Pennsylvania Pipeline Project Other Wetland Function and Value Assessment						
Wetland	**Cowardin[1]**	**County**	**Impact Level**	**Provided Principal Functions[2]**	**Within Existing ROW**	**Assessed Quality[3]**
BA5	PFO	Delaware	**None**	Sediment/Toxicant Retention		Poor
BA6	PFO	Delaware	**None**	Sediment/Toxicant Retention, Nutrient Removal		Poor
C10	PEM, PSS	Delaware	Low	Groundwater Recharge/Discharge, Floodflow Alteration, Sediment/Toxicant Retention	**X**	Fair
H41	PEM, PSS	Delaware	Low	Sediment/Toxicant Retention	**X**	Poor
I1	PEM, PSS	Delaware	**None**	Groundwater Recharge/Discharge, Floodflow Alteration, Sediment/Toxicant Retention, Production Export	**X**	Good
I5	PEM	Delaware	High	Sediment/Toxicant Retention, Nutrient Removal	**X**	Poor
I6	PEM	Delaware	Low	Sediment/Toxicant Retention, Nutrient Removal	**X**	Poor
I16	PEM, PFO	Delaware	**None**	Groundwater Recharge/Discharge, Floodflow Alteration, Sediment/Toxicant Retention	**X**	Fair
Q62	PSS	Delaware	Low	Groundwater Recharge/Discharge, Floodflow Alteration, Sediment/Toxicant Retention, Nutrient Removal		Good
A46	PEM	Chester	Low	Sediment/Toxicant Retention, Nutrient Removal	**X**	Poor
B12	PEM	Chester	Low	Groundwater Recharge/Discharge, Floodflow Alteration, Sediment/Toxicant Retention	**X**	Fair
B13	PEM	Chester	High	Sediment/Toxicant Retention	**X**	Poor
B14	PEM	Chester	Low	Groundwater Recharge/Discharge, Floodflow Alteration, Sediment/Toxicant Retention	**X**	Fair
B15	PEM	Chester	High	Groundwater Recharge/Discharge, Floodflow Alteration, Sediment/Toxicant Retention	**X**	Fair
B19	PEM	Chester	High	Groundwater Recharge/Discharge, Floodflow Alteration, Sediment/Toxicant Retention	**X**	Fair
B71	PFO	Chester	**None**	Groundwater Recharge/Discharge, Floodflow Alteration, Sediment/Toxicant Retention, Production Export	**X**	Good

Pennsylvania Pipeline Project Other Wetland Function and Value Assessment						
Wetland	**Cowardin[1]**	**County**	**Impact Level**	**Provided Principal Functions[2]**	**Within Existing ROW**	**Assessed Quality[3]**
BB29	PSS	Chester	Medium	Sediment/Toxicant Retention, Nutrient Removal	**X**	Poor
C33	PEM	Chester	Medium	Groundwater Recharge/Discharge, Floodflow Alteration, Sediment/Toxicant Retention, Nutrient Removal	**X**	Good
C34	PEM	Chester	Low	Sediment/Toxicant Retention, Nutrient Removal	**X**	Poor
C35	PEM	Chester	Medium	Groundwater Recharge/Discharge, Sediment/Toxicant Retention, Nutrient Removal	**X**	Fair
C42	PEM	Chester	High	None	**X**	Poor
C47	PEM	Chester	Medium	Groundwater Recharge/Discharge, Floodflow Alteration, Sediment/Toxicant Retention, Nutrient Removal, Production Export	**X**	Good
C48	PEM	Chester	Low	Sediment/Toxicant Retention, Nutrient Removal	**X**	Poor
C49	PEM	Chester	High	Sediment/Toxicant Retention	**X**	Poor
H15	PEM, PFO	Chester	Medium	Sediment/Toxicant Retention, Nutrient Removal	**X**	Poor
H16	PEM	Chester	High	Sediment/Toxicant Retention	**X**	Poor
H17	PEM, PFO	Chester	**None**	Groundwater Recharge/Discharge, Floodflow Alteration, Sediment/Toxicant Retention, Nutrient Removal	**X**	Good
K21	PEM	Chester	**None**	None	**X**	Poor

