

ENCLOSURE C – DESCRIPTION OF AQUATIC HABITAT

A. AQUATIC HABITAT

Based on field surveys, the proposed Pennsylvania Pipeline Project (Project) crosses a total of 25 wetlands and 40 streams in Chester County. Resource Tables 2 and 3 included in this Attachment provide details regarding the specific wetland/stream type, crossing distances, temporary and permanent impacts, and crossing methods for all the water resources impacted in Chester County. In addition, Enclosure A of this Attachment (Aquatic resources Report and Supplementals) includes completed field data forms and specifics for each resource impacted; Enclosure E, Part 4 of this Attachment (Impact Avoidance, Minimization, and Mitigation Procedures) describes the proposed construction crossing methods and mitigation measures; and Attachment 12 (Erosion and Sediment Control Plan) provides details regarding the various soil erosion control measures that will be implemented at each resource crossing. The following provides a description of the stream and wetland resources crossed by the Project in Chester County.

Streams

The Project crosses a total of 22 perennial streams, 7 intermittent streams, and 11 ephemeral streams in Chester County. Under Pennsylvania Code, Title 25, §93.3, surface waters are categorized into five protected use categories: aquatic life, water supply, recreation and fish consumption, special protection, and other. Surface waters classified under the aquatic life category are further divided into the following four subcategories:

- CWF – *Cold Water Fishes*—Maintenance and/or propagation of fish species including the family Salmonidae and additional flora and fauna which are indigenous to cold water habitat.
- WWF – *Warm Water Fishes*—Maintenance and propagation of fish species and additional flora and fauna which are indigenous to a warm water habitat.
- MF – *Migratory Fishes*—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.
- TSF – *Trout Stocked Fishery*—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. The PAFBC refers to TSF streams as Approved Trout Waters.

Based on a review of eMapPA maintained by Pennsylvania Department of Environmental Protection (PADEP) and a review of Drainage List A of Pennsylvania Code, Title 25, Chapter 93, §93.9h, the designated/protected uses and fisheries classifications for the streams crossed by the Project in Chester County include:

- 28 of the streams have a designated use for HQ-TSF and MF,
- 8 streams have a designated use for CWF and MF,

- 3 streams have a designated use for EV and MF,
- 1 stream has a designated use for TSF and MF,
- 8 streams are designated as both Approved Trout Waters (ATW) and Stocked Trout Streams (STS) , and
- 8 streams are designated Trout Natural Reproduction (TNR).

Of the total 40 streams crossed by the Project ROW in Chester County, a total of 28 are classified as High Quality (HQ) and 3 of the streams crossed are classified as Exceptional Value (EV). 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 streams must be maintained and protected in accordance with antidegradation requirements (Pennsylvania Code 025 §93.4a).

Of the 40 streams crossed in Chester County, many (7/11) are intermittent/ephemeral streams with a bank-to-bank crossing width equal to or less than 10 feet. A total of 38 streams have a crossing width of no wider than 20 feet, with the exception of the crossing at Black Horse Creek (40 feet) and at Marsh Creek (45 feet).

Riparian areas, located within 150 feet of the HQ and EV streams and 100 feet landward of the other streams, that are crossed by the Project in Chester County consist of a variety of different cover types. In areas where the Project parallels existing ROW, these areas will primarily consist of herbaceous/emergent vegetation. Areas of new ROW, including the expansion of the existing ROW, may consist of agricultural areas, open fields/pasture, and/or wetland and upland scrub-shrub and forested habitat.

All the streams crossed in Chester County will be restored to their original conditions (i.e., elevation, flow, stream substrate, hydrologic conditions, etc.) except for possibly a few limited areas of forested cover. These areas will retain their overall function, providing fish and wildlife habitat, but will have a long-term change in cover type.

Wetlands

The proposed Project will cross a total of 25 wetlands in Chester County (Table 2, Attachment 11). The wetland resources crossed represent a variety of different wetland types including palustrine emergent (PEM), palustrine scrub-shrub (PSS), palustrine forested (PFO), and combinations of these cover types. Of the 25 wetlands crossed by the Project in Chester County, the majority of the crossings 10 are less than 100 wide, 7 are between 100 feet and 200 feet wide, and 9 are greater than 200 feet wide.

