetlands are a category of wetlands that deserve special protection. In accordance with Pennsylvania Code 025 §105.17, EV wetlands are to exhibit one or more of the following five characteristics detailed in Sections 105.17(1)(i) through 105.17(1)(v):

(i) Wetlands which serve as habitat for fauna or flora listed as ‘‘threatened’’ or ‘‘endangered’’ under the Endangered Species Act of 1973 (7 United States Code Annotated [USCA] § 136; 16 USCA § § 4601-9, 460k-1, 668dd, 715i, 715a, 1362, 1371, 1372, 1402 and 1531—1543), the Wild Resource Conservation Act (32 P.S. § § 5301—5314), 30 Pa.C.S.(relating to the Fish and Boat Code) or 34 Pa.C.S. (relating to the Game and Wildlife Code).

(ii) Wetlands that are hydrologically connected to or located within 1/2-mile of wetlands identified under subparagraph (i) and that maintain the habitat of the threatened or endangered species within the wetland identified under subparagraph (i).

(iii) Wetlands that are located in or along the floodplain of the reach of a wild trout stream or waters listed as exceptional value under Chapter 93 (relating to water quality standards) and the floodplain of streams tributary thereto, or wetlands within the corridor of a watercourse or body of water that has been designated as a National wild or scenic river in accordance with the Wild and Scenic Rivers Act of 1968 (WSRA; 16 USCA § § 1271—1287) or designated as wild or scenic under the Pennsylvania Scenic Rivers Act (32 P. S.§ § 820.21—820.29).

(iv) Wetlands located along an existing public or private drinking water supply, including both surface water and groundwater sources, that maintain the quality or quantity of the drinking water supply.

(v) Wetlands located in areas designated by the Department as ‘‘natural’’ or ‘‘wild’’ areas within State Forest or Park lands, wetlands located in areas designated as Federal wilderness areas under the

Wilderness Act (16 USCA § § 1131—1136) or the Federal Eastern Wilderness Act of 1975 (16 USCA § 1132) or wetlands located in areas designated as National natural landmarks by the Secretary of the Interior under the Historic Sites Act of 1935 (16 USCA § § 461—467).

Using the definitions above, PennEast evaluated the classification of each wetland that was delineated within the 400-foot-wide survey corridor.

(i) PennEast consulted with agencies that regulate threatened and endangered (T&E) species. These agencies requested targeted surveys for several species that utilize wetlands as habitat, including: bog turtle (*Glyptemys muhlenbergiii*, federal endangered), eastern redbelly turtle (*Pseudemys rubriventris*, state threatened), northeastern bulrush (*Scirpus ancistrochaetus*, federal endangered), northern cricket frog (*Acris crepitans*, state endangered), Collin's sedge (*Carex collinsii*, state endangered), bog sedge (*Carex paupercula*, state threatened), variable sedge (*Carex polymorpha*, state endangered), and sweetgale (*Myrica gale*, state threatened), white-fringed orchid (*Platanthera blephariglottis*, proposed state endangered and sensitive), screw-stem (*Bartonia paniculata*, state proposed rare), rough-leaved aster (*Eurybia radula*, state proposed threatened), and creeping snowberry (*Gaultheria hispidula*, state rare). Within Luzerne County, these targeted survey requests were limited to northeastern bulrush, no populations of which were observed. Therefore, no EV wetlands in Luzerne County met this parameter.

(ii) In consultation with federal and state agencies that regulate T&E species and through T&E species surveys, no wetlands that are hydrologically connected to and maintaining the habitat of T&E species were identified within Luzerne County. Therefore, no EV wetlands in Luzerne County met this parameter.

(iii) The Project crosses multiple wild trout streams and tributaries thereto. The Project also crosses a few EV watercourses and their tributaries. PennEast evaluated each delineated wetland to determine if it was located within the floodplain of a wild trout stream or EV stream. In most instances, wetlands within a wild trout or EV watershed were categorized as EV. However, in some instances in these watersheds, no watercourses were located near a wetland, so it was classified as "other". Wetlands that were not in wild trout or EV watersheds were also classified as "other" wetlands. Therefore, several EV wetlands in Luzerne County met this parameter as denoted by "(iii)" in Table LU-L2-4 below.

(iv) As discussed in Section S2.A.5, PennEast used desktop analysis, consulted with public water suppliers, and contacted landowners to determine the locations of public or private drinking water supplies. Although several private wells were identified near the Project workspace in Luzerne County, only one was located within 50 feet of a wetland. PennEast has assumed that based on the proximity of the wetland to the water well, the wetland may maintain the quality or quantity of the drinking water supply. Therefore, one EV wetland in Luzerne County met this parameter as denoted by "(iv)" in Table LU-L2-4 below.

(v) The Project does not cross and wild or scenic rivers, nor is the Project located in any "natural" or "wild areas" within state forests or park lands, areas designated as federal wilderness areas, or areas designated as National Natural Landmarks. Therefore, no EV wetlands in Luzerne County met this parameter.

Table LU-L2-4 below provides an overview of the wetland delineated size and Pennsylvania Code, Title 25, Chapter 025 §105 wetland classification.

Table LU-L2-4
Size and Classifications of Impacted Wetlands in Luzerne County[1]

Milepost[2]	Wetland ID[3,4]	Delineated Size (acres)	Chapter 105 Wetland Classification[5]
PennEast Mainline Pipeline			
0R1	050715_JC_1001_PSS	1.934	Exceptional (iii)
0.1	050715_JC_1001b_PEM	0.253	Exceptional (iii)
0.1	050715_JC_1001a_PEM	0.080	Exceptional (iii)
1.4	032818_WA_001_PFO	0.374	Exceptional (iii)
2.1	050416_DB_1001_PFO	0.368	Other
3.1	011815_JC_002_PFO	1.052	Exceptional (iii)
6	092314_GO_001_PSS	0.017	Other
6.6R2	110915_WA_003_PEM	0.022	Other
12.1R3	072219_MU_1000_PEM - 1	0.529	Other
12.1R3	072219_MU_1000_PEM - 2	0.529	Other
12.1R3	072219_MU_1000_PEM - 3	0.529	Other
12.2R3	072219_MU_1001_PFO	0.280	Exceptional (iii)
12.2R3	072219_MU_1002_PEM	0.020	Other
13.2	060618_WA_002_PEM	0.193	Other
13.7	121814_JC_001_PEM	0.091	Other
14.1	111014_JC_002_PFO	0.172	Exceptional (iii)
14.7	042417_GM_1001_PFO	0.178	Exceptional (iii)
15	043015_JC_1001_PFO	0.410	Exceptional (iii)
15	043015_JC_1001_PEM - 1	0.116	Exceptional (iii)
15	043015_JC_1001_PEM - 2	0.116	Exceptional (iii)
16	112114_JC_003B_PFO - 1	1.960	Other
16.1	112114_JC_003B_PFO - 2	1.960	Other
16.2	112114_JC_003B_PFO - 3	1.960	Other
16.2	112114_JC_003B_PSS - 1	1.219	Other
16.2	112114_JC_003A_PSS - 1	1.191	Other
16.4	112114_JC_002_PSS	0.409	Other
16.4	112114_JC_002_PEM	0.070	Other
16.8	112014_JC_002_PFO	1.574	Other
16.8	112014_JC_002_PEM	0.344	Other
17.7	112014_JC_001_PFO	0.663	Exceptional (iii, iv)