Impact Level	
High - >50% of wetland is anticipated to be impacted ***or*** moderate portion of a large wetland complex	
Medium - 25-50% of wetland is anticipated to be impacted	
Low - 1-25% of wetland is anticipated to be impacted	
None - No Impact/Avoided Entirely/HDD Bored	
Generalized Assessment of Quality[3]	
Excellent	Many to All Functions and Values
Good	Several to Many Functions and Values
Fair	Few to Several Functions and Values
Poor	Few to No Functions and Values
Footnotes:	
[1]Cowardin classification only included for impacted portion of the wetland.	
[2]Wetland functions were determined using the Highway Method (USACE 1999)	
[3]Not a Highway Method category, assigned based on presence of principle functions and best professional judgement.	
X	Part or all of the assessed wetland [complex] is located within an existing [maintained] right-of-way.

F&V	CONSIDERATIONS/QUALIFIERS
Groundwater Recharge/Discharge	1. Public or private wells occur downstream of the wetland. 2. Potential exists for public or private wells downstream of the wetland. 3. Wetland is underlain by stratified drift. 4. Gravel or sandy soils present in or adjacent to the wetland. 5. Fragipan does not occur in the wetland. 6. Fragipan, impervious soils, or bedrock does occur in the wetland. 7. Wetland is associated with a perennial or intermittent watercourse. 8. Signs of groundwater recharge are present or piezometer data demonstrates recharge. 9. Wetland is associated with a watercourse but lacks a defined outlet or contains a constricted outlet. 10. Wetland contains only an outlet, no inlet. 11. Groundwater quality of stratified drift aquifer within or downstream of wetland meets drinking water standards.

F&V	CONSIDERATIONS/QUALIFIERS
	12. Quality of water associated with the wetland is high. 13. Signs of groundwater discharge are present (e.g., springs). 14. Water temperature suggests it is a discharge site. 15. Wetland shows signs of variable water levels. 16. Other
Floodflow Alteration	1. Area of this wetland is large relative to its watershed. 2. Wetland occurs in the upper portions of its watershed. 3. Effective flood storage is small or non-existent upslope of or above the wetland. 4. Wetland watershed contains a high percent of impervious surfaces. 5. Wetland contains hydric soils which are able to absorb and detain water. 6. Wetland exists in a relatively flat area that has flood storage potential. 7. Wetland has an intermittent outlet, ponded water, or signs are present of variable water level. 8. During flood events, this wetland can retain higher volumes of water than under normal or average rainfall conditions. 9. Wetland receives and retains overland or sheet flow runoff from surrounding uplands. 10. In the event of a large storm, this wetland may receive and detain excessive flood water from a nearby watercourse. 11. Valuable properties, structures, or resources are located in or near the floodplain downstream from the wetland. 12. The watershed has a history of economic loss due to flooding. 13. This wetland is associated with one or more watercourses. 14. This wetland watercourse is sinuous or diffuse. 15. This wetland outlet is constricted. 16. Channel flow velocity is affected by this wetland. 17. Land uses downstream are protected by this wetland. 18. This wetland contains a high density of vegetation. 19. Other
Fish and Shellfish Habitat	1. Forest land dominant in the watershed above this wetland. 2. Abundance of cover objects present.