As presented in detail in Attachment 11, Enclosure E, Part 2 (Section 2.8.1), each wetland crossed by the proposed Project in Chester County was evaluated in accordance with 25 Pa. Code § 105.17(1) to determine whether or not the wetland area satisfied the requirements for classification as an Exceptional Value (EV) wetland resource. Based on this evaluation, 10 wetlands crossed in Chester County are considered EV wetlands:

- 7 are classified as EV because they are located in the floodplain of a stream listed as EV under Chapter 93,
- 1 is located within the floodplain of a tributary to a wild trout stream,
- 1 is adjacent to a wetland that serves as habitat for fauna listed as threatened or endangered under the Endangered Species Act of 1973 and is located within the floodplain of a tributary to a wild trout stream, and
- 1 is adjacent to a wetland that serves as habitat for fauna listed as threatened or endangered under the Endangered Species Act of 1973 and is located within the floodplain a wild trout stream.

EV Wetlands Crossed by the Pennsylvania Pipeline Project in Chester County

Wetland ID	Cowardin Classification	EV Designation	Crossing Method
A46	PEM	EV Stream	Open Cut
B12	PEM	EV Stream	Open Cut
B13	PEM	EV Stream	Open Cut
B14	PEM	EV Stream	Open Cut
C33	PEM	EV Stream	Open Cut
C34	PEM	EV Stream	Open Cut
C35	PEM	EV Stream	Open Cut
C37	PEM	Wild Trout Tributary	HDD
	PFO		
C38	PEM	Adjacent to Bog Turtle; Wild Trout Tributary	Open Cut
C40	PEM	Adjacent to Bog Turtle; Wild Trout	Open Cut
Total Number Crossed 10			

SPLP also evaluated the functions and values of the wetland areas using the USACE Highway Methodology (USACE 1999) assessment method as it is generally acceptable to the PADEP and the United States Army Corps of Engineers (USACE). 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 expert, 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. In addition to the standard functions and values assessment, a Wetland Function-Value Evaluation Form was used to assess EV wetlands. Enclosure D (Attachment 11) and SPLP’s Resource Identification and Project Impacts (Attachment 11, Enclosure E, Part 2) describe the impacts, including functions and values, to EV wetlands crossed by the Project. Enclosure C of this Attachment provides a function and values assessment of the wetlands crossed by the Project in Chester County.

All the wetlands crossed in Chester County will be restored to their original conditions (i.e.,

elevation, hydrologic conditions, etc.) except for a few limited areas of forested cover. These wetland areas will retain their overall functions but will experience a long-term change in cover type.

A.1 Food Chain Production

All of 25 wetlands and 40 streams crossed by the proposed Project in Chester County are considered to have some potential for food chain production. Growth of herbaceous plants within the emergent wetlands constitutes the food chain base that supports primary consumers such as invertebrates and small mammal herbivores. Secondary and tertiary consumers, including both omnivores and carnivores, are supported by the diversity and abundance of prey items in the wetland and stream ecosystems.

In addition, most of the streams within the county support photosynthetic algae, overhanging woody vegetation, and/or small aquatic vascular plants that support invertebrate herbivores (*i.e.*, aquatic insects). Such invertebrates are consumed by small reptiles and fish that inhabit some of the streams along the proposed Project.

A.2 General Habitat

a. Nesting

Nesting habitat within the wetlands and streams is limited in areas where the proposed Project parallels existing right-of-way (ROW) in Chester County. Vegetation is routinely mowed or cut within the existing ROW and at station facilities, limiting the nesting habitat to low growing, herbaceous plants and some limited shrubs. These areas may provide suitable nesting habitat for various bird species that nest on, or near, the ground. Within wetlands and streams, the forest edge provides suitable woody cover for bird species that commonly nest in shrubby edge habitats. In areas where the ROW does not parallel an existing ROW in Chester County, the nesting habitat may include both upland and wetland interior forests, open fields/meadows, and/or scrub-shrub areas. Combined, all the crossed by the Project provide nesting habitat for a variety of bird species including raptors, grassland species, waterfowl, woodpeckers, and numerous songbirds.

b. Spawning

In general, the 25 wetlands crossed by the Project in Chester County do not include bodies of water large enough for fish spawning but may provide seasonal breeding habitats for amphibians, such as frogs and salamanders. Wetlands fed by a permanent source of surface water may also provide seasonal spawning habitat for small, non-game fish species.

