



Transcontinental Gas Pipe Line Company, LLC

**Requirement L-4, Environmental Assessment
Module S3 – Identification and Description of Potential
Project Impacts**

Regional Energy Access Project – Effort Loop

**April 2021
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MODULE S3

IDENTIFICATION AND DESCRIPTION OF POTENTIAL PROJECT IMPACTS

According to Module 3 of the Environmental Assessment Form Instructions, permanent impacts are defined as areas that are 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 a watercourse, floodway or body of water. Temporary impacts are defined as areas affected during the construction of a water obstruction or encroachment that consist 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. A temporary impact area 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 a watercourse, floodway or body of water. A summary of permanent and temporary, and direct and indirect impacts is provided in Table S3.A-1.

S3.A Summary of the Proposed Temporary and Permanent, Direct and Indirect Impacts

Due to the linear nature of the Effort Loop (Project), unavoidable resource impacts are proposed. Table S3.A-1 below outlines the overall impacts as it relates to each Project component. Detailed impacts by resource are provided in subfacility summary tables found in Appendix S3-1.

Table S3.A-1 Aquatic Resource Impact Summary Table				
Project Component¹	Impact Type	Resource¹	Direct (Acres)	Indirect (Acres)
Effort Loop (Monroe County)	Permanent	Wetland	-	1.62
		Watercourse	-	0.87
	Temporary	Wetland	0.60	1.2
		Watercourse	0.11	0.74
Notes:				
1. Watercourse impacts include floodway impacts				

Table S3.A-1 Aquatic Resource Impact Summary Table				
Project Component ¹	Impact Type	Resource ¹	Direct (Acres)	Indirect (Acres)
2. Temporary direct impact areas are not additory to the impact areas listed as indirect, and such impacts are already accounted for. Temporary direct impact areas consist of timber mats/bridges. Where wetlands and floodways overlap, the direct impact was applied to the wetlands.				

Permanent indirect impacts would include 1.62 acres to wetlands and 0.87 acres to watercourses. These permanent indirect impacts would be associated with the existing and proposed maintained right-of-way (ROW) and include the permanent functional conversion of 0.29 acres of Palustrine Forested (PFO) and Palustrine Scrub-Shrub (PSS) wetlands. The permanent conversion is due to these features being located within the proposed permanent maintained pipeline ROW. A 10-foot-wide herbaceous corridor will be maintained over the center of the pipeline within the wetland and riparian buffer areas. Trees within 15 feet of the centerline or between existing pipelines will be removed to maintain the integrity of the pipelines.

Temporary indirect impacts would include 1.2 acres to wetlands and 0.74 acres to watercourses. These temporary indirect impacts would be associated with impacts outside the existing and proposed maintained ROW and include the temporary functional conversion of 0.53 acres of PFO and PSS wetlands. These resources are located within the proposed permanent maintained pipeline ROW and will be replanted upon completion of construction.

Temporary direct impacts would include 0.60 acres to wetlands and 0.11 acres to watercourses. These temporary direct impacts would be associated with the temporary placement of mats and bridges over resources during construction.

S3.B Standard Information Responses

The below responses address resources identified in Module 2, Table S2.A.5-1.

S3.B.1i National, State, or Local Park, Forest or Recreation Area

The Project will cross municipal lands and/or recreation areas owned or managed by Monroe County, the Nature Conservancy, Chestnuthill Township and the Department of Conservation and Natural Resources (DCNR). These lands provide recreational opportunities with public parking areas for access and hiking trails. The Project is also located within 0.25 mile of the Delaware State Forest, State Game Lands, and additional lands managed by Chestnuthill

Township. Table S3.B.1-1 presents a summary of public land, conservation land, recreational areas, and other designated or special uses areas crossed by the Project facilities, including land ownership type.

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**Table S3.B.1-1
Federal, State, Municipal Lands, Recreation Areas and Easements within 0.25 Mile of the Project Facilities**

Facility, County, State/ Nearest Begin MP	Nearest End MP	Distance Crossed (miles) ^a	Name	Distance (miles) and Direction from Project	Land Affected During Construction ^b (acres)	Land Affected During Operation ^c (acres)	Description	Managing Agency
Effort Loop, Monroe, PA								
45.0	45.3	0.2	Unnamed	0.0	1.9	0.4	Easement - Private	Chestnuthill Township
45.2	45.3	<0.1	Unnamed	0.0	0.8	0.2	Easement - Private	Chestnuthill Township
46.6	46.8	0.1	Route 715 Chestnuthill Township Park	0.0	0.8	0.2	Local Park, Easement – Township / LWCF Property	Chestnuthill Township
47.9	48.2	0.1	Chestnuthill Township Park	0.0	2.5	0.2	Local Park	Chestnuthill Township
48.0	48.3	N/A ^d	West End Regional Park	<0.1/E	N/A ^d	N/A ^d	Local Park	Chestnuthill Township
53.9	54.9	0.9	Unnamed	0.0	10.3	5.7	Easement - Private	The Nature Conservancy
54.0	54.6	N/A ^d	Delaware State Forest	<0.1/SW	N/A ^d	N/A ^d	State Forest	DCNR BOF
54.4	56.6	N/A ^d	Delaware State Forest	<0.1/SW	N/A ^d	N/A ^d	State Forest	DCNR
56.6	57.2	N/A ^d	State Game Lands #129	<0.1/SW	N/A ^d	N/A ^d	State Game Lands	PGC
55.7	56.5	0.8	Long Pond Nature Preserve	0.0	10.1	5.2	Easement –County / Nature Preserve	DCNR

*Regional Energy Access Expansion Project – Effort Loop
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**Table S3.B.1-1
Federal, State, Municipal Lands, Recreation Areas and Easements within 0.25 Mile of the Project Facilities**

56.5	56.9	0.4	Long Pond Nature Preserve	0.0	5.2	2.2	Nature Preserve	The Nature Conservancy
Facility, County, State/ Nearest Begin MP	Nearest End MP	Distance Crossed (miles) ^a	Name	Distance (miles) and Direction from Project	Land Affected During Construction ^b (acres)	Land Affected During Operation ^c (acres)	Description	Managing Agency
<p>Sources: American Trails 2020; Environmental Resources Research Institute 1996; NPS 2020a; NPS 2020b; NPS 2020c; NPS 2020d; ; The Nature Conservancy 2020; NRCS 2019; PADCNr 2020a; PADCNr 2020b; PADCNr 2020c; PADEP 2020a; PGC 2020; PennDOT 2021; USDOT 2020; USFWS 2020; USFS 2019; USFS 2020; USGS 2020</p> <p>^a All values rounded to the nearest tenth; totals may not sum exactly due to rounding. ^b Construction impacts include area within permanent ROW. ^c Operation impacts associated with maintenance of permanent ROW and new permanent facility footprint. ^d N/A – not applicable; the facility does not cross the public land. ^e N/A – not applicable; no public lands have been identified with 0.25-mile of the facility.</p> <p>Key: "-" = MPs are not utilized for facility ATWS = additional temporary workspace BOF = Bureau of Forestry MP = Milepost N = North; S = South; W = West; E = East; NW = Northwest; NE = Northeast; SW = Southwest; SE = Southeast NOAA = National Oceanographic and Atmospheric Association NPS = National Parks Service PADEP = PA Department of Environmental Protection DCNR = PA Department of Conservation and Natural Resources PGC = PA Game Commission PFBC = PA Fish and Boat Commission PennDOT = PA Department of Transportation ROW = right-of-way USDOT = U.S. Department of Transportation</p>								

State Game Lands

The PA Game Commission (PGC) owns and manages approximately 1.5 million acres of State Game Lands throughout PA for the management of wildlife habitat and to provide opportunities for lawful hunting and trapping. Some secondary recreational uses including cycling, horseback riding, and snowmobiling along approved roads or trails are permitted on State Game Lands (PGC 2020).

State Game Land #129 is located <0.1-mile southwest of Effort Loop approximate to MP 56.8. While indirect impacts such as construction noise and dust may be anticipated, these impacts will be temporary and limited to the construction phase of the Project. Additionally, Project construction in relation to the location of State Game Land #129 is buffered by forest and State Route 115, both of which are anticipated to screen visual impacts and reduce noise from construction. Transco's Fugitive Dust Control Plan will be implemented during construction to minimize dust from construction activities.

State Forest

The Bureau of Forestry, a division of the DCNR, manages state forests in PA. The proposed Effort Loop is located <0.1 mile northeast of the Delaware State Forest in Monroe County, PA, approximate to Mile Post (MP) 56.5 and 54.4. The Delaware State Forest covers 83,519 acres in Pike, Monroe, Northampton and Carbon Counties, PA. Various recreational activities are allowed within the forest, including hunting, fishing, horseback riding, hiking, cross-country skiing, and snowmobiling (PADCNR 2020a). The Delaware State Forest is a working forest managed for such things such as active timber harvests, deer enclosure fences, and prescribed fires.

While indirect impacts such as construction noise and dust may be anticipated, these impacts will be temporary and limited to the construction phase of the Project. Additionally, Project construction in relation to the location of the Delaware State Forest is buffered by forest and State Route 115, both of which are anticipated to screen visual impacts and reduce noise from construction. Transco's Fugitive Dust Control Plan will be implemented during construction to minimize dust from construction activities.

Municipal and County Lands

The Route 715 Chestnuthill Township Park is crossed by the Effort Loop in Monroe County, PA from MP 46.6 to 46.8 and the Chestnuthill Township Park from MP 47.9 to 48.2

(PADCNR 2020c). The Chestnuthill Township Park includes hiking trails, basketball courts, a community center, an all-purpose sports field, and playground equipment.

Transco is coordinating with the municipalities which manage parks crossed by the Project in regard to construction safety measures and schedule to avoid and minimize potential impacts to local parks. Additionally, Transco will work with municipalities to confirm that affected areas are properly restored, and recreational use of public lands are returned to pre-existing use. Transco will use construction practices designed to minimize and/or avoid potential effects on public parks during construction, as described in Transco's Plan and Procedures. Transco's Fugitive Dust Control Plan will be implemented during construction to minimize dust from construction activities.

Land Conservation Programs / Easements

Transco reviewed publicly available information, conducted title searches, and held discussions with landowners to determine the locations of lands within conservation programs or subject to conservation easements. The Land and Water Conservation Fund (LWCF) is a federal program that safeguards natural areas and water resources to provide recreation opportunities across the country (LWCF 2020). Based on title research and consultation, and as shown in Table S3.B.1-1, Transco identified one LWCF tract impacted by the Project. Also, as depicted in Table S3.B.1-1, one unnamed private easement, managed by the Nature Conservancy is crossed by the Effort Loop, in Monroe County, PA, which in sum will require construction and operational impacts of 10.3 acres and 5.7 acres, respectively. Additionally, the Long Pond Nature Preserve managed by the DCNR is crossed by the Effort Loop which will require construction and operational impacts of 15.3 acres and 7.4 acres, respectively. For LWCF tracts with state funding interest and easement managed by the DCNR, Transco will continue to coordinate with DCNR and municipalities on impacts and any requested mitigation efforts.

S3.B.1.ii National Natural Landmark

The Project facilities, including the pipelines and aboveground facilities, will neither cross nor be located within 0.25 mile of national natural landmarks or registered national landmarks (NPS 2020b, 2020c).

S3.B.1.iii National Wildlife Refuge, or Federal, State, or Private Wildlife or Plant Sanctuaries

The Project facilities, including the pipelines and aboveground facilities, will neither cross a National Wildlife Refuge, or Federal, State, or Private Wildlife or Plant Sanctuaries.

S3.B.1.iv State Game Lands

Indirect impacts to State Game Land #129 is discussed in S3.B.1.i.

S3.B.1.v Areas Identified as Prime Farmland

Construction of the Effort Loop will affect approximately 144.8 acres of prime and important farmland soils. Appendix S3-2 identifies important farmlands crossed by the overall Regional Energy Access Expansion Project. Construction may result in temporarily removing those soils from agricultural production if construction occurs during the growing season. Pipeline construction and operation will not result in any long-term loss of prime and important farmland. Soils that are currently designated as prime farmland and farmland of statewide importance will retain their designation after construction. While some short-term decreases in agricultural productivity may result because of the disturbance of soil during construction, those effects can be mitigated over time by the restoration measures outlined in Appendix S3-3 Transco Plan and Procedures, and by resumption of proper soil management by landowners. Pipeline operation will not adversely affect agricultural soils, including prime farmland and farmland of statewide importance.

S3.B.1.vi Source for a Public Water Supply

Public Water Supply Well Information

Transco conducted a review of publicly available state web services and coordinated with public water suppliers, as necessary, to determine the coverage of public water service areas, source water type and locations, and to determine whether Well Head Protection Areas (WHPA) are crossed or within 0.25-mile of construction workspaces. Public water service areas crossed by the construction workspaces are presented in Table S3.B.6-1. Coordination between Transco and the Birchwood Mobile Home Park landowner indicated that permitted community water supply wells are within 0.25-mile of the Project, with the closest being 0.13-mile away. None of the wells have delineated WHPAs, but these wells would fall within Zone II of the Project's workspace. Transco does not anticipate that Project construction, through the implementation of the Transco Plan and Procedures, will impact these public water supply wells.

**Table S3.B.6-1
 Public Water Supply Service Areas Crossed by Construction Workspaces**

County, State	Approximate MPs/ Facility	Water Supplier	Public Water ID	Water Supply Type	Distance/Direction of Water Supply from Project Facilities (miles)	Project Facilities Crossing Upstream/ Downstream of Withdrawals
Effort Loop						
Monroe, PA	44.1 – 44.2	Birchwood Mobile Home Park	2450008	Groundwater	0.13/ West-southwest	N/A ^b
Aboveground Facilities						
Source: PADEP 2020h, ^b Water supply type is groundwater. Key: N/A = Not Applicable						

Wellhead Protection Areas

Under PA’s wellhead protection program, the WHPAs are the surface and subsurface area[s] surrounding a public water system, wellfield, spring, or infiltration gallery through which contaminants are reasonably likely to move toward and reach the water source. PA’s wellhead protection program establishes three zones of protection. Zone I is the immediate area surrounding the source, which may range from a radius of 100 to 400 feet depending on site-specific source and aquifer characteristics. Zone II is the area within a radius of 0.5-mile, unless a more detailed delineation is approved. Zone III is the area beyond Zone II that contributes surface water and groundwater to Zones I and II and may be significant in protecting the source (PADEP 2002). WHPAs delineated around public water systems in PA are site-specific, and the focal point of a local wellhead protection program is delineating and mapping the WHPAs (PADEP 2002). Coordination between Transco and the Birchwood Mobile Home Park landowner along the Effort Loop indicated that permitted community water supply wells are within 0.25-mile of the Project, with the closest being 0.13-mile away. None of the wells have delineated WHPAs, but these wells would fall within Zone II or 0.5-mile radius of the Project’s workspace. Transco does not anticipate that Project construction, through the implementation of the Transco Plan and Procedures, will impact WHPAs.

Public Surface Water Intake Information

Transco reviewed the PADEP eMapPA GIS-based web-based mapping tool to identify the presence of surface water intakes within 1.5 miles of the Project area on January 22, 2021. No surface water intakes were crossed by the Project pipeline facilities or occur within 1.5 miles of the workspace.

Private Water Supply Wells

In addition to identifying public water supply wells, Transco has identified private water supply wells and springs within 150 feet of construction workspaces that may serve individual uses or residences. No springs have been identified within 150 feet of the Project’s construction workspaces. Transco identified private wells through environmental surveys, directly contacting landowners, and through civil survey. Table S3.B.6-2 lists the private water supply wells identified to date within 150 feet of construction workspaces. Transco does not anticipate that Project construction, through the implementation of the Transco Plan and Procedures, will impact private water supply wells.

**Table S3.B.6-2
 Private Water Supply Wells Within 150 Feet of Construction Workspaces^a**

Facility /Nearest Milepost	County, State	Township	Use Type	Distance from Construction Work Area (feet)	Direction from Project
Effort Loop^a					
44.0	Monroe, PA	Ross	Private	28	Southwest
44.3	Monroe, PA	Ross	Private	49	Northeast
45.4	Monroe, PA	Chestnuthill	Private	7	Southwest
45.4	Monroe, PA	Chestnuthill	Private	17	Northeast
45.4	Monroe, PA	Chestnuthill	Private	1	Northeast
45.6	Monroe, PA	Chestnuthill	Private	12	East-Northeast
45.6	Monroe, PA	Chestnuthill	Private	45	East-Northeast
45.9	Monroe, PA	Chestnuthill	Private	6	West-Southwest
45.9	Monroe, PA	Chestnuthill	Private	53	East
45.9	Monroe, PA	Chestnuthill	Private	50	East
46.0	Monroe, PA	Chestnuthill	Private	5	West
46.3	Monroe, PA	Chestnuthill	Private	22	East-Northeast
46.3	Monroe, PA	Chestnuthill	Private	23	East-Northeast
46.7	Monroe, PA	Chestnuthill	Private	38	West-Southwest
46.9	Monroe, PA	Chestnuthill	Private	5	East-Northeast
47.0	Monroe, PA	Chestnuthill	Private	34	East-Northeast
47.2	Monroe, PA	Chestnuthill	Private	8	East-Northeast

Table S3.B.6-2
Private Water Supply Wells Within 150 Feet of Construction Workspaces^a

Facility /Nearest Milepost	County, State	Township	Use Type	Distance from Construction Work Area (feet)	Direction from Project
47.2	Monroe, PA	Chestnuthill	Private	8	East-Northeast
47.4	Monroe, PA	Chestnuthill	Private	15	West-Southwest
47.5	Monroe, PA	Chestnuthill	Private	41	East-Northeast
48.0	Monroe, PA	Chestnuthill	Private	108	East
48.6	Monroe, PA	Chestnuthill	Private	106	Southwest
49.1	Monroe, PA	Chestnuthill	Private	Within LOD	Southwest
49.1	Monroe, PA	Chestnuthill	Private	68	Northeast
49.3	Monroe, PA	Chestnuthill	Private	33	Southwest
49.4	Monroe, PA	Chestnuthill	Private	32	Southwest
49.4	Monroe, PA	Chestnuthill	Private	29	Southwest
49.5	Monroe, PA	Chestnuthill	Private	15	Southwest
50.4	Monroe, PA	Chestnuthill	Private	10	Northeast
50.4	Monroe, PA	Chestnuthill	Private	2	Northeast
51.3	Monroe, PA	Chestnuthill	Private	53	Northeast
51.8	Monroe, PA	Chestnuthill	Private	32	Northeast
52.3	Monroe, PA	Chestnuthill	Private	11	Southwest
52.6	Monroe, PA	Chestnuthill	Private	10	Southwest
53.0	Monroe, PA	Tunkhannock	Private	54	North
53.6	Monroe, PA	Tunkhannock	Private	94	Southwest
53.9	Monroe, PA	Tunkhannock	Private	6	Northeast
54.2	Monroe, PA	Tunkhannock	Private	46	Northeast
54.9	Monroe, PA	Tunkhannock	Private	46	Northeast

^a Includes associated aboveground facilities and contractor yards/staging areas along the pipelines.
 Key:
 LOD = Location of Disturbance

Transco will offer to have a qualified, independent testing service conduct groundwater tests for private wells located within 150 feet of the Project workspace or within 150 feet of blasting activities. Water quantity testing will include yield measurements using the existing pump and discharge line when possible and a portable submersible pump when necessary. Well modification for the purposes of testing will be completed with the permission of the landowner. Water samples collected for water quality analysis will be tested for specific conductivity, temperature, pH, turbidity, nitrate, volatile organic compounds, and total petroleum hydrocarbon.

Sampling methods will adhere to the prevailing Environmental Protection Agency and state sampling and analytical procedures in place at the time of construction.

A Transco representative will contact landowners after the sample analysis has been conducted to provide the sample results. In the unlikely event that construction of the Project temporarily affects the water quality or yield of a private or public well/spring, Transco will provide alternative water sources or other compensation to the well owner(s). In the unlikely event that a well/spring is permanently affected due to construction activities, Transco will repair, replace, or provide alternative sources of potable water.

S3.B.1.vii National Wild or Scenic River or the Commonwealth’s Scenic River System

No wild or scenic rivers are within 100 feet or will be crossed by the Project facilities (PADCNR 2007).

S3.B.1.viii Designated Federal Wilderness Area

The Project is not located in, or within 100 feet of a federal wilderness area.

S3.C.1-10 Subfacility Details Tables

The proposed water obstructions and encroachments are included in the Subfacility Details Table provided in Appendix S3-1. This table includes the subfacility identifier, subfacility code, resource identifier, coordinates, municipality, county, and temporary and permanent, indirect, and direct impacts for each subfacility.

S3.D Resource Function Effects

S3.D.1 Subfacility Identifier

The Project impacts are grouped by the subfacilities as defined by the PADEP, with additional notes added, as applicable.. The subfacilities applicable to the Project and their definition is provided in Table S3.D-1 below.

Table S3.D-1 Subfacility Codes Table		
Subfacility Code	Name	Definition
PIPE	Pipeline or Conduit	Used for installation of the proposed pipelines. The Effort Loop is 42 inches in diameter.
TMPWI	Temporary Wetland Impact	Used for direct and indirect temporary wetland impacts. This code does not apply to utility line crossings within the wetland.
TSIM	Temporary Stream Impact	Used for direct and indirect temporary stream impacts (access roads). This code does not apply to utility line crossings within the wetland.
TFIM	Temporary Floodway Impact	Used for direct and indirect temporary floodway impacts (access roads). This code does not apply to utility line crossings within the wetland.

The effects of the of the subfacilities identified in Table S3.D-1, either individually or in

combination, are provided in the following sections.

S3.D.2 Impact Types

The pipeline components of the Project will result in watercourse and wetland impacts, as referenced in Appendix S3-1. Impacts for the pipeline components utilized both the Pipe (PIPE) and Temporary Wetland Impact (TMPWI) subfacility codes. Impacts for access roads and staging areas outside of the ROW utilized the (TMPWI, TSIM, TFIM) subfacility code.

S3.D.2(i) Hydrologic

The characteristics of water quantity, stream flow, and sources, groundwater basal flows, drainage patterns, flushing characteristics, flow currents, natural recharge or source areas, stormwater and floodwater storage and control are discussed below.

Water Quantity, Stream Flow and Sources

Transco will cross waterbodies with flowing water present at the time of construction using primarily dry-ditch construction methodology. One wetland resource (W2-T2) will be conventionally bored as it is adjacent to a state highway and the highway bore will also include the boring of this resource. The trenchless construction methodology proposed would not result in effects to water quantity, stream flow and sources. The dry-ditch construction method shall be completed with a clean water bypass that may include dam and pump or flume pipe. Each option passes water around the crossing location, minimizing construction impacts downstream. The pipeline is installed in the dry, with the trench excavation, pipe installation, and backfill completed at this time. Once complete, the stream banks and streambed will be restored to pre-construction contours. To stabilize the banks, stream banks and riparian areas will be revegetated using approved seed mixes and/or erosion control blankets or matting.

Transco will install temporary equipment bridges across waterbodies to reduce the potential for turbidity caused by movement of construction equipment and vehicular traffic and also allow for continuous flow of the waterbodies. Equipment bridges may include instream supports. Equipment bridges will be constructed of clean rock or gravel and culverts, timber mats, or portable prefabricated bridges, depending on stream conditions (e.g., if excessively soft soils are encountered in the streambed, or if high water flows occur, portable bridges will be used at minor stream crossings instead of rock and culverts). Equipment bridges will be maintained until the pipe is installed and final restoration is completed. Equipment bridges will accommodate normal to high stream flow and will be maintained to prevent flow restriction during the period of time the bridge is in use during construction.

To minimize sedimentation during pipeline construction across each waterbody, trench spoil will be placed at least 10 feet away from waterbody banks, unless impractical due to topography. Erosion controls will be placed around spoil piles to prevent sediment from flowing into waterbodies. Within the top of bank (TOB) of streams a nominal 50-foot-wide construction ROW will be used and a 75-foot-wide construction ROW will be used in floodways, except where Transco has provided justification outlined in Requirement S - Alternative Analysis.

The pipeline components of the Project will also have temporary and permanent wetland impacts. Erosion and Sediment (E&S) Control Best Management Practices (BMP) will be installed during construction, which will avoid impacts to water quantity, stream flow and sources associated with the wetland crossings. Temporarily impacted wetlands will be restored upon completion of construction. Permanent wetlands impacts include functional conversion of PSS and PFO wetlands. Wetlands that will involve temporary or permanent functional conversion will be mitigated for offsite and/or replanted onsite, as outlined in Module 4.