Milepost[2]	Wetland ID[3,4]	Delineated Size (acres)	Chapter 105 Wetland Classification[5]
17.8	112014_JC_001_PEM	0.220	Exceptional (iii)
19.6	121614_JC_001_PFO - 1	0.991	Exceptional (iii)
19.7	121614_JC_001_PEM	0.629	Exceptional (iii)
19.7	121614_JC_001_PFO - 2	0.991	Exceptional (iii)
22.7	102115_WA_003_PFO	0.114	Other
Access Roads			
0R1	010716_GM_1002_PEM	0.123	Exceptional (iii)
0R1	053117_MB_1001_PSS	0.058	Exceptional (iii)
0R1	053117_MB_1001_PEM	0.056	Exceptional (iii)
0R1	010716_GM_1001_PEM	0.047	Exceptional (iii)
0R1	010716_GM_1001_PSS	0.032	Exceptional (iii)
13.1	081215_MK_019_PEM	0.108	Other
13.3	121814_JC_002_PEM	0.120	Exceptional (iii)
13.3	081215_MK_020_PEM	0.004	Exceptional (iii)
13.3	081215_MK_021_PEM	0.077	Other
13.2	081215_MK_022_PEM	0.013	Other
15.9	042417_GM_1002_PSS	0.739	Other
15.9	042417_GM_1002_PEM	0.044	Other
16.2	112114_JC_003A_PSS - 2	1.191	Other
16.1	112114_JC_003B_PSS - 2	1.219	Other
16.1	112114_JC_003B_PSS - 3	1.219	Other
16.4	112114_JC_002A_PSS - 1	0.882	Other
16.4	112114_JC_002A_PSS - 2	0.882	Other
16.8	112014_JC_002_PSS	0.986	Other
17.7	112014_JC_001_PSS	1.789	Exceptional (iii)
22.5	042517_GM_1001_PEM	0.031	Exceptional (iii)
22.6	042517_GM_1002_PEM	0.003	Exceptional (iii)

Milepost[2]	Wetland ID[3,4]	Delineated Size (acres)	Chapter 105 Wetland Classification[5]

Notes:
1. Source: PennDOT Pennsylvania county boundaries, dated 7/2018. Available at www.pasda.psu.edu.
2. All route deviations implemented after the FERC Certificate Application are denoted with an "R" and indicate a MP equation. MPs with an "R1" indicate route deviations implemented and provided to FERC prior to the issuance of the DEIS. MPs with an "R2" indicate route deviations implemented as part of the September 2016 Route Update. MPs with an "R3 indicate route deviations implemented post-FERC Certificate issuance. All MPs without an "R" indicate that the route has not changed since the Certificate Application.
3. In instances where a wetland is crossed by the proposed pipeline or workspace multiple times, crossing numbers (e.g. "-1", "-2") have been added to the Wetland ID.
4. Wetland ID Key: PEM = palustrine emergent, PFO = palustrine forested, PSS = palustrine scrub shrub
5. Resource Value Definitions: Pennsylvania Exceptional Value Wetland as defined by PA Code §105.17 (relating to special criteria for projects affecting important wetlands). Criteria are:
(i) Serves as habitat for fauna or flora listed as ''threatened'' or ''endangered''
(ii) Is hydrologically connected to or located within a 1/2-mile from habitat for fauna or flora listed as ''threatened'' or ''endangered'' and wetland dependent;
(iii) Located in or along the floodplain of the reach or tributaries of a wild trout stream or waters listed as exceptional value;
(iv) Located along an existing public or private drinking water supply.

S2.C Federal and State Threatened and Endangered Species Habitat

On behalf of PennEast, AECOM has consulted with the USFWS, National Marine Fisheries Service (NMFS), PGC, PFBC, and PADCNR to identify the potential presence of federally and state listed T&E species as well as species of special concern and significant habitats within the vicinity of the Project.

Table LU-L2-5 below lists the species identified through consultations with the aforementioned federal and state agencies as threatened, endangered, rare, candidate, or of concern in Luzerne County. As requested in the PADEP's EA Form Instructions, PennEast submitted a Large Project Pennsylvania Natural Diversity Inventory (PNDI) review for rare, candidate, threatened, and endangered species under the jurisdiction of the USFWS, PFBC, PGC and PADCNR for the PennEast Pipeline Project. The results of the Large Project Review are included in Table LU-L2-5 below.

Table LU-L2-5
Federally and State Listed Species Potentially Occurring Within the Action Area Luzerne County

Species Common Name	Scientific Name	Federal Status	State Status	Survey Status	Reporting Status	Status of State/Federal Review	Final State/Federal Clearance/Concurrence Issued[1]
Indiana bat	*Myotis sodalis*	Endangered	Endangered	Surveys completed October 2017	Final mist net report, fall portal survey report submitted April 2018	Concurrence via informal consultation received along with Biological Opinion – November 28, 2017. In their July 29, 2019 amended BO, the USFWS determined that the Modifications will not result in affects above what was analyzed in the November 28, 2017 BO.	Amended BO issued July 29, 2019
Northern long-eared bat	*Myotis septentrionalis*	Threatened	Endangered (January 2019)	Surveys completed October 2017	Final mist net report, fall portal survey report submitted April 2018	Biological Opinion issued November 28, 2017. In their July 29, 2019 amended BO, the USFWS determined that the Modifications will not result in affects above what was analyzed in the November 28, 2017 BO.	Amended BO issued July 29, 2019
Northeastern bulrush	*Scirpus ancistrochaetus*	Endangered	Endangered	Surveys completed August 2019	Final survey report submitted September 2019	Concurrence via informal consultation received along with Biological Opinion – November 28, 2017. In their July 29, 2019 amended Opinion, the USFWS determined that the Modifications will not result in affects above what was analyzed in the November 28, 2017 BO.	Amended BO issued July 29, 2019
Eastern small-footed bat	*Myotis leibii*	Not Listed	Threatened	Surveys completed August 2019	Final survey report submitted September 2019	PGC review complete	January 9, 2019
Timber rattlesnake	*Crotalus horridus*	Not Listed	Not Listed[2]	Surveys completed May 2016	Final survey report submitted August 2016	PFBC review complete for this species	October 11, 2018
Sundial lupine	*Lupinus perennis*	Not Listed	Rare	Incidental observation – no surveys requested	Observation submitted July 9, 2018	PADCNR review complete	August 24, 2018

Notes:
1. Not included in this table – new workspace adjustment within Pinchot State Forest, requested by the PADCNR Right-of-Way Licensing Division. Initial desktop and field review of the workspace indicates no additional species impacts or surveys are likely, but update letters have been sent to the USFWS, PGC, PFBC, and PADCNR to request their review of the workspace adjustment. On October 17, 2019, the PFBC and PADCNR each confirmed that they would not require additional surveys.
2. Formerly PA Candidate, delisted in 2016

S2.C.1 Pennsylvania Natural Diversity Inventory Receipts

Correspondence between PennEast, USFWS, NMFS, PADCNR, PFBC, and PGC is included in JPA Section G-1. Correspondence and reports that identify the specific locations of protected species has been redacted and is included in a separate, privileged volume in JPA SectionG-2.

S2.C.2 Pennsylvania Natural Diversity Inventory Potential Conflicts

PennEast has completed surveys for threatened and endangered species in Luzerne County. The species that may be impacted by the Project in Luzerne County include northern long-eared bat (*Myotis septentrionalis,* federal threatened), eastern small-footed bat (*M. leibii*, state threatened), timber rattlesnake (*Crotalus horridus,* delisted), and sundial lupine (*Lupinus perennis,* state rare). A summary of the surveys conducted and PNDI resolutions for these species is included below.