Most of the 22 perennial streams crossed by the proposed Project in Chester County provide potential habitat for seasonal spawning of game and non-game fish species.

c. Rearing

In areas where the proposed Project parallels existing ROW in Chester County wetlands are

not considered to have a high potential for wildlife rearing. This assessment is based on the routine maintenance activities conducted along the existing ROW within wetland and stream areas. The maintenance of the existing ROW limits the value of these wetlands for wildlife rearing.

In areas where the Project does not parallel an existing ROW in Chester County, the rearing habitat may include both upland and wetland interior forests, open fields/meadows, and/or scrub-shrub areas. Although these areas provide undisturbed areas of rearing habitat, the Project is not located in remote areas and the overall character of the surrounding area is primarily considered rural in terms of wildlife habitat. Consequently, these areas offer similar opportunities for rearing as the areas that parallel existing ROW.

Although some small mammals and birds may utilize the Project area in Chester County for rearing purposes, the habitat provided in the adjacent undisturbed areas provides more shelter and food sources than the existing ROW. Consequently, the majority of rearing activities will not occur in the Project area but rather the adjacent areas.

d. Resting

All of the 25 wetlands and 40 streams crossed in Chester County provide habitat that has the potential to be used for resting by a variety of birds and mammals. However, similar to the areas used for rearing, wildlife are likely to utilize more remote and secluded areas that offer more protection/cover for resting. Therefore, although the Project area does provide some resting habitat/areas for songbirds and possibly small mammals, these species are more likely to utilize the adjacent areas that provide more cover and/or perches.

e. Migration

The 25 wetlands crossed by the proposed Project in Chester County are not believed to be substantially utilized during the migration of wildlife or birds. However, some of the wetland complexes that support large areas of open water, including ponds or reservoirs, may be utilized by migrating waterfowl. Other areas along the Project that may be used during migration include the forested edge habitat along the existing ROW that may be used by migrating songbirds.

Seasonal migration of trout during spawning is likely to occur within 8 Approved Trout Waters and Stocked Trout Streams crossed by the Project in Chester County. Additionally, there is potential for anadromous fish migration to occur within the 28 streams designated as HQ-TSF and TSF.

f. Feeding

As indicated under Section A.1 (Food Chain Production), the 25 wetlands and 40 streams along the proposed route in Chester County provide a food source for invertebrates, birds, reptiles, amphibians, and mammals. In general, this function is limited relative to the areas located outside the proposed Project area which provide higher rates of primary productivity. However, wetland areas within the proposed Project area support small numbers of aquatic

insects, mollusks, or amphibians that meet specific prey requirements of birds and mammals with an affinity for wetland and stream habitats such as raccoon (*Procyon lotor*). In addition, streams traversed by the Project are likely utilized by a variety of wildlife species as a source of drinking water.

g. Escape Cover

The Project primarily parallels existing pipeline ROW or is located in primarily in rural areas in Chester County; therefore, there is limited escape cover provided in the Project area due to lack of habitat diversity and structure. Specifically, vegetation on the existing ROW is limited to shrubs and herbaceous plants as compared to the diversity of habitat structure provided in the adjacent and surrounding vegetated areas.

Streams and other waterbodies within the proposed Project area in Chester County provide escape cover for aquatic organisms when there is a presence of submerged stream bank vegetation/roots, aquatic plants, undercut banks, rocky substrates, and woody debris present.

h. Other

No other general habitat considerations were identified during either the wetland delineations or stream characterization surveys in Chester County.

