

ENCLOSURE D – PROJECT IMPACTS

A. PROJECT IMPACTS ON SENSITIVE RESOURCES

A.1 National, State or Local Park, Forest, or Recreation Areas

The Project does not cross any national parks or forests, but does cross three state and local parks in Chester County (table below). The Project crosses Marsh Creek State Park for approximately 0.09 mile and will impact 3 streams and 2 wetlands in this area, as defined by PADEP (refer to Section B.1). The Project also crosses Hickory Park for approximately 0.19 mile and will impact 5 streams and 1 wetland in this area (as defined by PADEP, refer to Section B.1), and Meadowbrook Manor Park for approximately 0.16 mile but does not impact any aquatic resources within this park. A discussion of wetland/stream construction methods and mitigation measures that SPLP will implement when crossing these resources is presented in Section B.1 (below) and Enclosure E, Part 2. There will be no long-term impact to these parks; however, park users may experience a short-term increase in the noise levels in the Project area during construction.

For all parks and recreation areas crossed by the Project, SPLP is working with the appropriate land administering agency to obtain the required land easements, licenses, and approvals on those lands.

A.2 Natural, Wild, or Wilderness Areas

No designated Natural, Wild, or Wilderness Areas are known to be crossed by the proposed Project in Chester County.

A.3 National, State, or Local Historic Sites

SPLP conducted a site file review at the Pennsylvania State Historic Preservation Office (PA SHPO) and on the PA SHPO's Cultural Resources Geographic Information System (CRGIS). In addition, a historic resources field reconnaissance survey was conducted for the proposed Project from April 2015 through May 2016. The Project's survey Area of Potential Effect (APE) for historic resources was developed in consultation with the PA SHPO.

Results of the site file review and historic resources field reconnaissance survey were submitted to the PA SHPO in May 2016. Based on the results of the study, a finding of no adverse effects to historic properties identified within the Project's APE for historic resources was recommended. After addressing all of the PA SHPO's comments and concerns, concurrence with SPLP's recommendations for historic resources was received in July 2016. The table below summarizes the impacts and recommendations for all NRHP-listed historic resources for the Project's APE for historic resources within Chester County.

National, State or Local Park, Forest, or Recreation Areas Crossed by the Pennsylvania Pipeline Project in Chester County

Resource	Distance Crossed (miles)	Stream Resources (number)			Stream Impacts (acres) ^{a, b, c}		Wetland Resources (number)			Wetland Impacts (acres) ^{a, b, c}			List of Streams Crossed	List of Wetlands Crossed
		Other	HQ/ EV	HDD/ Bore	PADEP Permanent _{d, e}	PADEP Temporary	Other	EV	HDD/ Bore	PADEP Permanent _{d, e}	PADEP Temporary	Conversion		
Marsh Creek State Park	0.09	0	3	2	0.054	0.027	2	0	2	0.02	0	0	S-H52 S-Q83 S-Q86	Q75 Q77
Hickory Park	0.19	0	5	5	0.002	0.000	1	0	1	0.11	0	0	S-C87 S-C89 S-C90 S-C91 S-C92	C43
Meadowbrook Manor Park	0.16	0	0	0	0	0	0	0	0	0	0	0	n/a	n/a

Source: PADCNR 2016

^a The Project will have minor temporary impacts associated with construction.

^b Disturbed areas will be restored in accordance with the E&S Plan located in Attachment 12.

^c 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.

^d Permanent impacts are those areas affected by a water obstruction or encroachment that consist of both direct and indirect impacts that result from the placement or construction of a water obstruction or encroachment and include areas necessary for the operation and maintenance of the water obstruction or encroachment located in, along or across, or projecting into the floodway.

^e Although PADEP defines operation and maintenance activities as permanent impacts, all wetlands and streams affected by the Project will be restored to pre-construction conditions.

Notes:

Although PADEP defines operation and maintenance activities as permanent impacts, all wetlands affected by the Project will be restored to pre-construction conditions including the presence of wetland soils, hydrology, and hydrophytic vegetation. In addition, the Project does not involve any permanent fill and there will be no permanent loss of wetland area associated with the Project. SPLP will not maintain the ROW through wetland areas (i.e., no mowing); therefore, the pre- and post-construction conditions of the Project-wide wetland areas will be the same, except for a nominal areal extent (approximately 0.4 acre) of forested wetland that will be converted to emergent wetland.

Although PADEP defines operation and maintenance activities as permanent impacts, all streams affected by the Project will be restored to pre-construction conditions including the elevation/contours, channel substrate, stream banks, and flow conditions/patterns. In addition, the Project does not involve any permanent fill and there will be no permanent loss of stream area associated with the Project.

National Historic Sites In or Adjacent To the Study Area for Pennsylvania Pipeline Project in Chester County

NRHP Site/Property	Impacts/Recommendations
Lionville Historic District (Key #001567), Uwchlan Township	HDD crossing, no adverse effects anticipated; received PHMC concurrence.
Benjamin Pennypacker House (Key #064409), West Whiteland Township	HDD crossing; vibration as a result of HDD will not be a structural concern, the method actually produces less vibration than open trench construction. SPLP will use best practices during construction, including the use of safety fence, keeping a minimum 25 foot distance from all structures, no mature trees or landscaping will be removed. No adverse effects anticipated; received PHMC concurrence.
Pleasant Hill Plantation Historic District (Key #079669), West Nantmeal Township	NHLD is across the road from pipeline permanent ROW but is within the 200 foot survey corridor. No tree clearing in this location. No adverse effects anticipated; received PHMC concurrence.
The Exton Hotel (Key #064335), West Whiteland Township	Adjacent to pipeline and within permit area of stream crossing but avoided by HDD. No adverse effects anticipated; received PHMC concurrence.
The Greenwood School (Key #050645), West Whiteland Township	Adjacent to pipeline but avoided by HDD. No adverse effects anticipated; received PHMC concurrence.
The William Everhart House (Key #064476), West Whiteland Township	Outside/adjacent to study corridor and avoided by HDD. No adverse effects anticipated; received PHMC concurrence.

The Project does not cross or impact any federally recognized Native American reservations or territories.

A.4 National Natural Landmarks

No designated national natural landmarks are crossed by the proposed Project in Chester County.

A.5 National Wildlife Refuges

No national wildlife refuges are crossed by the proposed Project in Chester County.

A.6 Cultural or Archaeological Landmarks

Archaeological surveys were conducted for the Project from December 2013 through November 2016. The APE for archaeological resources includes moderate to high probability areas within the construction ROW, USACE Permit Areas, Federal Emergency Management Agency (FEMA) delimited floodways, and previously identified archaeological sites per the PA SHPO’s CRGIS. Archaeological investigations included a Phase Ia reconnaissance survey to develop an archaeological assessment of probability for intact archaeological resources, and subsequent Phase Ib archaeological investigations consisting of a pedestrian survey of the entire APE, and systematic subsurface testing and surface inspection of the Project APE that was determined to be sensitive for the presence of archaeological resources.

Based on these efforts, SPLP identified a total of 78 newly identified and previously recorded archaeological sites within the proposed ROW: a total of 43 previously identified archaeological sites, and 35 new archaeological sites (refer to Enclosure E, Part 2). Fifteen of the newly identified and previously recorded archaeological sites are located within the proposed ROW in Chester County (below).

Archaeological Sites Located Within Chester County

Archaeological Site	No Additional Investigations (SHPO Concurrence)	Site Will be Avoided*
36CH0960	X	
36CH0961		X
36CH0959	X	
36CH0958	X	
36CH0963	X	
36CH0351		X
36CH0919		X
36CH0356		X
36CH0965		X
36CH0966		X
36CH0964		X
36CH0360	X	
36CH0361	X	
36CH0962	X	
36CH0994	X	
TOTAL	8	7

* Site will be avoided by either HDD, pipeline realignment, or site is located outside current APE.

An unanticipated discovery plan will be in place during construction and archaeological site monitors present during ground disturbing activities at areas recommended by the PA SHPO. No impacts to archaeological resources are anticipated by the construction, operation, and maintenance of the Project in Chester County.

A.7 State Game Lands

The Project does not cross any State Game Lands in Chester County.

A.8 Federal, State, Local or Private Plant or Wildlife Sanctuaries

The Project crosses the Upper Ridley/Crum Important Bird Area (IBA) in Chester County for approximately 2.2 miles and impacts 1 stream within the area (table below). There will be no impact to this stream as it will be crossed via HDD/bore.

The Project is co-located with the southwestern boundary of the Upper Ridley/Crum IBA. The majority of the land use in this area is residential and it is being crossed using HDD methods. There will be no long-term impacts to the purpose/function of this area as it will continue to provide essential habitat for the bird species that utilize it and there will be no change in the existing land use. A Migratory Bird Conservation Plan was submitted to the

Important Bird Areas Crossed by the Pennsylvania Pipeline Project in Chester County

Resource	Distance Crossed (miles)	Stream Resources (number)			Stream Impacts (acres) ^{a, b, c}		Wetland Resources (number)			Wetland Impacts (acres) ^{a, b, c}			List of Streams Crossed	List of Wetlands Crossed
		Other	HQ/EV	HDD/Bore	PADEP Permanent ^{d, e}	PADEP Temporary	Other	EV	HDD/Bore	PADEP Permanent ^{d, e}	PADEP Temporary	Conversion		
Upper Ridley/Crum	2.2	0	1	1	0.000	0.000	0	0	0	0	0	0	S-B35	n/a

Source: Audubon Society 2016

^a The Project will have minor temporary impacts associated with construction.