F&V	CONSIDERATIONS/QUALIFIERS
	STOP HERE IF THIS WETLAND IS NOT ASSOCIATED WITH A WATERCOURSE 3. Size of this wetland is able to support large fish/shellfish populations. 4. Wetland is part of a larger, contiguous watercourse. 5. Wetland has sufficient size and depth in open water areas so as not to freeze solid and retain some open water during winter. 6. Stream width (bank to bank) is more than 50 feet. 7. Quality of the watercourse associated with this wetland is able to support healthy fish/shellfish populations. 8. Streamside vegetation provides shade for the watercourse. 9. Spawning areas are present (submerged vegetation or gravel beds). 10. Food is available to fish/shellfish populations within this wetland. 11. Barrier(s) to anadromous fish (such as dams, including beaver dams, waterfalls, road crossing) are absent from the stream reach associated with this wetland. 12. Evidence of fish is present. 13. Wetland is stocked with fish. 14. The watercourse is persistent. 15. Man-made streams are absent. 16. Water velocities are not too excessive for fish usage. 17. Defined stream channel is present. 18. Other
Sediment/Toxicant/Pathogen Retention	1. Potential sources of excess sediment are in the watershed above the wetland. 2. Potential or known sources of toxicants are in the watershed above the wetland. 3. Opportunity for sediment trapping by slow moving water or deepwater habitat are present in this wetland. 4. Fine grained mineral or organic soils are present. 5. Long duration water retention time is present in this wetland. 6. Public or private water sources occur downstream. 7. The wetland edge is broad and intermittently aerobic. 8. The wetland is known to have existed for more than 50 years. 9. Drainage ditches have not been constructed in the wetland.

F&V	CONSIDERATIONS/QUALIFIERS
	STOP HERE IF WETLAND IS NOT ASSOCIATED WITH A WATERCOURSE. 10. Wetland is associated with an intermittent or perennial stream or a lake. 11. Channelized flows have visible velocity decreases in the wetland. 12. Effective floodwater storage in wetland is occurring. Areas of impounded open water are present. 13. No indicators of erosive forces are present. No high water velocities are present. 14. Diffuse water flows are present in the wetland. 15. Wetland has a high degree of water and vegetation interspersion. 16. Dense vegetation provides opportunity for sediment trapping and/or signs of sediment accumulation by dense vegetation is present. 17. Other
Nutrient Removal/Retention/Transformation	1. Wetland is large relative to the size of its watershed. 2. Deep water or open water habitat exists. 3. Overall potential for sediment trapping exists in the wetland. 4. Potential sources of excess nutrients are present in the watershed above the wetland. 5. Wetland saturated for most of the season. Ponded water is present in the wetland. 6. Deep organic/sediment deposits are present. 7. Slowly drained fine grained mineral or organic soils are present. 8. Dense vegetation is present. 9. Emergent vegetation and/or dense woody stems are dominant. 10. Opportunity for nutrient attenuation exists. 11. Vegetation diversity/abundance sufficient to utilize nutrients. STOP HERE IF WETLAND IS NOT ASSOCIATED WITH A WATERCOURSE. 12. Waterflow through this wetland is diffuse. 13. Water retention/detention time in this wetland is increased by constricted outlet or thick vegetation. 14. Water moves slowly through this wetland. 15. Other
Production Export (Nutrient)	1. Wildlife food sources grow within this wetland. 2. Detritus development is present within this wetland

F&V	CONSIDERATIONS/QUALIFIERS
	3. Economically or commercially used products found in this wetland. 4. Evidence of wildlife use found within this wetland. 5. Higher trophic level consumers are utilizing this wetland. 6. Fish or shellfish develop or occur in this wetland. 7. High vegetation density is present. 8. Wetland exhibits high degree of plant community structure/species diversity. 9. High aquatic vegetative diversity/abundance is present. 10. Nutrients exported in wetland watercourses (permanent outlet present). 11. "Flushing" of relatively large amounts of organic plant material occurs from this wetland. 12. Wetland contains flowering plants that are used by nectar-gathering insects. 13. Indications of export are present. 14. High production levels occurring, however, no visible signs of export (assumes export is attenuated). 15. Other
Sediment/Shoreline Stabilization	1. Indications of erosion or siltation are present. 2. Topographical gradient is present in wetland. 3. Potential sediment sources are present up-slope. 4. Potential sediment sources are present upstream. 5. No distinct shoreline or bank is evident between the waterbody and the wetland or upland. 6. A distinct step between the open waterbody or stream and the adjacent land exists (i.e., sharp bank) with dense roots throughout. 7. Wide wetland (>10') borders watercourse, lake, or pond. 8. High flow velocities in the wetland. 9. The watershed is of sufficient size to produce channelized flow. 10. Open water fetch is present. 11. Boating activity is present. 12. Dense vegetation is bordering watercourse, lake, or pond. 13. High percentage of energy-absorbing emergents and/or shrubs border a watercourse, lake, or pond. 14. Vegetation is comprised of large trees and shrubs that withstand major flood events or erosive incidents