A.3 Habitat for Threatened and Endangered Plant and Animal Species

As presented in the Attachment 6 (PNDI and Agency Coordination) and Attachment 9 (Project Description) of the JPA, SPLP has coordinated extensively with the Pennsylvania Department of Conservation and Natural Resources (PADCNR), Pennsylvania Game Commission (PGC), Pennsylvania Fish and Boat Commission (PAFBC), and U.S. Fish and Wildlife Service (USFWS) throughout the entire Project planning process. Based on this coordination, a two animal species of concern have been identified in Chester County:

Species of Concern	Clearance Letter	General Habitat Requirements	Conservation Plan
Animals			
Eastern redbelly turtle	10/26/15	Lakes, streams, ponds, rivers, marshes.	Not Required
Bog turtle	10/31/16	Occur in wet meadows and bogs where tussock sedge and grasses dominate the wetlands. Require open conditions associated with early-successional wetland habitat. Substrate must consist of deep mucky soils fed by groundwater seeps, with only modest amounts of open water.	Bog Turtle Conservation Plan

A.4 Environmental Study Areas

a. Sanctuaries

The Project crosses Upper Ridley-Crum Important Bird Area (IBA) in Chester County. This area is part of a network of sites throughout the Commonwealth that are considered essential for sustaining wild bird populations by the Pennsylvania Audubon Society. Once a site is officially identified as an IBA, volunteer monitoring efforts are often initiated. This monitoring focuses primarily on the breeding/nesting season - tracking the numbers and variety of birds breeding in that particular habitat.

b. Refuges

No National Wildlife Refuges or management areas, designated critical habitat, or significant habitats were identified within the proposed Project area in Chester County.

c. Other

Based on background data searches and field observations, two Core Habitats and 22 Supporting Landscapes will be crossed by the proposed Project in Chester County. Core habitats are areas that are most closely associated with the habitat for species of concern. These areas can support little disturbance without adversely affecting the habitat of the species of concern. Supporting Landscapes are the areas surrounding or adjacent to core habitat that are not considered the primary habitat of the species of concern or natural community. Supporting Landscapes represent the areas necessary to maintain vital ecological processes or secondary habitat that could be impacted by certain types of disturbance.

Core Habitat Crossed by the Pennsylvania Pipeline Project in Chester County

Name of Core Habitat	Distance Traversed (miles)	Aquatic Resources Present ^a
Great Marsh NHA	0.02	No
Marsh Creek Lake NHA	0.8	Yes

Source: PADCNr 2016

^a Attachment 11, Enclosure E, Part 4 provides a more detailed discussion of impacts to streams and wetlands, impact avoidance and minimization measures, and a description of the crossing construction measures that will be used.

Core Habitat Great Marsh is a large wetland complex comprised of graminoid marsh and shrub swamp natural communities as well as some successional wet meadow and swamp forest. This area is the largest inland wetland complex in southeastern Pennsylvania. The graminoid marsh is composed of a mix of grasses, sedges, rushes, cattail, and many forbes. The shrub swamp is dominated by swamp rose, arrowwood, black alder, red-willow dogwood, and button bush. The Project does not impact any aquatic resources within this area.

Core Habitat Marsh Creek Lake NHA is part of Marsh Creek State park, but also includes surrounding housing developments and agricultural fields. There are numerous streams and wetlands within the area that provide habitat for a variety of plant and animal species. Project waterbodies and wetlands located within this Core Habitat includes streams S-C72, S-C73,

S-C87, S-G52, and S-Q83 and wetlands C38, C40, C43, Q75, and Q76.

A.5 Stream Relocation, Enclosure, or Dredging

There are no stream relocations, enclosures, or waterway dredging/deepening activities proposed in conjunction with the proposed Project in Chester County. Therefore, a description of the instream macroinvertebrate communities is not required as part of this Environmental Assessment Form (EAF).

B WATER QUANTITY AND STREAMFLOW

B.1 Natural Drainage Patterns

The waterbodies in Chester County within the proposed Project ROW are located in the Delaware River Basin. The Project crosses the following HUC 12 watersheds in Chester County: Chester Creek, Upper Conestoga River, Valley Creek, Marsh Creek, East Branch Chester Creek, Lower French Creek, Ridley Creek, and Upper East Branch Brandywine Creek.