^b Disturbed areas will be restored in accordance with the E&S Plan located in Attachment 12.

^c 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.

^d Permanent impacts are those areas affected by a water obstruction or encroachment that consist of both direct and indirect impacts that result from the placement or construction of a water obstruction or encroachment and include areas necessary for the operation and maintenance of the water obstruction or encroachment located in, along or across, or projecting into the floodway.

^e Although PADEP defines operation and maintenance activities as permanent impacts, all wetlands and streams affected by the Project will be restored to pre-construction conditions.

Notes:

Although PADEP defines operation and maintenance activities as permanent impacts, all wetlands affected by the Project will be restored to pre-construction conditions including the presence of wetland soils, hydrology, and hydrophytic vegetation. In addition, the Project does not involve any permanent fill and there will be no permanent loss of wetland area associated with the Project. SPLP will not maintain the ROW through wetland areas (i.e., no mowing); therefore, the pre- and post-construction conditions of the Project-wide wetland areas will be the same, except for a nominal areal extent (approximately 0.4 acre) of forested wetland that will be converted to emergent wetland.

Although PADEP defines operation and maintenance activities as permanent impacts, all streams affected by the Project will be restored to pre-construction conditions including the elevation/contours, channel substrate, stream banks, and flow conditions/patterns. In addition, the Project does not involve any permanent fill and there will be no permanent loss of stream area associated with the Project.

USFWS in correspondence dated July 15, 2016. That correspondence and plan are included in Attachment 6, Tab 6B.

A.9 Prime Farmland

As shown on the maps in Enclosure B, the proposed Project will cross soils classified as Prime Farmland in Chester County. SPLP will take precautions during construction and restoration to protect these special soils.

Potential short-term impacts to prime farmland soils associated with construction of the proposed Project may include increased soil erosion and sedimentation on steep slopes and at stream crossings due to the removal of vegetation, compaction of soils caused by construction vehicles and equipment, inclusion of rock fragments in the topsoil caused by blasting, and poor revegetation of the soil types impacted by the proposed Project. One block valve site and permanent access road located Chester County will involve the conversion of approximately 0.37 acre of Prime Farmland to an industrial/commercial use; however, this conversion is not considered a significant impact to the total acreage of Prime Farmland crossed by the Project in Chester County (refer to Enclosure B of this Attachment) or the total acreage of Prime Farmland across the entire county.

To prevent and minimize impacts on prime farmland soils, in actively farmed areas SPLP will implement construction measures to avoid and minimize impacts on soil productivity, including segregation and conservation of topsoil, decompaction if necessary, and compensation of the landowner for temporary cessation of crop production during the construction period. Enclosure E, Part 2 of this Attachment provides a more detailed discussion of potential impacts and mitigation measures, including topsoil segregation, associated with Prime Farmland soils as well as preserved agricultural areas/farms crossed by the Project.

Because the Project ROW will be restored and most agricultural activities (except of orchards, tree farms, and vineyards) will be allowed to resume following installation of the pipelines, the Project will not have long term impacts on Prime Farmland soils.

A.10 Public and Private Water Supplies

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, three of these PWS areas have been identified in Chester County.

SPLP used the DCNR's Pennsylvania Groundwater Information System (PAGWIS) well data (PADCNR 2016) to identify private groundwater wells located within 150 feet of the proposed Project's HDD locations. In addition, SPLP has conducted independent identification and verification of private wells with landowners to determine the exact location(s) of their water well(s) prior to construction.

Potential impacts to public and private water supplies have been analyzed and addressed within two supplemental plans to the PPC Plan: the Water Supply Assessment, Preparedness Prevention and Contingency Plan and the Inadvertent Return Plan (Attachment 12).

A.11 Agricultural Preserved/Conservation Areas

Sunoco has reviewed the requirements of farmland preservation within Pennsylvania, such as Clean and Green Program, which provides for reduced property tax rates for landowners of rural agricultural, timber or open space properties greater than 10 acres in size. Enclosure E Part 2 of this Attachment provides a description of the program and SPLP's plan for addressing potential impacts to those areas.

B. ENVIRONMENTAL IMPACTS

B.1 Aquatic Habitats

For initial siting of the proposed Project, SPLP was prudent in siting potential worksites to minimize impacts to waterbodies in general, to the extent practicable for the entire Project. However, because this is a linear project, total avoidance of all wetlands and streams was not possible or practicable. The Project would result in temporary disturbance of stream and wetland resources during construction of the proposed facilities. In general, during construction of the new pipelines, the width of the construction ROW would typically be 75 feet: 50-foot-wide would be the post-construction permanent ROW and 25-foot-wide temporary workspace. However, to avoid and minimize impacts to stream/wetland resources, SPLP has reduced the construction ROW to 50 feet. SPLP will utilize one or more of the following methods to facilitate the crossing of streams and wetlands with vehicles, equipment, and haul trucks:

- **Timber Mat Bridge:** A temporary bridge assembled of timber mats. Typically installed at ephemeral and minor stream crossings. See the standard typical drawing in the Erosion and Sediment Control Plan (Attachment 12).
- **Culvert Bridge:** A temporary bridge installed with the use of culverts. Rock fill is used to form the road surface, which may be covered with timber mats. Utilized at medium and large stream crossings. See the standard typical drawing in the Erosion and Sediment Control Plan (Attachment 12).
- **Rail Car Bridge:** A temporary bridge assembled from a rail car. Utilized at medium and large stream crossings. See the standard typical drawing for timber mat and rail car in the Erosion and Sediment Control Plan (Attachment 12).
- **Timber Mat Wetland:** Timber mats will also be utilized when staging areas or additional workspace is required within wetlands. See the standard typical drawing in the Erosion and Sediment Control Plan (Attachment 12).

SPLP will utilize one or more of the following methods for installing the pipeline across streams and wetlands with an open-trench:

- Dry Open-Cut: Minor waterbodies with no flow or anticipated flow at the time of construction may be crossed using the open-cut crossing method. See the standard typical drawing in the Erosion and Sediment Control Plan (Attachment 12).
- Dry Flume: A flumed or dry crossing of a stream directs the flow of a stream through an alternate mechanism to allow for the trenching and pipe installation to occur in dry conditions. Where practical, this allows for drier trenching, pipe installation, and restoration while maintaining continuous downstream flow. See the standard typical drawing in the Erosion and Sediment Control Plan (Attachment 12).
- Dry Pump Bypass: The dam and pump method may be used for crossings of waterbodies where pumps can adequately transfer stream flow volumes around the work area and there are no concerns about sensitive species passage. See the standard typical drawing in the Erosion and Sediment Control Plan (Attachment 12).
- Dry Cofferdam: The cofferdam method, typically used on large streams/ivers, involves the installation of a cofferdam to isolate and divert flow around the work area in two phases. The first phase consists of the cofferdam installation on one of the banks and approximately halfway into the river to allow safe and dry installation of the pipeline across the river. The second phase involves the same process but from the opposite bank. This method allows continuous flow around the work area and there are no concerns about sensitive species passage. See the standard typical drawing in the Erosion and Sediment Control Plan (Attachment 12).

SPLP will utilize one or more of the following methods for installing the pipeline across wetlands with an open trench:

- Drag Section Technique: This technique involves carrying a prefabricated section of pipe into the wetland for placement into the excavated trench, if soil conditions permit. This technique requires the installation of equipment support along the working side of the trench to provide a stable work surface and minimize soil disturbance and rutting.
- Push/Pull Technique: This technique is generally used only in wetlands with standing water or soils that are saturated to the surface. The trench may be excavated using either a backhoe (working on equipment support in the wetland) or a dragline or clamshell dredge (working either in the wetland or from the edge of the wetland, depending on wetland size and extent of soil saturation). A prefabricated pipe is pushed from the edge of the wetland and/or pulled (*e.g.*, with a winch) from the opposite bank of the wetland into the excavated trench. Floats may be attached to the pipe to give it positive buoyancy, allowing it to be “floated” into place over the excavated trench. Once the pipe is positioned, these floats will be removed and the pipe will settle to the bottom of the trench and the trench will then be backfilled. The

push/pull technique enables the pipeline to be installed with minimal equipment operating in the wetland.