The PADCNR, PGC, and PFBC have provided clearance letters for the Project dated August 24, 2018, January 9, 2019, and October 11, 2018, respectively. These letters are provided in JPA Section G-1. On November 28, 2017, the USFWS issued a Biological Opinion (BO) for impacts that the Project may have on the northern long-eared bat and bog turtle. In its cover letter to the FERC, the USFWS stated that the Project is not likely to adversely affect the dwarf wedgemussel (*Alasmidonta heterodon*, federal endangered), Indiana bat (*Myotis sodalis*, federal endangered), or the northeastern bulrush. FERC has since re-initiated consultation with the USFWS to modify the 2017 BO, and the USFWS issued an amended BO on July 29, 2019. In the revised BO, the USFWS determined that the modifications will not result in affects above what was analyzed in the original BO. The USFWS addressed effects analysis for species under informal consultation in the amended BO cover letter; they also finalized formal consultation with "no jeopardy" findings for the northern long-eared bat and the bog turtle in the amended BO.

Since the original submission of this permit application, the PADCNR Right-of-Way-Licensing Division requested that PennEast consider a minor workspace adjustment in Pinchot State Forest. The purpose of this adjustment is to avoid a geological formation that the PADCNR has identified as being of particular interest and value to the property. PennEast has completed initial environmental surveys and desktop review of the workspace adjustment and has not identified any new resources or rare species conflicts. Letters were sent to the PADCNR, PGC, PFBC, and USFWS on October 11, 2019 which described the workspace change, provided maps, and requested that each agency review whether additional surveys were required. The PADCNR and PFBC each confirmed that no additional surveys were needed on October 17, 2019.

PennEast requests that the PADEP utilize a sequential review of the PNDI coordination in accordance with the PADEP's *Policy for PNDI Coordination during Permit Review and Evaluation* (Document Number 021-0200-001), which allows for a concurrent review of the permit application while the permit applicant completes PNDI coordination.

Northern Long-Eared Bat

In its BO, the USFWS concluded that tree removal within 0.25 mile of northern long-eared bat hibernacula is not likely to adversely affect the species, and vibrations generated by heavy machinery are not anticipated

to result in micro-climatic or structural changes to hibernacula. However, the USFWS also concluded that tree removal within 150 feet of maternity roosts is likely to adversely affect northern long-eared bat individuals with maternity colonies close to the Project. Tree removal will occur outside of the restricted pup season window, so this take is not prohibited by the 4(d) rule. To minimize impacts to the species, PennEast will implement the following conservation measures in Luzerne County:

- PennEast will only clear trees ≥5 inches diameter at breast height (dbh) between November 1 and March 31.
- PennEast will only clear trees ≥3 inches dbh between November 15 and March 31 within known fall swarming habitat areas.
- PennEast will not blast within 0.25-mile of known northern long-eared bat hibernacula.
- PennEast will work with the USFWS to conduct vibration, and/or temperature and humidity monitoring within subterranean features found at Tunnel 34 prior to, during, and after construction as long as landowner access continues to be granted.
- Prior to construction, PennEast will file with the FERC Secretary, for review and written approval by the Director of Office of Energy Projects, a list of locations by MP where, in accordance with the BO, the USFWS is requiring tree clearing restrictions that are specifically applicable to federally listed bat species.

Eastern Small-Footed Bat

PennEast received concurrence from the PGC regarding the eastern small-footed bat on January 9, 2019. The PGC provided options for PennEast to either complete Phase 2 surveys, or assume presence and commit to mitigating impacts at a 3:1 ratio. PennEast has completed Phase 2 surveys; no eastern small-footed bat roosting habitat was identified. Final survey reports were submitted to PGC in September, 2019.

Timber Rattlesnake

Portions of the Project in Luzerne County are within the range of the timber rattlesnake. Surveys have been completed for this species, and all reports have been submitted. Avoidance and minimization measures for the timber rattlesnake will include the re-creation of impacted gestation habitat in accordance with PFBC guidelines and the avoidance of occupied dens.

Pennsylvania Protected Plants

PennEast conducted rare plant surveys for targeted species, and none of the species were observed in Luzerne County. However, a population of sundial lupine (*Lupinus perennis*) was observed within the study corridor. Although this species was not observed within the proposed workspace, PennEast will follow the Rare Plant Mitigation Plan that has been approved by the PADCNR. In this plan, PennEast committed to additional pre-construction surveys in the areas where rare plant populations were identified in surveys conducted from 2015-2019. During the pre-construction surveys, individual plants and/or the extents of population boundaries will be mapped. If any rare plants are observed within the proposed Project

workspace, the avoidance, minimization, and mitigation measures that are outlined in the plan will be followed. Affected populations will be monitored for three growing seasons after construction.

S2.D Aquatic Resource Characterization

S2.D.1 Riverine Resources

The watercourse information contained within Table LU-L2-6 has the gradient class for each delineated watercourse in Luzerne County as well as the watershed as defined in the Pennsylvania Natural Heritage Program's (PNHP's) Aquatic Community Classification Project Steam Reach Watersheds data (PNHP 2018) and a summary of the results from the PA Riverine Condition Level 2 Rapid Assessment Protocol (L2RAP). Copies of the assessment area mapping and data sheets are provided in Appendix LU-L-2D. The Riverine Assessment Area, Riparian Vegetation, and Riparian Zone of Influence utilized to complete PA Riverine Condition L2RAP were based on the delineated watercourse boundaries identified pre-construction.

The following section contains information pertaining to the riverine resource types and conditions in Luzerne County 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.

The portion of the Project area in Luzerne County is located within the Toby Creek, Trout Brook, Abrahams Creek, Susquehanna River, Mill Creek, Gardner Creek, Little Bear Creek, Bear Creek, Meadow Run, Little Shades Creek, Shades Creek, Stony Run, and Lehigh River watersheds. The Toby Creek, Trout Brook, Abrahams Creek, Susquehanna River, Mill Creek, and Gardner Creek watersheds are all located within the Susquehanna River basin. The Little Bear Creek, Bear Creek, Meadow Run, Little Shades Creek, Shades Creek, Stony Run, and Lehigh River watersheds are all located within the Delaware River basin. These watersheds support cold water and cool water aquatic communities.

The watercourses associated with these aquatic communities typically consist of smaller, high-gradient, headwater and mid-reach watercourses with watersheds ranging in size from approximately 18 to 54 square miles (mi^2). The surrounding land uses in these watersheds consist primarily of forest and undeveloped land with some agricultural and residential, and few urban areas. Water quality tends to be higher in these watercourses with alkalinity and conductivity values ranging from low to relatively high and pH levels in the neutral range. Typical fish species found in these watercourses are comprised of brown trout (*Salmo trutta*), brook trout (*Salvelinus fontinalis*), rainbow trout (*Oncorhynchus mykiss*), fathead minnow (*Pimephales promelas*), pearl dace (*Margariscus margarita*), blacknose dace (*Rhinichthys atratulus*), and white sucker (*Catostomus commersoni*). Common aquatic macroinvertebrate taxa found in these waters include species from the Ephemeroptera, Plecoptera, and Trichoptera orders. According to the PFBC, the following watercourses within the Project area in Luzerne County are listed as supporting natural trout reproduction: Toby Creek, UNT to Abrahams Creek, Mill Creek, Little Bear Creek, Little Shades Creek, Shades Creek, and this section of the Lehigh River. As such, these watercourses provide the potential for trout fishing. None of the watercourses within the Project area in Luzerne County are listed by the PFBC as Stocked Trout Waters.

Within Luzerne County, the Project also crosses the Susquehanna River, a watercourse that is used for recreational boating and fishing. The proposed Project crosses the Harding to Berwick section of the Susquehanna River North Branch Water Trail. Powered boats, canoes, and kayaks can generally access this river segment year-round. A public boat launch in Nesbitt Park provides a concrete boat ramp for access approximately 5 miles downstream of the PennEast Crossing location. In addition, Appletree Road Boat Launch provides recreational access approximately 8.5 miles upstream of the proposed crossing. This launch is frequently used for canoe and kayak access as well as small fishing boats. The river supports a WWF with species including smallmouth bass (*Micropterus dolomieu*), walleye (*Sander vitreus*), muskellunge (*Esox masquinongy*), channel catfish (*Ictalurus punctatus*), rock bass (*Ambloplites rupestris*), common carp (*Cyprinus carpio*), and white suckers. Fishing is popular along the Susquehanna River in the area of Wilke Barre, and targeted species include smallmouth bass, walleye, and channel catfish.