Groundwater Basal Flows and Natural Recharge or Source Areas

No impacts to groundwater basal flows and natural recharge or source areas are anticipated as part of the Project. Impacts to groundwater basal flows and natural recharge or source areas will be avoided and minimized through the utilization of Transco's Plan and Procedures, found in Appendices S3-3. Additionally, potential impacts will also be minimized through the use of the Spill Plan for Oil and Hazardous Materials (Spill Plan) provided in Appendix S3-4 Construction Spill Prevention and Response Procedures for Oil and Hazardous Materials if incidents occur.

With the exception of the new main line valve at MP 49.6, no new impervious areas are required. The valve settings will have some impervious area, however, stormwater impacts will be mitigated for through a stormwater management design, which will promote infiltration at the site. All areas associated with the pipeline installation will be restored to approximate pre-construction contours to preserve the existing condition. This restoration shall limit the pipeline facilities from having adverse effects on groundwater basal flows and natural recharge or source areas.

Drainage Patterns, Flushing Characteristics and Flow Currents

The proposed Project will have minimal impacts to drainage patterns, flushing characteristics and flow currents to wetlands and waterbodies during construction with no long-term impacts anticipated.

Pipeline components of the Project will take place within or adjacent to a previously disturbed pipeline ROW. Stormwater controls, which will be installed during construction, have been designed to avoid impacts to natural drainage features. These controls will only have temporary impacts while installed and will be removed once the site is stabilized with vegetation. Minimal impacts to wetland resources are anticipated, as these functions are generally limited when compared to watercourses. Transco will restore pipeline facility workspaces to pre-construction contours.

Stormwater and Floodwater Storage and Control

The proposed Project will have minimal impacts to stormwater and floodwater storage and control during construction, with no long-term impacts anticipated. Aboveground facilities are located outside of Federal Emergency Management Agency (FEMA) Floodplains, FEMA Floodways and 50-foot floodways.

Restoration of pre-construction contours along the Effort Loop will preserve the existing condition of the FEMA floodplains, 50-foot floodways, and wetlands. This restoration shall limit the pipeline facilities from having adverse effects on flood-storage capacity or stormwater control. With the exception of the Main Line Valve at MP 49.6, no impervious areas are to be added as a result of the pipeline component of the Project. The Main Line Valve site will have impervious area and will include a stormwater management design that promotes infiltration at the site.

S3.D.2(ii) Biogeochemical

Hydrodynamics

Stream and wetland crossings will be restored to pre-existing conditions. Natural streambed materials will be replaced in the streambed and the pre-existing stream alignment should be restored to pre-construction alignments. Erosion control blankets shall be placed on restored stream banks to the ordinary high-water mark and surrounding wetland areas. If streams have existing bank protection, these bank protection measures shall be restored.

Forested riparian areas, PFO and PSS wetlands shall be restored with the exception of portions located within the proposed maintained ROW. Riparian areas and wetlands will be

revegetated using approved seed mixes. Transco will replant existing forested riparian buffers and PFO and PSS wetlands impacted outside of the permanent maintained ROW. A 10-foot-wide herbaceous corridor will be maintained over the center of the pipeline within the riparian buffer areas. Trees within 15 feet of the centerline or between existing pipelines will be removed to maintain the integrity of the pipelines. An Onsite Wetland and Riparian Reforestation Plan is included in Module 4, Appendix S4-2.

Food Chain Production

All of the wetland and waterbody crossings are adjacent to existing pipelines and are co-located. Cover types for these resources are primarily herbaceous, with some instances of forested cover types. Onsite replanting of existing forested riparian buffers, and impacted PSS and PFO wetlands will be implemented for the Project as outlined in Appendix S4-2. Cover type changes are likely to have minimal impact on aquatic habitat and the associated food chain production, as cover type changes expected to result from the Project are minimal.

Crossing windows for instream construction will be minimized to the extent practical. Each pipeline stream crossing (excluding travel lane) shall be conducted in an uninterrupted process and as quickly as possible to minimize the duration of in-stream disturbance. The stream banks shall be replaced and stabilized immediately following trench backfill. For crossings less than 10 feet in length, a standard 24-hour crossing window is estimated. For crossing from 10 – 100 feet in length, a standard 48-hour crossing window is estimated. The 24- or 48-hour timeframe is estimated for ditching / trenching of the pipe within the top-of-bank. Transco is requesting additional instream crossing duration at four stream crossings (S1-T2, S2-T1, S5-T2, and S4-T1), beyond the standard estimated crossing window. The additional duration at these crossings is due to site conditions, as outlined in Table S3.D.2-1.

Table S3.D.2-1 Additional Instream Crossing Duration Justification				
Watercourse Feature ID	Approximate Milepost	Crossing Length	Estimated Crossing Duration (hr)	Justification
S1-T2	49.4	15	72	Due to having to install the stream and adjacent wetland crossing simultaneously, as well as stream flow and steep terrain considerations. Additional time will be required to install the dam and complete the crossing

Table S3.D.2-1 Additional Instream Crossing Duration Justification				
Watercourse Feature ID	Approximate Milepost	Crossing Length	Estimated Crossing Duration (hr)	Justification
S2-T1	52.6	30	72	Due to having to install the stream and adjacent wetland crossing simultaneously, with steep terrain considerations. Additional time will be required to install the dam and complete the crossing.
S5-T2	53.6	10	72	Due to having to install the stream and adjacent wetland crossing simultaneously, and the length of the crossing. Additional time will be required to install the dam and complete the crossing.
S4-T1	57.4	6	48	Due to having to install two stream crossings simultaneously, additional time will be required to complete the crossing.

Crossing construction shall be completed as dry-open cut, with a clean water bypass that may include dam and pump or flume pipe. Each option passes water around the crossing location, minimizing construction impacts downstream. Additionally, the Pennsylvania Fish and Boat Commission (PFBC) instream construction restriction periods will be followed, unless waivers are obtained, further minimizing stream impacts. Due to the short instream construction duration and coordinated crossing window timing with the PFBC, impacts have been minimized at each crossing to the extent practical.

Water Quality

The PADEP Erosion and Sediment Pollution Control Program Manual, dated March 2012, was used as a primary reference for design and selection of E&S control BMPs to be implemented during the Project. These will be consistent with the requirements of the PA Code Title 25 Chapter 105 requirements, as it relates to wetland and waterbody impacts.

Sediment controls will be designed to stay within the limits-of-disturbance (LOD), with controls and plans in place to minimize potential impacts. Post-Construction Stormwater Management (PCSM) will be designed to manage stormwater runoff. With the implementation of the E&S Plan and PCSM, impacts to water quality are not anticipated.

The following techniques will be employed during construction to minimize the potential for soil erosion and sediment migration:

All Subfacility Types

- Erosion and sediment (E&S) BMP measures will be installed prior to commencement of earthwork and will not be removed until after the up-gradient areas are stabilized.
- Rock construction entrances will be installed along points of access to the pipeline alignment to mitigate the potential for construction vehicles to transport sediment onto public roadways.
- Sediment Barriers will be installed along the down-gradient perimeter of the work areas.
- Removal of the E&S control BMP measures will occur only after the disturbed areas have been stabilized by uniform perennial vegetative coverage (density) of seventy percent (70%) or greater, or by other permanent non-vegetative cover with a density sufficient to resist accelerated surface erosion and subsurface characteristics sufficient to resist sliding and other movements.
- Diligent maintenance of the E&S control BMP measures will be conducted throughout the duration of the project.

Pipeline

- At areas of concentrated flow in natural drainageways, diversions will be installed to intercept and convey upslope stormwater runoff around the work corridor without contacting disturbed surfaces.
- Waterbars and outlet structures will be installed to mitigate the potential for stormwater to erode soils on steep slopes by diverting water away from the pipeline alignment. Waterbars will discharge to a well vegetated area to limit the potential for sediment-laden water to flow downgradient from the terrace.
- Trench plugs will be installed intermittently within the pipeline trench and at wetland and stream crossings to control and allow for managing the flow of sediment-laden stormwater within the trench. Stormwater pooling within the excavation behind a trench plug will be removed and discharged through a pumped water filter bag over stable, undisturbed earth.
- Timber mats will be installed within wetland crossings to minimize the impacts and compaction of the wetland crossings.

- Timber bridges will be installed to cross streams to prevent onsite site sediments from entering the waterbodies.
- Cleaning procedures will be implemented to mitigate the spread of invasive species as outlined in Appendix S4-4 of Module S4.

PCSM measures will also be implemented for water quality in areas where it is required. The PCSM is designed to manage stormwater runoff associated with new impervious areas for the proposed aboveground facilities. The design will promote retention and infiltration into the ground, controlling sediments by keeping them onsite. With the implementation of the E&S Plan and the stormwater management measures, water quality impacts are not anticipated.

Transco reviewed the 303(d) lists for streams crossed by the Project that are included in EPA Categories 4 and 5. Category 4 lists waterbodies where TMDLs have been established or cannot be established due to the nature of the contamination. Category 5 lists waterbodies where TMDLs need to be developed by the state. (PADEP 2018, 2020d, 2020e). No surface waters crossed by the Project are classified as impaired waterbodies.

S3.D.2(iii) Habitat

General Habitat

General construction related impacts on wildlife species, as it relates to wetlands, waterbodies, and the surrounding areas, will result from habitat disturbance and human activities. Indirect impacts on wildlife will include those associated with increased human activity. Construction of the Project is likely to result in the temporary displacement of, or stress on, animals in areas adjacent to construction and cause movement of some wildlife away from the Project area. Stress on wildlife could affect general health, reproduction, and viability of young animals, depending on the sensitivity of a particular species, season of the year, and other factors. Impacts to forested areas may have an impact on nesting bird species, rearing of young, and availability of escape cover. While the Project does have impacts to typical wildlife habitat of the region, it is unlikely the Project has an influence on biodiversity, as the areas to be impacted are typical settings for the region, and unique areas have been avoided.

Other temporary impacts on wildlife species as a result of the general habitat impact could include those from pipeline trenching activities and associated spoil piles, which could result in a short-term barrier to movement to some species.

The Long Pond Nature Preserve Import Bird Area is located from MP 54.3 to 56.9. This area includes both public and private lands and includes the Long Pond Nature Preserve. Important Bird Areas may include migratory staging areas, winter roost sites and prime breeding areas for birds (NAS 2022a). According to the National Audubon Society, the Long Pond Preserve Important Bird Area's conservation interest is due to the unusual ecosystem with both wet-adapted and dry-adapted plants (NAS 2022b). Temporary impacts to the Important Bird Area are will occur during construction. Permanent impacts will take place through tree removal within the proposed permanent maintained pipeline ROW.

Temporary habitat alteration at the waterbody crossing locations may degrade fish spawning and nursery areas due to the excavation in the channel, resulting in temporary impacts. Because crossings will be completed in a short timeframe, these effects are expected to be temporary in nature and aquatic communities will subsequently recolonize the affected area once construction activity is complete. Permanent impacts to spawning are not anticipated as a result of this Project. Impacts to spawning should be avoided by timing construction to occur outside of the PFBC restricted period.

All of the stream crossings associated with the Project cross wild trout streams including some listed as Class A Wild Trout. At some of these crossings, wetlands are located adjacent to the wild trout streams. As a result, these wetlands are considered exceptional value (EV) under PA Code Chapter 105.17. Impacts to these wetlands, as well as all wetlands on the Project, have been minimized through workspace reductions. Work in these areas will follow the Transco Project Specific Wetland and Waterbody Construction and Mitigation Procedures found in Appendix S4-1. Because crossings will be completed in a short timeframe, these effects are expected to be temporary in nature and aquatic communities will subsequently recolonize the affected area once construction activity is complete. Additionally, the PFBC instream construction restriction periods will be followed, unless waivers are obtained, further minimizing stream impacts. Due to the short instream construction duration and coordinated crossing window timing with the PFBC, impacts have been minimized at each crossing.

During clearing and grading activities, more mobile wildlife species (e.g., larger mammals, birds, and reptiles) will be able to avoid the construction area, and many are expected to leave the area during construction and migrate to surrounding areas. Construction activity will be temporary and will occur in a given area for only a few weeks, in general. Habitat recovery will occur, aided by the use of the impact minimization and restoration measures.

Transco does not anticipate the Project will reduce or degrade habitat for terrestrial,

aquatic, or avian species significantly due to the pipeline co-location. Habitat fragmentation will be minimized through the use of pipeline co-location. While temporary impacts on food, cover, and water sources may occur, none of the species located within the Project area are specialized in such a way that construction of the Project will inhibit the overall fitness or reproductive output of the populations as a whole. Minimal changes to existing habitat types will occur due to this Project siting. Wildlife populations that utilize the Project area are not expected to be permanently adversely affected by the proposed Project.

Environmental Study Areas

The Project will not result in impacts to environmental study areas at any of the subfacility areas.

Threatened and Endangered Species

Potential conflicts were identified during the Pennsylvania Natural Heritage Program PNDI Environmental Tool Review. Consultation with each jurisdictional agency participating in the PNDI program is provided in Requirement G of the Joint Permit Application. Appropriate threatened and endangered species surveys were completed in 2020. As a result of the 2020 surveys, resources with potential conflict were identified within and/or adjacent to the Effort Loop Project area.

United States Fish and Wildlife Service

Probable presence of the federally threatened and state endangered northern long-eared bat (*Myotis septentrionalis*) was identified while conducting 2020 Summer Bat Acoustic Surveys. No presence of the northeastern bulrush or bog turtle were determined through surveys for the Project. Transco is still in a concurrent review phase with the United States Fish and Wildlife Service (USFWS) and a final clearance is pending. Transco will submit the final USFWS clearance to PADEP upon receipt.

Pennsylvania Game Commission

Probable presence of two Pennsylvania state endangered bat species: the little brown bat (*Myotis lucifugus*) and the tri-colored bat (*Perimyotis subflavus*) were identified while conducting 2020 Summer Bat Acoustic Surveys.

On March 15, 2022, Transco submitted a summary of surveys, reports and proposed Project-specific restrictions to protect the state-listed bat species to the PGC and Transco has agreed to conduct species-specific conservation measures to reduce potential adverse effects. On May 4, 2022, issued a response letter for the Project, indicating that no impacts are likely and no further coordination with the PGC Environmental Review Division will be necessary for the Project at this time.

Department of Conservation of Natural Resources

Three DCNR state-listed plants: Blunt-manna grass (*Glyceria obtusa*), white-fringed orchid (*Platanthera blephariglottis*) and Showy goldenrod (*Solidago speciosa*) were found within or adjacent to the Project. The identified population of the white fringed-orchid is outside of the proposed LOD. As a mitigation measure, Transco has proposed to place orange safety fencing along the LOD immediately adjacent to the population of white fringed-orchid as a visual and restrictive barrier at this location. Blunt manna-grass and showy goldenrod was found in multiple wetlands within and adjacent to the proposed Effort Loop LOD. To minimize impacts to the populations of blunt manna-grass and showy goldenrod, topsoil segregation is proposed to maintain the existing seed source within the soils. These areas will be allowed to re-seed naturally, and no permanent seed mixes are proposed within these areas for restoration. Wash racks will be utilized during construction to control the spread of invasive species at the construction access locations immediate to these populations. Showy goldenrod was found in multiple wetlands within and adjacent to the proposed Effort Loop LOD.

A Botanical Survey Report was submitted to the PADCNR on November 25, 2020. On August 23, 2021, the DCNR provided a response letter for the Project indicating “No Impact Anticipated per Avoidance, Mitigation, and Monitoring”. On April 21, 2022, Transco submitted an updated PNDI submission with the current Project footprint as proposed in the permit application. The DCNR issued a response letter on May 3, 2022 again indicating that “No Impact Anticipated per Avoidance, Mitigation, and Monitoring” based on the measures proposed in the previous correspondences.

Pennsylvania Fish and Boat Commission

On April 21, 2022, Transco submitted an updated PNDI submission with the current Project footprint as proposed in the permit application. The PFBC issued a response letter on May 3, 2022, indicating that there have been no changes in the on-site biological information, therefore the PFBC’s comments regarding potential impacts to species under their jurisdiction remain unchanged as detailed in the September 7, 2021, letter. No surveys or studies were requested by the PFBC during Project consultation for the Effort loop.

S3.D.2(iv) Recreation

Hunting

Hunting on certain tracts of land along and adjacent to the proposed Effort Loop is allowed by the public. The Long Pond Nature Preserve under the management of The Nature Conservancy is enrolled in the PGC's public access cooperator program and is subject to all State Game Lands rules and regulations. The Long Pond Nature Preserve is enrolled in the PGC's deer management assistance program (DMAP) where hunters can apply for doe licenses specific to the properties associated with the Long Pond Nature Preserve. Two gated parking lots to the Long Pond Nature Preserve's – Long Pond Barrens section, located along the proposed Effort Loop from milepost 55.7 to 56.9, provide parking for not only the Long Pond Barrens, but also provide parking for State Game Lands 129 and the Delaware State Forest, which allow public hunting opportunities. Private lands along the Project may allow for recreational hunting opportunities; however, such opportunities are limited to only those with permission to access these properties. Hunting opportunities may be temporarily impacted as it is anticipated that construction may overlap with hunting seasons, and therefore may temporarily limit hunting opportunities in and within the vicinity of the ROW. Transco will coordinate with affected landowners to minimize potential conflicts with hunting to the extent practicable.

Fishing

The Effort Loop has stream crossings within the McMichael Creek, Pohopoco Creek, Sugar Hollow Creek, Poplar Creek, Mud Run and Tunkhannock Creek watersheds which are considered naturally reproducing trout streams by the PFBC. In addition, crossings located in the Pohopoco Creek, Sugar Hollow Creek, and Poplar Creek watersheds carry a Class A wild trout designation. PFBC instream construction restrictions for naturally reproducing trout stream would be from October 1 – December 31; while the Class A designated streams would be from October 1 – April 1.

The restrictions outlined above have been adopted to minimize potential impacts to spawning trout at the instream crossings. Due to the adoption of the trout restrictions, and use of approved Project BMPs, it is expected that minimal impacts will occur as a result of the Project and the impact will not extend downstream of the crossing locations.

Access and use of portions of these properties to recreationally fish may be limited during construction; however, fishing opportunities exist to those that have permission to access the property upstream and downstream of the construction activities.

Hiking and Plant/Wildlife Observation

Permanent impacts on hiking or observation of plants/wildlife is not expected as a result of the proposed Project. Two gated parking lots to the Long Pond Nature Preserve's – Long Pond Barrens section, located along the proposed Effort Loop from MP 55.7 to 56.9, provide parking for not only the Long Pond Barrens, but also provides parking for State Game Lands #129 and the Delaware State Forest, which allow public hiking and observation of plants/wildlife. Access and use of portions of these properties for hiking and observation of plants/wildlife may be temporarily disrupted. Transco will coordinate with affected landowners regarding planned construction activities.

Swimming/Boating

Watercourses crossed by the Project area are minor or intermediate streams. Due to the size of these streams swimming and boating opportunities area limited within and surrounding the crossing locations.

S3.D.3 Effect on Overall Ecology

The majority of impacts associated with construction of the pipeline component of the Project are temporary in nature. Streams impacted by the project will be crossed in dry conditions with equipment bridges installed to not create sediment pollution in the watercourse. Although minor stream and wetland impacts (TSIM, TFIM, TMPWI and PIPE) will occur during construction of the pipelines, they will be crossed and restored in accordance with PADEP Chapter 102 and 105 guidelines. As a result, there is very minimal effect to the overall regime and ecology of the watercourse or wetland associated with the Project. Water quality, streamflow, fish and wildlife, aquatic habitat, and instream and downstream uses are minimally impacted on these stream and wetland functions.

S3.D.4 Upstream and Downstream Property or Riparian Rights

The Project is not expected to result in impacts to upstream and downstream properties. The implementation of the BMPs associated with applicable state and federal permits to be approved for the project prior to construction will minimize impacts to properties upstream and

downstream of the Project. The general nature of construction of pipeline projects is that its impacts are temporary in nature.

S3.E Antidegradation Analysis

Transco is meeting the state antidegradation requirements contained in Chapters 93, 95, 102 and 105 through various measures provided in the Project design, such as proposed construction measures and requests for permit approvals for activities associated with the Project. Where the Project is located within EV and HQ watersheds, as defined by Chapter 93, Transco will install required ABACT BMPs, protecting the designated and existing uses of the high-quality streams. BMPs outlined in the E&S control and site restoration plans will be installed, monitored and maintained until the Project meets the vegetative cover requirements required by the approved permits for earth disturbance and water obstruction and encroachment. During the Project's construction, any issues identified with the BMPs shall be repaired as described in the permits and plans.

No changes to the aquatic community or water chemistry within the streams or wetlands crossed or impacted by the Project are anticipated to occur. All streams crossed by the Project shall utilize clean water bypass BMPs during construction to allow continuous flow of all streams crossed, and these streams will be restored to pre-existing conditions once construction is complete. The wetland impacts associated with temporary disturbance will be restored and stabilized upon final restoration with PSS and PFO impacted wetlands outside the proposed maintained corridor being replanted. The wetland, stream, and floodway impacts are considered isolated to their disturbance area and do not extend beyond the Projects LOD.

As part of the Project design, impacts to resources were avoided and minimized where possible and include the following measures: pipeline collocation within/adjacent to an existing ROW, restoration of disturbed areas to pre-existing conditions with the exception of above ground facilities, and limiting the extent and duration of earth disturbance. Transco has provided a nominal workspace of 75 feet in wetlands and floodways and 50 feet within the stream top-of-bank for the pipeline installation where possible. Where these nominal workspaces were exceeded, site specific justification has been provided in Requirement S - Alternatives Analysis. During construction, excavated trenches will be kept to the minimum width and depth necessary to safely complete construction activities. Project access has been designed to utilize existing access roads as much as possible, thereby minimizing the need for new road construction.

Consultation with state and federal agencies regulating threatened and endangered (T&E) species has occurred and is ongoing. Transco is still in a concurrent review phase with the USFWS with final clearance pending. Transco will submit the USFWS clearance to PADEP upon receipt. Transco has completed and concluded consultation with the Pennsylvania Department of Conservation and Natural Resources (DCNR), the Pennsylvania Fish and Boat Commission (PFBC), and the Pennsylvania Game Commission.

During construction, the Transco's Construction Spill Prevention and Response Procedures for Oil and Hazardous Materials (Spill Plan) outlined in Appendix S3-4 will be implemented to minimize the potential for spills and the effects of any spills that may occur. Details of how the site materials are managed, including the storage of equipment, hazardous materials, fuels, and lubricating oils and other construction items are identified in the Spill Plan. The plan defines the procedures for spill notification, emergency response, spill response, personal protective equipment, clean-up procedures and spill presentation practices.

The cumulative effect of the Project will not result in the impairment of the Commonwealth's "Exceptional Value" and "Other" wetland resources. A review of the Section 303(d) list of the Clean Water Act indicated that no surface waters crossed by the Project are classified as impaired waterbodies (PADEP 2020d, 2020e). The wetland impacts will involve temporary disturbance while the pipeline is being installed, and the wetlands will be restored in accordance with the Onsite Restoration Plan, as shown in Appendix S4-2, and the approved Chapter 102 permit. The wetland impacts are isolated to their disturbance area.. The Project has been collocated with Transco's existing gas pipeline system, to avoid fragmentation and to minimize resource impacts. Construction BMPs, including erosion control devices and timber matting, to mitigate for soil compaction within the wetlands, will be utilized to minimize impacts throughout the Project. Transco will follow its Project specific Upland Erosion Control, Revegetation, and Maintenance Plan (Appendix S3-3) and its Project-Specific Wetland and Waterbody Construction and Mitigation procedures (Appendix S4-1), as well as other permit conditions outlined by the PADEP. The Effort Loop is a component of the Regional Energy Access Expansion Project which is a single and complete Project, with no foreseeable additional impacts to wetland resources of the Commonwealth of Pennsylvania, other than those proposed. The Project will not result a major impairment of the Commonwealths "EV" or "Other" wetland resources.

S3.F. Alternatives Analysis

The Alternatives Analysis is provided in Requirement S of the Joint Permit Application.

S3.G. Potential Secondary Impact Evaluation

S3.G.1 Environmental Impacts on Adjacent Lands

Streams

This section describes the potential secondary impacts to aquatic resources associated with the Project's stream crossings, including aquatic habitats, riparian areas, water quantity and water quality.

Aquatic Habitats

Construction of the Project will likely result in only short-term impacts on water resources in the immediate Project area due to disturbance within the stream bed. The impacts on surface waters would be temporary and mostly associated with active construction activities. Once construction is complete, the Project area will be restored, ceasing disturbance for the stream. Aquatic habitat impacts upstream or downstream of the Project are not anticipated as the work is isolated to the Project workspace.