The Project does not propose permanent fill in any waterbodies or wetlands. All impacts to these resources are considered to be minor and temporary, or completely avoided utilizing HDD or conventional bore crossing methods. Waterbody and wetland crossings will be restored in accordance with the E&S Plan (Attachment 12) that dictates the restoration of the existing condition topography, stream bed substrate, and wetland soils, hydrology, and vegetation. Enclosure E Part 4 of this Attachment (Impact Avoidance, Minimization, and Mitigation Procedures) describes the proposed construction crossing methods and mitigation measures, and Enclosure E Part 2 provides a Project-wide description of the direct and indirect/secondary impacts to the wetland/stream resources crossed by the Project. Tables 1 through 4 included in this Attachment provide specific details regarding the Chester County wetland/stream type, crossing distances, temporary and permanent impacts, and crossing methods for all the water resources impacted. The following provides a description of the impacts and mitigation associated with the stream and wetland resources crossed by the Project in Chester County.

Streams

Stream impacts have been calculated based on the entire limit of disturbance (LOD) and reflect the existing cover types within this entire area regardless of where the Project ROW co-locates/overlaps an existing utility ROW. Permanent and temporary impacts are based on the following PADEP definitions:

- Permanent impacts are those areas affected by a water obstruction or encroachment that consist of both direct and indirect impacts that result from the placement or construction of a water obstruction or encroachment and include areas necessary for the operation and maintenance of the water obstruction or encroachment located in, along or across, or projecting into the floodway.

Although PADEP defines operation and maintenance activities as permanent impacts, all streams affected by the Project will be restored to pre-construction conditions including the elevation/contours, channel substrate, stream banks, and flow conditions/patterns. In addition, the Project does not involve any permanent fill and there will be no permanent loss of stream area associated with the Project.

- Temporary impacts are those areas affected during the construction of a water obstruction or encroachment that consists of both direct and indirect impacts located in, along or across, or projecting into a watercourse, floodway or body of water that are restored upon completion of construction. This does not include areas that will be maintained as a result of the operation and maintenance of the water obstruction or encroachment located in, along or across, or projecting into the floodway.

Excluding floodway only crossings, the proposed Project will cross 40 streams in Chester County: 22 perennial streams and 18 intermittent/ephemeral streams (Attachment 11, Table 3). As presented in Section D of Enclosure C of this Attachment, 8 streams are

designated Approved Trout Water and Stocked Trout Streams by the PA Fish and Boat Commission. Additionally in Chester County, 8 streams are designated Trout Natural Reproduction.

Excluding floodway only crossings, the Project directly impacts the waters of 28 streams in Chester County that have a designated use for high quality trout stocked fishery (HQ-TSF) and migratory fish (HQ-MF), 8 streams that have a designated use for cold water (CWF) and migratory fish (MF), 3 streams have a designated use for exceptional value, migratory fishery (EV, MF), and 1 stream that has a designated use for stocked fishery (TSF) and migratory fish (MF). Attachment 11, Table 3 provides a summary of all the existing use and designated use classifications associated with the streams crossed in Chester County.

Construction and operation of the Project will not alter the designated uses of the streams crossed in Chester County or impair the ability of these streams to continue to provide habitat for aquatic species. SPLP will construct stream crossings in accordance with the Pennsylvania Department of Environmental Protection (PADEP) and Pennsylvania Fish and Boat Commission's (PAFBC's) restrictions on construction timing in trout streams. In general, these restrictions prohibit construction in wild trout streams between October 1 and December 31, and prohibit construction in stocked trout streams between March 1 and June 15. SPLP has received correspondences from the PAFBC in regards to imposed trout stream restrictions and are included in Attachment 6, Tab 6C. These restrictions are provided on the aerials site plans provided in Attachment 7, Tab 7A.

To minimize stream impacts, SPLP proposes to cross 26 streams in Chester County via the HDD / Bore crossing method: 18 of these streams are classified as HQ and none are classified EV. Although this method eliminates all temporary surface impacts associated with the typical open cut method, there is a potential for an inadvertent return of the drilling fluids into the stream. Accordingly, SPLP has prepared an Inadvertent Return Assessment, Preparedness, Prevention and Contingency Plan for the Project (Attachment 12, Tab C). This plan details the impact minimization measures and response protocol in the event of an inadvertent return near a stream. SPLP will adhere to the plan during all construction activities where the HDD construction method is planned under streams.

Project construction will result in the clearing of areas located 100-150 feet landward of the stream (i.e., riparian area) and within the construction corridor, but the impacts have been minimized to the maximum extent possible while allowing safe installation of the pipelines. Enclosure E Part 2 of this Attachment (Resource Identification and Project Impacts) describes potential impacts and mitigation to riparian areas, and outlines how the Project's stream construction and restoration activities will comply with the antidegradation requirements associated with the HQ and EV stream crossings.

Native stream bed material will be separated from other spoil for reinstallation after restoration (see the E&S Plan provided in Attachment 12). In accordance with the PADEP E&S Manual, an evaluation was completed for sheer stress of stream flow against restored native stream bed material. If the evaluation indicated that the stream would not be stable with native material post-construction, then rip rap will be used per the E&S requirements. Site specific waterbody crossing and restoration plans providing direction for the

installation of rip rap at these streams are included within the E&S Plans (Attachment 12). In these cases where rip rap is used and the stream bed is composed of rock, cobble, or gravel, then the native stone will be used for the top six inches of rip rap. Every effort will be made to segregate the entire top layer of native stone in streams with less than six inches of native stone where rip rap is proposed. Rip rap will be used to the minimum extent necessary to stabilize the stream bank, which is typically evidenced by a lack of vegetation or a water line. Stream banks above this elevation will be stabilized with erosion control blanket and revegetated.

As part of the proposed Project, SPLP will conduct hydrostatic testing of the constructed pipelines prior to placing them in use. In order to conduct these safety tests, water will be withdrawn from local surface water sources. However, there are no proposed water withdrawal locations in Chester County.

Construction of the proposed Project in Chester County would result in minor, short-term impacts to stream resources: 0.243 acre of permanent and 0.028 acre of temporary disturbance. These impacts would occur as a result of in-stream construction activities or construction on slopes adjacent to stream channels and would result in a temporary localized increase in turbidity levels and downstream sediment deposition. Sediments that become suspended during the short period of in-stream disturbance are expected to settle out of the water column relatively quickly. SPLP has designed the Project to avoid and minimize impacts to stream resources to the greatest extent possible. SPLP will conduct all activities in accordance with their Chapter 102 Permit requirements and will implement erosion and sediment control best management practices (BMPs), including appropriate ABACT measures for HQ/EV stream resources, as presented below. Enclosure E Part 4 of this Attachment (Impact Avoidance, Minimization, and Mitigation Procedures) provides a detailed description of the stream crossing construction methods as well as a discussion of potential impacts to streams, including the impact avoidance and minimization measures SPLP has and/or will implement. In addition, Enclosure E Part 2 of this Attachment (Resource Identification and Project Impacts) provides a description of potential direct and indirect/secondary stream impacts and mitigation measures for the Project.

As summarized above and presented in detail in Enclosure E Part 2 (Resource Identification and Project Impacts), the Project will have no long-term adverse impacts on streams crossed by the Project in Chester County.

Floodways

Floodways are defined by PADEP as *“The channel of the watercourse and those portions of the adjoining floodplains which are reasonably required to carry and discharge the 100-year flood. The boundary of the 100-year floodway is as indicated on the maps and flood insurance studies provided by FEMA. In an area where no FEMA maps nor studies have defined the boundary of the floodway, it is assumed, absent evidence to the contrary, that the floodway extends from the stream to 50 feet landward from the top of the bank of the stream* As presented in Table 3 of this Attachment, the proposed Project will impact a total of 5.268 acres of floodway including 3.435 acres of permanent impact and 1.833 acres of temporary impact in Chester County during construction. No fill, aboveground facilities,

or alteration of surface elevations/contours are proposed in these areas as they will be restored to pre-construction conditions. As such, the Project will not result in any long-term impacts to floodways in Chester County.

Wetlands

Wetland impacts have been calculated based on the entire LOD and reflect the existing cover types within this entire area regardless of where the Project ROW co-locates/overlaps an existing utility ROW. Permanent and temporary impacts are based on the following PADEP definitions:

- Permanent impacts are those areas affected by a water obstruction or encroachment that consist of both direct and indirect impacts that result from the placement or construction of a water obstruction or encroachment and include areas necessary for the operation and maintenance of the water obstruction or encroachment located in, along or across, or projecting into the floodway.

Although PADEP defines operation and maintenance activities as permanent impacts, all wetlands affected by the Project will be restored to pre-construction conditions including the presence of wetland soils, hydrology, and hydrophytic vegetation. In addition, the Project does not involve any permanent fill and there will be no permanent loss of wetland area associated with the Project. SPLP will not maintain the ROW through wetland areas (i.e., no mowing); therefore, the pre- and post-construction conditions of the wetland areas will be the same, except for a nominal areal extent (approximately 0.4 acre) of forested wetland that will be converted to emergent wetland. When SPLP submitted its original Chapter 105 applications, it conservatively estimated for purposes of calculating the application fee to the Commonwealth that the area of all disturbed wetlands would be permanently impacted, and paid the application fee accordingly. It must be noted that only 0.405 acre of wetlands will be permanently converted Project-wide, and payment of the prior fee should not be construed to indicate that SPLP considers the remaining temporary incursions into wetlands to be permanent. In fact, all such areas will be restored to original function and values, and replanted to pre-construction conditions, excepting for the 0.405 acres of palustrine forested wetlands, which will be converted to palustrine emergent wetlands following construction of the Project.