Appropriate nesting, spawning, rearing, resting, migration, feeding, and escape cover appear to be provided for the aquatic organisms within the larger watercourses identified within the Project area in Luzerne County. Fin fish were observed within the majority of the identified perennial watercourses. Macroinvertebrate taxa were observed primarily within the perennial watercourses of the Project area in Luzerne County. The substrate of the identified watercourses most often consisted of cobble and gravel; with boulder, sand, silt, and clay present. Course plant material, such as wood, was observed within the majority of the watercourses. These features can provide microhabitat for aquatic organisms. Resting areas were found within the moderate gradient areas of the watercourses (e.g., pools and runs). Migration within the Project area watercourses is possible but was not observed during field investigations. Food sources appeared to be derived from both terrestrial and aquatic vegetation and invertebrates. Natural flushing occurs within the perennial watercourses as sediments and other particles are deposited along the banks and within the channels. Due to the seasonal flow of intermittent watercourses and periodic flow of the ephemeral watercourses, these features are not regularly flushed.

The flow patterns upstream and downstream of the Project area watercourses are a slightly sinuous channel type. The watercourses within the Project area in Luzerne County range from high to low gradient and groundwater and overland runoff support flow for the identified intermittent and perennial watercourses. The identified watercourses carry surface water runoff and influence groundwater through the streambed.

The flood-prone areas of the Project area in Luzerne County were observed to be generally functional. Flood-prone areas reduce the force, height, and volume of floodwaters to downstream areas by acting as a floodwater storage area. The flood-prone areas of the Project area in Luzerne County were observed to be dominated by both native and non-native shrub and herbaceous vegetative species. Vegetation within flood-prone areas helps to slow runoff, trap sediments, and increase absorption of flood waters. The intact riparian corridors help prevent sedimentation and erosion.

The most obvious source of pollution observed within the Project area in Luzerne County was roadway and agricultural runoff. The watercourses within the Project area were adjacent to vegetated riparian corridors, which limited the effects of these pollution sources.

The watercourses within the Project area in Luzerne County will either be crossed via open cut method, conventional bore, or HDD method. The watercourses crossed via open trench method will be restored to their original contours following construction, which is typically within two days. A 75-foot-wide limit of

disturbance will typically be cleared around watercourses located in forested areas. Following restoration, a 30-foot-wide permanent ROW will be maintained for the life of the pipeline. No trees will be permitted to grow within that width. The watercourses crossed via HDD will have no above-ground disturbance.

Table LU-L2-6
Characterization of Impacted Riverine Resources in Luzerne County[1]

Milepost[2]	Watercourse Identifier[3,4]	Gradient Class[5]	Watershed Size[5]	PA Riverine Condition L2RAP Score
PennEast Mainline Pipeline				
0.6	092414_GO_1001_P_IM	2	2	0.76
1.4	032818_WA_1000_P_IN	2	1	0.86
2.1	050416_DB_1001_I_MI	1	2	0.61
2.6	011815_JC_1000_I_MI	1	2	0.87
3.1	011815_JC_1001_P_MI	1	2	0.64
3.1	011815_JC_1002_I_MI	1	2	0.7
3.5	101717_AB_1001_I_MI	1	2	0.66
4.3R2	020916_BT_1001_I_MI	1	1	0.78
4.3R2	020916_BT_1003_P_MI	1	1	0.68
4.9R3	020916_BT_1004_I_MI	1	1	-
5.1	020916_BT_1006_I_MI	1	1	0.86
5.1	020916_BT_1007_I_MI	1	1	0.87
6	092314_GO_1001_I_MI	3	1	0.19
6.1	092414_GO_1002_I_IN	1	3	0.24
6.2R2	092414_GO_1003_P_IM	1	4	0.43
6.9	102315_WA_1001_P_MA (1) - 1	1	4	0.46
7.2	102315_WA_1001_P_MA (1) - 2	1	4	0.46
7	102315_WA_1001_P_MA (2) - 1	1	4	0.46
7.1	102315_WA_1001_P_MA (2) - 2	1	4	0.46
9.7R2	071416_GM_1001_P_IN	2	2	0.72
10.1R2	050416_DB_1002_I_MI	3	3	0.4
10.8R2	110514_JC_1002_P_IM	3	3	0.94
11.5R2	121614_JC_1000_P_MI	1	1	0.84
11.5R2	121614_JC_1001_E_MI	1	1	0.8
12.4R2	121514_JC_1001_E_MI	3	3	0.49
13	121814_JC_1010_P_MI	3	1	0.65
13.1	121814_JC_1011_P_MI	3	1	0.76
13.2	121814_JC_1013_E_MI	3	1	0.31
13.2	121814_JC_1012_E_MI	3	1	0.49

Milepost[2]	Watercourse Identifier[3,4]	Gradient Class[5]	Watershed Size[5]	PA Riverine Condition L2RAP Score
13.3	121814_JC_1007_E_MI	3	1	0.39
13.3	121814_JC_1008_P_MI - 1	3	1	0.78
13.6	121814_JC_1005_P_MI	3	1	0.78
13.6	121814_JC_1006_I_MI	3	1	0.87
13.7	121814_JC_1004_I_MI	3	1	0.8
13.8	121814_JC_1003_I_MI	3	1	0.92
13.9	121814_JC_1002_P_MI	3	1	0.79
13.9	121814_JC_1001_P_MI	3	1	0.87
14	121814_JC_1000_I_MI	3	1	-
14.1	111014_JC_1001_E_MI	3	1	0.84
14.7	041017_NJ_1002_I_MI	3	1	0.8
15	043015_JC_1001_I_MI	3	1	0.85
16.2	112114_JC_1003_P_IM - 1	2	3	0.85
16.2	112114_JC_1002_P_MI	2	3	0.85
16.4	112114_JC_1001_P_MI - 1	2	3	0.78
16.7	112014_JC_1003_P_IM - 1	3	2	0.84
16.9	112014_JC_1002_P_MI	3	2	0.86
17.7	112014_JC_1001_P_MI	3	1	0.7
18.3	111914_JC_1002_P_IM	3	1	0.83
18.4	111914_JC_1001_P_IM	3	1	0.84
19	121814_JC_1014_E_MI	3	2	-
19	121814_JC_1014_I_MI	3	2	-
19.6	121614_JC_1009_P_IM	3	2	0.86
20	121714_JC_1001_E_MI	2	2	0.76
20	121614_JC_1007_P_MI	2	2	-
20.1	121614_JC_1006_P_MI	2	2	0.83
21.2	121614_JC_1004_I_MI	3	1	0.66
22.5	102115_WA_002_E_MI	3	2	-
22.6	102115_WA_001_E_MI	3	2	-
22.7	050615_JC_1001_P_IM	3	2	0.96
22.7	102115_WA_001_I_MI	3	2	-
Access Roads				
13.3	121814_JC_1008_P_MI - 2	3	1	0.78
13.3	081215_MK_013_I_MI	3	1	0.78
13.3	081215_MK_014_P_IM	3	1	0.86