The proposed Project ROW crosses two physiographic provinces of Pennsylvania in Chester County. The general drainage pattern of the streams located in the Piedmont Lowland Section and the Piedmont Upland sections is dendritic, which is similar to the branching of tree roots. Dendritic drainage patterns develop in regions underlain by homogeneous material that is subject to a similar resistance to weathering.

B.2 Flushing Characteristics

The ability of a stream to maintain its flushing characteristics of both natural and introduced material is primarily defined by its width, flow velocity, and substrate. Most of the streams in the Chester County area are low to medium-gradient streams that are best characterized as having moderate rates of flushing and residence times.

The majority of 25 wetlands located in Chester County within the proposed Project area do not contain surface waters that support continuous flow; therefore, the majority of the wetlands crossed by the Project are considered to have a very low flushing ability based on their topography (low-lying depressions), limited sustained flows, and thick vegetation.

B.3 Current Patterns

Except in the wetlands that are associated with perennial streams, there are no sustained currents present within the wetlands crossed by the proposed Project in Chester County.

In general, the drainage patterns associated with the 40 streams crossed in Chester County is dendritic and does not generally contain complex current patterns. Natural meanders with minimal obstructions are present.

B.4 Groundwater Discharge for Baseflow

Some of the wetlands associated with the proposed Project in Chester County are associated with seeps or springs and are therefore located in areas of groundwater discharge, which may contribute to the baseflow of the streams. However, details on the amount of groundwater discharge associated with the Project area wetlands/seeps has not been determined.

Based on the local topography and geology, there is a potential for some Project streams in Chester County to be augmented by groundwater discharge. However, no studies have been conducted to quantify the contribution of groundwater discharge to the baseflow of the streams located within the Project area.

B.5 Natural Recharge Area for Ground and Surface Waters

Most of 25 wetlands crossed in Chester County by the proposed Project are either located at points of seasonal groundwater discharge such as seeps or springs, or are associated with streams. Therefore, some of these wetlands are considered natural recharge areas for surface water. Similarly, some of the wetlands and streams in Chester County may act as groundwater recharge areas based on their geographic location/setting and underlying material.

B.6 Storm and Floodwater Storage and Control

One of the primary functions of wetlands and floodplains is to store stormwater and attenuate floodwaters. In addition, baseflow conditions of the majority of the streams traversed in Chester County is much lower than their bankfull condition; consequently, they all have additional capacity for storm and floodwater storage and control. Given the number of wetlands and streams within the Project area in Chester County, storm and floodwater storage and control is considered to be moderate to high.

B.7 Public and Private Water Supplies/Wells

SPLP used PADEP's eMapPa system to identify Public Water Supply (PWS) areas that utilized "Groundwater Wells" and "Surface Water Intakes" as their source. The PWS data was used to create a file of all known public water supply areas within 1 mile of the Project workspace and notification letters and maps were sent to these identified PWS authorities. In the letters, Sunoco requested the locations of the authority's PWS groundwater well and/or surface intakes. Based on the information received, five of these PWS areas have been identified in Chester County.

SPLP used DCNR's PAGWIS well data to identify a total of 22 recorded private groundwater wells located within 150 feet of the proposed Project's HDD locations: three of these are located in Chester County.

C. WATER QUALITY

The water quality of the Project waterbodies in Chester County is considered good as is

evidenced by the EV, HQ-TSF, TSF, CWF, and trout classifications. Table 3 of this Attachment of the JPA, provides a summary of all the existing use and designated use classifications associated with the Project streams.

C.1 Preventing Pollution

Most of the land surrounding the proposed Project area in Chester County is either forested or agricultural. Consequently, potential sources of pollution are minor and mainly limited to possible agricultural runoff. A majority of the waterbodies traversed by the proposed Project have good water quality as is evidenced by the presence of anadromous fish species (based on state classifications), and the trout and water quality state designations (for designated and existing uses). There is not a great concern of pollution in the general proposed Project area.

The wetlands within the proposed Project area in Chester County have some limited capacity to mitigate pollution. The water detention capacities and growth of vegetation allow the wetlands to filter some pollutants. However, no studies have been conducted to quantify either the pollution prevention capacities of the wetlands, or the need for such functions in the proposed Project area.