- Temporary impacts are those areas affected during the construction of a water obstruction or encroachment that consists of both direct and indirect impacts located in, along or across, or projecting into a watercourse, floodway or body of water that are restored upon completion of construction. This does not include areas that will be maintained as a result of the operation and maintenance of the water obstruction or encroachment located in, along or across, or projecting into the floodway.

The proposed Project will cross 25 wetlands palustrine emergent (PEM), palustrine scrub-shrub (PSS), palustrine forested (PFO)) in Chester County including a total of 3.713 permanent and 0.001 temporary acres, as defined by PADEP. As presented in Attachment

11 Table 2, impacts to these wetland resources include the following:

- All wetlands will be restored to meet wetland criteria, there will be no permanent loss of wetland area/acreage (i.e., no fill);
- A total of 3.588 acres of PEM including 3.587 acres of permanent and 0.001 acre of temporary impact;
- A total of 0.004 acre of PSS including 0.004 acre of permanent and 0 acre of temporary impact;
- A total of 0.122 acre of PFO including 0.122 acre of permanent and 0 acre of temporary impact;
- All PEM and PSS areas will be restored to their pre-existing conditions;
- A total of 0.029 acre permanent PFO to PEM conversion;
- A total of 0.093 acre of PFO areas will be restored to PFO;
- SPLP has developed a Compensatory Mitigation Plan to mitigate for the permanent impacts to wetland resources in Chester County (refer to Enclosure F of this Attachment); and,
- Refer to the Project’s Impact Avoidance, Minimization, and Mitigation Procedures provided in Attachment 11, Enclosure E, Part 4 for details regarding wetland restoration and monitoring.

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.

EV Wetlands Crossed by the Pennsylvania Pipeline Project in Chester County

Wetland ID	Cowardin Classification	EV Designation	Crossing Method	Impacts	
				PADEP Permanent Impacts	PADEP Temporary Impacts
Chester					
A46	PEM	EV Stream	Open Cut	0.015	0
B12	PEM	EV Stream	Open Cut	0.001	0
B13	PEM	EV Stream	Open Cut	0.031	0.001
B14	PEM	EV Stream	Open Cut	0.024	0
C33	PEM	EV Stream	Open Cut	0.193	0
C34	PEM	EV Stream	Open Cut	0.005	0
C35	PEM	EV Stream	Open Cut	0.145	0
C37	PEM	Wild Trout Tributary	HDD	0.02	0
	PFO			0.002	0
C38	PEM	Adjacent to Bog Turtle; Wild Trout Tributary	Open Cut	0.077	0
C40	PEM	Adjacent to Bog Turtle; Wild Trout	Open Cut	0.1	0
Total Number Crossed 10				0.613	0.001

The Project will cross a total of 10 EV wetlands in Chester County. As presented above and described below, these wetlands have been classified as EV wetlands based on a number of different ecological considerations.

- A total of 7 wetlands in Chester County are considered to be EV wetlands because they are located in or along the floodplain of the reach of an EV stream or within the floodplain of its tributary: wetlands A46, B12, B13, B14, C33, C34, and C35. SPLP plans to cross all of these wetlands using the open cut method. Construction using the open cut method will result in the temporary disturbance of vegetation, soil, and hydrology; however, all these PEM EV wetland areas will be restored to their pre-existing condition and there will be no long term impact to the wetlands' vegetation, hydrology, or soils. Consequently, the functions and values of all the EV wetlands in Chester County will not be impacted nor will their classification as EV wetlands be altered.
- A total of 2 wetlands (C38 and C40) in Chester County are classified as EV wetlands because they are located in proximity to a wetland that supports either suitable habitat of individual bog turtles (*Glyptemys muhlenbergii*), a federally listed endangered species; however, both these wetlands were determined not to support the bog turtle nor do they have any suitable habitat. Wetland C38 is located in the floodplain of a tributary of a wild trout stream and C40 is located in the floodplain of a wild trout designated stream. Both these PEM wetlands will be crossed using the open cut method resulting in the temporary disturbance of vegetation, soil, and hydrology. However, both wetland areas will be restored to their pre-existing condition and there will be no long term impact to the wetlands' vegetation, hydrology, or soils. Consequently, the functions and values of these 2 wetlands will not be impacted nor will their classification as EV wetlands be altered.
- One wetland in Chester County is considered to be an EV wetland because it is located in or along the floodplain of a tributary to a wild trout stream (C37). SPLP plans to cross this wetland via the HDD method this eliminating all earth disturbances. Consequently, there will be no impacts to the wetland vegetation, hydrology, soils, and functions and values of this wetland area. Consequently, the functions and values of this wetland will not be impacted nor will its classification as an EV wetland be altered.

Enclosure E Part 2 of this Attachment (Resource Identification and Project Impacts) describes the process for identifying EV wetlands and how the Project will comply with the antidegradation requirements associated with EV wetlands. In addition, Enclosure C of this Attachment provides a function and values assessment of all the wetlands crossed by the Project. The following presents a summary of the impacts to the EV wetlands crossed by the Project:

- A total of 10 wetlands crossed in Chester County are classified as EV wetlands.
- SPLP proposes to HDD / Bore one of the EV wetlands to avoid surface disturbances in these areas.
- A total of 0.613 acre of permanent and 0.001 acre of temporary impacts to the EV wetlands.
- All EV wetlands will be restored to meet wetland criteria, there will be no permanent loss of wetland area/acreage (i.e., no fill);
- A total of 0.611 acre of PEM including 0.610 acre of permanent and 0.001 acre of

- temporary impact to EV wetlands;
- A total of 0.002 acre of PFO including 0.002 acre of permanent and 0 acre of temporary impact to EV wetlands;
- All EV PEM and PSS areas will be restored to their pre-existing conditions;
- There will be no permanent EV PFO to PEM conversion; and,
- A total of 0.002 acre of EV PFO areas will be restored to PFO.
- Refer to the Project's Impact Avoidance, Minimization, and Mitigation Procedures provided in Attachment 11, Enclosure E, Part 4 for details regarding wetland restoration and monitoring.

In order to minimize wetland impacts, SPLP proposes to cross 9 wetlands in Chester County via the HDD / Bore crossing method. Although this method eliminates all temporary surface impacts associated with the typical open cut method, there is a potential for an inadvertent return of the drilling fluids into the wetland. Accordingly, SPLP has prepared an Inadvertent Return Assessment, Preparedness, Prevention and Contingency Plan for the Project (Attachment 12, TabC). This plan details the impact minimization measures and response protocol in the event of an inadvertent return near a wetland. SPLP will adhere to the plan during all construction activities where the HDD construction method is planned under wetlands.

Wetland impacts resulting from construction of the proposed Project in Chester County include temporary disturbance to vegetation, soils, and hydrology. Topsoil within the wetlands will be separated during construction and then replaced to original horizon and elevation in wetland areas to maintain the natural seed bed and to facilitate with revegetation of the wetland areas. In addition, all wetlands will be restored to their pre-construction contours/elevations such that surface water hydrology is restored and the re-establishment of hydrophytic vegetation is facilitated. Impacts to wetland hydrology vary depending on the primary source of hydrology, underlying geology/soils, and the wetlands position relative to the water table (i.e., perched water tables, confining layer, and/or fragipans to maintain hydrology). SPLP has designed the Project to avoid and minimize impacts to wetland resources to the greatest extent possible, and will conduct all activities in accordance with their Chapter 102 Permit requirements and will implement erosion and sediment control best management practices (BMPs), including appropriate ABACT measures for EV wetland resources, as presented below. Enclosure E Part 4 of this Attachment (Impact Avoidance, Minimization, and Mitigation Procedures) provides a detailed description of the wetland construction methods as well as a discussion of potential impacts to wetlands, including the impact avoidance and minimization measures SPLP has and/or will implement. In addition, Enclosure E Part 2 of this Attachment (Resource Identification and Project Impacts) provides a more detailed description of potential direct and indirect/secondary wetland impacts, including hydrology, and mitigation measures for the Project.

As mentioned above, 1 wetland in Chester County will undergo a permanent vegetative cover class change (permanent conversion) from PFO to PEM; this wetland is not an EV Wetland. As a result of a combination of construction avoidance/minimization measures and post-construction planting/mitigation measures, the permanent conversion has been reduced to a total of 0.029 acre in this county. The table below lists the affected wetland's

functions and values (refer to Attachment 11, Enclosure C, Part 2), along with its EV status, the wetland area delineated, acreage of Project impacts, and acreage of permanent conversion.