Milepost[2]	Watercourse Identifier[3,4]	Gradient Class[5]	Watershed Size[5]	PA Riverine Condition L2RAP Score
13.3	081215_MK_015_I_MI	3	1	0.85
13.3	081215_MK_016_E_MI	3	1	0.88
13.3	081215_MK_017_P_IM	3	1	0.63
14	041717_WA_1001_E_MI	1	2	0.34
16.1	112114_JC_1003_P_IM - 2	2	3	0.85
16.4	112114_JC_1001_P_MI - 2	2	3	0.78
16.7	112014_JC_1003_P_IM - 2	3	2	0.84
22.5	042017_MK_1002_P_MI	3	2	0.73
22.5	042517_GM_1001_P_IN	3	2	0.8
22.7	042517_GM_1002_I_MI	3	2	0.71
22.8	042517_GM_1003_P_MI	1	4	0.78

Notes:
1. Source: PennDOT Pennsylvania county boundaries, dated 7/2018. Available at www.pasda.psu.edu.
2. All route deviations implemented after the FERC Certificate Application are denoted with an "R" and indicate a MP equation. MPs with an "R1" indicate route deviations implemented and provided to FERC prior to the issuance of the DEIS. MPs with an "R2" indicate route deviations implemented as part of the September 2016 Route Update. MPs with an "R3 indicate route deviations implemented post-FERC Certificate issuance. All MPs without an "R" indicate that the route has not changed since the Certificate Application.
3. In instances where a watercourse is crossed by the proposed pipeline or workspace multiple times, crossing numbers (e.g. "-1", "-2") have been added to the Watercourse ID.
4. Watercourse ID: P = perennial, I = intermittent, E = ephemeral, MA = major, IN = intermediate, MI = minor, C = canal, D = ditch
5. Source: PNHP Aquatic Community Classification Project Stream Reach Watersheds available at http://www.naturalheritage.state.pa.us/Aquatic_GIS.aspx

Riparian Property

Properties upstream and downstream of the Project area in Luzerne County include existing roadway, agricultural land, forest land, and industrial land. These land uses should not have any further impact on the aquatic habitat within the Project area. Upstream and downstream properties will not be affected during the watercourse and wetland crossings. The areas that are to be open cut for pipeline installation will be restored to original grade as soon as practicable, therefore limiting the open exposure of the trench. This activity will be performed under appropriate weather conditions, and flow will be maintained during construction. The proposed Project will not result in the increase, diminution, or direction of flow; therefore, the property rights of landowners upstream, downstream, or adjacent to the Project would not be affected by the Project.

S2.D.2 Wetland Resources

Table LU-L2-7 includes the HGM classification, Palustrine Community Classification, and Chapter 105 Wetland Classification for each impacted wetland in Luzerne County, as well as a summary of the results

from the PA Wetland Condition L2RAP. Copies of the assessment area mapping and data sheets are provided in Appendix LU-L-2E. The Assessment Area and 100- and 300-foot Zones of Influence utilized to complete the PA Wetland Condition L2RAP were based on the delineated wetland boundaries identified pre-construction.

In addition to the L2RAP, a functional value assessment was conducted for each wetland delineated within the Project Study Area utilizing the United States Army Corps of Engineers' *The Highway Methodology Workbook: Supplement*. (USACE, 1999). The completed forms are located in Appendix LU-L-2F.

The wetlands identified within the Study Area in Luzerne County consisted primarily of PEM, PSS and PFO wetlands with various wetland complexes consisting of combinations of these vegetation cover types. The landform/geomorphic settings of these wetlands included hillside seep/springs, isolated depressions, and floodplains. The most common primary indicators of hydrology were Saturation (A3) and Oxidized Rhizospheres along Living Roots (C3). The most common secondary indicators observed were Drainage Patterns (B10) and Geomorphic Position (D2). The primary sources of hydrology differed between wetland types. Groundwater primarily provided hydrology to the hillside seep wetlands. The hydrology of the floodplain wetlands was provided by floodwaters from an adjacent watercourse. The hydrology of the isolated wetlands was provided by surface water runoff collection from surrounding uplands.

The most common dominant tree species observed were red maple (*Acer rubrum*) and eastern hemlock (*Tsuga canadensis)*. The most common dominant sapling/shrub species observed were black willow (*Salix nigra*), gray dogwood (*Cornus racemosa),* and highbush blueberry (*Vaccinium corymbosum*). The most common herbaceous plant species observed were flat-top goldenrod (*Euthamia graminifolia*), jewelweed (*Impatiens capensis*), common rush (*Juncus effusus*), and sensitive fern (*Onoclea sensibilis*).

Wetland soils varied by wetland; however, some generalizations can be made. The most common matrix hues were 7.5YR and 10YR, with low chroma (≤2) and values ranging between 2 and 4. Soils often met the criteria for hydric soil indicators Depleted Matrix (F3) or Redox Dark Surface (F6). The most common soil texture was silt loam.

The wetlands identified within the Project area in Luzerne County were located primarily within forest land and agricultural land. The Project is primarily crossing these resources in the forested areas where the riparian corridors are mainly intact and did not show evidence of sedimentation or erosion. These vegetated wetlands within the Project area in Luzerne County have the ability to filter overland, storm, and flood flows.

Natural recharge for ground and surface waters appears to be present within the majority of the Project area wetlands in Luzerne County. The hydrology of the identified wetlands was noted to be influenced by flooding when located adjacent to watercourses. These wetlands are influenced by the water levels of the adjacent watercourses and are able to store flood waters and allow for absorption. The combined effect of these functions results in a reduction of peak flows and downstream flooding.

The most obvious sources of pollution observed within the Project area in Luzerne County were roadway and agricultural runoff. Wetlands were located within the floodways of several of the watercourses. These

areas contributed to pollution prevention by filtering, detaining, and/or transforming sediment, toxins, litter and/or nutrients carried in the runoff.

Table LU-L2-7
Characterization of Impacted Wetland Resources in Luzerne County[1]

Milepost[2]	Wetland ID[3,4]	Delineated Size (acres)	Chapter 105 Wetland Classification[5]	HGM Classification[6]	Palustrine Community Classification[7]	PA Wetland Condition L2RAP Score
PennEast Mainline Pipeline						
0R1	050715_JC_1001_PSS	1.934	Exceptional (iii)	DFC	(SLG) Circumneutral Mixed Shrub Wetland	0.9
0.1	050715_JC_1001b_PEM	0.253	Exceptional (iii)	DFC	(HG) Mixed Forb-Graminoid Wet Meadow	0.9
0.1	050715_JC_1001a_PEM	0.080	Exceptional (iii)	DFC	(HG) Mixed Forb-Graminoid Wet Meadow	0.9
1.4	032818_WA_001_PFO	0.374	Exceptional (iii)	R2c	(WLG) Hemlock-Mixed Hardwood Palustrine Woodland	0.95
2.1	050416_DB_1001_PFO	0.368	Other	R2c	(WLG) Highbush Blueberry Palustrine Woodland	0.91
3.1	011815_JC_002_PFO	1.052	Exceptional (iii)	R2c	(WLG) Hemlock-Mixed Hardwood Palustrine Woodland	0.84
6	092314_GO_001_PSS	0.017	Other	R4	(SLG) Circumneutral Mixed Shrub Wetland	0.68
6.6R2	110915_WA_003_PEM	0.022	Other	DFA	(HG) Bluejoint-Reed Canary-grass Marsh	0.62
12.1R3	072219_MU_1000_PEM - 1	0.529	Other	FLn	(HG) Mixed Forb-Graminoid Wet Meadow	0.98
12.1R3	072219_MU_1000_PEM - 2	0.529	Other	FLn	(HG) Mixed Forb-Graminoid Wet Meadow	0.98