C.2 Sedimentation Control and Patterns

The proposed Project area is primarily located within or adjacent to either forested or agricultural areas in Chester County. Many of the agricultural fields have vegetation buffers bordering the streams. As a result, the existing sources of sediment within the proposed Project area are limited to potential runoff from plowed agricultural fields, or runoff from unpaved roads. Generally, clear water was evident in most of the streams surveyed within the proposed Project area.

During periods of high precipitation and runoff, the wetlands within the proposed Project area can be expected to limit the transport of sediments to downstream or downslope areas. However, no studies have been conducted to quantify the volume of sediments retained by, or deposited in, these wetlands.

C.3 Salinity Distribution

Only freshwater wetlands and streams were identified in the Project area in Chester County. There is no evidence of any naturally occurring or man-induced salinity associated with the wetlands and streams identified within the proposed Project area.

C.4 Natural Water Filtration

As previously stated, the wetlands and streams crossed by the proposed Project in Chester County are located in relatively undeveloped, forested or agricultural areas and there does not appear to be a great need for the natural filtration of water. Based on field observations, the surface water is considered to be of good quality.

D. RECREATION

D.1 Game Species

Hunting is a common and popular recreational activity in the vicinity of the proposed Project area in Chester County, which contains an abundance of both small and large game species. Although the level of hunting activities and specific game species hunted in the Project area are unknown, the Project traverses several areas where game hunting is assumed to occur.

The proposed Project does not cross any Pennsylvania State Game Land (SGL) in Chester County. The proposed Project does not cross any privately-owned hunting club in Chester County.

D.2 Non-Game Species

The level of recreational activities involving non-game species, such as bird watching, wildlife photography, and amateur naturalist study, occurring in wetlands/streams located within the Project area in Chester County is not known. Due to the location of the majority of the proposed Project area near forested lands, the wetlands and streams traversed by the proposed Project offer a high potential for recreational observation.

D.3 Fishing

Many of the streams associated with the proposed Project offer high quality recreational and sport fishing opportunities. In Chester County, 8 of the Project streams have been designated by the PAFBC as ATW and STS, 8 are designated TNR, and 1 stream has been designated as TSF and MF.

Additionally, 8 of the streams in Chester County have a designation of CWF and MF, 3 are designated EV and MF, and 28 are designated HQ-TSF and MF.

D.4 Hiking

As identified in the table below, the Project crosses one hiking trail and two bicycle trails/routes in Chester County. The existing pipeline ROW already forms a long, linear, relatively unobstructed corridor, which offers the potential for use as a hiking trail; however, the amount of hiking that occurs along the entire corridor is not expected to be significant, since most of the existing ROW passes through private properties.

Hiking and Water Trails Crossed by the Pennsylvania Pipeline Project in Chester County

Name of Trail	Aquatic Resources Present
Chester Valley Trail	No
BicyclePA Route S	No
BicyclePA Route L	No

Source: PADNCR and Rails-to-Trails Conservancy 2016

D.5 Observation (Plant/Wildlife)

There is limited to moderate potential for recreational plant or wildlife observation in Chester County as most the properties are privately owned and there is limited access to the Project area.

D.6 Other Recreation

The Project crosses Marsh Creek State Park, Hickory Park, and Meadowbrook Park in Chester County. In addition to the recreational hunting and fishing opportunities described above for the proposed Project, these park areas provide additional recreational activities, including biking, backpacking, camping, picnicking, horseback riding, canoeing, kayaking, boating, rafting, scenic drives, cross-country skiing, and motorized vehicle use (i.e., all-terrain vehicles, snowmobiles).

E. UPSTREAM AND DOWNSTREAM PROPERTY

The proposed Project is located within relatively undeveloped agricultural or forested areas. In many instances, individuals who own wetlands and riparian areas also own most of the adjacent property. The proposed Project will not cause long-term degradation of water quality, alter flow volumes, or change the direction of flow. In addition, operation of the proposed Project is not expected to interfere with the normal riparian rights of upstream or downstream landowners.

F. OTHER ENVIRONMENTAL FACTORS

There were no other environmental factors of concern identified during the field surveys conducted for the proposed Project in Chester County.