Permanent Vegetation Cover Type Conversion Impacts in Chester County, by Wetland, Including Wetland Functions and Values

Wetland ID	EV Status (Reason for EV Designation) ¹	Total Wetland in Survey Area (acre) ²	Project Impacts		Total PFO Conversion (acre) ⁵	Description of Wetland Functions and Values
			Wetland in PADEP Temp. Impact/Temp. Work-space Area (acre) ³	Wetland in PADEP Perm. Impact Area/Perm. ROW (acre) ⁴		
H15	N/A	1.040	0	0.172	0.029	Sediment/Toxicant Retention, Nutrient Removal

Notes:

1. EV = Exceptional Value
PWS = Wetland is located along a Public Water Supply
2. Survey Area was typically a minimum of 200 feet wide or wider, depending on location, and in all cases exceeded the proposed Project limits of disturbance.
3. PADEP Temporary Impact/Temporary Workspace Areas are the construction workspace areas that will not become part of the 50-foot-wide permanent ROW for the Project. Typically, this consists of any workspace beyond the 50-foot-wide permanent ROW, including additional temporary workspaces, and temporary access roads.
4. PADEP Permanent Impact Area/Permanent ROW is the area necessary for the operation and maintenance of the water obstruction or encroachment located in, along or across, or projecting into the wetland. The permanent ROW will be 50 feet wide for this Project. Although PADEP defines operation and maintenance activities as permanent impacts, all wetlands affected by the Project will be restored to pre-construction conditions including the presence of wetland soils, hydrology, and hydrophytic vegetation. In addition, the Project does not involve any permanent fill and there will be no permanent loss of wetland area associated with the Project. SPLP will not maintain the ROW through wetland areas (i.e., no mowing); therefore, the pre- and post-construction conditions of the Project-wide wetland areas will be the same, except for a nominal areal extent (approximately 0.4 acre) of forested wetland that will be converted to emergent wetland.
5. Final PFO Conversion is the total acreage of wetland vegetation cover type converted from PFO vegetation to scrub-shrub or emergent wetland vegetation, after on-site restoration and plantings. Onsite restoration will include replanting all PSS in disturbed areas, and replanting PFO areas in accordance with the Compensatory Mitigation Plan (Attachment 11, Enclosure F). There will be no loss of wetland acreage due to fill.

The nature and size of the cover type conversions in the wetland would not significantly or adversely affect the functions and values of the wetland. There will be no loss of wetland acreage due to fill or new impervious areas in the wetland, and the areas will be restored to wetlands and permanently revegetated and stabilized. Accordingly, the functions related to sediment/toxicant retention and nutrient removal should remain equally effective or become better than the pre-construction wetland condition, where emergent/meadow vegetation can function more effectively for sediment/toxicant retention than forest vegetation.

Overall, the amount of PFO conversion represents a small fraction of the overall wetland, compared to both the size of that wetland delineated in the Project survey area (as detailed in the table), and also of the larger wetland that typically extends beyond the Project survey area. The total amount of PFO conversion in Chester County represents 2.8% of the total delineated area of the wetland that has a permanent conversion. Where the total size of this same wetland outside the survey area is typically much greater, this percent would be even further reduced. In summary, the very small amount of permanent conversion of vegetation cover type in these wetlands would not represent any meaningful change or reduction of the overall functions/values of the wetland.

As summarized above and presented in detail in Enclosure E Part (Resource Identification and Project Impacts), the Project will have no adverse impacts on EV wetlands (105.18a(a)) and will not have a significant adverse impact on the other wetlands (105.18a(b)) crossed by the Project in Chester County.

Erosion and Sediment Control Measures

As presented in Section 3.0 of the Erosion and Sediment Control Plan Narrative (Chapter 102 Permit Application), SPLP will implement a number of erosion and sediment control measures to protect both the stream and wetland resources, including HQ/EV resources, in Chester County. Specifically, general stabilization and structural controls will be used to (1) divert stormwater flows away from exposed areas, (2) convey runoff, (3) prevent sediments from moving off-site, and (4) reduce the erosive forces of runoff waters. Compost filter socks and other structural controls that will be utilized during construction activities will include the following:

Vegetative Stabilization Controls: Grounds disturbed by any of the operations necessary to complete the work for this Project will be permanently seeded, or if specified, sodded, unless occupied by structures or paved. A temporary cessation of earth disturbance activities that lasts for four days or longer requires temporary stabilization. Disturbed areas, which are at final grade, will be seeded and mulched immediately. If seeding cannot be completed immediately after the area reaches final grade due to weather conditions, the disturbed area will be stabilized and mulched with straw at the rate of 3 tons per acre.

Structural Controls: Temporary control facilities to be used during construction include the use of compost filter socks and rock construction entrances. Other structural controls as described below may also be used as deemed necessary based on conditions encountered in the field. Installation guidelines and locations for the below devices are as shown on the Erosion and Sediment Control drawings (Attachment 12). The temporary control measures that will be used on this Project include, but are not limited to [Note – those identified in bold text are suitable for use in HQ/EV resources]:

- **Compost Filter Socks:** This temporary sedimentation control measure consists of wood or metal posts driven through a compost filled mesh tube. Filter socks will be located as needed on side-slope and down-slope boundaries of disturbed areas. Compost filter socks will be sized in accordance with PADEP Construction Detail

provided in Attachment 4 of the Chapter 102 Permit Application. Compost filter socks will be used in drainage areas with HQ and EV waters.

- **Silt Fence:** This temporary sedimentation control measure will be installed at existing level grade. Both ends of each fence section will be extended at least 8 feet upslope across undisturbed ground at 45 degrees to the main fence alignment to allow for pooling of water. A 6-inch deep trench will be excavated, minimizing the disturbance on the downslope side. The bottom of the trench will be at level grade. Silt fence will be sized using in accordance with PADEP Construction Detail provided in Attachment 4 of the Chapter 102 Permit Application. Silt fence will not be used in drainage areas with HQ and EV waters – See Compost Filter Socks.
- **Rock Filter Outlet:** Rock filter outlets will be used, as necessary, to address problems of concentrated flows to sediment barriers. In the event of unanticipated concentrated flow and sediment barrier failure, a rock filter outlet will be installed unless the concentrated flow can be diverted away from the barrier. Rock filter outlets used in drainage areas with HQ and EV waters need a 6” layer of compost installed on the upslope side of the rock.
- **Compost Sock Sediment Trap:** This temporary sedimentation control measure is useful in controlling runoff from access roads and may also be used at other locations where a temporary sediment trap is appropriate. The minimum base width will be equivalent to the height of the trap and sediment accumulation will not exceed 1/3 the total height of the trap. Ends of the trap will be a minimum of 1 foot higher in elevation than the mid-section, which will be located at the point of discharge. Compost sock sediment trap will be sized in accordance with PADEP Construction Detail provided in Attachment 4 of the Chapter 102 Permit Application. Compost sock sediment traps can be used in drainage areas with HQ and EV waters.
- **Tarpaulin Covers:** Tarpaulin covers will be used, as necessary, to protect topsoil storage stockpiles from wind and precipitation erosion. Stockpile slopes will be 2:1 or less. A minimal amount of soil will be stockpiled so that the height of the stockpile is less than 35 feet.
- **Rock Construction Entrance:** Temporary access routes will be established on and proximate to the site to facilitate construction activities. The use of access routes will help confine truck and equipment traffic to specific corridors thus minimizing land disturbance and protecting vegetation. Site traffic during wet weather will be limited. No vehicles will be permitted in streams or rivers.
- **Wash Racks:** Wash racks will be used at rock construction entrances and will be designed to accommodate anticipated vehicular traffic. A water supply will be made available at wash racks to wash the wheels of vehicles exiting the site. Reasonable methods which are sanctioned by the PADEP as alternatives to installation of tire wash stations on public road access points for gathering pipeline projects in EV/HQ or siltation impaired watersheds include:
 - For paved surface public roads: use of a **vacuum truck sweeper** or sweeper with a catch bin attachment.
 - For dirt or gravel surface public roads: rigorous manual removal of

mud/dirt from vehicle/equipment tires prior to exiting construction site, supplemented by immediate recover, by manual or mechanical means, of soil which may become discharged onto public roadways. Dust control and/or compaction via rolling of the dirt public road surface will be implemented as needed.