Temporary habitat alteration at the crossing location and increased suspended solids concentrations and sedimentation downstream from the crossing may occur if a BMP, such as a dam and pump or sediment barrier, were to fail. This could temporarily degrade fish spawning and nursery areas, resulting in a temporary reduction in reproductive potential. Transco expects these effects to be temporary in nature because the suspended sediments will be flushed by the existing currents or settle out, and aquatic communities will subsequently recolonize the affected area. It is unlikely that temporary increases in turbidity will have an adverse effect on aquatic biota of the area. Transco will monitor and inspect BMP's during construction, to maintain their working condition and address any issues as they are identified. Should a failure occur, secondary impacts will generally be limited to the short period of in-stream construction, and conditions are expected to return to normal following stream restoration activities.

Water Quantity

Potential secondary impacts on water quantity or the hydrology of streams could result from changes in the existing drainage patterns and alteration in flow and water levels from construction. However, the Project does not involve any stream relocations, enclosures, channel deepening/dredging activities, and addition of impervious surfaces in the wetland/stream complex. Because the Project does not involve direct impacts to natural and current drainage

patterns and streams will be restored to approximate original contours following construction, the Project will not result in secondary impacts to existing drainage patterns. Transco will cross waterbodies with flowing water present at the time of construction using dry-ditch construction methods. The dry-ditch construction method shall be completed with a clean water bypass that may include dam and pump or flume pipe. Each option passes water around the crossing location, minimizing secondary impacts downstream. A Post-Construction Wetland and Watercourse Monitoring Plan has been included in Module S4.D and will include monitoring for potential secondary impacts to hydrology.

Water Quality

As noted in Section S3.D.2(ii) above, secondary impacts related to the loss of water quality to adjacent stream locations can occur during construction and restoration of the Project. Potential secondary impacts to stream water quality beyond the Project's limit of disturbance could result from: release of sediments/turbid waters from trenching, dewatering, clearing and grading of adjacent land and stream banks; and release of pollutants from construction equipment or activities adjacent to waters. In accordance with the Chapter 102 E&S requirements, water will be pumped from the trench and discharged into vegetated upland areas after first being filtered through a straw bale structure and/or filter bag. The rate of flow from the pump will be regulated to prevent scouring from runoff. Dewatering will be conducted in a manner designed to prevent the flow of heavily silt-laden water directly into adjacent waterbodies thereby minimizing secondary impacts. Potential secondary impacts from stream bank subsidence will be avoided by leaving roots/stumps in place, except for over the trench, and by stabilizing/revegetating stream banks as soon as possible after construction. Post-construction monitoring will ensure that successful restoration occurs, or necessary corrective actions are implemented to result in successful restoration, thereby avoiding potential secondary impacts from stream bank subsidence/subsequent downstream erosion and sedimentation. Additionally, aerial and ground inspections during Project operation will identify stream bank subsidence and soil erosion issues which will be rectified by repairs or installation of temporary erosion control devices until permanent erosion control measures become effective.

Wetlands

This section describes the potential secondary impacts to aquatic resources associated with the Project's wetland crossings, including aquatic habitats, water quantity and water quality.

Habitat

General construction related impacts on wildlife species, as it relates to wetlands, will result from habitat disturbance and human activities. Secondary impacts on wildlife will include those associated with increased human activity. Construction of the Project is likely to result in the temporary displacement of, or stress on, animals in areas adjacent to construction and cause movement of some wildlife away from the Project area. Stress on wildlife could affect general health, reproduction, and viability of young animals, depending on the sensitivity of a particular species, season of the year, and other factors. Other temporary impacts on wildlife species could include those from pipeline trenching activities and associated spoil piles, which could result in a short-term barrier to movement to some species.

During clearing and grading activities, more mobile wildlife species (e.g., larger mammals, birds, and reptiles) will be able to avoid the construction area, and many are expected to temporarily leave the area during construction and migrate to surrounding areas. Construction activity will generally be temporary and will occur in a given area for only a few weeks, in general. Habitat recovery will occur, aided by the use of the impact minimization and restoration measures thereby minimizing secondary impacts.

Transco does not anticipate the Project will reduce or degrade habitat for terrestrial, aquatic, or avian species significantly due to the pipeline co-location. Habitat fragmentation has been minimized through the use of pipeline collocation. While temporary impacts on food, cover, and water sources may occur, none of the species located within the Project area are specialized in such a way that construction of the Project will inhibit the overall fitness or reproductive output of the populations as a whole. Minimal changes to existing habitat types will occur due to this Project siting. Wildlife populations that utilize the Project area are not expected to be permanently adversely affected by the proposed Project.

Water Quantity

Potential secondary impacts on water quantity or wetland hydrology could result from changes in the existing drainage patterns and alteration in flow and water levels from construction. However, the Project does not involve any addition of structures or impervious surfaces in the wetlands. Because the Project does not involve direct impacts to natural and current drainage patterns and wetlands will be restored to approximate original contours following construction, the Project will not result in secondary impacts to existing drainage patterns. A Post-Construction

Wetland and Watercourse Monitoring Plan has been included in Module S4.D and will include monitoring for potential secondary impacts to hydrology.

Compaction of wetland soils and rutting within wetlands could temporarily impact wetland hydrology. These impacts will be minimized by using temporary equipment mats. The segregation of topsoil within the trench line of wetland crossings will also limit the potential for soil compaction. The replacement of topsoil to the original soil horizons and elevations will promote the return of native vegetation along with the return of natural groundwater direction and flow rates.

Water Quality

As noted in Section S3.D.2(ii) above, secondary impacts related to the loss of water quality to adjacent wetland locations have the opportunity to occur during construction and restoration of the Project. Construction activities can disturb surface soils and cause subsequent sediment transport into adjacent wetlands. Sedimentation will be minimized by installing temporary sediment control measures between the upland construction areas and the wetlands, as described above. Permanent erosion controls, including slope breakers, trench breakers, and vegetative cover, will be used in adjacent upland areas to minimize long-term sedimentation into the wetlands. During construction, potential secondary impacts will be minimized by installing energy-dissipation devices at the down-slope end of slope breakers to minimize erosion of soil off the ROW into wetlands. Trench plugs will be installed in upland slopes adjacent to wetlands to prevent trench erosion. Trench plugs also will be installed at the edges of the wetland and on either side of waterbody crossings to prevent subsurface drainage along the pipeline.

S3.G.2 Impacts on all other Dams, Water Obstructions, or Encroachments

There are no other dams, water obstructions, or encroachments necessary to fulfill this Project purpose.

S3.H Cumulative Impacts to Wetland Resources

The cumulative impacts to wetland resources assessment was performed in accordance with PADEP's Comprehensive Environmental Assessment Technical Guidance Document (TGD) entitled *Comprehensive Environmental Assessment of Proposed Project Impacts for Chapter 105 Water Obstruction and Encroachment Permit Applications Technical Guidance Number 310-2137-006*. Based upon its assessment Transco believes there will be no significant measurable cumulative effects of the Project on wetlands or watercourses.

Cumulative impacts associated with the Project may result from the impacts of construction and operation of the Project components combined with the impacts of other proposed major developments occurring within the vicinity of the Project. To review potential cumulative impacts, Transco considered recently completed, current, and reasonably foreseeable future major projects and other human-related activities (collectively “activities”) near the Project facilities. The basic assumption of the cumulative impacts analysis was that if activities were deemed to have minor or insignificant impacts, the cumulative impacts resulting from the activities and Project would also be considered minor or insignificant. Focus was placed on permanent wetland and watercourse impacts, as temporary impacts are not considered an adverse cumulative impact according to the TGD.

To minimize Project impacts, Transco co-located the Effort Loop entirely within the existing Transco Leidy Line System. The existing ROW was previously cleared with forested or scrub-shrub wetland communities being permanently converted to Palustrine Emergent (PEM) wetlands. Permanent loss of wetlands along the ROW from past projects is considered negligible due to the nature of the linear projects. The proposed Project will expand the functional conversion of some of these forested and scrub-shrub wetland resources; however, Transco minimized permanent functional conversion by proposing replanting of wetland resources, as outlined in Module S4-Appendix S4-2 – Onsite Wetland and Riparian Reforestation Plan. The existing Transco pipelines and adjacent utility corridors are subject to routine maintenance in order to maintain safe and reliable energy transmission. The wetlands crossed by the existing ROW’s are in many instances an extension of the same resource associated with the Project. These resources would only be temporarily impacted to conduct routine maintenance and are not further discussed due to not being considered permanent impacts.

Transco’s proposed LOD was identified to provide for safe and efficient construction of large diameter pipeline facilities in accordance with OSHA regulations (29 CFR 1926.650-1926.652, Subpart P) and Interstate Natural Gas Association of America’s (INGAA’s) workspace guidelines (INGAA 1999). As an interstate natural gas pipeline facility, Transco’s system is designed, constructed, operated, and maintained in accordance with the U.S. Department of Transportation’s (USDOT) Pipeline and Hazardous Materials Safety Administration (PHMSA) Standard 49, Code of Federal Regulations (CFR) Part 192 (49 CFR Part 192.475-77). In accordance with the regulations, Transco has developed an enhanced pipeline Integrity Management Program to improve pipeline safety along its entire pipeline system and implements this program to comply with the requirements of 49 CFR Part 192, Subpart O. These federal safety standards, combined with robust integrity management programs and recent advances in pipeline manufacturing, construction, and inspection techniques, lengthen the life of Transco’s pipelines.

There are no permanent direct impacts associated with the Project. Permanent indirect impacts would include 1.62 acres to wetlands and 0.87 acres to watercourses. These permanent indirect impacts would be associated with the existing and proposed maintained right-of-way (ROW) and include the permanent functional conversion of 0.29 acres of Palustrine Forested (PFO) and Palustrine Scrub-Shrub (PSS) wetlands. The PFO and PSS wetland cover type conversion will result in a change to the wetland cowardin class but will result in no more than minimal individual and cumulative adverse environmental effects. Temporary and permanent functional conversion impacts will be offset through the enhancement at an offsite compensatory mitigation site, described in the Appendix S4-3.

A list of identified past, current, and reasonably foreseeable actions (federal, non-federal, and private) in the vicinity of the Project are identified in Table S3.H-1. With respect to other permanent wetland impacts from projects proposed by other entities, Transco reviewed publicly-available sources to identify actions requiring federal and/or state permits or authorizations, including the FERC's eLibrary of pending and approved major natural gas actions from 2018 to January 2020 (FERC 2021a), FERC-regulated hydropower (FERC 2021b), USACE Public Notices (USACE 2020a, 2020b) published between 2018 and 2020, and state-specific resources such as transportation improvement plans (PennDOT 2020) and public portals for state water quality permits (PADEP 2020). In addition, Transco contacted local county and municipal planning agencies for information regarding current and planned developments in the Project areas.

Table S3.H-1 discusses the potential cumulative effects on resources that could result from the Project in conjunction with those actions identified. Cumulative effects were considered relative to water quality and use, including effects on groundwater, surface water, and wetlands. The assessment of cumulative water quality and use effects assumes that Project effects are minimized by the successful implementation of the environmental protection and mitigation measures. Reasonably foreseeable actions identified are subject to permit requirements like that of the Project, which will help to minimize and/or mitigate impacts.

**Table S3.H-1
 Past, Present, and Reasonably Foreseeable Future Actions Evaluated for Potential Cumulative Effects**

Project (Company Name as appropriate)	Location (County, State)	Status / Estimated Construction Date	Description	Approximate Closest Distance (miles) (to Project)	Approximate Construction Impacts	Overlapping Geographic Scope(s) and Discussion of Impact
FERC-Jurisdictional Natural Gas Actions						
PennEast Pipeline Project (CP15-558-000, CP19-78-000, CP20-47-000)	Luzerne, Carbon, Bucks, Monroe, and Northampton, PA. Mercer and Hunterdon, NJ	Permitting - In Progress Phase I Construction Anticipated : January 2021 to September 2022; Phase II Construction Undetermined (duration estimated at 15 months)	Phase I includes 68 miles of 36-inch pipe, 31,800 HP compressor station, three receipt interconnects, and three delivery interconnects constructed entirely within PA. Phase II includes 46-miles of new greenfield pipeline and one new compressor station in NJ.	Crosses Regional Energy Lateral (closely parallel MP 2.0 to 6.3; MP 14.6 to 15.0; MP 17.3 to 17.8; MP 18.5 to 18.8; MP 22.1 to 22.3); 0.1-mile west of Carverton Interconnect & Tie-In; 0.1-mile east of Lower Demunds REL Tie-in; 0.1-mile south of Hildebrandt Interconnect & M&R; 5.7 miles southwest of Station 210 Pooling Point	1,588 acres	<u>Water Quality and Use:</u> 269 waterbody crossings and approximately 27 acres of wetland impact. Action will cross some of the same waterbodies as the Project; restoration is expected to be complete prior to construction start for the Project. Impacts to wetlands/waterbodies will be permitted by federal/state agencies; therefore, no significant cumulative impacts are anticipated.
Adelphia Gateway (CP18-46-000)	Northampton, Bucks, Montgomery, Chester, PA. New Castle, DE.	In Construction (May 2020 to October 2021)	Conversion of 84 miles of existing pipeline to natural gas pipeline; 5 miles of new pipeline laterals, two new compressor stations, existing and new meter stations, and other appurtenant facilities.	0.1-mile west of Delaware River Regulators Facility; 0.2-mile east of Compressor Station 200;	42 acres	<u>Water Quality and Use:</u> Minimal waterbody (2) and wetland (1 acre) crossings due to use of existing pipeline. No cumulative effects to water quality and use are anticipated.
Other Natural Gas Facility Actions						
Sunoco Mariner East II	Chester and Delaware, PA (and other PA counties – impacts described herein are limited to counties listed here)	Construction ongoing in 2020	Mariner East II is an expansion of the existing Sunoco Mariner East pipeline system. Sunoco recently upgraded its existing Mariner East I pipeline to transport natural gas liquids from Ohio and the Pittsburgh area to its Marcus Hook Industrial Complex in Delaware County	2 miles west of Compressor Station 200	281 acres	<u>Water Quality and Use:</u> 82 waterbody crossings and approximately 5 acres of wetland impact. Construction and restoration are anticipated to be complete before the Project commences; therefore, no cumulative impacts are anticipated.
Various Well Developments	Luzerne, PA	Active oil and gas wells have been constructed throughout the county in the past 10 years.	Oil and Gas Natural Wells	Varies	Varies	Well Development has been minimal in the Project counties over the past 10 years, however future development is possible. Two unconventional wells (no conventional wells) were drilled in Luzerne County within the past 10 years. Well construction may have temporary impacts with localized permanent impacts during operation. BMPs would be utilized during construction and would avoid and/or minimize impacts; therefore, no cumulative impacts are anticipated as a result of oil and gas well development.
USACE Regulated In-Water Actions						
None	-	-	-	-	-	=
Transportation Facility Actions						
Pittston Avenue/Route 315	Luzerne, PA	Ongoing	Intersection upgrade with traffic signals.	1.0 mile northeast of Regional Energy Lateral Loop MP 10.6		<u>Water Quality and Use:</u> Action to be conducted in accordance with permit conditions; therefore, no cumulative impacts anticipated.

Table S3.H-1
Past, Present, and Reasonably Foreseeable Future Actions Evaluated for Potential Cumulative Effects

Project (Company Name as appropriate)	Location (County, State)	Status / Estimated Construction Date	Description	Approximate Closest Distance (miles) (to Project)	Approximate Construction Impacts	Overlapping Geographic Scope(s) and Discussion of Impact
Various Other Roadway and Bridge Actions	Multiple Counties, PA; Multiple Counties, NJ; and Baltimore County, MD	Completed, ongoing construction, and proposed	Active and proposed PennDOT, NJDOT, and MDOT roadway and bridge actions.	Various	Various	<u>Water Quality and Use:</u> Construction/repairs could have temporary impacts on water resources. BMPs would be utilized during construction and would avoid/minimize impacts; therefore, no cumulative impacts are anticipated.
Residential/Commercial/Industrial Developments						
North Bacton Hill Road	Chester, PA	Development pending	Reallocation of gross floor area by constructing two buildings, totaling 35000 square feet.	0.4 mile southeast from Compressor Station 200	Information Not Available	<u>Water Quality and Use:</u> Action to be conducted in accordance with permit conditions; therefore, no cumulative impacts anticipated.
South Bacton Hill Road	Chester, PA	Development approved	Divide an existing 71.5-acre tract into three separate lots for the future development of a data center complex and solar field.	0.96 mile south of Compressor Station 200	71.5 acres	<u>Water Quality and Use:</u> Action to be conducted in accordance with permit conditions; therefore, no cumulative impacts anticipated.
Phoenixville Pike	Chester, PA	Development under review	Construct two office/flex buildings	1 mile northeast of Compressor Station 200	Information Not Available	<u>Water Quality and Use:</u> Action to be conducted in accordance with permit conditions; therefore, no cumulative impacts anticipated.
Bacton Hill Expansion	Chester, PA	Development approved	Expand surface parking area to include private fueling station and outdoor storage area.	0.20 mile south of Compressor Station 200	Information Not Available	<u>Water Quality and Use:</u> Action to be conducted in accordance with permit conditions; therefore, no cumulative impacts anticipated.
Market Street ^b	Luzerne, PA	Proposed	Single-family home	0.06 mile southwest of Regional Energy Lateral Loop MP 11.1	Information Not Available	<u>Water Quality and Use:</u> Action to be conducted in accordance with permit conditions; therefore, no cumulative impacts anticipated.
Beverage Company ^c	Luzerne, PA	Proposed	Beverage company will be moving into an existing commercial site.	1.2 miles northeast of Regional Energy Lateral Loop MP 10.5	Information Not Available	<u>Water Quality and Use:</u> Action to be conducted in accordance with permit conditions; therefore, no cumulative impacts anticipated.
Railroad Street Salt Shed ^c	Luzerne, PA	Proposed	Construction of a salt shed next to existing pole barn.	2.9 miles southwest of Regional Energy Lateral Loop MP 10.3	Information Not Available	<u>Water Quality and Use:</u> Action to be conducted in accordance with permit conditions; therefore, no cumulative impacts anticipated.
Union Street Quarry ^c	Luzerne, PA	Proposed	Expand quarry operations toward Union Street	0.5 miles southwest of Regional Energy Lateral Loop MP 11.0	Information Not Available	<u>Water Quality and Use:</u> Action to be conducted in accordance with permit conditions; therefore, no cumulative impacts anticipated.
Manchester Drive ^c	Luzerne, PA	Ongoing	Adding infrastructure, in addition to milling and paving work	0.82 miles east of Regional Energy Lateral Loop MP 11.2	Information Not Available	<u>Water Quality and Use:</u> Action to be conducted in accordance with permit conditions; therefore, no cumulative impacts anticipated.
Maplewood Drive ^c	Luzerne, PA	Ongoing	Adding infrastructure, in addition to milling and paving work	0.13 miles east of Regional Energy Lateral Loop MP 11.2	Information Not Available	<u>Water Quality and Use:</u> Action to be conducted in accordance with permit conditions; therefore, no cumulative impacts anticipated.
Various Single-Family Home Construction, Additions, and Out-buildings	Multiple Counties, PA; Multiple Counties, NJ	Completed, ongoing construction, and proposed	Active and proposed construction of single-family homes.	Varies	Varies	Single-family home development is on-going within the Project counties. Residential construction may have temporary impacts with localized permanent impacts during operation. BMPs would be utilized during construction and would avoid and/or minimize impacts; therefore, no cumulative impacts are anticipated as a result of single-family home construction.

**Table S3.H-1
 Past, Present, and Reasonably Foreseeable Future Actions Evaluated for Potential Cumulative Effects**

Project (Company Name as appropriate)	Location (County, State)	Status / Estimated Construction Date	Description	Approximate Closest Distance (miles) (to Project)	Approximate Construction Impacts	Overlapping Geographic Scope(s) and Discussion of Impact
Various Residential, Commercial, and Industrial Developments	Multiple Counties, PA; Multiple Counties, NJ	Completed, ongoing construction, and proposed	Active and proposed residential, commercial, and industrial developments.	Various	Various	<u>Water Quality and Use:</u> Construction could have temporary impacts on water resources. Actions to be conducted in accordance with permit conditions; therefore, no cumulative impacts are anticipated.
<p>Sources: FERC 2021a and 2021b; PADEP 2020; PADEP, Office of Oil and Gas 2020; PennDOT 2020a and 2020b; USACE 2020a, 2021b, 2020c; East Whiteland Township Planning Commission 2020a and 2020b; Sipple 2020; Bucks County Planning Commission 2020a and 2020b; Boyd 2020; Kernan 2020; Bilger 2020; Barry 2020; Calluori 2020; Chester County Planning Commission 2020; Calaruso 2020; D'Amico 2020; Dell 2020, Eck 2020; Fairchild 2020a, 2020b, 2020c; LaPlace 2020; Leach 2020; Levecchia 2020; Luzerne County Planning and Zoning Department 2020; Majewski 2020; Rost 2020; Scheffler 2020; Watkins 2020; York County Planning Commission 2020.</p> <p>^a Information provided by Tunkhannock Township ^b Information included due to proximity to the Project ^c Information provided by Laflin Borough ^d Information provided by the Burlington County Planning Board</p> <p>Key: I = Interstate PA = Pennsylvania PADEP = Pennsylvania Department of Environmental Protection PennDOT = Pennsylvania Department of Transportation SR = State Route</p>						

As described in Table S3.H-1, many of the projects considered in the cumulative impact assessment involve wetland and watercourse crossings. Transco expects that these projects will be or were constructed in accordance with the FERC Order (for FERC jurisdictional pipelines) and applicable environmental permit conditions and construction plans to avoid, minimize, and mitigate effects on wetlands and watercourses. Other projects not regulated by the FERC would also need to comply with federal and state regulations and permit conditions relative to wetlands and waterbody effects, including implementation of BMPs to avoid and minimize potential effects, as well as development of suitable mitigation plans for unavoidable effects or losses of water resources. Based on the above analysis, Transco believes there will be no significant measurable cumulative effects of the Project on wetlands or watercourses.