Milepost[2]	Wetland ID[3,4]	Delineated Size (acres)	Chapter 105 Wetland Classification[5]	HGM Classification[6]	Palustrine Community Classification[7]	PA Wetland Condition L2RAP Score
12.1R3	072219_MU_1000_PEM - 3	0.529	Other	FLn	(HG) Mixed Forb-Graminoid Wet Meadow	0.98
12.2R3	072219_MU_1001_PFO	0.280	Exceptional (iii)	SLsn	(SLG) Circumneutral Mixed Shrub Wetland	0.98
12.2R3	072219_MU_1002_PEM	0.020	Other	DFA	(HG) Mixed Forb-Graminoid Wet Meadow	0.98
13.2	060618_WA_002_PEM	0.193	Other	FLg	(HG) Mixed Forb-Graminoid Wet Meadow	0.83
13.7	121814_JC_001_PEM	0.091	Other	DFC	(HG) Mixed Forb-Graminoid Wet Meadow	0.97
14.1	111014_JC_002_PFO	0.172	Exceptional (iii)	R4	(WLG) Red Maple-Mixed Shrub Palustrine Woodland	0.96
14.7	042417_GM_1001_PFO	0.178	Exceptional (iii)	R3	(WLG) Red Maple-Highbush Blueberry Palustrine Woodland	0.96
15	043015_JC_1001_PFO	0.410	Exceptional (iii)	R4	(WLG) Red Maple-Mixed Shrub Palustrine Woodland	0.97
15	043015_JC_1001_PEM - 1	0.116	Exceptional (iii)	R4	(HG) Mixed Forb-Graminoid Wet Meadow	0.97
15	043015_JC_1001_PEM - 2	0.116	Exceptional (iii)	R4	(HG) Mixed Forb-Graminoid Wet Meadow	0.97
16	112114_JC_003B_PFO - 1	1.960	Other	R2	(WLG) Red Maple-Mixed Shrub Palustrine Woodland	0.88
16.1	112114_JC_003B_PFO - 2	1.960	Other	R2	(WLG) Red Maple-Mixed Shrub Palustrine Woodland	0.88

Milepost[2]	Wetland ID[3,4]	Delineated Size (acres)	Chapter 105 Wetland Classification[5]	HGM Classification[6]	Palustrine Community Classification[7]	PA Wetland Condition L2RAP Score
16.2	112114_JC_003B_PFO - 3	1.960	Other	R2	(WLG) Red Maple-Mixed Shrub Palustrine Woodland	0.88
16.2	112114_JC_003B_PSS - 1	1.219	Other	R2	(SLG) Circumneutral Mixed Shrub Wetland	0.88
16.2	112114_JC_003A_PSS - 1	1.191	Other	R2	(SLG) Circumneutral Mixed Shrub Wetland	0.88
16.4	112114_JC_002_PSS	0.409	Other	R2	(SLG) Circumneutral Mixed Shrub Wetland	0.89
16.4	112114_JC_002_PEM	0.070	Other	R2	(HG) Mixed Forb-Graminoid Wet Meadow	0.89
16.8	112014_JC_002_PFO	1.574	Other	R3	(WLG) Hemlock-Mixed Hardwood Palustrine Woodland	0.87
16.8	112014_JC_002_PEM	0.344	Other	R3	(HG) Mixed Forb-Graminoid Wet Meadow	0.87
17.7	112014_JC_001_PFO	0.663	Exceptional (iv)	R2	(WLG) Red Maple-Mixed Shrub Palustrine Woodland	0.84
17.8	112014_JC_001_PEM	0.220	Other	R2	(HG) Mixed Forb-Graminoid Wet Meadow	0.84
19.6	121614_JC_001_PFO - 1	0.991	Exceptional (iii)	R2	(WLG) Hemlock-Mixed Hardwood Palustrine Woodland	0.89
19.7	121614_JC_001_PEM	0.629	Exceptional (iii)	R2	(HG) Mixed Forb-Graminoid Wet Meadow	0.89

Milepost[2]	Wetland ID[3,4]	Delineated Size (acres)	Chapter 105 Wetland Classification[5]	HGM Classification[6]	Palustrine Community Classification[7]	PA Wetland Condition L2RAP Score
19.7	121614_JC_001_PFO - 2	0.991	Exceptional (iii)	R2	(WLG) Hemlock-Mixed Hardwood Palustrine Woodland	0.89
22.7	102115_WA_003_PFO	0.114	Other	SLt	(WLG) Red Maple-Mixed Shrub Palustrine Woodland	0.89
Access Roads						
0R1	010716_GM_1002_PEM	0.123	Exceptional (iii)	FLg	(HG) Mixed Forb-Graminoid Wet Meadow	0.71
0R1	053117_MB_1001_PSS	0.058	Exceptional (iii)	FLg	(SLG) Circumneutral Mixed Shrub Wetland	0.73
0R1	053117_MB_1001_PEM	0.056	Exceptional (iii)	FLg	(HG) Mixed Forb-Graminoid Wet Meadow	0.73
0R1	010716_GM_1001_PEM	0.047	Exceptional (iii)	FLg	(HG) Mixed Forb-Graminoid Wet Meadow	0.88
0R1	010716_GM_1001_PSS	0.032	Exceptional (iii)	FLg	(WLG) Highbush Blueberry Palustrine Woodland	0.88
13.1	081215_MK_019_PEM	0.108	Other	R3c	(HG) Mixed Forb-Graminoid Wet Meadow	0.87
13.3	121814_JC_002_PEM	0.120	Exceptional (iii)	R3c	(HG) Mixed Forb-Graminoid Wet Meadow	0.93
13.3	081215_MK_020_PEM	0.004	Exceptional (iii)	R2c	(HG) Mixed Forb-Graminoid Wet Meadow	0.94
13.3	081215_MK_021_PEM	0.077	Other	DFA	(HG) Mixed Forb-Graminoid Wet Meadow	0.93
13.2	081215_MK_022_PEM	0.013	Other	DFA	(HG) Mixed Forb-Graminoid Wet Meadow	0.94

Milepost[2]	Wetland ID[3,4]	Delineated Size (acres)	Chapter 105 Wetland Classification[5]	HGM Classification[6]	Palustrine Community Classification[7]	PA Wetland Condition L2RAP Score
15.9	042417_GM_1002_PSS	0.739	Other	FLg	(SLG) Circumneutral Mixed Shrub Wetland	0.79
15.9	042417_GM_1002_PEM	0.044	Other	FLg	(HG) Mixed Forb-Graminoid Wet Meadow	0.79
16.2	112114_JC_003A_PSS - 2	1.191	Other	R2	(SLG) Circumneutral Mixed Shrub Wetland	0.88
16.1	112114_JC_003B_PSS - 2	1.219	Other	R2	(SLG) Circumneutral Mixed Shrub Wetland	0.88
16.1	112114_JC_003B_PSS - 3	1.219	Other	R2	(SLG) Circumneutral Mixed Shrub Wetland	0.88
16.4	112114_JC_002A_PSS - 1	0.882	Other	R2	(SLG) Circumneutral Mixed Shrub Wetland	0.89
16.4	112114_JC_002A_PSS - 2	0.882	Other	R2	(SLG) Circumneutral Mixed Shrub Wetland	0.89
16.8	112014_JC_002_PSS	0.986	Other	R3	(SLG) Circumneutral Mixed Shrub Wetland	0.87
17.7	112014_JC_001_PSS	1.789	Other	R2	(SLG) Circumneutral Mixed Shrub Wetland	0.84
22.5	042517_GM_1001_PEM	0.031	Exceptional (iii)	FLg	(HG) Mixed Forb-Graminoid Wet Meadow	0.84
22.6	042517_GM_1002_PEM	0.003	Exceptional (iii)	FLg	(HG) Mixed Forb-Graminoid Wet Meadow	0.96

Milepost[2]	Wetland ID[3,4]	Delineated Size (acres)	Chapter 105 Wetland Classification[5]	HGM Classification[6]	Palustrine Community Classification[7]	PA Wetland Condition L2RAP Score