- **Pumped Water Filter Bag:** Pumped water filter bags may be used to filter water pumped from disturbed areas prior to discharging to surface waters. Compost filter socks will be installed within 50 feet of any receiving surface water or where grassy area is not available. Filter bags will be installed in accordance with PADEP Construction Detail provided in Attachment 4 of the Chapter 102 Permit Application.
- **Erosion Control Blanket:** A manufactured erosion control blanket will be installed on all slopes 3:1 or steeper and within 50 feet of surface water or 100 feet of special protected waters (HQ/EV resources). The blanket will be biodegradable but capable of providing protection for two growing seasons. Straw or similar fiber material will be placed between two biodegradable nets. The top net will be heavyweight and UV stabilized; the bottom net will be a lightweight netting. Erosion control blankets will be anchored and stapled in place in accordance with the manufacturer's recommendations and the detail on the construction drawings provided in the Chapter 102 Permit Application. For slopes between 3:1 and 1:1 use erosion control blanket SC 150 as manufactured by North American Green or Owner approved equal material or equal method.
- **Waterbars:** Waterbars will be installed across the ROW on all slopes greater than 5 percent. Waterbars will be constructed at a slope of 2 percent and discharge to a well-vegetated area. Waterbars will not discharge into an open trench. Waterbars will be oriented so that the discharge does not flow back onto the ROW. Obstructions (e.g. compost filter socks) will not be placed in any waterbars. Where needed, they will be located below the discharge end of the waterbar. Waterbars will be installed in accordance with PADEP Construction Detail provided in Attachment 4 of the Chapter 102 Permit Application.
- **Trench Plugs:** Impervious trench plugs are required for all stream, river, wetland, or other water body crossings. Trench plugs are also used on slope run spacing and will be installed in accordance with the Chapter 102 Permit Application.

a. Food chain production

Wetlands traversed in Chester County are considered to have some potential for food chain production and support all the trophic levels including producers and primary, secondary, and tertiary consumers. Specifically, the 25 wetlands and 40 streams crossed in Chester County support a diversity of macroinvertebrates, insects, amphibians, reptiles, herbivorous species, and predators (carnivores and omnivores). During construction of the proposed Project, vegetation will be removed and the animals will be temporarily displaced. In the case of less mobile species, mortality of some individuals could result during construction but this loss will not alter the species composition or populations of the animals affected. Until restoration of the proposed Project area is completed, the food chain production in the affected wetlands will be temporarily altered. However, restoration/seeding of the ROW will occur immediately following construction and revegetation of the wetland areas will

occur within the first growing season. Similar to the natural succession of wetland areas, establishment of the temporarily disturbed scrub-shrub and forested areas will take several more growing seasons to reestablish but the areas will colonize quickly with producers and the higher trophic level species from the adjacent habitats.

Likewise, aquatic life in the 22 perennial streams crossed in Chester County would be temporarily impacted at, or downstream from, the proposed construction sites. Potential impacts include the degradation of benthic habitat due to direct disturbance to the bottom substrate in the trench zone, and associated disturbances to aquatic vegetation and invertebrates with the construction ROW. Indirect impacts from sedimentation may affect areas downstream of some sites depending on the type of construction method and water flow/conditions at the time of construction, but generally conditions would be expected to resolve relatively quickly (*e.g.*, dry crossing methods involving in-stream excavation would have a limited effect on downstream sedimentation for a period of 1 to 3 days). Impacts to food chain production in the 18 ephemeral/intermittent streams crossed in Chester County are expected to be less as these streams typically support a less diverse assemblage of aquatic life/species due to lack of a sustained presence of water in these streams.

b. General habitat

1. Nesting

SPLP has prepared a Project-specific Migratory Bird Conservation Plan (Attachment 9 – Project Description) that incorporates the general recommendations of the USFWS’s Adaptive Management Practices for Conserving Migratory Birds. One of these measures is a commitment to clear all trees located within the construction ROW in Chester County between September 1 and March 31 to avoid impacts to the nesting period of most birds. In addition, SPLP has routed the Project adjacent to (and overlapping) existing ROWs to the maximum extent practicable, which will serve to reduce the loss of nesting habitat.

Following construction, the nesting potential for birds requiring forest edge conditions or canopies for nesting will be shifted to the new ROW edge. The nesting potential for birds that nest on or near the ground will be increased and reestablished within the ROW. There will be a permanent, but negligible, decrease in the nesting potential for birds that require forest interior habitat for nesting.

During operation, the Project would not have adverse impacts on nesting in Chester County.

2. Spawning

Construction of the proposed Project may have an adverse effect on fish spawning in the 22 perennial streams crossed in Chester County if conducted during the fish spawning seasons. However, short-term, direct impacts to spawning fish are generally avoided by adherence to permit conditions restricting work within stream channels to dates outside the fish spawning seasons. SPLP would adhere to the

PADEP's/PAFBC's in-stream construction time windows designed to reduce impacts to fisheries; SPLP anticipates any required restrictions will be written into the permit on a stream-specific basis. In addition, direct impacts to spawning fish will be avoided by use of the HDD / Bore crossing method that does not disturb the stream bed or banks: 26 streams in Chester County will be crossed using the HDD / Bore method.

Indirect, long-term impacts to fish spawning could occur if substantial changes to stream substrate or current patterns result from Project construction. However, substantial changes to stream substrate and current patterns are not anticipated as a result of the Project because the native stream substrates will be replaced and stream bed and banks will be restored as closely as possible to the original contours following construction.

Some amphibian species may spawn in depressions in seasonally flooded wetlands. If construction occurs during the spawning season, some losses may occur. After Project construction and wetland restoration are completed, there is not expected to be a long-term adverse impact on amphibian spawning.

During operation, the Project would not have any impact on spawning in Chester County.

3. Rearing

The Project has been co-located with existing ROWs to the extent possible and is not located in remote, undeveloped expanses of land, as such the 25 wetlands located within the Project area in Chester County are not considered to have a high potential for wildlife rearing. Some animal species more tolerant of human activity and rural landscapes may occur in the Project area and may utilize the Project area sporadically for rearing their young. However, the impacts to wildlife rearing are expected to be minimal as the wildlife will just relocate or utilize adjacent areas with similar habitat during construction activities. No long-term impacts to rearing are anticipated as a result of the Project.

During operation, the Project would not have adverse impacts on rearing areas in Chester County.

4. Resting

The 25 wetlands and 40 streams crossed by the Project in Chester County are expected 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 areas for resting. Impacts to wildlife resting areas are expected to be minimal as the wildlife will just utilize adjacent areas with similar habitat during construction activities. No long-term impacts to resting areas are anticipated as a result of the Project.

During operation, the Project would not have adverse impacts on resting habitat in

Chester County.

5. Migration

As previously stated, SPLP has prepared a Project-specific Migratory Bird Conservation Plan (Attachment 9 – Project Description) that incorporates the general recommendations of the USFWS’s Adaptive Management Practices for Conserving Migratory Birds. One of these measures is a commitment to clear all trees located within the construction ROW in Chester County between September 1 and March 31 to avoid impacts to the nesting period of migratory birds. In addition, SPLP has co-located the Project adjacent to (and overlapping) existing ROWs to the maximum extent practicable, which will serve to reduce the loss of nesting habitat. Based on these measures and others that SPLP will implement, bird migration patterns are not expected to be affected by the Project.

Direct impacts to migrating fish species (*e.g.*, trout) in the 22 perennial streams crossed by the Project in Chester County would generally be avoided by adherence to permit conditions and restricting work within stream channels to dates outside the fish spawning/migration seasons. In addition, all streams will be returned to their pre-construction contours following construction and there would be no long-term obstacles/obstructions preventing fish from migrating upstream or downstream.

During operation, the Project would not have adverse impacts on migration in Chester County.

6. Feeding

Construction activities would temporarily affect the 25 wetlands and 40 streams crossed in Chester County to function as feeding areas. Specifically, clearing of the construction ROW and excavation of the trench would temporarily eliminate food sources on the ROW and would discourage wildlife from feeding in the general Project area.

Excavation of wetland habitats would temporarily remove primary production, causing wildlife species to seek other areas to feed until the ROW became revegetated. Similarly, the turbidity level in streams that have flow/water present at the time of construction may be slightly elevated and result in less feeding activities in the Project area. However, following restoration of the ROW and reestablishment of pre-construction conditions the feeding habits of local wildlife will return to normal.

During operation, the Project would not have any impact on feeding activities in Chester County.

7. Escape Cover

Incremental widening of the existing ROW and/or clearing of new ROW in Chester

County would have a negligible, short-term effect on escape cover. After construction and revegetation are completed, the existing ROW will be widened and will provide essentially the same escape cover that existed prior to construction. Although the understory layer of shrubs and small trees that had developed because of increased light availability along the forested ROW edge will require several growing seasons to reestablish, this same habitat type will still be available on the other side of the ROW that was not disturbed during construction.

Operation of the Project would not have any impact on escape cover in Chester County.

8. Other

Impacts to other general habitats were not identified during the wetland delineation surveys or stream characterization in Chester County.

c. Habitat for Threatened and Endangered Plant and Animal Species

SPLP has coordinated extensively with the Pennsylvania Department of Conservation and Natural Resources (PADCNR), the Pennsylvania Game Commission (PGC), the PAFBC, and the USFWS throughout the entire Project planning process. Based on this coordination a number of species of concern have been identified in the Project area and SPLP has conducted all surveys and developed conservation plans as required by the agencies. SPLP has received either a “no effect/impact” or a “not likely to adversely affect” determination from the PADCNR, the PGC, the PAFBC, and the USFWS. Attachment 6 (PNDI and Agency Coordination) of this application provides a detailed summary of these agency consultations as well as all of the agency approved conservation plans. SPLP will adhere to all conditions provided within the final determination letters and associated conservation plans to ensure that the agency determinations remain valid.

d. Environmental study areas

1. Sanctuaries

The Project crosses the Upper Ridley/Crum IBA in Chester County. Potential impacts and mitigation associated with this area are described in Section A.8.

2. Refuges

There are no designated wildlife refuges known to occur within or near the proposed Project area; consequently, none will be impacted by the proposed Project in Chester County.