F&V	CONSIDERATIONS/QUALIFIERS
	15. Vegetation is comprised of a dense resilient herbaceous layer that stabilizes sediments and the shoreline on a small scale (inches) 16. Other
Wildlife Habitat	1. Wetland is not degraded by human activity. 2. Water quality of the watercourse, pond, or lake associated with this wetland meets or exceeds Class A or B standards. 3. Wetland is not fragmented by development. 4. Upland surrounding this wetland is undeveloped. 5. More than 40% of this wetland edge is bordered by upland wildlife habitat at least 500 feet in width. 6. Wetland is contiguous with other wetland systems connected by a watercourse or lake. 7. Wildlife overland access to other wetlands is present. 8. Wildlife food sources are within this wetland or are nearby. 9. Wetland exhibits a high degree of interspersion of vegetation classes and/or open water. 10. Two or more islands or inclusions of upland within the wetland are present. 11. Dominant wetland class includes deep or shallow marsh or wooded swamp. 12. More than three acres of shallow permanent open water (less than 6.6 feet deep), including streams in or adjacent to wetland, are present. 13. Density of the wetland vegetation is high. 14. Wetland exhibits a high degree of plant species diversity. 15. Wetland exhibits a high degree of diversity in plant community structure (e.g., tree/ shrub/vine/grasses/mosses) 16. Plant/animal indicator species are present. (List species for project) 17. Animal signs observed (tracks, scats, nesting areas, etc.) 18. Seasonal uses vary for wildlife and wetland appears to support varied population diversity/abundance during different seasons. 19. Wetland contains or has potential to contain a high population of insects. 20. Wetland contains or has potential to contain large amphibian populations. 21. Wetland has a high avian utilization or it's potential. 22. Indications of less disturbance-tolerant species are present.

F&V	CONSIDERATIONS/QUALIFIERS
	23. Signs of wildlife habitat enhancement are present (birdhouses, nesting boxes, food sources,
Recreation	1. Wetland is part of a recreation area, park, forest, or refuge. 2. Fishing is available within or from the wetland. 3. Hunting is permitted in the wetland. 4. Hiking occurs or has potential to occur within the wetland. 5. Wetland is a valuable wildlife habitat. 6. The watercourse, pond, or lake associated with the wetland is unpolluted. 7. High visual/aesthetic quality of this potential recreation site. 8. Access to water is available at this potential recreation site for boating, canoeing, or fishing. 9. The watercourse associated with this wetland is wide and deep enough to accommodate canoeing and/or non-powered boating. 10. Off-road public parking available at the potential recreation site. 11. Accessibility and travel ease is present at this site. 12. The wetland is within a short drive or safe walk from highly populated public and private areas. 13. Other
Education/Scientific Value	1. Wetland contains or is known to contain threatened, rare, or endangered species. 2. Little or no disturbance is occurring in this wetland. 3. Potential educational site contains a diversity of wetland classes which are accessible or potentially accessible. 4. Potential educational site is undisturbed and natural. 5. Wetland is considered to be a valuable wildlife habitat. 6. Wetland is located within a nature preserve or wildlife management area. 7. Signs of wildlife habitat enhancement present (bird houses, nesting boxes, food sources, etc.). 8. Off-road parking at potential educational site suitable for school bus access in or near wetland. 9. Potential educational site is within safe walking distance or a short drive to schools. 10. Potential educational site is within safe walking distance to other plant communities. 11. Direct access to perennial stream at potential educational site is available. 12. Direct access to pond or lake at potential educational site is available.