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APPENDIX S3-1
SUBFACILITY DETAILS TABLE

TABLE S3-1-1 EFFORT LOOP - WETLANDS SUBFACILITY DETAILS TABLE-PIPE

Milepost	Crossing Name ¹	Wetland ID ²	Cowardin Code ³	§ 105.17 Classification ⁴	Latitude	Longitude	County	Municipality	SUBFACILITY CODE: PIPE									IMPACT GROUP SUBFACILITIES
									Type ⁵	Product Code ⁶	Pipeline Diameter	Depth of Cover ⁷	Line Encased ⁸	Shut Off Controls ⁹	Attached to Water Obstruction ¹⁰	ROW Width ¹¹	Pipe Length ¹²	Temporary Wetland Impact (TMPWI) ¹³
																(linear ft.)	(linear ft.)	
45.2	EL-1	W1-T5	PEM	EV	40.914629	-75.386533	Monroe	CHESTNUTHILL	TRNC	PETRO	42	3'	No	Yes	No	90	63	0.045
45.8	EL-2	W4-T6	PEM	EV	40.922641	-75.390990	Monroe	CHESTNUTHILL	TRNC	PETRO	42	3'	No	Yes	No	90	26	0.017
45.8	EL-2	W4-T6	PSS	EV	40.922665	-75.391063	Monroe	CHESTNUTHILL	TRNC	PETRO	42	3'	No	Yes	No	90	26	0.015
46.1	EL-4	W1-T2	PEM	EV	40.926194	-75.392190	Monroe	CHESTNUTHILL	TRNC	PETRO	42	3'	Yes	Yes	No	75	141	0.262
46.3	EL-5	W2-T2	PEM	Other	40.928552	-75.394809	Monroe	CHESTNUTHILL	DB	PETRO	42	3'	No	Yes	No	50	28	0.028
46.3	EL-5	W2-T2	PSS	Other	40.928569	-75.394896	Monroe	CHESTNUTHILL	DB	PETRO	42	3'	No	Yes	No	50	38	0.049
49.4	EL-7	W1-T1	PEM	EV	40.965227	-75.427572	Monroe	CHESTNUTHILL	TRNC	PETRO	42	3'	No	Yes	No	75	65	0.092
49.4	EL-7	W1-T1	PSS	EV	40.965361	-75.427690	Monroe	CHESTNUTHILL	TRNC	PETRO	42	3'	No	Yes	No	75	16	0.043
52.7	EL-9	W2-T1	PEM	EV	41.004150	-75.460722	Monroe	TUNKHANNOCK	TRNC	PETRO	42	3'	No	Yes	No	75	0	0.013
53.7	EL-10	W9-T2	PEM	EV	41.013987	-75.474836	Monroe	TUNKHANNOCK	TRNC	PETRO	42	3'	Yes	Yes	No	75	0	0.083
53.7	EL-10	W9-T2	PFO	EV	41.013768	-75.474350	Monroe	TUNKHANNOCK	TRNC	PETRO	42	3'	Yes	Yes	No	75	137	0.311
55.2	EL-11	W12-T2	PEM	EV	41.029724	-75.495298	Monroe	TUNKHANNOCK	TRNC	PETRO	42	3'	No	Yes	No	75	0	0.013
55.2	EL-11	W12-T2	PFO	EV	41.029802	-75.495210	Monroe	TUNKHANNOCK	TRNC	PETRO	42	3'	No	Yes	No	75	21	0.022
56.6	EL-11	W14-T2	PEM	EV	41.044145	-75.513301	Monroe	TUNKHANNOCK	TRNC	PETRO	42	3'	No	Yes	No	90	0	0.024
56.6	EL-12	W4-T3	PEM	EV	41.044526	-75.514189	Monroe	TUNKHANNOCK	TRNC	PETRO	42	3'	No	Yes	No	90	0	0.004
56.6	EL-12	W4-T3	PFO	EV	41.044625	-75.514159	Monroe	TUNKHANNOCK	TRNC	PETRO	42	3'	No	Yes	No	90	12	0.019
57.0	EL-13	W3-T1	PEM	EV	41.048297	-75.519456	Monroe	TUNKHANNOCK	TRNC	PETRO	42	3'	Yes	Yes	No	75	67	0.350
57.0	EL-13	W3-T1	PFO	EV	41.048704	-75.519828	Monroe	TUNKHANNOCK	TRNC	PETRO	42	3'	Yes	Yes	No	75	147	0.236
57.0	EL-13	W15-T2	PFO	EV	41.047566	-75.518300	Monroe	TUNKHANNOCK	TRNC	PETRO	42	3'	No	Yes	No	75	0	0.057
57.0	EL-13	W3A-T1	PFO	Other	41.048324	-75.519235	Monroe	TUNKHANNOCK	TRNC	PETRO	42	3'	No	Yes	No	75	0	0.005
57.2	EL-14	W4A-T1	PEM	EV	41.050762	-75.522473	Monroe	TUNKHANNOCK	TRNC	PETRO	42	3'	No	Yes	No	75	0	0.018
57.2	EL-14	W4-T1	PEM	EV	41.049795	-75.521341	Monroe	TUNKHANNOCK	TRNC	PETRO	42	3'	Yes	Yes	No	75	822	0.950
57.3	EL-15	W6-T1	PEM	EV	41.051055	-75.523046	Monroe	TUNKHANNOCK	TRNC	PETRO	42	3'	Yes	Yes	No	118	126	0.093
57.4	EL-16	W10-T1	PEM	EV	41.052950	-75.525565	Monroe	TUNKHANNOCK	TRNC	PETRO	42	3'	No	Yes	No	75	17	0.015
57.4	EL-16	W8-T1	PEM	EV	41.052879	-75.525197	Monroe	TUNKHANNOCK	TRNC	PETRO	42	3'	No	Yes	No	75	0	0.004
57.4	EL-16	W8-T1	PSS	EV	41.052842	-75.525255	Monroe	TUNKHANNOCK	TRNC	PETRO	42	3'	No	Yes	No	75	17	0.061

Notes:

1. Unique identifier for Single and Complete Crossings.
2. Unique name for impacted resource.
3. Cowardin Codes: PEM = Palustrine Emergent; PSS = Palustrine Scrub-Shrub Wetland; PFO = Palustrine Forested.
4. Exceptional Value Wetland Classifications as defined in §105.17 of the PA Code.
5. Description of the method of pipe crossing employed. TRNC - Open Trenched, DB - Direct Bore/Drill.
6. Description of the product delivered in the pipeline. PETRO - Petroleum, Natural Gas, Oil, etc.
7. If shallow bedrock is present during the construction phase, the pipeline may be installed with a minimum of 1 foot of cover.
8. Notes if concrete encasement is used on the pipeline at the crossing.
9. Notes if shut off controls are employed or required.
10. Notes if the pipe is attached to another water obstruction.
11. Indicates the width of the right-of-way (ROW) at the resource crossing. For those features that are only partially within the ROW, a width across the ROW is noted.
12. Pipe length measured as the length of the wetland crossing. N/A indicates the resource is in the Project workspace, but not crossed by the pipe.
13. Area of wetland impact within the Project workspace, where only temporary fill or excavation is occurring.

TABLE S3-1-2 EFFORT LOOP - STREAM SUBFACILITY DETAILS TABLE-PIPE

Milepost	Crossing Name ¹	Watercourse ID ²	Stream Type ³	Chapter 93 Classification ⁴		PFBC Classification ⁷	Latitude	Longitude	County	Municipality	Type ⁸	Product Code ⁹	Pipeline Diameter	Depth of Cover ¹⁰	Line Encased ¹¹	Shut Off Controls ¹²	Attached to Water Obstruction ¹³	ROW Width ¹⁴	Pipe Length ¹⁵
				Designated Use ⁵	Existing Use ⁶													(linear ft.)	(linear ft.)
45.9	EL-3	S3-T5	Ephemeral	HQ-CWF, MF	N/A	Wild Trout	40.923474	-75.391366	Monroe	CHESTNUTHILL	TRNC	PETRO	42	4'	No	Yes	No	113	110
48.5	EL-6	S1-T1	Intermittent	CWF, MF	HQ-CWF, MF	Class A Wild Trout	40.955281	-75.416497	Monroe	CHESTNUTHILL	TRNC	PETRO	42	4'	No	Yes	No	53'	115
49.4	EL-7	S1-T2	Perennial	CWF, MF	HQ-CWF, MF	Class A Wild Trout	40.965327	-75.427675	Monroe	CHESTNUTHILL	TRNC	PETRO	42	4'	No	Yes	No	63	66
51	EL-8	S4-T2 (Floodway)	Ephemeral	EV, MF	N/A	Class A Wild Trout	40.982549	-75.442380	Monroe	CHESTNUTHILL	TRNC	PETRO	42	3'	No	Yes	No	113	183
52.7	EL-9	S2-T1	Perennial	CWF, MF	EV, MF	Class A Wild Trout	41.004167	-75.460835	Monroe	TUNKHANNOCK	TRNC	PETRO	42	4'	No	Yes	No	63	160
53.7	EL-10	S5-T2	Perennial	HQ-CWF, MF	N/A	Wild Trout	41.013894	-75.474590	Monroe	TUNKHANNOCK	TRNC	PETRO	42	4'	Yes	Yes	No	63	10
57.0	EL-13	S7-T2 (Floodway)	Intermittent	HQ-CWF, MF	N/A	Wild Trout	41.048062	-75.518932	Monroe	TUNKHANNOCK	TRNC	PETRO	42	3'	No	Yes	No	90	49
57.0	EL-13	S8-T2 (Floodway)	Ephemeral	HQ-CWF, MF	N/A	Wild Trout	41.048730	-75.519672	Monroe	TUNKHANNOCK	TRNC	PETRO	42	3'	No	Yes	No	90	0
57.4	EL-16	S4-T1	Perennial	HQ-CWF, MF	N/A	Wild Trout	41.052836	-75.525317	Monroe	TUNKHANNOCK	TRNC	PETRO	42	4'	No	Yes	No	50	130

Notes:

1. Unique identifier for Single and Complete Crossings.
2. Unique name for impacted resource. In cases where only the 50' floodway was impacted, the ID has been noted.
3. The flow regime of the stream; I = Intermittent, E = Ephemeral, P = Perennial.
4. Chapter 93 classification as outlined in Title 25 of the PA Code: CWF = Coldwater Fishes, WWF = Warm Water Fishes, MF = Migratory Fishes, HQ = High Quality, EV = Exception Value, TSF = Trout Stocked Fishery.
5. Those uses specified in PACODE Chapter 93.4(a) and 93.9a-93.9c for each water body or segment whether or not they are being attained.
6. Those uses actually attained in the water body on or after 11/28/75, whether or not they are included in the water quality standards.
7. PA Fish and Boat Commission stream designation, as it relates to trout or other species where seasonal restrictions are implemented.
8. Description of the method of pipe crossing employed. TRNC - Open Trenched, DB - Direct Bore/Drill.
9. Description of the product delivered in the pipeline. PETRO - Petroleum, Natural Gas, Oil, etc.
10. If shallow bedrock is present during the construction phase, the pipeline may be installed with a minimum of 1 foot of cover.
11. Notes if concrete encasement is used on the pipeline at the crossing.
12. Notes if shut off controls are employed or required.
13. Notes if the pipe is attached to another water obstruction.
14. Indicates the width of the right-of-way (ROW) at the resource crossing. For those features that are only partially within the ROW, a width across the ROW is noted.
15. Pipe length measured as the length of the stream crossing and includes floodway as shown in the ARIT. N/A indicates the resource is in the Project workspace, but not crossed by the pipe.

TABLE S3-1-3 EFFORT LOOP - STREAM SUBFACILITY DETAILS TABLE - ACCESS												
										SUBFACILITY CODE: TSIM		
Milepost	Crossing Name ¹	Watercourse ID ²	Classification Type Code ³	Chapter 93 Classification ⁴		PFBC Classification ⁷	Latitude	Longitude	County	Municipality	Remarks ⁸	Temporary Stream Impact (TSIM)
				Designated Use ⁵	Existing Use ⁶							Regulatory Area (Square Feet) ⁹
45.5	EL-AR-1	S2-T5	HYD	HQ-CWF, MF	N/A	Wild Trout	40.917607	-75.387308	Monroe	CHESTNUTHILL	EXISTING ACCESS ROAD WITH CULVERT	2917
57.4	EL-AR-2	S4-T1	HYD	HQ-CWF, MF	N/A	Wild Trout	41.052620	-75.525817	Monroe	TUNKHANNOCK	TEMPORARY ROAD CROSSING	2929

Notes:

1. Unique identifier for Single and Complete Crossings.
2. Unique name for impacted resource.
3. The classification code for the impacted resource.
4. Chapter 93 classification as outlined in Title 25 of the PA Code: CWF = Coldwater Fishes, WWF = Warm Water Fishes, MF = Migratory Fishes, HQ = High Quality, EV = Exception Value, TSF = Trout Stocked Fishery.
5. Those uses specified in PACODE Chapter 93.4(a) and 93.9a-93.9z for each water body or segment whether or not they are being attained.
6. Those uses actually attained in the water body on or after 11/28/75, whether or not they are included in the water quality standards.
7. PA Fish and Boat Commission stream designation, as it relates to trout or other species where seasonal restrictions are implemented.
8. Description of the activity associated with the crossing.
9. Area of temporary stream impact where temporary stream crossing for access is proposed.

APPENDIX S3-2
SOIL CHARACTERIZATION TABLE

**Appendix S3-2
Soil Characteristics Table**

MP Begin ^a	MP End ^a	Map Unit Symbol ^b	Percent Slope ^c	Depth to Bedrock (inches) ^{c,d}	Land Capability Class ^{c,e}	High Compaction Potential ^f	Erosion Potential ^{c,g}	Wind Eordibility Group ^c	Poor Revegetaiton Potential ^h	Stony/Rock Soils ⁱ	Hydric Soil ^c	Prime Farmland/ Farmland of Statewide Importance ^{c,i}
Effort Loop (Monroe, PA)												
43.72	43.72	MeB	6	36 (fragipan)	2e	N	N (SL)	N	N	N	N	Y (Prime)
43.72	43.78	LkB	6	48	2e	N	N (MO)	N	N	Y	N	Y (Prime)
43.78	43.90	LkC	12	48	3e	N	N (MO)	N	N	Y	N	Y (State)
43.90	43.90	AnB	6	-	2e	N	N (MO)	N	N	N	N	Y (Prime)
43.90	43.95	WhC	12	15/45/51	4e/3e	N	N (SL)	N	N	Y	N	Y (State)
43.95	44.06	WhB	6	15/45/50	3e/2e	N	N (SL)	N	N	Y	N	Y (State)
44.06	44.15	WhC	12	15/45/51	4e/3e	N	N (SL)	N	N	Y	N	Y (State)
44.15	44.19	WaB	6	27 (fragipan)	2e	N	N (MO)	N	N	N	N	Y (Prime)
44.19	44.21	HaC	14	50	3e	N	Y (SE)	N	Y	Y	N	Y (State)
44.21	44.27	HaB	5	50	2e	N	N (MO)	N	N	Y	N	Y (State)
44.27	44.31	LkC	12	48	3e	N	N (MO)	N	N	Y	N	Y (State)
44.31	44.59	WhB	6	15/45/50	3e/2e	N	N (SL)	N	N	Y	N	Y (State)
44.59	44.63	WhC	12	15/45/51	4e/3e	N	N (SL)	N	N	Y	N	Y (State)
44.63	44.67	WhD	20	15/45/52	6e/4e	N	N (SL)	N	Y	Y	N	N
44.67	44.73	WhC	12	15/45/51	4e/3e	N	N (SL)	N	N	Y	N	Y (State)
44.73	44.79	WhB	6	15/45/50	3e/2e	N	N (SL)	N	N	Y	N	Y (State)
44.79	44.81	WhC	12	15/45/51	4e/3e	N	N (SL)	N	N	Y	N	Y (State)
44.81	44.90	WKE	53	15/40/45	7e/7e	N	Y (SE)	N	Y	Y	N	N
44.90	44.94	WhD	20	15/45/52	6e/4e	N	N (SL)	N	Y	Y	N	N
44.94	45.19	LxC	17	30	7s	N	Y (SE)	N	Y	Y	N	N
45.19	45.27	BbC	17	29 (fragipan)	7s	N	Y (SE)	N	Y	Y	N	N
45.27	45.34	LsC	12	30	3e	N	N (MO)	N	N	Y	N	Y (State)
45.34	45.36	WyB	6	-	3s	N	N (SL)	N	N	N	N	Y (State)
45.36	45.38	ChA	2	-	2s	N	N (SL)	N	N	N	N	Y (Prime)

**Table 7A-1
Soil Characteristics by Milepost Segment for Each Soil Map Unit Along the Proposed Pipeline Routes**

MP Begin ^a	MP End ^a	Map Unit Symbol ^b	Percent Slope ^c	Depth to Bedrock (inches) ^{c,d}	Land Capability Class ^{c,e}	High Compaction Potential ^f	Erosion Potential ^{c,g}	Wind Eordibility Group ^c	Poor Revegetaiton Potential ^h	Stony/Rock Soils ⁱ	Hydric Soil ^c	Prime Farmland/ Farmland of Statewide Importance ^{c,j}
45.38	45.42	BrA	2	30 (fragipan)	2w	N	N (SL)	N	N	N	N	Y (Prime)
45.42	45.48	ChB	6	-	2e	N	N (SL)	N	N	N	N	Y (Prime)
45.48	45.55	ChA	2	-	2s	N	N (SL)	N	N	N	N	Y (Prime)
45.55	45.59	BrA	2	30 (fragipan)	2w	N	N (SL)	N	N	N	N	Y (Prime)
45.59	45.66	ChA	2	-	2s	N	N (SL)	N	N	N	N	Y (Prime)
45.66	45.81	ChB	6	-	2e	N	N (SL)	N	N	N	N	Y (Prime)
45.81	45.89	ReA	2	18 (fragipan)	3w/3w	N	N (SL)	N	N	N	N	Y (State)
45.89	45.91	Wb	2	-	4w	Y	N (SL)	N	N	N	Y	N
45.91	45.96	ReA	2	18 (fragipan)	3w/3w	N	N (SL)	N	N	N	N	Y (State)
45.96	46.06	BrA	2	30 (fragipan)	2w	N	N (SL)	N	N	N	N	Y (Prime)
46.06	46.09	WyC	12	-	4s	N	N (SL)	N	N	N	N	Y (State)
46.09	46.12	W		—	-	—	—	—	—	—	—	—
46.12	46.13	WyC	12	-	4s	N	N (SL)	N	N	N	N	Y (State)
46.13	46.29	WyB	6	-	3s	N	N (SL)	N	N	N	N	Y (State)
46.29	46.38	BrB	6	30 (fragipan)	2w	N	N (SL)	N	N	N	N	Y (Prime)
46.38	46.40	WyB	6	-	3s	N	N (SL)	N	N	N	N	Y (State)
46.40	46.44	WyC	12	-	4s	N	N (SL)	N	N	N	N	Y (State)
46.44	46.52	WyB	6	-	3s	N	N (SL)	N	N	N	N	Y (State)
46.52	46.58	WyC	12	-	4s	N	N (SL)	N	N	N	N	Y (State)
46.58	46.63	WyB	6	-	3s	N	N (SL)	N	N	N	N	Y (State)
46.63	46.66	WyD	20	-	4e	N	N (SL)	N	Y	N	N	N
46.66	46.71	WyB	6	-	3s	N	N (SL)	N	N	N	N	Y (State)
46.71	46.74	WhC	12	15/45/51	4e/3e	N	N (SL)	N	N	Y	N	Y (State)
46.74	46.80	WhB	6	15/45/50	3e/2e	N	N (SL)	N	N	Y	N	Y (State)

**Table 7A-1
Soil Characteristics by Milepost Segment for Each Soil Map Unit Along the Proposed Pipeline Routes**

MP Begin ^a	MP End ^a	Map Unit Symbol ^b	Percent Slope ^c	Depth to Bedrock (inches) ^{c,d}	Land Capability Class ^{c,e}	High Compaction Potential ^f	Erosion Potential ^{c,g}	Wind Eordibility Group ^c	Poor Revegetaiton Potential ^h	Stony/Rock Soils ⁱ	Hydric Soil ^c	Prime Farmland/ Farmland of Statewide Importance ^{c,j}
46.80	46.85	WKE	53	15/40/45	7e/7e	N	Y (SE)	N	Y	Y	N	N
46.85	46.91	WhC	12	15/45/51	4e/3e	N	N (SL)	N	N	Y	N	Y (State)
46.91	46.94	WhD	20	15/45/52	6e/4e	N	N (SL)	N	Y	Y	N	N
46.94	46.99	WhC	12	15/45/51	4e/3e	N	N (SL)	N	N	Y	N	Y (State)
46.99	47.00	WhD	20	15/45/52	6e/4e	N	N (SL)	N	Y	Y	N	N
47.00	47.05	WhC	12	15/45/51	4e/3e	N	N (SL)	N	N	Y	N	Y (State)
47.05	47.11	WKE	53	15/40/45	7e/7e	N	Y (SE)	N	Y	Y	N	N
47.11	47.26	WhC	12	15/45/51	4e/3e	N	N (SL)	N	N	Y	N	Y (State)
47.26	47.27	HaB	5	50	2e	N	N (MO)	N	N	Y	N	Y (State)
47.27	47.30	GP	20	1 (paralithic)	8e/8e	N	—	—	—	Y	N	N
47.30	47.40	HaB	5	50	2e	N	N (MO)	N	N	Y	N	Y (State)
47.40	47.44	WhB	6	15/45/50	3e/2e	N	N (SL)	N	N	Y	N	Y (State)
47.44	47.48	HaC	14	50	3e	N	Y (SE)	N	Y	Y	N	Y (State)
47.48	47.51	WaB	6	27 (fragipan)	2e	N	N (MO)	N	N	N	N	Y (Prime)
47.51	47.66	WhC	12	15/45/51	4e/3e	N	N (SL)	N	N	Y	N	Y (State)
47.66	47.68	WKE	53	15/40/45	7e/7e	N	Y (SE)	N	Y	Y	N	N
47.68	47.70	WaB	6	27 (fragipan)	2e	N	N (MO)	N	N	N	N	Y (Prime)
47.70	47.72	WKE	53	15/40/45	7e/7e	N	Y (SE)	N	Y	Y	N	N
47.72	47.78	WeD3	20	15/45	6e	N	N (SL)	N	Y	Y	N	N
47.78	47.81	WKE	53	15/40/45	7e/7e	N	Y (SE)	N	Y	Y	N	N
47.81	47.83	HaB	5	50	2e	N	N (MO)	N	N	Y	N	Y (State)
47.83	47.87	WhD	20	15/45/52	6e/4e	N	N (SL)	N	Y	Y	N	N
47.87	47.93	WhB	6	15/45/50	3e/2e	N	N (SL)	N	N	Y	N	Y (State)
47.93	48.06	HaB	5	50	2e	N	N (MO)	N	N	Y	N	Y (State)
48.06	48.10	HaC	14	50	3e	N	Y (SE)	N	Y	Y	N	Y (State)
48.10	48.15	HaB	5	50	2e	N	N (MO)	N	N	Y	N	Y (State)

**Table 7A-1
Soil Characteristics by Milepost Segment for Each Soil Map Unit Along the Proposed Pipeline Routes**

MP Begin ^a	MP End ^a	Map Unit Symbol ^b	Percent Slope ^c	Depth to Bedrock (inches) ^{c,d}	Land Capability Class ^{c,e}	High Compaction Potential ^f	Erosion Potential ^{c,g}	Wind Eordibility Group ^c	Poor Revegetaiton Potential ^h	Stony/Rock Soils ⁱ	Hydric Soil ^c	Prime Farmland/ Farmland of Statewide Importance ^{c,i}
48.15	48.26	WhB	6	15/45/50	3e/2e	N	N (SL)	N	N	Y	N	Y (State)
48.26	48.31	LkC	12	48	3e	N	N (MO)	N	N	Y	N	Y (State)
48.31	48.39	KaB	5	24 (fragipan)	2w	N	N (MO)	N	N	N	N	Y (Prime)
48.39	48.48	KvB	6	15/40	3e	N	N (SL)	N	N	Y	N	Y (State)
48.48	48.51	KvD	20	15/40	6e	N	Y (SE)	N	Y	Y	N	N
48.51	48.53	KaB	5	24 (fragipan)	2w	N	N (MO)	N	N	N	N	Y (Prime)
48.53	48.56	MeC	12	36 (fragipan)	3e	N	N (MO)	N	N	N	N	Y (State)
48.56	48.61	MeB	6	36 (fragipan)	2e	N	N (SL)	N	N	N	N	Y (Prime)
48.61	48.66	KvC	12	15/40	4e	N	N (MO)	N	N	Y	N	N
48.66	48.88	LkB	6	48	2e	N	N (MO)	N	N	Y	N	Y (Prime)
48.88	49.06	KvB	6	15/40	3e	N	N (SL)	N	N	Y	N	Y (State)
49.06	49.10	KvC	12	15/40	4e	N	N (MO)	N	N	Y	N	N
49.10	49.13	WeB3	6	15/45	3e	N	N (SL)	N	N	Y	N	Y (State)
49.13	49.21	WhC	12	15/45/51	4e/3e	N	N (SL)	N	N	Y	N	Y (State)
49.21	49.27	WKE	53	15/40/45	7e/7e	N	Y (SE)	N	Y	Y	N	N
49.27	49.29	WeC3	12	15/45	4e	N	N (SL)	N	N	Y	N	N
49.29	49.37	HaB	5	50	2e	N	N (MO)	N	N	Y	N	Y (State)
49.37	49.38	WhC	12	15/45/51	4e/3e	N	N (SL)	N	N	Y	N	Y (State)
49.38	49.40	WKE	53	15/40/45	7e/7e	N	Y (SE)	N	Y	Y	N	N
49.40	49.45	Hy	2	-	3w	Y	N (SL)	N	N	N	Y	N
49.45	49.48	Pp	2	-	1	N	N (SL)	N	N	N	N	Y (Prime)
49.48	49.49	MeC	12	36 (fragipan)	3e	N	N (MO)	N	N	N	N	Y (State)
49.49	49.53	WKE	53	15/40/45	7e/7e	N	Y (SE)	N	Y	Y	N	N
49.53	49.58	KvD	20	15/40	6e	N	Y (SE)	N	Y	Y	N	N
49.58	49.62	KvB	6	15/40	3e	N	N (SL)	N	N	Y	N	Y (State)