3. Other

The Project crosses 2 Core Habitats (table below) and 22 Supporting Landscapes in Chester County. The Project crosses the Great Marsh Natural Heritage Area (NHA) for

approximately 0.02 mile and does not impact any aquatic resources in the area. The Project also crosses the Marsh Creek Lake NHA for approximately 0.8 mile and will impact 5 streams and 5 wetlands within the area. There will be 0.107 acre permanent and 0.027 acre temporary stream impacts, and 0.295 acre permanent wetlands impact to the resources, as defined by PADEP (refer to Section B.1). A discussion of wetland/stream construction methods and mitigation measures that SPLP will implement when crossing these resources is presented in Section B.1 (above) and Enclosure E, Part 2.

The Project crosses the Great Marsh Natural Heritage Area (NHA) with a temporary access road. The access road will utilize an existing roadway; therefore, any impacts will be temporary and minor. There will be no long-term impact to this area. It will continue to provide essential habitat for the species utilizing the habitat and there will be no change in the existing land use.

The Project is co-located with existing ROW to the maximum extent possible where it crosses the Marsh Creek Lake NHA and the 22 Supporting Landscape areas. By co-locating with existing ROW the Project will minimize permanent habitat alterations to the maximum extent practicable. Many of the Supporting Landscape Areas will be crossed using HDD methods, as they encompass residential areas. Where the Project is not co-located with existing ROW there may be expansion of edge habitat due to construction. However, there will be no long-term impacts to the purpose/function of these areas as they will continue to provide essential habitat for the species utilizing the habitat and there will be no change in the existing land use.

B.2 Water Quantity and Streamflow

a. Natural drainage patterns

Construction of the proposed Project in accordance with SPLP's Impact Avoidance, Minimization, and Mitigation Procedures (Enclosure E, Part 4 of this Attachment) is not expected to affect natural drainage patterns in Chester County. There are no stream relocations, enclosures, or channel deepening/dredging activities proposed in conjunction with the Project's 40 stream crossings in Chester County that could alter drainage patterns in the Project area. Upon completion of construction in the 25 wetlands crossed, all soil disturbed during construction will be replaced to original horizons and contours. This will restore the direction and rates of flow to pre-construction conditions and will promote re-establishment of hydrophytic vegetation and wetland hydrology. Operation of the Project would not have any impact on the natural drainage patterns in Chester County.

Enclosure E, Part 2 of this Attachment (Resource Identification and Project Impacts) describes the stream and wetland impacts associated with construction of the Project including the restoration of pre-construction contours and hydrology.

b. Flushing characteristics

Construction of the proposed Project in accordance with SPLP's Impact Avoidance, Minimization, and Mitigation Procedures (Enclosure E, Part 4 of this Attachment) is not

expected to affect the flushing characteristics of the 40 streams crossed in Chester County. SPLP has sited the ROW such that the stream crossings are generally perpendicular and thereby of minimal impact. In addition, the Project will not alter the volume of water or flow rates that the streams typically/naturally experience. Furthermore, stream channels will be restored to pre-construction contours, thereby restoring pre-existing flushing characteristics and patterns within both the stream and wetlands crossed. Similarly, operation of the Project would not have any impact on the natural drainage patterns in Chester County.

Core Habitats Crossed by the Pennsylvania Pipeline Project in Chester County

Resource	Distance Crossed (miles)	Stream Resources (number)			Stream Impacts (acres) ^{a, b, c}		Wetland Resources (number)			Wetland Impacts (acres) ^{a, b, c}			List of Streams Crossed	List of Wetlands Crossed
		Other	HQ/EV	HDD/Bore	PADEP Permanent ^{d, e}	PADEP Temporary	Other	EV	HDD/Bore	PADEP Permanent ^{d, e}	PADEP Temporary	Conversion		
Great Marsh NHA	0.02	0	0	0	0.000	0.000	0	0	0	0	0	0	n/a	n/a
Marsh Creek Lake NHA	0.8	0	5	2	0.107	0.027	3	2	3	0.295	0	0	S-C72 S-C73 S-C87 S-G52 S-Q83	C38 C40 C43 Q75 Q76

Source: PADCNR 2016

^a The Project will have minor temporary impacts associated with construction.

^b Disturbed areas will be restored in accordance with the E&S Plan located in Attachment 12.

^c 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.

^d Permanent impacts are those areas affected by a water obstruction or encroachment that consist of both direct and indirect impacts that result from the placement or construction of a water obstruction or encroachment and include areas necessary for the operation and maintenance of the water obstruction or encroachment located in, along or across, or projecting into the floodway.

^e Although PADEP defines operation and maintenance activities as permanent impacts, all wetlands and streams affected by the Project will be restored to pre-construction conditions.

Notes:

Although PADEP defines operation and maintenance activities as permanent impacts, all wetlands affected by the Project will be restored to pre-construction conditions including the presence of wetland soils, hydrology, and hydrophytic vegetation. In addition, the Project does not involve any permanent fill and there will be no permanent loss of wetland area associated with the Project. SPLP will not maintain the ROW through wetland areas (i.e., no mowing); therefore, the pre- and post-construction conditions of the Project-wide wetland areas will be the same, except for a nominal areal extent (approximately 0.4 acre) of forested wetland that will be converted to emergent wetland.

Although PADEP defines operation and maintenance activities as permanent impacts, all streams affected by the Project will be restored to pre-construction conditions including the elevation/contours, channel substrate, stream banks, and flow conditions/patterns. In addition, the Project does not involve any permanent fill and there will be no permanent loss of stream area associated with the Project.

c. Current patterns

As previously stated for the natural drainage patterns, there are no stream relocations, enclosures, or channel deepening/dredging activities proposed in conjunction with the Project's 40 stream crossings in Chester County that could alter current patterns in the Project area.

Construction of the Project in accordance with SPLP's Impact Avoidance, Minimization, and Mitigation Procedures (Enclosure E, Part 4 of this Attachment) will not result in long-term changes to current patterns in streams or wetlands in Chester County. All stream and wetland areas will be restored to their pre-construction contours such that there will be no potential for obstructions or alteration of flow/current patterns resulting from the Project. Operation of the Project would not have any impact on the natural drainage patterns in Chester County.

Enclosure E, Part 2 of this Attachment (Resource Identification and Project Impacts) describes the stream and wetland impacts associated with construction of the Project including the restoration of pre-construction contours and hydrology.

d. Groundwater discharge for baseflow

Construction of the proposed Project in accordance with SPLP's Impact Avoidance, Minimization, and Mitigation Procedures (Enclosure E, Part 4 of this Attachment) is not expected to affect groundwater discharge that may be important for supporting stream baseflow or wetland hydrology in Chester County. Trench plugs will be installed in the trench at the entry and exit of all wetlands/streams crossed to prevent draining of wetlands/streams along the trench line. In addition, there are no groundwater control features or interceptor structures incorporated into the Project design. Topographic contours and drainage patterns will be restored following construction of the Project, and impacts to groundwater discharge are not anticipated in Chester County.

e. Natural recharge area for ground and surface waters

Most of the 25 wetlands traversed by the proposed Project in Chester County occur in areas of groundwater discharge and are not likely to be natural recharge areas for groundwater, but may act as recharge areas for surface waters. However, the pipelines are not expected to alter natural drainage patterns, flushing characteristics, or current patterns. Furthermore, the Project does not involve the addition of large expanses of new impervious surfaces. Therefore, impacts to the natural recharge of surface waters as a result of construction and operation of the proposed Project in Chester County are unlikely.

f. Storm and floodwater storage and control

Construction in accordance with SPLP's Impact Avoidance, Minimization, and Mitigation Procedures (Enclosure E, Part 4 of this Attachment) will not negatively impact the ability of streams or wetlands to either store or control storm and flood waters. In addition, there are no proposed aboveground facilities in Chester County. Overall, construction of the

proposed Project is not expected to negatively impact the ability of streams or wetlands to either store or control storm and flood waters.

B.3 Water Quality

a. Preventing pollution

To prevent pollution SPLP will implement pollution prevention procedures outlined in its E&S Plan and supporting documents (Attachment 12) for protection of water quality during Project construction in Chester County. Specifically, SPLP will implement their Preparedness, Prevention, and Contingency Plan (Attachment 12, TabA); Water Supply Assessment, Preparedness, Prevention and Contingency Plan (Attachment 12, TabB); and, Inadvertent Return Assessment, Preparedness, Prevention and Contingency Plan (Attachment 12, TabC) to prevent and address potential spills of hazardous materials/fluids during construction. In addition, SPLP has applied for and will adhere to all provisions of the Pennsylvania Erosion and Sedimentation Control General Permit No. 2 (ESCGP-2) to minimize pollution into the wetlands and streams crossed in Chester County from erosion and sedimentation associated with the Project. Implementation of these plans and compliance with the permits will minimize the potential for pollution to the maximum extent possible. In addition, Enclosure E Part 2 provides a Project-wide description of the potential direct and indirect/secondary impacts to the wetland/stream resources crossed by the Project.