Notes:
1. Source: PennDOT Pennsylvania county boundaries, dated 7/2018. Available at www.pasda.psu.edu.
2. All route deviations implemented after the FERC Certificate Application are denoted with an "R" and indicate a MP equation. MPs with an "R1" indicate route deviations implemented and provided to FERC prior to the issuance of the DEIS. MPs with an "R2" indicate route deviations implemented as part of the September 2016 Route Update. MPs with an "R3 indicate route deviations implemented post-FERC Certificate issuance. All MPs without an "R" indicate that the route has not changed since the Certificate Application.
3. In instances where a wetland is crossed by the proposed pipeline or workspace multiple times, crossing numbers (e.g. "-1", "-2") have been added to the Wetland ID.
4. Wetland ID Key: PEM = palustrine emergent, PFO = palustrine forested, PSS = palustrine scrub shrub
5. Resource Value Definitions: Pennsylvania Exceptional Value Wetland as defined by PA Code §105.17 (relating to special criteria for projects affecting important wetlands). Criteria are:
(i) Serves as habitat for fauna or flora listed as ''threatened'' or ''endangered"
(ii) Is hydrologically connected to or located within a 1/2-mile from habitat for fauna or flora listed as ''threatened'' or ''endangered'' and wetland dependent;
(iii) Located in or along the floodplain of the reach or tributaries of a wild trout stream or waters listed as exceptional value;
(iv) Located along an existing public or private drinking water supply.
6. HGM Classification Key: DFA = Depression temporary, DFC = Depression seasonal, FLg = Flat organic soil, R2 = Riverine lower perennial, R2c = Riverine floodplain complex, R3 = Riverine upper perennial, R3c = Riverine headwater complex, R4 = Riverine intermittent, SLt = Topographic slope
1. Palustrine Community Classification Key: FG = Forest Group , HG = Herbaceous Group , SLG = Shrubland Group , WLG = Woodland Group

Functions and Values

The USACE's *Highway Methodology Workbook Supplement, Wetlands Function and Values A Descriptive Approach,* (September 1999) was utilized by PennEast to evaluate the functions and values of all wetland areas crossed by the proposed Project. The document provides guidance to permit applicants, consultants, and USACE project managers on how to identify and display wetland functions and values and is generally acceptable to the PADEP and the USACE. The document is a supplement to the Highway Methodology Workbook published by the Regulatory Branch in 1993, which defines procedures to integrate Section 404 permit requirements with highway planning and engineering and the National Environmental Policy Act (NEPA). The evaluation of wetland functions and values is an integral part of the overall phased approach of the Highway Methodology. The USACE defines functions as self-sustaining properties of a wetland ecosystem that exist in the absence of society and values as benefits that derive from either one or more functions and the physical characteristics associated with a wetland.

A Wetland Function-Value Evaluation Form was used to assess the functions/values of the impacted wetlands (Table LU-L2-8). In accordance with the method, eight functions (groundwater recharge/discharge, floodflow alteration, fish and shellfish habitat, sediment/toxicant/pathogen retention, nutrient removal/retention/transformation, production export, sediment/shoreline stabilization, and wildlife habitat), and five values (recreation, educational/scientific value, uniqueness/heritage, visual quality/aesthetics, and threatened/endangered species habitat) were assessed for each impacted wetland. Copies of the Wetland Function-Value Evaluation Forms for Luzerne County can be found in Appendix LU-L-2F, and a summary table of the ecological functions served by each wetland delineated within the Project workspace Luzerne County has been included below.

Table LU-L2-8
Functions and Values of Impacted Wetland Resources in Luzerne County[1]

Milepost[2]	Wetland ID[3,4]	Function/Value
PennEast Mainline Pipeline		
0R1	050715_JC_1001_PSS	Groundwater Recharge/Discharge, Floodflow Alteration, Sediment/Toxicant Retention, Nutrient Removal, Production Export, Wildlife Habitat
0.1	050715_JC_1001b_PEM	Groundwater Recharge/Discharge, Floodflow Alteration, Sediment/Toxicant Retention, Nutrient Removal, Production Export, Wildlife Habitat
0.1	050715_JC_1001a_PEM	Groundwater Recharge/Discharge, Floodflow Alteration, Sediment/Toxicant Retention, Nutrient Removal, Production Export, Wildlife Habitat
1.4	032818_WA_001_PFO	Groundwater Recharge/Discharge, Floodflow Alteration, Fish and Shellfish Habitat, Sediment/Toxicant Retention, Wildlife Habitat
2.1	050416_DB_1001_PFO	Groundwater Recharge/Discharge, Floodflow Alteration, Sediment/Toxicant Retention, Nutrient Removal, Sediment/Toxicant Retention, Wildlife Habitat

Milepost[2]	Wetland ID[3,4]	Function/Value
3.1	011815_JC_002_PFO	Groundwater Recharge/Discharge, Floodflow Alteration, Fish and Shellfish Habitat, Sediment/Toxicant Retention, Nutrient Removal, Sediment/Shoreline Stabilization, Wildlife Habitat
6	092314_GO_001_PSS	Groundwater Recharge/Discharge, Floodflow Alteration, Fish and Shellfish Habitat, Sediment/Toxicant Retention, Nutrient Removal, Sediment/Shoreline Stabilization
6.6R2	110915_WA_003_PEM	Wildlife Habitat
12.1R3	072219_MU_1000_PEM - 1	Groundwater Recharge/Discharge, Floodflow Alteration, Sediment/Toxicant Retention
12.1R3	072219_MU_1000_PEM - 2	Groundwater Recharge/Discharge, Floodflow Alteration, Sediment/Toxicant Retention
12.1R3	072219_MU_1000_PEM - 3	Groundwater Recharge/Discharge, Floodflow Alteration, Sediment/Toxicant Retention
12.2R3	072219_MU_1001_PFO	Groundwater Recharge/Discharge, Floodflow Alteration, Sediment/Toxicant Retention, Nutrient Removal, Sediment/Shoreline Stabilization
12.2R3	072219_MU_1002_PEM	Floodflow Alteration
13.2	060618_WA_002_PEM	Groundwater Recharge/Discharge
13.7	121814_JC_001_PEM	Groundwater Recharge/Discharge, Wildlife Habitat
14.1	111014_JC_002_PFO	Groundwater Recharge/Discharge, Wildlife Habitat
14.7	042417_GM_1001_PFO	Floodflow Alteration
15	043015_JC_1001_PFO	Floodflow Alteration
15	043015_JC_1001_PEM - 1	Floodflow Alteration
15	043015_JC_1001_PEM - 2	Floodflow Alteration
16	112114_JC_003B_PFO - 1	Groundwater Recharge/Discharge
16.1	112114_JC_003B_PFO - 2	Groundwater Recharge/Discharge
16.2	112114_JC_003B_PFO - 3	Groundwater Recharge/Discharge
16.2	112114_JC_003B_PSS - 1	Groundwater Recharge/Discharge
16.2	112114_JC_003A_PSS - 1	Groundwater Recharge/Discharge
16.4	112114_JC_002_PSS	Floodflow Alteration, Uniqueness/Heritage
16.4	112114_JC_002_PEM	Floodflow Alteration, Uniqueness/Heritage
16.8	112014_JC_002_PFO	Visual Quality/Aesthetics
16.8	112014_JC_002_PEM	Visual Quality/Aesthetics
17.7	112014_JC_001_PFO	Visual Quality/Aesthetics
17.8	112014_JC_001_PEM	Visual Quality/Aesthetics
19.6	121614_JC_001_PFO - 1	Fish and Shellfish Habitat
19.7	121614_JC_001_PEM	Fish and Shellfish Habitat