**Table 7A-1
Soil Characteristics by Milepost Segment for Each Soil Map Unit Along the Proposed Pipeline Routes**

MP Begin ^a	MP End ^a	Map Unit Symbol ^b	Percent Slope ^c	Depth to Bedrock (inches) ^{c,d}	Land Capability Class ^{c,e}	High Compaction Potential ^f	Erosion Potential ^{c,g}	Wind Eordibility Group ^c	Poor Revegetaiton Potential ^h	Stony/Rock Soils ⁱ	Hydric Soil ^c	Prime Farmland/ Farmland of Statewide Importance ^{c,i}
49.62	49.62	LkB	6	48	2e	N	N (MO)	N	N	Y	N	Y (Prime)
49.62	49.65	LkC	12	48	3e	N	N (MO)	N	N	Y	N	Y (State)
49.65	49.73	LkB	6	48	2e	N	N (MO)	N	N	Y	N	Y (Prime)
49.73	49.75	KvC	12	15/40	4e	N	N (MO)	N	N	Y	N	N
49.75	49.77	KvB	6	15/40	3e	N	N (SL)	N	N	Y	N	Y (State)
49.77	49.78	KvC	12	15/40	4e	N	N (MO)	N	N	Y	N	N
49.78	49.79	KvB	6	15/40	3e	N	N (SL)	N	N	Y	N	Y (State)
49.79	49.84	WKE	53	15/40/45	7e/7e	N	Y (SE)	N	Y	Y	N	N
49.84	49.86	KvC	12	15/40	4e	N	N (MO)	N	N	Y	N	N
49.86	50.03	LkB	6	48	2e	N	N (MO)	N	N	Y	N	Y (Prime)
50.03	50.07	KvB	6	15/40	3e	N	N (SL)	N	N	Y	N	Y (State)
50.07	50.12	LkB	6	48	2e	N	N (MO)	N	N	Y	N	Y (Prime)
50.12	50.31	KvB	6	15/40	3e	N	N (SL)	N	N	Y	N	Y (State)
50.31	50.40	LkB	6	48	2e	N	N (MO)	N	N	Y	N	Y (Prime)
50.40	50.46	MeB	6	36 (fragipan)	2e	N	N (SL)	N	N	N	N	Y (Prime)
50.46	50.48	LkB	6	48	2e	N	N (MO)	N	N	Y	N	Y (Prime)
50.48	50.53	LkC	12	48	3e	N	N (MO)	N	N	Y	N	Y (State)
50.53	50.57	LkD	20	58	4e	N	Y (SE)	N	Y	Y	N	N
50.57	50.61	LkB	6	48	2e	N	N (MO)	N	N	Y	N	Y (Prime)
50.61	50.64	LkD	20	58	4e	N	Y (SE)	N	Y	Y	N	N
50.64	50.65	LkC	12	48	3e	N	N (MO)	N	N	Y	N	Y (State)
50.65	50.68	LkD	20	58	4e	N	Y (SE)	N	Y	Y	N	N
50.68	50.72	LkC	12	48	3e	N	N (MO)	N	N	Y	N	Y (State)
50.72	50.79	LgB	4	33 (fragipan)	7s	N	N (SL)	N	N	Y	N	N
50.79	50.85	AwB	6	21 (fragipan)/	6s/6s	Y	N (MO)	N	N	N	N	N

**Table 7A-1
Soil Characteristics by Milepost Segment for Each Soil Map Unit Along the Proposed Pipeline Routes**

MP Begin ^a	MP End ^a	Map Unit Symbol ^b	Percent Slope ^c	Depth to Bedrock (inches) ^{c,d}	Land Capability Class ^{c,e}	High Compaction Potential ^f	Erosion Potential ^{c,g}	Wind Eordibility Group ^c	Poor Revegetaiton Potential ^h	Stony/Rock Soils ⁱ	Hydric Soil ^c	Prime Farmland/ Farmland of Statewide Importance ^{c,j}
				27 (fragipan)								
50.85	51.61	LgB	4	33 (fragipan)	7s	N	N (SL)	N	N	Y	N	N
51.61	51.95	LgC	17	33 (fragipan)	7s	N	N (MO)	N	Y	Y	N	N
51.95	52.05	DxE	53	34	7s	N	Y (SE)	N	Y	Y	N	N
52.05	52.09	DxC	17	34	7s	N	N (SL)	N	Y	Y	N	N
52.09	52.14	DxE	53	34	7s	N	Y (SE)	N	Y	Y	N	N
52.14	52.22	DxC	17	34	7s	N	N (SL)	N	Y	Y	N	N
52.22	52.25	BxC	12	29 (fragipan)/ 71	7s	N	Y (SE)	N	Y	Y	N	N
52.25	52.61	DxC	17	34	7s	N	N (SL)	N	Y	Y	N	N
52.61	52.63	DxE	53	34	7s	N	Y (SE)	N	Y	Y	N	N
52.63	52.67	VaE	62	40	7s	N	—	N	Y	Y	N	N
52.67	52.68	DxE	53	34	7s	N	Y (SE)	N	Y	Y	N	N
52.68	52.75	DxC	17	34	7s	N	N (SL)	N	Y	Y	N	N
52.75	52.79	DxB	5	24	6s	N	N (SL)	N	Y	Y	N	N
52.79	52.84	DxC	17	34	7s	N	N (SL)	N	Y	Y	N	N
52.84	52.92	DxB	5	24	6s	N	N (SL)	N	Y	Y	N	N
52.92	53.56	MfB	4	36 (fragipan)	6s	N	N (SL)	N	N	Y	N	N
53.56	53.61	MoB	4	16 (fragipan)	7s	Y	N (SL)	N	N	Y	N	N
53.61	53.69	Wb	2	-	4w	Y	N (SL)	N	N	N	Y	N
53.69	53.71	SpB	2	24 (fragipan)	7s	Y	N (SL)	N	N	Y	Y	N
53.71	53.74	BxB	5	25 (fragipan)	7s	N	N (SL)	N	N	Y	N	N
53.74	53.94	CxB	4	-	7s	N	N (SL)	N	N	Y	N	N

**Table 7A-1
Soil Characteristics by Milepost Segment for Each Soil Map Unit Along the Proposed Pipeline Routes**

MP Begin ^a	MP End ^a	Map Unit Symbol ^b	Percent Slope ^c	Depth to Bedrock (inches) ^{c,d}	Land Capability Class ^{c,e}	High Compaction Potential ^f	Erosion Potential ^{c,g}	Wind Eordibility Group ^c	Poor Revegetaiton Potential ^h	Stony/Rock Soils ⁱ	Hydric Soil ^c	Prime Farmland/ Farmland of Statewide Importance ^{c,j}
53.94	54.02	LgB	4	33 (fragipan)	7s	N	N (SL)	N	N	Y	N	N
54.02	54.25	BxB	5	25 (fragipan)	7s	N	N (SL)	N	N	Y	N	N
54.25	54.43	CxB	4	-	7s	N	N (SL)	N	N	Y	N	N
54.43	54.79	CpA	2	-	1	N	N (SL)	N	N	N	N	Y (Prime)
54.79	55.06	CxB	4	-	7s	N	N (SL)	N	N	Y	N	N
55.06	55.17	BxB	5	25 (fragipan)	7s	N	N (SL)	N	N	Y	N	N
55.17	55.32	AwB	6	21 (fragipan)/ 27 (fragipan)	6s/6s	Y	N (MO)	N	N	N	N	N
55.32	55.39	BxB	5	25 (fragipan)	7s	N	N (SL)	N	N	Y	N	N
55.39	55.48	CxB	4	-	7s	N	N (SL)	N	N	Y	N	N
55.48	55.51	DxB	5	24	6s	N	N (SL)	N	Y	Y	N	N
55.51	55.61	CxB	4	-	7s	N	N (SL)	N	N	Y	N	N
55.61	55.65	BxB	5	25 (fragipan)	7s	N	N (SL)	N	N	Y	N	N
55.65	55.68	DxB	5	24	6s	N	N (SL)	N	Y	Y	N	N
55.68	56.05	BxB	5	25 (fragipan)	7s	N	N (SL)	N	N	Y	N	N
56.05	56.37	CxB	4	-	7s	N	N (SL)	N	N	Y	N	N
56.37	56.83	BxB	5	25 (fragipan)	7s	N	N (SL)	N	N	Y	N	N
56.83	56.88	AwB	6	21 (fragipan)/ 27 (fragipan)	6s/6s	Y	N (MO)	N	N	N	N	N
56.88	56.91	SpB	2	24 (fragipan)	7s	Y	N (SL)	N	N	Y	Y	N

**Table 7A-1
Soil Characteristics by Milepost Segment for Each Soil Map Unit Along the Proposed Pipeline Routes**

MP Begin ^a	MP End ^a	Map Unit Symbol ^b	Percent Slope ^c	Depth to Bedrock (inches) ^{c,d}	Land Capability Class ^{c,e}	High Compaction Potential ^f	Erosion Potential ^{c,g}	Wind Eordibility Group ^c	Poor Revegetaiton Potential ^h	Stony/ Rock Soils ⁱ	Hydric Soil ^c	Prime Farmland/ Farmland of Statewide Importance ^{c,j}
56.91	57.04	CnB	4	15 (fragipan)/ 16 (fragipan)	7s/7s	Y	N (SL)	N	N	Y	Y	N
57.04	57.47	Cy	13	-	-	N	—	—	—	N	N	N
57.47	57.50	CxB	4	-	7s	N	N (SL)	N	N	Y	N	N

^a As identified in USDA NRCS SSURGO database and USDA NRCS Web Soil Survey and USDA NRCS Web Soil Survey. Dashes indicate no data available.

^b Approximate mileposts may not reflect actual pipeline footage.

^c Percent slope is recorded as the "representative slope" of the soil series, which may have a range of slopes.

^d Where no bedrock depth is identified, as noted by a dash, bedrock depth is assumed to be greater than the deepest depth noted in the USDA NRCS Web Soil Survey (>60, >65, >80). Depth to bedrock is included for soil series components separated by a slash "/". Bedrock depth is identified by a number, soils with paralithic bedrock and fragipan layer depths are noted parenthetically.

^e Land capability classes are included for soil series components separated by a slash "/".

Land capability classes are defined as follows:

Class 1 – soils with moderate limitations that restrict their use;

Class 2 – soils with moderate limitations that reduce the choice of plants or that require moderate conservation practices;

Class 3 – soils with severe limitations that reduce the choice of plants or that require moderate conservation practices, or both;

Class 4 – soils with very severe limitations that reduce the choice of plants or that require very careful management;

Class 5 – soils that are not likely to erode but have other limitations that limit their use, impractical to remove;

Class 6 – soils that have severe limitations that make them generally unsuitable for cultivation;

Class 7– soils that have very severe limitations that make them unsuitable for cultivation and that restrict their use mainly to grazing, forestland, or wildlife habitat; and

Class 8 – soils and miscellaneous areas that have limitations that preclude commercial plant production and that restrict their use to recreational purposes, wildlife habitat, watershed, or esthetic purposes.

Capability Subclasses - are soil groups within one class designated by adding e, w, s, or c. e = main hazard is risk for erosion unless close-growing plant cover is maintained; w = water in or on the soil interferes with plant growth or cultivation; s = soil is limited mainly because it is shallow, droughty, or stony; c = chief limitation of the soil sis climate that is very cold or very dry.

^f Compaction Potentials: Soils with Yes compaction potential are those with more than 18 percent clay in the surface horizon with somewhat poorly drained or wetter drainage class.

^g Erosion Potential: NRCS rating for the relative hazard of off-road or off-trail erosion of soil by water that may result from construction of forest roads and trails. Relative hazards are recorded as N (MO) = no, moderate; N(SL)= no, slight; Y(VS) = yes, very severe; Y(SE) = yes, severe. Wind erosion groups of 1 or 2 are recorded as Y = yes, other wind erosion groups are recorded as N = no.

^h Poor Revegetation Potential: Soils with poor revegetation potential are those with greater than 15 percent slopes or with a very low available water storage (less than 2.5 inches of water per 40 inches of soil).

ⁱ Stony/Rocky Soils: Soils with a Yes risk for introducing large rocks into the topsoil are those with 15 percent or more percent by weight of the surface horizon occupied by rock fragments greater than 3 inches in size or soils with bedrock within 36 inches of the surface.

^j Prime Farmland Soils: Yes = Y (Prime) and Farmland of Statewide Importance Yes = Y (State); N = no. No farmland of local importance is crossed by the proposed pipelines in PA.

APPENDIX S3-3

**TRANSCO PROJECT SPECIFIC UPLAND EROSION
CONTROL, REVEGETATION, AND MAINTENANCE
PLAN**



Transcontinental Gas Pipe Line Company, LLC

**Transco Project-Specific Upland Erosion Control,
Revegetation, and Maintenance Plan**

Regional Energy Access Expansion

March 2021

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I. APPLICABILITY

- A. The intent of this Plan is to identify baseline mitigation measures for minimizing erosion and enhancing revegetation for the Transcontinental Gas Pipe Line Company, LLC (Transco) Regional Energy Access Expansion (Project). Transco will specify in its application for a new Federal Energy Regulatory Commission (FERC) authorization and in prior notice and advance notice filings, individual measures in this Plan it considers unnecessary, technically infeasible, or unsuitable due to local conditions and fully describe alternative measures they would use. Transco will also explain how those alternative measures would achieve a comparable level of mitigation. Deviations from the FERC Plan proposed by Transco to reflect site-specific conditions are **bolded** in the text.

Once the Project is authorized, Transco will request further changes as variances to the measures in the Transco Plan. The Director of the Office of Energy Projects (Director) will consider approval of variances upon Transco's written request, if the Director agrees that a variance:

1. provides equal or better environmental protection;
2. is necessary because a portion of this Plan is infeasible or unworkable based on project-specific conditions; or
3. is specifically required in writing by another federal, state, or Native American land management agency for the portion of the project on its land or under its jurisdiction.

Project-related impacts on wetland and waterbody systems are addressed in the Transco Project-specific Wetland and Waterbody Construction and Mitigation Procedures (Transco Procedures).

II. SUPERVISION AND INSPECTION

A. ENVIRONMENTAL INSPECTION

1. At least one Environmental Inspector is required for each construction spread during construction and restoration (as defined by Section V). The number and experience of Environmental Inspectors assigned to each construction spread shall be appropriate for the length of the construction spread and the number/significance of resources affected.

2. Environmental Inspectors shall have peer status with all other activity inspectors.
3. Environmental Inspectors shall have the authority to stop activities that violate the environmental conditions of FERC's Orders, stipulations of other environmental permits or approvals, or landowner easement agreements; and to order appropriate corrective action.

B. RESPONSIBILITIES OF ENVIRONMENTAL INSPECTORS

At a minimum, the Environmental Inspector(s) shall be responsible for:

1. Inspecting construction activities for compliance with the requirements of the Transco Plan, Transco Procedures, the environmental conditions of FERC's Orders, the mitigation measures (as approved and/or modified by the Order), other environmental permits and approvals, and environmental requirements in landowner easement agreements.
2. Identifying, documenting, and overseeing corrective actions, as necessary to bring an activity back into compliance.
3. Verifying that the limits of authorized construction work areas and locations of access roads are visibly marked before clearing, and maintained throughout construction;
4. Verifying the location of signs and highly visible flagging marking the boundaries of sensitive resource areas, waterbodies, wetlands, or areas with special requirements along the construction work area.
5. Identifying erosion/sediment control and soil stabilization needs in all areas.
6. Ensuring that the design of slope breakers will not cause erosion or direct water into sensitive environmental resource areas, including cultural resource sites, wetlands, waterbodies, and sensitive species habitats.
7. Verifying that dewatering activities are properly monitored and do not result in the deposition of sand, silt, and/or sediment into sensitive environmental resource areas, including wetlands, waterbodies, cultural resource sites, and sensitive species habitats; stopping dewatering activities if such deposition is occurring and ensuring the design of the discharge is changed to prevent reoccurrence; and verifying that dewatering structures are removed after completion of dewatering activities.

8. Ensuring that subsoil and topsoil are tested in agricultural and residential areas to measure compaction and determine the need for corrective action.
9. Advising the Chief Construction Inspector when environmental conditions (such as wet weather or frozen soils) make it advisable to restrict or delay construction activities to avoid topsoil mixing or excessive compaction.
10. Ensuring restoration of contours and topsoil.
11. Verifying that the soils imported for agricultural or residential use are certified as free of noxious weeds and soil pests, unless otherwise approved by the landowner.
12. Ensuring that erosion control devices are properly installed to prevent sediment flow into sensitive environmental resource areas (e.g., wetlands, waterbodies, cultural resource sites, and sensitive species habitats) and onto roads, and determining the need for additional erosion control devices.
13. Inspecting and ensuring the maintenance of temporary erosion control measures at least:
 - a. on a daily basis in areas of active construction or equipment operation;
 - b. a minimum of once a week in areas with no construction or equipment operation; and
 - c. within 24 hours of each 0.5-inch of rainfall.
14. Ensuring the repair of all ineffective temporary erosion control measures within 24 hours of identification, or as soon as conditions allow if compliance with this time frame would result in greater environmental impacts.
15. Keeping records of compliance with the environmental conditions of FERC's Orders, and the mitigation measures in the Transco application submitted to the FERC, and other federal or state environmental permits during active construction and restoration.
16. Identifying areas that should be given special attention to ensure stabilization and restoration after the construction phase.

17. Verifying that locations for disposal of excess construction materials for beneficial reuse comply with Section III.E.

III. PRE-CONSTRUCTION PLANNING

Transco will do the following before construction:

A. CONSTRUCTION WORK AREAS

1. Identify all construction work areas (e.g., construction right-of-way, extra workspace areas, additional temporary workspaces [ATWS] areas, pipe storage and contractor yards, borrow and disposal areas, and access roads) that would be needed for safe construction. Transco will ensure that appropriate cultural resources and biological surveys are conducted, as determined necessary by the appropriate federal and state agencies.
2. Transco will expand required cultural resources and endangered species surveys in anticipation of the need for activities outside of authorized work areas.
3. Plan construction sequencing to limit the amount and duration of open trench sections, as necessary, to prevent excessive erosion or sediment flow into sensitive environmental resource areas.

B. DRAIN TILE AND IRRIGATION SYSTEMS

1. Attempt to locate existing drain tiles and irrigation systems.
2. Contact landowners and local soil conservation authorities to determine the locations of future drain tiles that are likely to be installed within three years of the authorized construction.
3. Develop procedures for constructing through drain-tiled areas, maintaining irrigation systems during construction, and repairing drain tiles and irrigation systems after construction.
4. Engage qualified drain tile specialists, as needed to conduct or monitor repairs to drain tile systems affected by construction. Use drain tile specialists from the Project area, if available.

C. GRAZING DEFERMENT

Develop grazing deferment plans with willing landowners, grazing permittees, and land management agencies to minimize grazing disturbance of revegetation efforts.

D. ROAD CROSSINGS AND ACCESS POINTS

Plan for safe and accessible conditions at all roadway crossings and access points during construction and restoration.

E. DISPOSAL PLANNING

Determine methods and locations for the regular collection, containment, and disposal of excess construction materials and debris (e.g., timber, slash, mats, garbage, drill cuttings and fluids, excess rock) throughout the construction process. Disposal of materials for beneficial reuse must not result in adverse environmental impact and is subject to compliance with all applicable survey, landowner or land management agency approval, and permit requirements.

F. AGENCY COORDINATION

Transco will coordinate with the appropriate local, state, and federal agencies as outlined in this Plan and/or required by the FERC's Orders.

1. Obtain written recommendations from the local soil conservation authorities or land management agencies regarding permanent erosion control and revegetation specifications.
2. Develop specific procedures in coordination with the appropriate agencies to prevent the introduction or spread of invasive species, noxious weeds, and soil pests resulting from construction and restoration activities. Refer to the Transco Project-specific Invasive Species Management Plan.
3. Develop specific procedures in coordination with the appropriate agencies and landowners, as necessary, to allow for livestock and wildlife movement and protection during construction.
4. Develop specific blasting procedures in coordination with the appropriate agencies that address pre- and post-blast inspections; advanced public notification; and mitigation measures for building foundations, groundwater wells, and springs. Use appropriate methods (e.g., blasting mats) to prevent damage

to nearby structures and to prevent debris from entering sensitive environmental resource areas. Refer to the Transco Project-specific Blasting Plan.

G. SPILL PREVENTION AND RESPONSE PROCEDURES

Transco has filed a Project-specific Spill Prevention and Response Procedures, as specified in Section IV of the staff's Procedures. A copy will be filed with the Secretary of the FERC (Secretary) prior to construction and made available in the field on each construction spread. Refer to the Transco Project-specific Construction Spill Prevention and Response Procedures for Oil and Hazardous Materials.

H. RESIDENTIAL CONSTRUCTION

For all properties with residences located within 50 feet of construction work areas, Transco will avoid removal of mature trees and landscaping within the construction work areas unless necessary for safe operation of construction equipment, or as specified in landowner agreements; fence the edge of the construction work area for a distance of 100 feet on either side of the residence; and restore all lawn areas and landscaping immediately following clean-up operations, or as specified in landowner agreements. If seasonal or other weather conditions prevent compliance with these time frames, maintain and monitor temporary erosion controls (sediment barriers and mulch) until conditions allow completion of restoration.

I. WINTER CONSTRUCTION PLANS

Transco has filed a Project-specific Winter Construction Plan.

The plan addresses:

1. Winter construction procedures (e.g., snow handling and removal, access road construction and maintenance, soil handling under saturated or frozen conditions, and topsoil stripping).
2. Stabilization and monitoring procedures if ground conditions will delay restoration until the following spring (e.g., mulching and erosion controls, inspection and reporting, stormwater control during spring thaw conditions).
3. Final restoration procedures (e.g., subsidence and compaction repair, topsoil replacement, seeding).

IV. INSTALLATION

A. APPROVED AREAS OF DISTURBANCE

1. Project-related ground disturbance will be limited to the construction right-of-way, extra workspace areas, ATWS areas, pipe storage yards, borrow and disposal areas, access roads, and other areas approved in the FERC's Orders. Any Project-related ground disturbing activities outside these areas will require prior Director approval. This requirement does not apply to activities needed to comply with the Plan and Procedures (i.e., slope breakers, energy-dissipating devices, dewatering structures, and drain tile system repairs) or minor field realignments and workspace shifts per landowner needs and requirements that do not affect other landowners or sensitive environmental resource areas. All construction or restoration activities outside authorized areas are subject to all applicable survey and permit requirements, and landowner easement agreements.
2. **The Transco construction rights-of-way widths in upland locations for this Project will include:**
 - a. **90 feet for the Regional Energy Lateral; and**
 - b. **100 feet for the Effort Loop.**

Transco will provide extra workspaces and ATWS areas outside the construction rights-of-way for full construction right-of-way topsoil segregation and to ensure safe construction where required by topographic conditions (e.g., side-slopes) or soil limitations. Extra workspace and ATWS areas may also be used in limited, non-wetland or non-forested areas for truck turn-arounds where no reasonable alternative access exists.

Project use of extra workspace and ATWS areas outside authorized work areas is subject to landowner or land management agency approval and compliance with all applicable survey and permit requirements. **Transco will request variances (per Section I.A) for these additional areas and will report the requested and approved variances in its weekly construction reports to FERC.** The following materials will be included in the reports:

- a. the location of each additional area by milepost and reference to previously filed alignment sheets showing the additional areas;

- b. identification of the filing at FERC containing evidence that the additional areas were previously surveyed; and
- c. a statement that landowner approval has been obtained and is available in project files.

B. TOPSOIL SEGREGATION

1. Unless the landowner or land management agency specifically approves otherwise, Transco will prevent the mixing of topsoil with subsoil by stripping topsoil from either the full work area or from the trench and subsoil storage area (ditch plus spoil side method) in:
 - a. cultivated or rotated croplands, and managed pastures;
 - b. residential areas;
 - c. hayfields; and
 - d. other areas at the landowner's or land managing agency's request.
2. In residential areas, importation of topsoil is an acceptable alternative to topsoil segregation.
3. Where topsoil segregation is required:
 - a. segregate at least 12 inches of topsoil in deep soils (more than 12 inches of topsoil); and
 - b. make every effort to segregate the entire topsoil layer in soils with less than 12 inches of topsoil.
4. Maintain separation of salvaged topsoil and subsoil throughout all construction activities.
5. Segregated topsoil may not be used for padding the pipe, constructing temporary slope breakers or trench plugs, improving or maintaining roads, or as a fill material.
6. Stabilize topsoil piles and minimize loss due to wind and water erosion with use of sediment barriers, mulch, temporary seeding, tackifiers, or functional equivalents, where necessary.

C. DRAIN TILES

1. Mark locations of drain tiles damaged during construction.
2. Probe all drainage tile systems within the area of disturbance to check for damage.
3. Repair damaged drain tiles to their original or better condition. Do not use filter-covered drain tiles unless the local soil conservation authorities and the landowner agree. Use qualified specialists for testing and repairs.
4. For new pipelines in areas where drain tiles exist or are planned, ensure that the depth of cover over the pipeline is sufficient to avoid interference with drain tile systems. For adjacent pipeline loops in agricultural areas, install the new pipeline with at least the same depth of cover as the existing pipeline(s).

D. IRRIGATION

Maintain water flow in crop irrigation systems, unless shutoff is coordinated with affected parties.