SPLP has also developed a Void Mitigation Plan for Karst Terrain and Underground Mining and is provided as part of the E&S Plan and provides an assessment of potential impacts and avoidance and mitigation measures during open-cut and drilling procedures (Attachment 12, TabD). The Water Supply and Inadvertent Return plans also provide an assessment of the geology in terms of potential risks to groundwater supplies from below surface inadvertent returns.

b. Sedimentation control and patterns

Construction procedures and best management practices that will be implemented in Chester County by SPLP to control erosion and sedimentation into streams and wetlands during Project construction are provided in the Project's Impact Avoidance, Minimization, and Mitigation Procedures (Enclosure E, Part 4 of this Attachment) and E&S Plan (Attachment 12). In addition, SPLP will apply for and adhere to all provisions of the Pennsylvania ESCGP-2 to minimize pollution from erosion and sedimentation.

After construction is completed, the contours in the 25 wetlands crossed in Chester County will be restored, pre-construction drainage patterns will be re-established, and the wetland will be revegetated/stabilized to minimize erosion. Similarly, the banks of the 40 streams crossed will be restored to pre-construction conditions and stabilized in accordance with the E&S Plan (Attachment 12) to minimize erosion and sedimentation. In addition, Enclosure E Part 2 provides a Project-wide description of the potential direct and indirect/secondary impacts to the wetland/stream resources crossed by the Project. Compliance with all permit requirements will ensure that impacts associated with erosion

and sedimentation are minimized or avoided in Chester County.

c. Salinity distribution

Only freshwater streams and wetlands were observed during field surveys for the Project in Chester County. There was no evidence of naturally occurring or human-induced salinity associated with the freshwater wetlands and waterbodies within the proposed Project area.

d. Natural water filtration

The removal and disturbance of vegetation during construction will temporarily reduce the natural water filtration ability of the 25 wetlands and 40 riparian areas crossed by the Project in Chester County. However, in accordance with SPLP's Impact Avoidance, Minimization, and Mitigation Procedures (Enclosure E, Part 4 of this Attachment) and their Erosion and Sediment Control Plan (Attachment 12) erosion/sedimentation filtration measures will be implemented during construction to provide adequate water filtration to minimize stormwater pollution. After installation of the Project, the ROW will be seeded and revegetated, restoring permanent vegetation and natural water filtration for the long term. In addition, the sizes and dimensions of the wetlands and riparian buffers will not be altered. Therefore, construction and operation of the proposed Project in Chester County is not expected to have a long-term adverse impact upon the natural water filtration capabilities of riparian areas or wetlands.

B.4 Recreation

a. Game species

The Project does not cross any Pennsylvania State Game Lands in Chester County; however, hunting is likely to occur on some privately owned properties crossed by the proposed pipelines.

Construction of the proposed Project in Chester County would result in minor, short-term impacts to hunting, but these will be limited to the periods of active construction. Hunting activities and construction activities in the same area are not compatible and will be prohibited from occurring at the same time, for safety reasons. The Project construction/restoration schedule may overlap with the hunting season of a few game species and therefore may restrict hunting opportunities near the pipeline ROW. Similarly, SPLP will work with private landowners to avoid conflicts with hunting, to the extent possible. After Project construction and restoration, no impacts on populations of game species, or hunting activities, are anticipated. Similarly, operation of the Project will not affect future hunting opportunities/activities in the Project area.

b. 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 proposed Project area in Chester County is not known.

Recreational activities involving non-game species are not expected to be significantly affected by construction of the proposed Project as they will be limited to the construction period when activities will be prohibited within the Project area for safety reasons. After Project construction and ROW restoration in Chester County, there should be no impacts on recreational activities involving non-game species.

c. Fishing

Fishing activities in Chester County are limited to the 22 perennial streams crossed by the Project. Specifically, of the 22 perennial streams in the county, 6 are designated CWF, 13 are designated TSF, and 22 are designated MF. Similar to the game and non-game recreational impacts, short-term impacts to fishing activities will be associated with the preclusion of these activities within the Project area during construction. No long-term impacts to fishing opportunities are expected to occur in Chester County.

d. Hiking and Water Trails

The Project crosses one hiking trail and two bicycle trails/routes in Chester County (table below). The existing Project 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

Impacts to the trails crossed in Chester County are expected to be short-term and limited to the time needed for construction of the proposed Project. The bike routes are associated with West Main Street and Bulltown Road that will be bored under; therefore, there will be no interruption to the use of these trails during construction of the Project. There are no water resource crossing associated with any of these trail crossing. During construction, hiking through the construction corridor will be prohibited.

Operation of the Project will not impact the long-term use of the recreational trails crossed in Chester County.

e. Observation (plant/wildlife)

The Project has been sited along existing ROWs to the extent possible; therefore, 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. During construction, access to the Project area for the purpose of plant/wildlife viewing will be prohibited. Following construction, the ROW would be restored and

revegetated, and wildlife are expected to return to the Project area and viewing opportunities would be restored. No long-term impacts to wildlife observation are expected in Chester County.

f. Other

Other recreational activities that may occur in or near the proposed Project in Chester County include 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). During construction, access to the Project area for the purpose of recreation will be prohibited. Impacts to recreation opportunities are expected to be short-term and limited to the time needed for construction of the proposed Project.

B.5 Upstream and Downstream Property

The proposed Project will not cause long-term degradation of water quality, alter flow volumes, or change the direction of flow in the 40 streams crossed in Chester County. In addition, operation of the proposed Project is not expected to interfere with the riparian rights of upstream/downstream landowners or the storage capacity of floodplains in Chester County. Enclosure E Part 2 provides a Project-wide description of the potential direct and indirect/secondary impacts to the upstream and downstream properties associated with the wetland/stream resources crossed by the Project.

B.6 Other Environmental Factors

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

C. ENVIRONMENTAL IMPACTS ON ADJACENT LAND AND WATER RESOURCES

Construction of the proposed Project in accordance with SPLP's Impact Avoidance, Minimization, and Mitigation Procedures (Enclosure E, Part 4 of this Attachment) is expected to avoid and minimize indirect impacts, to the extent possible, associated with the proposed Project in Chester County. However, indirect and secondary impacts to adjacent lands or water resources may result from construction of the proposed Project in Chester County in the areas located downstream/downgradient of the wetland and stream crossings. SPLP has prepared a Resource Identification and Project Impacts report (Enclosure E, Part 2 of this Attachment) that includes an analysis and discussion of potential secondary impacts and proposed mitigation measures associated with the Project.

D. CUMULATIVE IMPACTS

SPLP has prepared a cumulative impacts analysis (CIA) (Enclosure E, Part 6 of this Attachment) to comply with the requirements of 25 Pennsylvania Code (Pa. Code) §§

105.14(b)(14) and 105.15 to evaluate the cumulative impact of the Project and other potential or existing projects, and if numerous piecemeal changes may result in a major impairment of the wetland resources, including consideration of interrelated wetland areas (streams), affected by the Project. The CIA also has been prepared to comply with the requirements of §§ 105.18a(a)(6) and 105.18a(b)(6) to evaluate if the effect of the Project when considered in combination with the impacts of other potential or existing projects may result in the impairment of the Commonwealth's exceptional value (EV) wetland resources or a major impairment of the Commonwealth's other wetland resources, respectively.

Accordingly, the CIA prepared for the Project addresses the cumulative impact of the Project and other potential or existing SPLP projects and other projects within the Cumulative Impact Assessment Area (CIAA) of the Project (see Enclosure E, Part 6, Section 3.0 of this Attachment for a discussion of the CIAA). As part of this analysis, the numerous wetland impacts associated with all the Chapter 105 applications related to this Project have been evaluated to determine if the impacts may result in the impairment of the Commonwealth's EV wetland resources or a major impairment of the Commonwealth's other wetland resources. Refer to the CIA (Enclosure E, Part 6 of this Attachment) for additional information related to SPLP's cumulative impact analysis methods and results.

As presented in the Alternatives Analysis (Enclosure F, Part 3 of this Attachment), during initial and detailed planning, pipeline routing, and aboveground facility siting of the proposed Project, SPLP was prudent in siting the ROW to avoid and minimize impacts to wetlands and waterbodies to the extent practicable for the entire Project. However, because this is a linear project, complete avoidance of all wetlands and waterbodies was not possible or practicable (Enclosure F, Part 3, Section 4.0 of this Attachment). As a result of this wetland impact avoidance and minimization effort, the Project will disturb approximately 36.7 acres of wetlands during construction, and with mitigation will result in a limited palustrine wetland cover type conversion of 0.405 acre across 19 wetlands. As demonstrated in this Project Impact analysis, with the implementation of the Project and best management practices as proposed, impacts to wetlands will be minor and temporary.

Based on SPLP's analysis of cumulative impacts, implementation of the Project and other potential or existing projects within the CIAA, in consideration of interrelated wetland areas (streams), will not result in the impairment of the Commonwealth's EV wetland resources or a major impairment of the Commonwealth's other wetland resources.

E. OTHER WATER OBSTRUCTIONS OR ENCROACHMENTS

All water obstruction and stream encroachments that require a permit to construct and operate the proposed Project in Chester County are described in this Joint Permit Application.