Milepost[2]	Wetland ID[3,4]	Function/Value
19.7	121614_JC_001_PFO - 2	Fish and Shellfish Habitat
22.7	102115_WA_003_PFO	Groundwater Recharge/Discharge, Floodflow Alteration, Fish and Shellfish Habitat, Sediment/Toxicant Retention, Nutrient Removal, Production Export, Wildlife Habitat
Access Roads		
0R1	010716_GM_1002_PEM	Groundwater Recharge/Discharge, Floodflow Alteration, Sediment/Toxicant Retention, Nutrient Removal, Production Export, Wildlife Habitat
0R1	053117_MB_1001_PSS	Groundwater Recharge/Discharge, Floodflow Alteration, Sediment/Toxicant Retention, Nutrient Removal, Production Export, Wildlife Habitat
0R1	053117_MB_1001_PEM	Groundwater Recharge/Discharge, Floodflow Alteration, Sediment/Toxicant Retention, Nutrient Removal, Production Export, Wildlife Habitat
0R1	010716_GM_1001_PEM	Groundwater Recharge/Discharge, Floodflow Alteration, Sediment/Toxicant Retention, Nutrient Removal, Production Export, Sediment/Shoreline Stabilization, Wildlife Habitat
0R1	010716_GM_1001_PSS	Groundwater Recharge/Discharge, Floodflow Alteration, Sediment/Toxicant Retention, Nutrient Removal, Production Export, Sediment/Shoreline Stabilization, Wildlife Habitat
13.1	081215_MK_019_PEM	Groundwater Recharge/Discharge, Sediment/Toxicant Retention
13.3	121814_JC_002_PEM	Groundwater Recharge/Discharge, Wildlife Habitat
13.3	081215_MK_020_PEM	Groundwater Recharge/Discharge, Floodflow Alteration, Wildlife Habitat
13.3	081215_MK_021_PEM	Groundwater Recharge/Discharge, Wildlife Habitat
13.2	081215_MK_022_PEM	Wildlife Habitat
15.9	042417_GM_1002_PSS	Floodflow Alteration
15.9	042417_GM_1002_PEM	Floodflow Alteration
16.2	112114_JC_003A_PSS - 2	Groundwater Recharge/Discharge
16.1	112114_JC_003B_PSS - 2	Groundwater Recharge/Discharge
16.1	112114_JC_003B_PSS - 3	Groundwater Recharge/Discharge
16.4	112114_JC_002A_PSS - 1	Floodflow Alteration, Uniqueness/Heritage
16.4	112114_JC_002A_PSS - 2	Floodflow Alteration, Uniqueness/Heritage
16.8	112014_JC_002_PSS	Visual Quality/Aesthetics
17.7	112014_JC_001_PSS	Visual Quality/Aesthetics

Milepost[2]	Wetland ID[3,4]	Function/Value
22.5	042517_GM_1001_PEM	Groundwater Recharge/Discharge, Floodflow Alteration, Sediment/Toxicant Retention, Wildlife Habitat
22.6	042517_GM_1002_PEM	Groundwater Recharge/Discharge, Floodflow Alteration, Sediment/Toxicant Retention

Notes:
1. Source: PennDOT Pennsylvania county boundaries, dated 7/2018. Available at www.pasda.psu.edu.
2. All route deviations implemented after the FERC Certificate Application are denoted with an "R" and indicate a MP equation. MPs with an "R1" indicate route deviations implemented and provided to FERC prior to the issuance of the DEIS. MPs with an "R2" indicate route deviations implemented as part of the September 2016 Route Update. MPs with an "R3 indicate route deviations implemented post-FERC Certificate issuance. All MPs without an "R" indicate that the route has not changed since the Certificate Application.
3. In instances where a wetland is crossed by the proposed pipeline or workspace multiple times, crossing numbers (e.g. "-1", "-2") have been added to the Wetland ID.
Wetland ID Key: PEM = palustrine emergent, PFO = palustrine forested, PSS = palustrine scrub shrub

S2.D.3 Lacustrine Resources

In Luzerne County, the proposed Project will cross the Francis E. Walter Reservoir (Resource ID: 052115_JC_1001_P_MA) which spans the Luzerne and Carbon County boundaries. The following is a summary of the results from the PA Lacustrine Condition L2RAP evaluation. Copies of the assessment area mapping and data sheets are provided in Appendix LU-L-2G. Table LU-L2-9 lists the name, unique Project identifier, and results of the PA Lacustrine Condition L2RAP evaluation of the lacustrine resources in Luzerne County.

The overall L2RAP score for lacustrine resource 052115_JC_1001_MA was 0.70. The average depth of the proposed impact area ranged from 15 to 20 feet within the Assessment Area. Both the Riparian Shoreline and Riparian Zone of Influence Vegetation Conditions consisted of a combination of High Marginal, dense herbaceous vegetation along the north side of the reservoir and Optimal, forested vegetation with a dense shrub layer along the south side of the reservoir. There were no observed Shoreline and Near-shore Human Alterations on either side of the proposed impacted area.

In addition to the L2RAP, the inherent functions, habitat attributes, and recreational uses of the Francis E. Walter Reservoir were evaluated for the purposes of the Project. The reservoir was constructed in 1961 for the purposes of flood risk management associated with the Lehigh River. In 1988, recreation became a Congressionally-authorized use of the reservoir. Since then boating, fishing, hunting, wildlife viewing, and picnicking have become popular public uses associated with the reservoir and the surrounding land. The reservoir offers a variety of habitats for many fish species which include large and smallmouth bass, stocked brown and rainbow trout, perch, and a variety of panfish. The land surrounding the reservoir consists almost entirely of forested PA State Game Lands with populations of whitetail deer, turkey, and other game species.

Construction of the Project through the Lehigh River/Francis E. Walter Reservoir will occur using the dam and pump open cut method. This construction method would involve diverting water from the upstream side around the construction area, excavation of the pipeline trench across the waterbody, installation of a

prefabricated pipeline segment, backfill of the trench with excavated material, and removal of the temporary dam.

The crossing of the reservoir will be constructed between mid-October and February, when the reservoir levels are drawn down and water levels are typically the lowest. During this time, the river will be narrower and shallower. These conditions would allow PennEast to construct the crossing within 48 hours and minimize the possibility of downstream sedimentation and impacts to wild trout migration. Additionally, recreational impacts to fishing and boating would be reduced by constructing during low-flow conditions in late fall or during the winter.

The crossing location will not affect the existing recreational access points and opportunities that are available close to the Frances E. Walter Reservoir.

Table LU-L2-9
Characterization of Impacted Lacustrine Resources in Luzerne County[1]

Milepost[2]	Watercourse Identifier[3,4]	Gradient Class[5]	Watershed Size[5]	PA Lacustrine Condition L2RAP Score
PennEast Pipeline Mainline				
23	052115_JC_1001_P_MA	1	4	0.97

Notes:
1. Source: PennDOT Pennsylvania county boundaries, dated 7/2018. Available at www.pasda.psu.edu.
2. All route deviations implemented after the FERC Certificate Application are denoted with an "R" and indicate a MP equation. MPs with an "R1" indicate route deviations implemented and provided to FERC prior to the issuance of the DEIS. MPs with an "R2" indicate route deviations implemented as part of the September 2016 Route Update. MPs with an "R3 indicate route deviations implemented post-FERC Certificate issuance. All MPs without an "R" indicate that the route has not changed since the Certificate Application.
3. In instances where a watercourse is crossed by the proposed pipeline or workspace multiple times, crossing numbers (e.g. "-1", "-2") have been added to the Watercourse ID.
4. Watercourse ID: P = perennial, I = intermittent, E = ephemeral, MA = major, IN = intermediate, MI = minor, C = canal, D = ditch
5. Source: PNHP Aquatic Community Classification Project Stream Reach Watersheds available at http://www.naturalheritage.state.pa.us/Aquatic_GIS.aspx

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