E. ROAD CROSSINGS AND ACCESS POINTS

1. Maintain safe and accessible conditions at all road crossings and access points during construction. Refer to the Transco Project-specific Traffic Management Plan.
2. If crushed stone access pads are used in residential or agricultural areas, place the stone on synthetic fabric to facilitate removal.
3. Minimize the use of tracked equipment on public roadways. Remove soil or gravel spilled or tracked onto roadways daily or more frequent as necessary to maintain safe road conditions. Repair damages to roadway surfaces, shoulders, and bar ditches.

F. TEMPORARY EROSION CONTROL

Install temporary erosion controls immediately after initial disturbance of the soil. Temporary erosion controls must be properly maintained throughout construction (on a daily basis) and reinstalled as necessary (such as after backfilling of the trench) until replaced by permanent erosion controls or restoration is complete.

1. Temporary Slope Breakers

- a. Temporary slope breakers are intended to reduce runoff velocity and divert water off the construction right-of-way. Temporary slope breakers may be constructed of materials such as soil, silt fence, staked hay or straw bales, or sand bags.
- b. Install temporary slope breakers on all disturbed areas, as necessary to avoid excessive erosion. Temporary slope breakers must be installed on slopes greater than five percent where the base of the slope is less than 50 feet from waterbody, wetland, and road crossings at the following spacing in Pennsylvania (closer spacing shall be used if necessary):

<u>Slope (%)</u>	<u>Spacing (feet)</u>
5 - 15	300
>15 - 30	200
>30	100

- c. Direct the outfall of each temporary slope breaker to a stable, well vegetated area or construct an energy-dissipating device at the end of the slope breaker and off the construction right-of-way.
- d. Position the outfall of each temporary slope breaker to prevent sediment discharge into wetlands, waterbodies, or other sensitive environmental resource areas.

2. Temporary Trench Plugs

Temporary trench plugs are intended to segment a continuous open trench prior to backfill.

- a. Temporary trench plugs may consist of unexcavated portions of the trench, compacted subsoil, sandbags, or some functional equivalent.
- b. Position temporary trench plugs, as necessary, to reduce trenchline erosion and minimize the volume and velocity of trench water flow at the base of slopes.

3. Sediment Barriers

Sediment barriers are intended to stop the flow of sediments and to prevent the deposition of sediments beyond approved workspaces or into sensitive resources.

- a. Sediment barriers may be constructed of materials such as silt fence, staked hay or straw bales, compacted earth (e.g., driveable berms across travelways), sand bags, or other appropriate materials.
 - b. At a minimum, install and maintain temporary sediment barriers across the entire construction right-of-way at the base of slopes greater than five percent where the base of the slope is less than 50 feet from a waterbody, wetland, or road crossing until revegetation is successful as defined in this Plan. Leave adequate room between the base of the slope and the sediment barrier to accommodate ponding of water and sediment deposition.
 - c. Where wetlands or waterbodies are adjacent to and downslope of construction work areas, install sediment barriers along the edge of these areas, as necessary to prevent sediment flow into the wetland or waterbody.
4. Mulch
- a. Apply mulch on all slopes (except in cultivated cropland) concurrent with or immediately after seeding, where necessary to stabilize the soil surface and to reduce wind and water erosion. Spread mulch uniformly over the area to cover at least 75 percent of the ground surface at a rate of 2 tons/acre of straw or its equivalent, unless the local soil conservation authority, landowner, or land managing agency approves otherwise in writing.
 - b. Mulch can consist of weed-free straw or hay, wood fiber hydromulch, erosion control fabric, or some functional equivalent.
 - c. Mulch all disturbed upland areas (except cultivated cropland) before seeding if:
 - (1) final grading and installation of permanent erosion control measures will not be completed in an area within 20 days after the trench in that area is backfilled (10 days in residential areas), as required in Section V.A.1; or

- (2) construction or restoration activity is interrupted for extended periods, such as when seeding cannot be completed due to seeding period restrictions.
- d. If mulching before seeding, increase mulch application on all slopes within 100 feet of waterbodies and wetlands to a rate of 3 tons/acre of straw or equivalent.
- e. If wood chips are used as mulch, do not use more than 1 ton/acre and add the equivalent of 11 lbs/acre available nitrogen (at least 50 percent of which is slow release).
- f. Ensure that mulch is adequately anchored to minimize loss due to wind and water.
- g. When anchoring with liquid mulch binders, use rates recommended by the manufacturer. Do not use liquid mulch binders within 100 feet of wetlands or waterbodies, except where the product is certified environmentally non-toxic by the appropriate state or federal agency or independent standards-setting organization.
- h. Do not use synthetic monofilament mesh/netted erosion control materials in areas designated as sensitive wildlife habitat, unless the product is specifically designed to minimize harm to wildlife. Anchor erosion control fabric with staples or other appropriate devices.

V. RESTORATION

A. CLEANUP

1. Commence cleanup operations immediately following backfill operations. Complete final grading, topsoil replacement, and installation of permanent erosion control structures within 20 days after backfilling the trench (10 days in residential areas). If seasonal or other weather conditions **(such as higher than average precipitation) or other construction conditions (such as tie-ins and associated travel lanes)** prevent compliance with these time frames, maintain temporary erosion controls (i.e., temporary slope breakers, sediment barriers, and mulch) until conditions allow completion of cleanup. **Temporary stabilization will be completed in accordance with state permits, and soils will be allowed**

to dry following higher than average precipitation before being returned to the trench. To minimize the number of tie-ins, Transco will utilize field bends where practicable and minimize the number of hydrostatic test sections. Open trench will be protected with safety fence.

Transco has filed with the Secretary for the review and written approval of the Director, a Winter Construction Plan (as specified in Section III.I). Refer to the Transco Project-specific Winter Construction Plan.

2. A travel lane may be left open temporarily to allow access by construction traffic if the temporary erosion control structures are installed as specified in Section IV.F. and inspected and maintained as specified in Sections II.B.12 through 14. When access is no longer required the travel lane must be removed and the right-of-way restored.
3. Rock excavated from the trench may be used to backfill the trench only to the top of the existing bedrock profile. Rock that is not returned to the trench shall be considered construction debris, unless approved for use as mulch or for some other use on the construction work areas by the landowner or land managing agency.
4. Remove excess rock from at least the top 12 inches of soil in all cultivated or rotated cropland, managed pastures, hayfields, and residential areas, as well as other areas at the landowner's request. The size, density, and distribution of rock on the construction work area shall be similar to adjacent areas not disturbed by construction. The landowner or land management agency may approve other provisions in writing.
5. Grade the construction right-of-way to restore pre-construction contours and leave the soil in the proper condition for planting.
6. Remove construction debris from all construction work areas unless the landowner or land managing agency approves leaving materials onsite for beneficial reuse, stabilization, or habitat restoration.
7. Remove temporary sediment barriers when replaced by permanent erosion control measures or when revegetation is successful.

B. PERMANENT EROSION CONTROL DEVICES

1. Trench Breakers

- a. Trench breakers are intended to slow the flow of subsurface water along the trench. Trench breakers may be constructed of materials such as sand bags or polyurethane foam. Do not use topsoil in trench breakers.
- b. An engineer or similarly qualified professional shall determine the need for and spacing of trench breakers. Otherwise, trench breakers shall be installed at the same spacing as and upslope of permanent slope breakers.
- c. In agricultural fields and residential areas where slope breakers are not typically required, install trench breakers at the same spacing as if permanent slope breakers were required.
- d. At a minimum, install a trench breaker at the base of slopes greater than five percent where the base of the slope is less than 50 feet from a waterbody or wetland and where needed to avoid draining a waterbody or wetland. Install trench breakers at wetland boundaries, as specified in the Transco Procedures.
- e. Trench breakers will be installed in wetlands to prevent water from traveling along the trench and altering micro-watersheds within the wetlands.

2. Permanent Slope Breakers

- a. Permanent slope breakers are intended to reduce runoff velocity, divert water off the construction right-of-way, and prevent sediment deposition into sensitive resources. Permanent slope breakers may be constructed of materials such as soil, stone, or some functional equivalent.
- b. Construct and maintain permanent slope breakers in all areas, except cultivated areas and lawns, unless requested by the landowner, using spacing recommendations obtained from the local soil conservation authority or land managing agency.

In the absence of written recommendations, use the following spacing unless closer spacing is necessary to avoid excessive erosion on the construction right-of-way:

<u>Slope (%)</u>	<u>Spacing (feet)</u>
5 - 15	300
>15 - 30	200
>30	100

- c. Construct slope breakers to divert surface flow to a stable area without causing water to pool or erode behind the breaker. In the absence of a stable area, construct appropriate energy-dissipating devices at the end of the breaker.
- d. **Unless restricted by state permitting**, slope breakers may extend slightly (about four feet) beyond the edge of the construction right-of-way to effectively drain water off the disturbed area. Where slope breakers extend beyond the edge of the construction right-of-way, they are subject to compliance with all applicable survey requirements.

C. SOIL COMPACTION MITIGATION

1. Test topsoil and subsoil for compaction at regular intervals in agricultural and residential areas disturbed by construction activities. Conduct tests on the same soil type under similar moisture conditions in undisturbed areas to approximate pre-construction conditions. Use penetrometers or other appropriate devices to conduct tests.
2. Plow severely compacted agricultural areas with a paraplow or other deep tillage implement. In areas where topsoil has been segregated, plow the subsoil before replacing the segregated topsoil. If subsequent construction and cleanup activities result in further compaction, conduct additional tilling.
3. Perform appropriate soil compaction mitigation in severely compacted residential areas.

D. REVEGETATION

1. General

- a. Transco will ensure successful revegetation of soils disturbed by Project-related activities, except as noted in Section V.D.1.b.
- b. Restore all turf, ornamental shrubs, and specialized landscaping in accordance with the landowner's request, or compensate the landowner. Restoration work must be performed by personnel familiar with local horticultural and turf establishment practices.

2. Soil Additives

Fertilize and add soil pH modifiers in accordance with written recommendations obtained from the local soil conservation authority, land management agencies, or landowner. Incorporate recommended soil pH modifier and fertilizer into the top two inches of soil as soon as practicable after application.

3. Seeding Requirements

- a. Prepare a seedbed in disturbed areas to a depth of three to four inches using appropriate equipment to provide a firm seedbed. When hydroseeding, scarify the seedbed to facilitate lodging and germination of seed.
- b. Seed disturbed areas in accordance with written recommendations for seed mixes, rates, and dates obtained from the local soil conservation authority or at the request of the landowner or land management agency. Seeding is not required in cultivated croplands unless requested by the landowner.
- c. Perform seeding of permanent vegetation within the recommended seeding dates. If seeding cannot be done within those dates, use appropriate temporary erosion control measures discussed in Section IV.F and perform seeding of permanent vegetation at the beginning of the next recommended seeding season. Dormant seeding or temporary seeding of annual species may also be used, if necessary, to establish cover, as approved by the Environmental Inspector. Lawns may be seeded on a schedule established with the landowner.

- d. In the absence of written recommendations from the local soil conservation authorities, seed all disturbed soils within six working days of final grading, weather and soil conditions permitting, subject to the specifications in Section V.D.3.a through V.D.3.c.
- e. Base seeding rates on Pure Live Seed. Use seed within 12 months of seed testing.
- f. Treat legume seed with an inoculant specific to the species using the manufacturer's recommended rate of inoculant appropriate for the seeding method (broadcast, drill, or hydro).
- g. In the absence of written recommendations from the local soil conservation authorities, landowner, or land managing agency to the contrary, a seed drill equipped with a cultipacker is preferred for seed application.

Broadcast or hydroseeding can be used in lieu of drilling at double the recommended seeding rates. Where seed is broadcast, firm the seedbed with a cultipacker or roller after seeding. In rocky soils or where site conditions may limit the effectiveness of this equipment, other alternatives may be appropriate (e.g., use of a chain drag) to lightly cover seed after application, as approved by the Environmental Inspector.

VI. OFF-ROAD VEHICLE CONTROL

To each owner or manager of forested lands, offer to install and maintain measures to control unauthorized vehicle access to the right-of-way. These measures may include:

- a. signs;
- b. fences with locking gates;
- c. slash and timber barriers, pipe barriers, or a line of boulders across the right-of-way; and
- d. conifers or other appropriate trees or shrubs across the right-of-way.

VII. POST-CONSTRUCTION ACTIVITIES AND REPORTING

A. MONITORING AND MAINTENANCE

1. Conduct follow-up inspections of all disturbed areas, as necessary, to determine the success of revegetation and address landowner concerns. At a minimum, conduct inspections after the first and second growing seasons.
2. Revegetation in non-agricultural areas shall be considered successful if upon visual survey the density and cover of non-nuisance vegetation are similar in density and cover to adjacent undisturbed lands. In agricultural areas, revegetation shall be considered successful when upon visual survey, crop growth and vigor are similar to adjacent undisturbed portions of the same field, unless the easement agreement specifies otherwise.

Continue revegetation efforts until revegetation is successful.

3. Monitor and correct problems with drainage and irrigation systems resulting from pipeline construction in agricultural areas until restoration is successful.
4. Restoration will be considered successful when the right-of-way surface condition is similar to adjacent undisturbed lands, construction debris is removed (unless otherwise approved by the landowner or land managing agency per Section V.A.6), revegetation is successful, and proper drainage has been restored.
5. Routine vegetation mowing or clearing over the full width of the permanent right-of-way in uplands will not be done more frequently than every three years. However, to facilitate periodic corrosion/leak surveys, a corridor not exceeding 10 feet in width centered on the pipeline may be cleared at a frequency necessary to maintain the 10-foot corridor in an herbaceous state. In no case will routine vegetation mowing or clearing occur during the migratory bird nesting season between April 15 and August 1 of any year unless specifically approved in writing by the responsible land management agency or the U.S. Fish and Wildlife Service.
6. Efforts to control unauthorized off-road vehicle use, in cooperation with the landowner, shall continue throughout the life of the project. Maintain signs, gates, and permanent access roads as necessary.

B. REPORTING

1. Transco will maintain records that identify by milepost:
 - a. method of application, application rate, and type of fertilizer, pH modifying agent, seed, and mulch used;
 - b. acreage treated;
 - c. dates of backfilling and seeding;
 - d. names of landowners requesting special seeding treatment and a description of the follow-up actions;
 - e. the location of subsurface drainage repairs or improvements made during restoration; and
 - f. problem areas and how they were addressed.
2. Transco will file with the Secretary quarterly activity reports documenting the results of follow-up inspections required by Section VII.A.1; problem areas, including those identified by the landowner; and corrective actions taken for at LEAST 2 YEARS FOLLOWING CONSTRUCTION.

APPENDIX S3-4

**CONSTRUCTION SPILL PREVENTION AND RESPONSE
PROCEDURES FOR OIL AND HAZARDOUS MATERIALS**

Construction Spill Prevention and Response Procedures for Oil and Hazardous Materials

03.00.002-OG-A

Revision 03

Effective Date 01/23/2020



Construction Spill Prevention and Response Procedures for Oil and Hazardous Materials

REGIONAL ENERGY ACCESS EXPANSION PROJECT

July 2022

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Direct Pipe® Monitoring, Inadvertent Return Response, and Contingency Plan

Abbreviations and Acronyms

CI	Chief Inspector
OM	Operations Manager
dt/day	Dekatherms per day
EC	Emergency Coordinator
LEPC	Local Emergency Planning Committee
Mdt/d	Thousand dekatherms per day
MLV	Mainline valve
MP	Milepost
OD	Outside diameter
PPE	Personal protective equipment
Project	Project Name
SOC	Security Operations Center
SPCC	Spill Prevention Control and Countermeasure
TBD	To be determined

SECTION 1 - GENERAL INFORMATION

1.1. Project Location and Description

Transco, indirectly owned by The Williams Companies, Inc. (Williams), is seeking authorization from the Federal Energy Regulatory Commission (FERC or Commission) under Section 7(c) of the Natural Gas Act and Part 157 of the Commission's regulations, to construct, own, operate, and maintain the proposed Project facilities.

The Project is an expansion of Transco's existing natural gas transmission system that will enable Transco to provide an incremental 829,400 dekatherms per day (Dth/d) of year-round firm transportation capacity from the Marcellus Shale production area in northeastern Pennsylvania (PA) to multiple delivery points along Transco's Leidy Line in PA, Transco's mainline at the Station 210 Zone 6 Pooling Point¹ in Mercer County, New Jersey (NJ) and multiple delivery points in Transco's Zone 6 in NJ, PA, and Maryland (MD). The Project will consist of the following components:

- Approximately 22.2 miles of 30-inch-diameter pipeline partially collocated with Transco's Leidy Line A from milepost (MP) 0.00 to MP 22.32 in Luzerne County, PA (Regional Energy Lateral);
- Approximately 13.8 miles of 42-inch-diameter pipeline collocated with Transco's Leidy Line System from MP 43.72 to MP 57.50 in Monroe County, PA (Effort Loop);
- New electric motor driven compressor station identified as Compressor Station 201 with 9,000 nominal horsepower (HP) in Gloucester County, NJ;
- Addition of two gas-fired turbine driven compressor units with 31,800 nominal HP at International Organization for Standardization (ISO) conditions at existing Compressor Station 505 in Somerset County, NJ, to accommodate the abandonment and replacement of approximately 16,000 HP from eight existing internal combustion engine-driven compressor units and increase the certificated station compression by 15,800 HP;
- Addition of two gas-fired turbine driven compressor units with 63,742 nominal HP at ISO conditions and modification of three existing compressors at existing Compressor Station 515 in Luzerne County, PA to support the Project and to

¹ A pooling point defines the aggregation of gas from multiple physical and/or virtual receipt points to a single physical or virtual point, and the disaggregation of gas from a single physical or virtual point to multiple physical and/or virtual delivery points.

accommodate the abandonment and replacement of approximately 17,000 HP from five existing gas-fired reciprocating engine driven compressors and increase the certificated station compression by 46,742 HP;

- Uprate and rewheel two existing electric motor-driven compressor units at existing Compressor Station 195 in York County, PA to increase the certificated station compression by 6,000 HP and accommodate the abandonment of two existing gas-fired reciprocating engine driven compressors, which total approximately 8,000 HP;
- Modifications at existing Compressor Station 200 in Chester County, PA;
- Uprate one existing electric motor-driven compressor unit at Compressor Station 207 in Middlesex County, NJ to increase the certificated station compression by 4,100 HP;
- Modifications to three (3) existing pipeline tie-ins in PA (Hildebrandt Tie-in, Lower Demunds REL Tie-in, and Carverton Tie-in);
- Addition of regulation controls at an existing valve setting on Transco's Mainline "A" in Bucks County, PA (Mainline A Regulator);
- Modifications at the existing Delaware River Regulator in Northampton County, PA;
- Modifications at the existing Centerville Regulator in Somerset County, NJ;
- Modifications to the existing valves and piping at the Princeton Junction (Station 210 Pooling Point) in Mercer County, NJ;
- Modifications to three (3) existing delivery meter stations in NJ (Camden M&R Station, Lawnside M&R Station, and Mt. Laurel M&R Station);
- Modifications to one (1) existing delivery meter station in MD (Beaver Dam M&R Station);
- Contractual changes (no modifications) at ten (10) existing delivery meter stations in PA and NJ (Algonquin-Centerville Meter Station, Post Road Meter Station, New Village Meter Station, Spruce Run Meter Station, Marcus Hook Meter Station, Ivyland Meter Station, Repaupo Meter Station, Morgan Meter Station, Lower Mud Run Meter Station, and Chesterfield Meter Station);

- Additional ancillary facilities, such as mainline valves (MLVs), cathodic protection, communication facilities, and internal inspection device (e.g., pig) launchers and receivers in PA; and
- Existing, improved, and new access roads and contractor yards/staging areas in PA, NJ, and MD.

Subject to FERC's certification of the Project and receipt of the necessary permits and authorizations, Transco anticipates construction of the Project would commence in second quarter 2023 to meet a proposed in-service date in fourth quarter 2024.

1.2. Definitions:

Oil is defined in the SPCC regulations as oil of any kind or in any form including, but not limited to, petroleum, fuel oil, sludge, oil refuse, and oil mixed with wastes other than dredged spoil and oily mixtures.

Hazardous Material as defined by the DOT includes:

- Hazardous substances, hazardous wastes, marine pollutants, elevated temperature materials, materials designated as hazardous in the Hazardous Materials Table (see 49 CFR 172.101), and materials that meet the defining criteria for hazard classes and divisions in part 173 of subchapter C of this chapter. Hazardous Materials typically found on construction projects include, but are not limited to, petroleum oils, hydraulic fluids, engine coolants (ethylene glycol), x-ray film developer, chemical additives, pipe coatings, used abrasive blasting media, etc. Hazardous Substance is defined in DOT 49 CFR 171.8 and EPA 40 CFR 302.4 and OSHA 29 CFR 1910.120.

Hazardous Materials as specified in contracts means:

- Any substance, materials, and chemicals defined or included in the definition of "hazardous substances," hazardous materials," "toxic substances," "solid wastes," "pollutants," "contaminants," or similar identification, under any Environmental Law.
- Any other chemical, material, or substance, exposure to which is prohibited, limited or regulated by any governmental Authority; or 3) any regulated constituents or substances in concentrations or levels that exceed numeric or risk-based standards established under Environmental Laws.

Hazardous Substance as defined in 49 CFR 171.8 is material, including its mixtures and solutions, that:

- Is listed in the appendix A to §172.101
- Is in a quantity, in one package, which equals or exceeds the reportable quantity (RQ) listed in the appendix A to §172.101 of this subchapter; and
- When in a mixture or solution is in a concentration by weight which equals or exceeds the concentration corresponding to the RQ of the material (except for radionuclides, Under 40 CFR 302.4 (CERCLA), hazardous substances are designated as:
- Listed hazardous substances. The elements and compounds and hazardous wastes appearing in table 302.4 are designated as hazardous substances under section 102(a) of the Act.

- Unlisted hazardous substances. A solid waste, as defined in 40 CFR 261.2, which is not excluded from regulation as a hazardous waste under 40 CFR 261.4(b), is a hazardous substance under section 101(14) of the Act if it exhibits any of the characteristics identified in 40 CFR 261.20 through 261.24.

Under 29 CFR 1910.120, the term "hazardous substance" encompasses those substances defined as hazardous by the U.S. Environmental Protection Agency (EPA) and the U.S. Department of Transportation (DOT).

1.3. Contractor Responsibility:

The Contractor shall be familiar with this Construction Spill Plan and its contents prior to commencing any construction-related activities. The Plan will be followed to prevent any spills that may occur during the project and to mitigate any spills that do occur.

Company representatives assigned to this project include:

Operations Manager (OM):	<i>Insert name here</i>
Chief Inspector (CI):	<i>Insert name here</i>
Environmental Specialist (Permitting):	<i>Insert name here</i>
Environmental Specialist (Compliance):	<i>Insert name here</i>

SECTION 2 - SPILL PLAN REQUIREMENTS

Contractor shall determine the approximate quantities of oil or oil-like substances (including fuels) and any hazardous materials or substances that will be present or stored at the work site(s) to assist Company’s Environmental Inspector in identifying the appropriate spill plan that shall be applicable for the Work. For Section 2.2 and 2.3 the quantities carried by fuel trucks that are on site temporarily to refuel equipment shall not be included in Contractor’s calculation of the amount of oil or oil-like substances stored at any facility/site.

2.1. Company Construction Spill Plan for Oil and Hazardous Materials

If during the course of Work, any amount of oil or oil-like substances or hazardous materials will be present or stored at any facility/site, or any disturbance of a wetlands or waterbody, Contractor shall comply with and complete the remaining sections and requirements of this document (i.e., Construction Spill Plan). Contractor’s field personnel shall be familiar with this plan before initiating any onsite activities and shall follow all requirements and responsibilities of this plan as they are listed for Contractor. Contractor shall provide, prior to start of the Work but no later than the pre-job meeting, all of the initial information required by the applicable/designated plan. Contractor shall provide Company with additional information to keep the plan current.

2.2. U.S. Environmental Protection Agency Tier I Qualified Facility Spill Prevention, Control, and Countermeasure (SPCC) Plan

If during the course of Work, greater than 1,320 gallons of oil or oil-like substances but less than 10,000 gallons with no containers greater than 5,000 gallons in capacity will be present or stored at any facility/site, Contractor shall comply with 2.1 above and complete the remaining sections

and requirements of this document PLUS comply with and complete the requirements of the “U.S. Environmental Protection Agency Tier I Qualified Facility SPCC Plan,” attached to this section, or develop a full SPCC Plan. Contractor’s field personnel shall be familiar with this plan before initiating any onsite activities and shall follow all requirements and responsibilities of this plan as they are listed for Contractor. Contractor shall provide, prior to start of the Work but no later than the pre-job meeting, all of the initial information required by the plan. Contractor shall provide Company with additional information to keep the plan current.