F&V	CONSIDERATIONS/QUALIFIERS
	13. No known safety hazards exist within the potential educational site. 14. Public access to the potential educational site is controlled. 15. Handicap accessibility is available. 16. Site is currently used for educational or scientific purposes. 17. Other
Uniqueness/Heritage	1. Upland surrounding wetland is primarily urban. 2. Upland surrounding wetland is developing rapidly. 3. More than 3 acres of shallow permanent open water (less than 6.6 feet deep), including streams, occur in wetlands. 4. Three or more wetland classes are present. 5. Deep and/or shallow marsh or wooded swamp dominate. 6. High degree of interspersion of vegetation and/or open water occur in this wetland. 7. Well-vegetated stream corridor (15 feet on each side of the stream) occurs in this wetland. 8. Potential educational site is within a short drive or a safe walk from schools. 9. Off-road parking at potential educational site is suitable for school buses. 10. No known safety hazards exist within this potential educational site. 11. Direct access to perennial stream or lake exists at potential educational site. 12. Two or more wetland classes are visible from primary viewing locations. 13. Low-growing wetlands (marshes, scrub-shrub, bogs, and open water) are visible from primary viewing locations. 14. Half an acre of open water or 200 feet of stream is visible from the primary viewing locations. 15. Large area of wetland is dominated by flowering plants or plants that turn vibrant colors in different seasons. 16. General appearance of the wetland visible from primary viewing locations is unpolluted and/or undisturbed. 17. Overall view of the wetland is available from the surrounding upland. 18. Quality of the water associated with the wetland is high. 19. Opportunities for wildlife observations are available. 20. Historical buildings are found within the wetland. 21. Presence of pond or pond site and remains of a dam occur within the wetland.

F&V	CONSIDERATIONS/QUALIFIERS
	22. Wetland is within 50 yards of the nearest perennial watercourse. 23. Visible stone or earthen foundations, berms, dams, standing structures, or associated features occur within the wetland. 24. Wetland contains critical habitat for a state- or federally-listed threatened or endangered species. 25. Wetland is known to be a study site for scientific research. 26. Wetland is a natural landmark or recognized by the state natural heritage inventory authority as an exemplary natural community. 27. Wetland has local significance because it serves several functional values. 28. Wetland has local significance because it has biological, geological, or other features that are locally rare or unique. 29. Wetland is known to contain an important archaeological site. 30. Wetland is hydrologically connected to a state or federally designated scenic river. 31. Wetland is located in an area experiencing a high wetland loss rate. 32. Other
Visual Quality/Aesthetics	1. Multiple wetland classes are visible from primary viewing locations. 2. Emergent marsh and/or open water are visible from primary viewing locations. 3. A diversity of vegetative species is visible from primary viewing locations. 4. Wetland is dominated by flowering plants or plants that turn vibrant colors in different seasons. 5. Land use surrounding the wetland is undeveloped as seen from primary viewing locations. 6. Visible surrounding land use form contrasts with wetland. 7. Wetland views absent of trash, debris, and signs of disturbance. 8. Wetland is considered to be a valuable wildlife habitat. 9. Wetland is easily accessed. 10. Low noise level at primary viewing locations. 11. Unpleasant odors absent at primary viewing locations. 12. Relatively unobstructed sight line exists through wetland. 13. Other
Endangered Species Habitat	1. Wetland contains or is known to contain threatened or endangered species. 2. Wetland contains critical habitat for a state or federally listed threatened or endangered species.