2.3. U.S. Environmental Protection Agency Full SPCC Plan

If during the course of Work, 5,000 gallons or more of oil or oil-like substances contained in a single container, or a total of 10,000 gallons or more, will be present or stored at any facility/site, Contractor shall comply with 2.1 above and complete the remaining section of this document PLUS comply with and complete the requirements of a full U.S. Environmental Protection Agency SPCC Plan, which must be reviewed and approved by a professional engineer. Contractor’s field personnel shall be familiar with this plan before initiating any onsite activities and shall follow all requirements and responsibilities of this plan as they are listed for Contractor. Contractor shall provide, prior to start of the Work but no later than the pre-job meeting, all of the initial information required by the plan. Contractor shall provide Company with additional information to keep the plan current.

SECTION 3 - DRAINAGE PATTERNS AND SPILL PREVENTION PRACTICES

3.1. Drainage Patterns

Drainage patterns across the Project are dendritic or tree shaped. This pattern develops in a variety of structural and lithological environments such as in the mountainous and hilly areas. The evolution of dendritic pattern is guided by the lithological characteristics mainly the permeability of underlying rocks, the amount and regime of rainfall and resultant surface runoff and the time factor. Typically, surface runoff will sheet flow across level surfaces and will infiltrate into soil and to some degree underlying rocks until permeability and lithological characteristics prevent such infiltration at which point surface to groundwater will discharge downslope in the form of seeps or provide base flow to streams. Surface runoff will channelize as slopes increase or topography funnels flow paths at which time energy will increase and accelerated erosion will begin to form dendritic patterns.

Responsibility: Chief Inspector

Construction and Operations personnel will be familiar with drainage patterns for the project and be prepared to implement measures to control any release.

3.2. Spill Prevention Practices

The Contractor shall take the following precautions to ensure that an oil or hazardous materials spill does not occur:

A. Containers/Pumps/Concrete Coating

1. All containers shall be stored on level ground at least 100 feet from any waterway, wetland, or designated municipal watershed area or as prescribed by a project specific permit. All containers should be located within temporary containment.

2. Temporary containment will include, but not be limited to, temporary hay bale berms with plastic sheets underlining the entire contained area. and it is recommended that these areas be inspected daily or after any significant precipitation event.
3. Containment areas shall be capable of containing 110% of the volume of the single largest container of hazardous material being stored plus sufficient freeboard to hold the 25 year/24 hour storm.
4. All container storage areas shall be routinely inspected for integrity purposes. If hazardous wastes are being stored a weekly inspection must be documented.
5. Leaking and/or deteriorated containers shall be replaced as soon as the condition is first detected with clean-up measures immediately taking place.
6. No incompatible materials shall be stored in the same containment area.
7. No container storage areas shall be left unsecured during non-work hours.
8. Accumulated rainwater in the containment areas must be inspected prior to release to the ground; it must be free of sheens or other hazardous materials.
9. Pumps operating within 100 feet of a waterbody or wetland boundary shall utilize the appropriate agricultural or industrial grade containers/materials as a secondary containment system to prevent spills.
10. Concrete coating operations shall not be performed within 100 feet of a wetland or waterbody unless the location is an existing industrial site designated for such use. If no reasonable alternatives exist, consult with the EI and Company Environmental Lead for other options.
11. Secondary containment should be installed around all stationary hydraulic equipment at Trenchless Technology Crossings

B. Tanks

1. The Contractor shall operate only those tanks that meet the requirements and specifications of applicable regulations and that are surrounded with temporary containment as described above.
2. Self-supporting tanks shall be constructed of materials compatible with its contents.
3. All tanks shall be routinely inspected for integrity purposes.
4. Vehicle mounted tanks shall be equipped with flame/spark arrestors on vents to ensure that self-ignition does not occur.
5. Tanks will not be used to store incompatible materials in sequence unless first thoroughly decontaminated.
6. Any tank utilized for storing different products between construction locations will be thoroughly decontaminated prior to refilling.

C. Unloading/Loading Areas

1. If it is necessary during the project, re-fueling and transferring of liquids shall only occur in pre-designated locations that are on level ground and at least 100 feet from any waterway. Where conditions require construction equipment (e.g., Bobcat/front-end loader/excavator) to be re-fueled within 100 feet of any waterway, or as prescribed by a project specific permit, the above requirements shall also apply and will be strictly enforced. This activity must be continuously manned (minimum of two attendants plus a Company Inspector) to ensure that overfilling, leaks, or spills do not occur. In addition, all this equipment must be surrounded by temporary containment as described above.
2. All service vehicles used to transport fuel must travel only on approved access roads and workspace and be equipped with an appropriate number of fire extinguishers and an oil spill response kit as identified in Table 2 of Appendix A.

D. Inadvertent Return Contingency Plan

1. See Appendix C

SECTION 4 - EMERGENCY RESPONSE PROCEDURES

This section provides a generic description of emergency response procedures to be performed to address oil and hazardous materials spills at the job site. Each response will vary depending upon the nature and extent of the incident. However, the general procedures outlined below will be followed.

4.1. Contractor Responsibilities

1. The Contractor must designate both an Emergency Coordinator (EC) and an Alternate EC for the project.
2. The Contractor is responsible for appropriately addressing all spills that occur directly as a result of construction-related activities.
3. For all spills the internal notification requirements of this Plan as well as WIMS 11.05.00.01 – Incident Notification and Reporting need to be followed. For spills (spills that take less than a shovel-full of dirt to clean-up), no internal notification requirements of this Plan need to be followed. However, this does not relieve the Contractor from appropriately remediating the area and reporting the spill in the daily report.
4. The Contractor shall supply the necessary manpower, PPE, and spill response equipment to appropriately address all spills that directly occur as a result of construction-related activities.
5. Ensure that all emergency spill response equipment and PPE is well-stocked and in good condition. Replace used materials when necessary.
6. If the situation warrants it, the Contractor, in consultation with the CI, shall immediately notify any local emergency spill response contractors for assistance.
7. The Contractor shall be responsible for hiring a Company approved emergency spill response contractor if the nature of the incident requires it.
8. The Contractor is responsible for immediately notifying the CI, EI or Operations Manager of any spills. The Contractor is responsible immediately reporting all spills to the CI (or OM) who will immediately contact Security Operations Center (SOC) at **855-945-5762** per 11.05.00.01 – Incident Notification and Reporting. Table 2 (of Appendix A) includes a list of emergency contacts.

4.2. Company Responsibilities

1. The Company shall be responsible for ensuring that the Contractor adequately follows the procedures outlined in this Plan at all times.
2. The Company shall be responsible for all verbal and written external notifications made to any regulatory agency or any local emergency responders.

4.3. Emergency Contacts

Table 1 (Appendix A) provides a list of Company and Contractor emergency contacts.

4.4. Duties of Chief Inspector or Operations Manager

The duties of the CI, EI or OM for reportable spills include the following:

1. Determine the source, character, amount, and extent of the spill.
2. Assess the potential hazards to the job site, environment, and surrounding community and contact the Construction Employee Safety Representative if any hazards are detected.
3. Evacuate the area if necessary.
4. Report the spill in accordance with the internal notification procedures outlined in Section 5.1 and the external notification procedures outlined in Section 5.2.
5. Commit manpower and equipment for minor incidents that can be reasonably remediated by the Contractor.
6. Oversee Contractor's spill response efforts to contain and control all spills to ensure they adequately follow the procedures outlined in this Plan.
7. Document the Contractor's response effort, including taking photographs wherever possible.
8. Generate a Concern Report, or request that the SOC generate a Concern Report.

SECTION 5 - EMERGENCY SPILL RESPONSE AND PERSONAL PROTECTIVE EQUIPMENT

Table 2 (Appendix A) provides a list of the minimally required Emergency Spill Response Equipment and Personal Protective Equipment (PPE) for this project.

SECTION 6 - SPILL NOTIFICATION PROCEDURES

6.1. Internal Notifications

1. All spills are to be immediately reported to the CI, EI or OM who will immediately contact SOC per [11.05.00.01 – Incident Notification and Reporting](#). Table I (Appendix A) includes a list of emergency contacts.
2. The person reporting the spill/release should review Appendix B for a list of minimum information requirements needed for reporting to the SOC.
3. The SOC is responsible for generating a Concern Report and notifying the appropriate Environmental Specialist.
4. The Environmental Specialist will review the Concern Report and “escalate” or “close” the concern as appropriate.
5. The SOC is responsible for notifying Manager, Environmental Services, as specified in [11.05.00.01 – Incident Notification and Reporting](#). Included as Appendix A is Table 1, which is a list of Company and Contractor emergency contact numbers.

6.2. External Notifications

1. The SOC is responsible for immediately notifying the National Response Center (NRC), and other regulatory agencies, as specified in [11.05.00.01 – Incident Notification and Reporting](#).
2. The CI, EI and or OM will consult with the appropriate Company Lead Environmental

Specialist and determine who will be responsible for any necessary first-response notifications to an emergency spill response team to help contain the spill. If the spill occurs offshore, refer to the Offshore Spill Response Plan (OSRP). The CI (or OM) is responsible for any necessary first-response notifications to an emergency spill response team for assistance containing the spill. If the spill occurs offshore, refer to the Offshore Spill Response Plan (OSRP).

3. After all required immediate notifications are made by the SOC, Manager, Environmental Services will make any necessary subsequent verbal and written notifications to regulatory agencies.
4. If a spill poses a threat to human health or the environment, the SOC, shall coordinate with the EH&S Representative for the affected area to immediately contact the Local Emergency Planning Committee (LEPC). When determining if the LEPC should be contacted or not, any gas release to the atmosphere must be taken into consideration. Note: Linear Projects may extend through multiple LEPC jurisdictions. As a result, all jurisdictions must be listed below.

The appropriate LEPC is:

Name:	<i>Enter</i>
Organization:	<i>Enter</i>
Phone Number:	<i>Enter</i>

6.3. Emergency Spill Response Contractors

The Company has arrangements with several emergency spill response contractors to address emergency responses beyond the capabilities of the Contractor.

If necessary, the following firms could be utilized for this project:

Company:	<i>Enter</i>
Name:	<i>Enter</i>
Location:	<i>Enter</i>
Phone Number:	<i>Enter</i>

Company:	<i>Enter</i>
Name:	<i>Enter</i>
Location:	<i>Enter</i>
Phone Number:	<i>Enter</i>

6.4. Local Emergency Responders

The Contractor or the CI (or OM) may call the following local emergency responders should their assistance be required:

Service	Telephone Number
Emergency Medical Services	<i>Enter</i>
Hospital	<i>Enter</i>
Fire	<i>Enter</i>
Police	<i>Enter</i>

Note: Linear Projects may extend through multiple Emergency Responder areas. Contractor must ensure all jurisdictions are listed. Use attachments as needed.

SECTION 7 – CLEAN-UP PROCEDURES

The following section outlines specific procedures to be followed when addressing spills:

7.1. Spills

1. Small spills and leaks must be remediated as soon as feasible. Use absorbent pads wherever possible.
2. Restrict spills to the containment area, if possible, by stopping or diverting flow.
3. If the spill exceeds the containment structure's capacity, immediately construct additional containment using sandbags or fill material. Every effort must be made to prevent the spills from entering a water body.
4. If a spill reaches a water body, immediately place oil booms downstream in order to contain the material. As soon as possible, remove the floating layer with absorbent pads.
5. After all recoverable oil has been collected and drummed, place all contaminated PPE, spill clean-up equipment, and any impacted soil into appropriate containers.
6. For significant quantities of impacted soils, construct temporary waste piles using plastic sheets. This material should subsequently be transferred into lined roll-off boxes as soon as feasible.
7. The Company Lead Environmental Specialist will coordinate all waste characterization, profiling, and disposal activities.

7.2. Equipment Cleaning/Storage

1. Upon completion of remedial activities, the Contractor shall be responsible for decontaminating the used emergency response equipment as well as the PPE.
2. The Contractor shall be responsible for replacing any spent emergency response equipment and PPE prior to resuming construction-related activities.
3. Decontamination rinse fluids shall be collected and containerized. The Environmental Specialist will coordinate waste characterization and disposal activities.
4. Reusable PPE shall be tested and inventoried prior to being placed back into service.

7.3. Waste Disposal

The Contractor may be responsible for waste management and waste disposal or any waste generated as the result of a spill (review contract language and project specifics). However, the Contractor's Environmental Representative will coordinate with the Williams Environmental Specialist for all waste characterization, profiling, and disposal activities. The Williams Environmental Specialist should refer to 03.00.00.03 – Waste Management, as needed.

Appendix A

Table 1: List of Emergency Contacts

Name	Job Description	Phone Number (24-hr)
Security Operations Center (SOC)	24-hour Call Center	855-945-5762
Chief Inspector	<i>Insert name here</i>	<i>Enter number</i>
Operations Manager	<i>Insert name here</i>	<i>Enter number</i>
Environmental Specialist	<i>Insert name here</i>	<i>Enter number</i>
Contractor	Job Description	Phone Number
Emergency Coordinator	<i>Insert name here</i>	<i>Enter number</i>
Alternate Emergency Coordinator	<i>Insert name here</i>	<i>Enter number</i>
Regulatory Agencies	Name	Phone Number
	National Response Center	800/424-8802
	State Emergency Response Commission (SERC)	<i>Enter number</i>
	<i>Insert jurisdictional agency here (LEPC, FD, PD, Sheriff, etc.)</i>	<i>Enter number</i>

Table 2: Emergency Spill Response and Personal Protective Equipment

Modify this list as necessary for site conditions. *Minimum requirements are shown with an **.

Equipment	Quantity	Location
Chemical spill kit	1	adjacent to workspace
Oil spill kit	1	adjacent to workspace

SPILL RESPONSE EQUIPMENT:
1, 55-gallon open-head drum *
Blank drum labels *
2 shovels *
1 oil boom (10' x 3") * / 2 oil booms recommended
10 oil pillows (18" x 18") *
10 oil socks (48" x 3") *
25 oil mats/pads (24" x 24") *
1 box garden-sized, 6-mil, disposal polyethylene bags (w/ ties) *
1 bag loose chemical pulp 3 chemical pillows (18" x 18")
3 chemical socks (48" x 3") 10 chemical mats/pads (24" x 24")

PERSONAL PROTECTIVE EQUIPMENT:
The inventory of PPE should include enough for at least 4 responders reacting to a significant leak/spill.
4 pairs of oil-proof gloves *
Splash goggles
half-face respirators (w/ cartridges for benzene)
Tyvek suits
waterproof/ chemical resistant hip-waders

Appendix B

Spill/Release Reporting Checklist

Call SOC for any Spill. Gather the following information when reporting spills/releases to the SOC:	Notes	
Name, title, company and phone number of person reporting incident		
Spill/release location, project, facility, right-of-way (state, county, city, township, range, address, coordinates, nearest crossroads)		
Date of spill/release		
Time of spill/release		
Was material released as a liquid, solid, or gas?		
Description of material released (oil, hydraulic fluid, glycol, condensate, etc.)		
Estimated amount (volume or weight) of material spilled/released (Specify Unit – gal, ft ³ , lbs., etc.)		
Has spill/release been stopped?		
Duration of spill/release (date and time release was stopped)		
Affected media (land, water, air, secondary containment, building, etc.)		
Has affected area of spill/release been cleaned up?		
Duration of spill/release cleanup activities		
Estimated volume and/or weight of cleaned up material. Specify type of material removed such as soil, concrete, pads, and unit of measure (gal, ft ³ , lbs., etc.)		
Containment of cleaned up material (drum, tank, roll off) and location (spill site, contractor yard, station)		
Brief description of cause of spill/release		
Complete Environmental Concern Report – Contact SOC		
Contacts:	SOC (Required)	
	Supervisor	
	Pipeline Control	
	Environmental Specialist	
Additional Notes:		

Revision History

Rev Date	Rev #	Request #	Section #	Description
01/23/2020	00	N/A	N/A	New WIMS Operating Guideline attachment.
3/18/2021	01	N/A	N/A	Regional Energy Access Expansion Project
3/1/2022	02	N/A	N/A	Regional Energy Access Expansion Project- TD Updates
7/14/2022	03	N/A	N/A	Regional Energy Access Expansion Project- TD Updates – DP Plan – Appendix C

Appendix C

Direct Pipe[®] Monitoring, Inadvertent Return Response, and Contingency Plan



Transcontinental Gas Pipe Line Company, LLC

**Direct Pipe® Monitoring,
Inadvertent Return Response, and Contingency Plan**

Regional Energy Access Expansion

July 2022

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List of Acronyms and Abbreviations

cfs	Cubic feet per second
CI	Chief Inspector
Commission	Federal Energy Regulatory Commission
Contractor	Direct Pipe® Contractor
DP	Direct Pipe®
Dth/d	Dekatherms per day
EI	Environmental Inspector
FERC or Commission	Federal Energy Regulatory Commission
HDD	Horizontal Directional Drill
Plan	Direct Pipe® Monitoring, Inadvertent Return Response, and Contingency Plan
HP	Horsepower
IR	Inadvertent Return
ISO	International Organization for Standardization
Mdt/d	Thousand Dekatherms Per Day
MLV	Mainline Valve
MP	Milepost
M&R	Meter and Regulating
NSF/ANSI	NSF/American National Standards Institute
NTU	Nephelometric Turbidity Units
OD	Outside Diameter
PADEP	Pennsylvania Department of Environmental Protection
PFBC	Pennsylvania Fish and Boat Commission
Project	Regional Energy Access Expansion
Protocol	Drilling Fluids Management Protocol
ROW	Right-of-Way
SDS	Safety Data Sheets
State Agency	State Agency
Transco	Transcontinental Gas Pipe Line Company, LLC

UAV	Unmanned Aerial Vehicle
USFWS	United States Fish and Wildlife Service
Williams	The Williams Companies, Inc.

1 INTRODUCTION

1.1 PROJECT BACKGROUND

Transco, indirectly owned by The Williams Companies, Inc. (Williams), is seeking authorization from the Federal Energy Regulatory Commission (FERC or Commission) under Section 7(c) of the Natural Gas Act and Part 157 of the Commission's regulations, to construct, own, operate, and maintain the proposed Project facilities.

The Project is an expansion of Transco's existing natural gas transmission system that will enable Transco to provide an incremental 829,400 dekatherms per day (Dth/d) of year-round firm transportation capacity from the Marcellus Shale production area in northeastern Pennsylvania (PA) to multiple delivery points along Transco's Leidy Line in PA, Transco's mainline at the Station 210 Zone 6 Pooling Point¹ in Mercer County, New Jersey (NJ) and multiple delivery points in Transco's Zone 6 in NJ, PA, and Maryland (MD). The Project will consist of the following components:

- Approximately 22.2 miles of 30-inch-diameter pipeline partially collocated with Transco's Leidy Line A from milepost (MP) 0.00 to MP 22.2 in Luzerne County, PA (Regional Energy Lateral);
- Approximately 13.8 miles of 42-inch-diameter pipeline collocated with Transco's Leidy Line System from MP 43.72 to MP 57.50 in Monroe County, PA (Effort Loop);
- New electric turbine driven compressor station identified as Compressor Station 201 with 9,000 nominal horsepower (HP) in Gloucester County, NJ;
- Addition of two gas-fired turbine driven compressor units with 31,800 nominal HP at International Organization of Standardization (ISO) conditions at existing Compressor Station 505 in Somerset County, NJ, to accommodate the abandonment and replacement of approximately 16,000 HP from eight existing internal combustion engine-driven compressor units and increase the certificated station compression by 15,800 HP;
- Addition of two gas-fired turbine driven compressor units with 63,742 nominal HP at ISO conditions and modification of three existing compressors at existing

¹ A pooling point defines the aggregation of gas from multiple physical and/or virtual receipt points to a single physical or virtual point, and the disaggregation of gas from a single physical or virtual point to multiple physical and/or virtual delivery points.

Compressor Station 515 in Luzerne County, PA to support the Project and to accommodate the abandonment and replacement of approximately 17,000 HP from five existing gas-fired reciprocating engine driven compressors and increase the certificated station compression by 46,742 HP;

- Uprate and re-wheel two existing electric motor-driven compressor units at existing Compressor Station 195 in York County, PA to increase the certificated station compression by 6,000 HP and accommodate the abandonment of two existing gas-fired reciprocating engine driven compressors, which total approximately 8,000 HP;
- Modifications at existing Compressor Station 200 in Chester County, PA;
- Uprate one existing electric motor-driven compressor unit at Compressor Station 207 in Middlesex County, NJ to increase the certificated station compression by 4,100 HP;
- Modifications to three (3) existing pipeline tie-ins in PA (Hildebrandt Tie-in, Lower Demunds REL Tie-in, and Carverton Tie-in);
- Addition of regulation controls at an existing valve setting on Transco's Mainline "A" in Bucks County, PA (Mainline A Regulator);
- Modifications at the existing Delaware River Regulator in Northampton County, PA;
- Modifications at the existing Centerville Regulator in Somerset County, NJ;
- Modifications to the existing valves and piping at the Princeton Junction (Station 210 Pooling Point) in Mercer County, NJ;
- Modifications to three (3) existing delivery meter stations in NJ (Camden M&R Station, Lawnside M&R Station, and Mt. Laurel M&R Station);
- Modifications to one (1) existing delivery meter station in MD (Beaver Dam M&R Station);
- Contractual changes (no modifications) at ten (10) existing delivery meter stations in PA and NJ (Algonquin-Centerville Meter Station, Post Road Meter Station, New Village Meter Station, Spruce Run Meter Station, Marcus Hook Meter Station, Ivyland Meter Station, Repaupo Meter Station, Morgan Meter Station, Lower Mud

Run Meter Station, and Chesterfield Meter Station);

- Additional ancillary facilities, such as mainline valves (MLVs), cathodic protection, communication facilities, and internal inspection device (e.g., pig) launchers and receivers in PA; and
- Existing, improved, and new access roads and contractor yards/staging areas in PA, NJ, and MD.

Transco is proposing to use the Direct Pipe® (DP) construction method to cross the Susquehanna River as part of the Project. As part of the FERC's *Guidance for Horizontal Directional Drill Monitoring, Inadvertent Return Response, and Contingency Plans*, FERC defines an HDD as any type of trenchless construction method, including horizontal directional drilling and proprietary technologies, that utilizes drilling fluids under pressure. Although Transco is not proposing an HDD, Direct Pipe® technology would fit under this definition because it is a trenchless method that utilizes drilling fluid under pressure.

Transco has conducted geotechnical studies at the proposed DP crossing to evaluate the risks inherent in using the DP crossing method and has determined that the proposed crossing is feasible with a high likelihood of success. The DP Design Plan is included as Appendix B. Transco has developed this DP Monitoring, Inadvertent Return Response, and Contingency Plan (Plan) to establish procedures for monitoring and managing risks throughout the installation, and to allow for a quick and organized response in the event of an inadvertent release during the DP process. The specific objectives of this Plan include:

- Defining the DP process and how to identify when it has failed and should be abandoned;
- Identifying the procedures that will be followed if a DP must be abandoned;
- Minimizing the potential for an inadvertent release of drilling fluids;
- Identifying the timely detection of an inadvertent release of drilling fluids;
- Providing for environmental protection of waterbodies and associated habitats, in the event an inadvertent release occurs;
- Establishing response procedures to address containment and clean-up of an inadvertent release of fluids; and
- Providing for notifying the appropriate parties and regulatory agencies in the event of an inadvertent release of fluids.

Transco will ensure that the DP Contractor(s) (Contractor) complies with the methods outlined herein during construction, restoration, and operation of the Project. Contractor personnel will be trained on the requirements of this Plan during mandatory pre-construction environmental training. Compliance will be documented in the field by Environmental Inspectors (EI) in weekly construction inspection reports, which will be submitted to FERC for review and comment. This Plan is subject to revision based on new data or on agency recommendations.

Preparing for a successful DP crossing, one that minimizes impacts to sensitive resources and the surrounding communities, means that the Project team has:

- Identified the appropriate resources to oversee the installation and provided clear direction on roles and responsibilities.
- Trained its personnel on how to properly monitor conditions of the installation so that they may recognize both normal and abnormal operating conditions.
- Trained its employees on how to respond to abnormal operating conditions, to take corrective or mitigating actions before a warning sign escalates into something more concerning.
- Trained its employees on how to respond to an inadvertent return, so they may understand direct actions that need to be taken in the field to mitigate the impact, and so they may know how to report such an incident.

1.2 DIRECT PIPE® PROCESS

The DP installation method is a single-pass trenchless pipe installation method that is a registered trademark of the trenchless technology system developed by Herrenknecht AG, Germany. It combines the benefits of microtunneling and HDD techniques. Relative to a traditional HDD installation, this technology minimizes the likelihood of hydraulic fracture and inadvertent release of drilling fluids because lower annular fluid pressures are required. This method uses simultaneous borehole excavation and pipe installation in a single pass process which reduces the risk of hole collapse.

DP is a remotely-controlled, guided, steerable, pipe installation process that provides continuous support to the excavation face. The process involves pushing pipe (casing or product pipe), behind a micro-tunneling boring machine (MTBM) from a pipe thruster positioned in a launch pit. A key element of DP is the ability to continuously support and control the tunnel face by applying mechanical force from the pipe thruster as well as slurry fluid pressure to the tunnel face that balances soil and groundwater pressures. A cutter wheel at the leading end of the MTBM

excavates material as a pressurized slurry system removes the cuttings through a dedicated discharge line located inside of the pipe. Since the slurry returns through dedicated discharge lines inside the pipe, the risk of inadvertent returns is reduced. The DP process does not require routine personnel entry into the tunnel; however, entry may be required for survey verification or repair/maintenance activities.

For DP crossings with a carrier pipe that is less than 42 inches, it is common to perform the DP operations with a larger casing pipe and then thrust the carrier pipe into the tunnel behind the larger casing pipe. This size difference leaves an annular space around the smaller carrier pipe. For such circumstances, a settlement analysis should be performed to examine the site-specific conditions and the DP design, and to calculate possible settlement. As determined by the settlement analysis, the annular space may need to be grouted to minimize the likelihood for subsidence.

1.3 DIRECT PIPE® CROSSING INFORMATION

The following tables summarize basic information for the DP location associated with the project. Please note there is not a Wetland Crossings table as there are no wetlands being crossed with the DP.

- **Table 1:** Provides information pertaining to the proposed **DP crossing** location including the crossing name, pipeline diameter, location (DP launching and receiving milepost), total length; and subsurface material.
- **Table 2:** Provides information pertaining to the proposed **waterbody crossings** including a unique feature identification, stream flow rate, DP launching and receiving stationing, elevation difference, depth of cover, and horizontal setback from the DP launching and receiving exit locations.
- **Table 3:** As recommended by the FERC Guidance, this table contains an abbreviated list of **potential unique conditions** or features that may increase the risk of DP failure or potential resource impacts. Subsurface mines were the only example of unique conditions that was encountered at this DP site. The subsurface mines were anticipated to cause significant problems for the HDD construction method, but this DP has been designed with safe separation above any potential mining activity.

**Table 1
Proposed DP Locations**

Crossing Name	Pipeline Diameter (inches)	Approx. Entry Milepost	Approx. Exit Milepost	Total Length (feet)	Subsurface Material
Project Component Name					
Susquehanna River	30	13.72	13.47	1,297	Clay, Sand, Silt, and Gravel

**Table 2
DP Waterbody Crossings**

Waterbody ID (Name)	Estimated Range of Stream Flow During Crossing (cfs)	Entry Station ^a	Exit Station ^a	Entry/Exit Elevation Difference (feet)	Depth of Cover ^b (feet)	Horizontal Setback Distance (Entry/Exit, feet) ^c
DP ID						
Susquehanna River	855 to 8,846	0+00	12+97	6.7 feet	~25 – 45 feet	Entry - ~270 feet Exit - ~273 feet

^a Stationing as shown on Direct Pipe® Design Drawing. E&S stationing has not yet been developed.
^b Vertical separation between the bed of the waterbody and the DP profile
^c Distance from the closest edge of the sensitive resource being crossed to the DP entry and exit locations

**Table 3
Unique Conditions or Features within Proximity to DP**

Unique Condition	Description and Mitigation
DP ID: Susquehanna River	
Subsurface mines	Subsurface coal mining was observed in the desktop geology review, with coal seams identified in some of the geotechnical borings completed. These mines were considered problematic for the HDD method at this site. This DP has been designed within the alluvial soils overlying the bedrock with safe clearance above the potential coal seams/voids.

Comments on Settlement, Grouting

The DP profile for the Susquehanna River crossing was designed with an adequate depth of cover to minimize the risk of surface subsidence resulting from the overcut around the carrier pipe. As detailed in GeoEngineers’ Design Report in Appendix B, a systemic settlement analysis was performed and indicates the surface settlement would be less than 1 inch in the vicinity of Main Street, assuming the 30-inch carrier pipe is in a 46-inch diameter hole. However, to further minimize the risk of surface settlement, Transco will simultaneously inject a bentonite-based grout into the annulus while thrusting the 30-inch carrier pipe behind the anticipated 42-inch casing. The grouting location would be at the reducer between the 42-inch casing and 30-inch carrier

pipe. The grouting pump would supply grout at a calculated rate to fill the annulus as the carrier pipe is advanced. The Trenchless Engineer and the DP Operator will monitor the grouting rates using the protocols outlined in Section 6 and will adjust as necessary to minimize the chances for an inadvertent return caused by excessive pump rates. Additionally, the grout volumes and pipe advance rates will be monitored to ensure the annular space is adequately filled.

2 PERSONNEL RESPONSIBILITIES

2.1 GENERAL / SHARED RESPONSIBILITIES

Transco and the Contractor will employ qualified personnel prior to the start of DP operations that have responsibilities in their field. The project team have overall responsibility for implementing this Plan and ensuring compliance. Additionally, compliance with this Plan and all Project permits as noted in Resource Report 1, is the responsibility of all personnel on this Project, including the Contractor.

Shared responsibilities include:

- Verify that a copy of this Plan is available on-site and accessible to all construction personnel.
- Verify that all workers are properly trained and familiar with all aspects of the DP activity and with the implementation of the Plan, prior to and during tunneling operations.
- Verify that all DP equipment is in working order, including annular pressure monitoring equipment.
- Monitoring the DP alignment for IRs and other signs of environmental impact.
- Maintain constant communication with project team leadership and Contractor personnel if an inadvertent return (IR) is suspected.
- In the event of an IR, coordinate corrective actions and the cleanup response and notify regulatory agencies timely. Verify all waste materials are properly containerized, labelled, and removed from the site to an approved facility.
- Confirm that drilling mud/spoils/cuttings associated with the crossings are managed and disposed of at an approved facility if contaminated soil is encountered.
- Recognize that all personnel on site have the authority to stop work. Stop work may be utilized as response protocols require, or it may be utilized in the event this Plan is not being followed.

2.2 SPECIFIC OVERALL ROLES AND RESPONSIBILITIES

The Contractor will be responsible for conducting all DP operations in accordance with all Project permits, the engineering/geotechnical design, best management practices, industry standards, and this plan. Transco's project team will monitor and record DP operations and

ensure compliance with all applicable permit conditions. Specific overall roles and responsibilities for personnel are:

Project Manager (PM) – The Project Manager is the leader of the project team and has the accountability for all aspects of the Project.

Trenchless Engineer – Transco will designate a Professional Engineer (PE) or Professional Geologist (PG) responsible for the trenchless design and engineering review of the DP throughout the entire project life cycle. The Trenchless Engineer will be on site during drilling operations.

Construction Manager (CM) – Individual who has direct oversight over the inspection workforce, contractor, and all construction activities associated with the Project.

Spread Chief Inspector (CI) – Transco will designate a CI for the Regional Energy Lateral project scope item. The CI will have overall authority for construction activities that occur on the Regional Energy Lateral, including the DP installation.

Trenchless Inspector – The Trenchless Inspector's primary responsibility is to observe and document all DP site activities occurring during each shift. The Trenchless Inspector will be familiar with this Plan, the Contractor's drill plan, the Project specifications, and all permit conditions. The Trenchless Inspector shall ensure the Contractor follows all items as described in this plan. Should the Trenchless Inspector observe a deviation or out of compliance condition, the CI, CM, and EI shall be notified immediately.

Environmental Inspector (EI) – One EI will be assigned during active construction. The EI will have peer status with all other activity inspectors and will report directly to the Transco CI who has overall authority on the Construction Right-of-Way (ROW). Some larger projects will have a Lead EI. In this case, the Lead EI will report directly to the CI. The EI will have the authority to stop activities that violate the environmental conditions of the FERC Certificate (as applicable), other federal and state permits, or landowner requirements and to order corrective action.

Environmental Specialist Compliance Manager (ECM) – The ECM works closely with the EIs to provide guidance and ensure consistency from the EIs. The ECM also coordinates with EIs on the documentation of field conditions or concerns and pushes that information to the Environmental Project Lead. The ECM is the lead for permitting and environmental compliance efforts during construction of the Project. The ECM is typically the point of contact between Company and regulatory agencies.

General Contractor Superintendent – The General Contractor Superintendent will be the senior field representative of the Contractor. This Superintendent has responsibility for the entire construction spread, including the DP installation.

DP Superintendent – The DP Superintendent will be the senior on-site representative of the Contractor and will have the overall responsibility for implementing this Plan on behalf of the Contractor. The DP Superintendent will report directly to the General Contractor Superintendent. The DP Superintendent will be familiar with all aspects of the DP activities, the contents of the Plan, and the conditions of approval under which the activity is permitted to take place. The DP Superintendent will make a copy of this Plan available at the drill site and will distribute it to the appropriate construction personnel. The DP Superintendent will ensure that workers are properly trained and familiar with the necessary procedures for response to an IR.

DP Operator – The DP Operator will be responsible for operating the DP equipment and pumps, monitoring circulation back to the DP launching location and monitoring annular pressures during tunneling. In the event of loss of circulation or abnormal annular pressure readings, the DP Operator must communicate the event to the DP Foreman, Superintendent, and Contractor field crews, as well as the onsite Trenchless Inspector and EI. The DP Operator is responsible for stoppage or changes to the DP program in the event of observed or anticipated IR.

DP Contractor Personnel – During DP installation, field crews will be responsible for monitoring the DP alignment along with the Transco field representatives. Field crews, in coordination with the EI, will be responsible for timely notifications and responses to observed releases in accordance with this Plan.

3 PRE-CONSTRUCTION ACTIVITIES

3.1 TRAINING

Prior to DP site set-up, and consistent with the FERC guidelines, site-specific implementation, environmental, and safety training will be conducted for all Transco and Contractor personnel. This training will address all applicable environmental impact avoidance and minimization measures that will be implemented during tunneling. Each person involved in DP operations will be familiar with the locations of IR containment equipment and materials, and the specific procedures for handling IRs. Training will be conducted for any new personnel added to the Project after DP activities have commenced. Documentation of those who received training will be maintained as described in Section 4. The site-specific training will include, but not be limited to:

- Safety and environmental training specific to the DP installation;
- Site-specific geotechnical and design conditions;
- The locations of sensitive environmental resources;
- The location, operation, inventory, and condition of IR response equipment and materials;
- Provisions of this Plan and site-specific permit and monitoring requirements;
- Pre-construction landowner and agency notification requirements;
- Site-specific IR monitoring requirements;
- DP procedures for IR prevention;
- Protocols for detecting, communicating, and reporting IRs; and
- IR response procedures for mitigating impacts and recovery operations.

3.2 SITE INSPECTION

Transco will inspect the DP path prior to the start of DP activities. If site-specific conditions impede the ability to conduct visual inspection along the DP alignment, modifications to the proposed inspection routine will be developed and communicated to the Contractor, Project team and EI. Inspections may include the use of a boat or an unmanned aerial vehicle (UAV) to evaluate the drill alignment. If previously unidentified conditions or features are discovered that necessitate a modification to the approved Plan, Transco will coordinate with FERC to obtain the necessary variances prior to implementation.

3.3 PRE-CONSTRUCTION LANDOWNER NOTIFICATION

Transco will notify landowners prior to construction as detailed in Section 8, Notifications.

3.4 PRE-CONSTRUCTION AGENCY NOTIFICATION

Transco will notify agencies prior to construction as detailed in Section 8, Notifications.

4 DOCUMENTATION

A copy of this Plan will be available and accessible to all construction personnel. Documentation detailed in Table 4 below will be maintained by parties noted in the right-most column. If requested, this information will be provided to FERC and other federal and state agencies with applicable regulatory jurisdiction.

**Table 4
Documentation Maintained**

Procedure	Documentation	Personnel Responsible for Maintaining Documentation
Employee Training	<ul style="list-style-type: none"> • All personnel on this Project will be trained for environmental compliance, including IR management. • Record of employee training detailing when training was conducted, material covered, and employees in attendance. 	<ul style="list-style-type: none"> • ECM • CM
DP Visual and Pedestrian Monitoring	<ul style="list-style-type: none"> • Environmental and Construction Inspectors will document within daily reports IR monitoring and the finding of these inspections. • An IR Tracking Log will be maintained. 	<ul style="list-style-type: none"> • DP Contractor • EI • Trenchless Inspector
DP Instrument Logs	<ul style="list-style-type: none"> • Tunneling progression • MTBM performance information and thrusting loads • Slurry fluid discharge rate, pressure, and volume. • Lubrication fluid volumes. • Down-hole annular pressure monitoring. • Navigation/guidance system survey information 	<ul style="list-style-type: none"> • DP Contractor
Slurry Fluid and Lubrication Fluid Composition	<ul style="list-style-type: none"> • Use of drilling fluid additives, including the quantity, timing, and location of use. • Monitoring logs of slurry fluid and lubrication fluid physical properties throughout tunneling activities. • Laboratory results of sampled drilling fluid/source water for any inorganic and organic environmental contaminants. 	<ul style="list-style-type: none"> • DP Contractor
Public and Agency Inquiries/Comments	<ul style="list-style-type: none"> • A record of communication with the public and agencies that has occurred during DP activities. • This record will include inquiries and comments, as well as response actions. 	<ul style="list-style-type: none"> • ECM • Land Representatives • CM (support as necessary)

A summary of DP-specific information will be included in the applicable construction status reports provided to FERC. This information may include overall status, a summary of visual and pedestrian monitoring activities, issues encountered (including any IRs) and response actions, and complaints and how they were addressed.

4.1 PROJECT ORGANIZATIONAL CHARTS

Project specific organizational charts that include contact information are found in Appendix A.

5 DRILLING FLUID MANAGEMENT

The DP process utilizes drilling fluids to facilitate the associated operations. There are two separate drilling fluid systems in this operation - the engineered drilling fluid (or slurry fluid) and the lubrication fluid. Both the slurry fluid and the lubrication fluid can be comprised of water and bentonite clay. Bentonite clay is an absorbent aluminum phyllosilicate clay consisting mostly of sodium montmorillonite. It is a naturally occurring clay, extremely hydrophilic, and expands when wet absorbing several times its dry mass in water. Exact mixtures of fluids and additives for the slurry fluid and the lubrication fluid will be included within the Drilling Fluids Management Plan which will be developed by the Contractor and their Mud Engineer and evaluated by Transco. This section describes how the drilling fluid will be managed throughout the installation process including proper disposal techniques of excess drilling fluids and associated materials.

For this crossing, Transco plans to withdraw water from the Susquehanna River for use as drilling fluid, and Transco has acquired the necessary permits from SRBC to do so. If the contractor proposes a drilling fluid from an off-site location, the source must be submitted to Transco for approval. If the water supply is a non-municipal source, the drilling fluid/water source should be tested for environmental contaminants prior to use, and documentation of consultation with local and state agencies regarding the results of such tests be provided.

A Drilling Fluids Management Protocol (Protocol) will be developed by the Contractor ahead of DP activities. The Protocol will include the items outlined in Sections 5.1 through 5.4, below.

5.1 DRILLING FLUID TYPES

The composition of drillings fluids and its engineering properties will be formulated to be suitable for the given subsurface conditions encountered. There are two types of drilling fluid used during the DP process. The lubrication fluid and the engineered drilling fluid (or slurry fluid), described below:

Lubrication Fluid

- Stabilize the borehole against collapse, and counterbalance the earth and groundwater pressure along the length of the drive;
- Create a filter cake to prevent fluid loss to the formation;
- Reduce the friction between the pipe and the tunnel.

Slurry Fluid

- Support the excavation face;
- Lubricate, cool, and clean the cutter head;
- Mix with and transport spoils through the slurry return line to the separation plant at the ground surface for recycling or disposal.

5.2 ADDITIVES

A list of proposed drilling fluid additives, including Safety Data Sheets, will be provided in Appendix C by the Contractor, once selected. Only pre-approved, non-petrochemical-based, non-hazardous additives that comply with permit requirements and environmental regulations will be utilized. Additionally, proposed additives will conform with NSF/ANSI Standard 60 (Drinking Water Treatment Chemicals – Health Effects). Transco will work with FERC and the applicable state agencies, should additional and/or alternate drilling fluid products be proposed.

5.3 DISPOSAL

Drilling fluid and cuttings handling and disposal will comply with the stipulations outlined below:

- Contractor will provide a process and description for how the materials will be collected and stored (e.g., will it be placed into portable tanks or roll-off containers). This will vary significantly based on volume, location, environmental conditions, space, etc.
- Transco and Contractor will assess and determine the appropriate facilities where the materials will be sent for disposal.
- Contractor will provide a sampling plan for conducting any analytical or waste characterization required by the disposal facility. The plan will address if the materials needs to be treated or solidified prior to disposal, and the means and methods to do so, if required.
- All documentation relating to disposal will be kept on-site, tallied for accuracy, and later stored within the Plan, specifically Appendix D for Project record.

5.4 TRACKING LOGS

Instrument logs will be monitored throughout the day to ensure function and progression with tunneling progression, drilling fluid discharge rate and pressure, and downhole annular

pressure monitoring. Construction Inspectors will document daily the condition of the worksite which will include a visual check of all equipment that is a part of the drilling fluid management effort. This will be recorded on daily reports.

6 DIRECT PIPE® OPERATIONAL CONDITIONS AND RESPONSE ACTIONS

The DP construction method was chosen for this crossing because of the reduced risk of inadvertent returns. To further minimize the potential environmental impact associated with a loss or release of DP slurry or lubrication fluids, Transco and its Contractor will employ best efforts to maintain full circulation of fluids through the slurry lines and recycle the fluid to the extent practical. Transco and its Contractor will utilize real-time annular pressure monitoring with the use of a down-hole annular pressure tool throughout tunneling operations, to help prevent hydraulic fracture and IR. The annular pressure readings will be recorded and evaluated relative to calculated and expected annular drilling fluid pressure ranges. The Contractor will also measure slurry fluid circulation rates and pressures, will closely monitor the DP slurry returns to ensure that fluids are circulating to the return pits. Additionally, the lubrication fluid volume that is introduced at the launch seal and from the MTBM will be monitored relative to the tunneling rate.

Monitoring of the DP alignment for an IR is an integral component of this plan and the success of any DP. Monitoring frequency will vary depending upon a multitude of factors and characterized by the operating conditions listed below. For the purposes of this plan and the DP operations there are three operating conditions:

- Normal Tunneling (Full Slurry Fluid Circulation);
- Loss of Slurry Fluid Circulation or lubrication fluid; and
- Inadvertent Returns

The following sections describe drilling and monitoring procedures for each operational condition.

6.1 CONDITION 1: NORMAL TUNNELING (FULL DRILLING FLUID CIRCULATION)

When DP operations are in progress and full slurry fluid circulation is being maintained within the DP slurry lines with no loss of lubrication fluid, the following monitoring protocol shall be implemented:

- The presence of slurry fluid returns within the DP slurry lines will be periodically monitored and documented.
- Land-based areas along the alignment will be periodically walked and visually inspected for signs of inadvertent fluid returns as well as surface heaving and settlement.
- The river will be visually inspected from the banks for a visible fluid plume.

Inspections may include the use of a boat or UAV to evaluate the drill alignment.

- Slurry and lubrication fluid products present at the jobsite shall be documented.
- Slurry and lubrication fluid properties will be tested, monitored, and recorded during drilling operations.
- Slurry and lubrication fluid pump rates and pump durations will be recorded.
- Monitor lubrication fluid tank levels.
- During tunneling operations, downhole annular pressures will be recorded and evaluated relative to calculated and anticipated annular drilling fluid pressure range.
- If the downhole annular pressure begins to deviate outside of the calculated and anticipated annular drilling fluid pressure range, the Contractor will evaluate tunneling conditions and take necessary and reasonable steps to bring the annular drilling fluid pressure back within the expected range.

6.2 CONDITION 2: LOSS OF SLURRY FLUID CIRCULATION OR LOSS OF LUBRICATION FLUID

When DP operations are in progress, some minor losses of fluid can be expected as part of the process during normal tunneling operations. When fluid circulation is lost or significantly diminished (“loss of circulation”), or if lubrication fluid volume is lost, all protocol identified in Condition 1 above will be followed, and additionally, the following monitoring protocol will be implemented:

- The EI will be notified by the Trenchless Engineer or Trenchless Inspector of lost or significantly diminished slurry fluid returns or loss in lubrication fluid volume. The EI will immediately notify the ECM of the status of the drill. The ECM and Trenchless Engineer will coordinate and notify PADEP as outlined in Section 8.2.2.
- The DP will continue while the EI, Trenchless Engineer, Trenchless Inspector, and Contractor will then immediately perform a walkthrough inspection along the drill alignment looking for inadvertent returns. Visual inspection frequency will be increased along the alignment as well as other areas of high risk for inadvertent returns. Inspections will include attention to sensitive environmental resources. Inspections may include the use of a boat or UAV to evaluate the drill alignment.
- If the conditions suggest the high likelihood of an IR, the Trenchless Engineer will make the decision to stop the DP for further evaluation.

- Pump rates and pump durations will be recorded to estimate the lost circulation volumes. The Contractor will take reasonable steps to restore circulation, and the Trenchless Inspector will document steps. The slurry and/or lubrication fluid properties will be evaluated and modified in consultation with the mud engineer/technician as it relates to the subsurface formation being encountered.
- If fluid loss continues, the EI will increase the frequency of visual inspection along the drilled path alignment as appropriate. Pump rates and pump durations will be recorded along with lubrication tank losses to estimate the lost fluid volumes. Site-specific parameters will be evaluated and additional reasonable steps to restore circulation will be taken.

6.3 CONDITION 3: INADVERTENT RETURNS

During DP activities it is typical for drilling fluid to surface near the upland launching and receiving points, where there is less overburden to counteract the fluid pressures. Such returns are both normal and anticipated and are therefore not considered “inadvertent returns”. The DP entry and exit locations and the workspace have been designed to minimize the impact of such returns. At these locations, containment measures will be in place to prevent migration outside of the workspace and to protect adjacent resources.

As outlined in Section 6.2, Transco will conduct monitoring in the event of lost or significantly diminished slurry volumes or loss in lubrication fluid volumes. If during that continued monitoring an inadvertent return of fluids is detected, the following will occur:

- Work will be stopped;
- Clean up protocol, described in Section 7.2, will be employed immediately;
- The EI and Trenchless Engineer or Trenchless Inspector will document the location, magnitude, and potential impact of the IR and notify the ECM;
- The ECM and Trenchless Engineer will coordinate and make the required notifications outlined in Section 8.2.3;

Prior to restarting DP Operations, the Trenchless Engineer will submit a Restart Report that includes the following information:

- Date and time of the release;
- Location (latitude and longitude) of the release;
- Estimated volume of release;

- Impact to sensitive resources, if applicable;
- Clean up procedures/containment employed;
- Analysis of the cause of the release;
- Assessment of alternative approaches to reduce possibility of a release upon restart;
- Analysis of risk of additional release(s);
- Proposed schedule for recommencement of DP operations and anticipated duration of DP operations; and
- Applicable maps and photographs.

Drilling operations (aside from cleanup and containment) will not continue until the Restart Plan has been authorized by PADEP.

7 RESPONDING TO INADVERTENT RETURNS

7.1 MATERIALS AND EQUIPMENT

DP personnel will be required to have containment materials readily accessible and on site throughout the DP process. Since drilling fluid seepage can be easily controlled on land where it has the greatest potential of occurring, containment items will be stored within the drilling sites. The Contractor will also have heavy equipment such as tracked excavators, a rubber-tired excavator, or a skid steer that may be utilized to control and clean up drilling fluid seepage.

The following materials and equipment will be maintained at the DP site in sufficient quantities to contain any inadvertent releases of drilling fluid:

- Straw or hay bales;
- Wood stakes, t-post, or rebar to secure bales;
- Buckets, wheel barrows, and/or 55-gallon drums;
- Plastic sheeting or geotextile fabric;
- Silt fence;
- Sand bags;
- Sledge hammers;
- Shovels and push brooms;
- Storage tanks; and
- Leak-free hose(s) and portable pump(s).

The following materials and equipment will be maintained at a nearby location in sufficient quantities to contain any inadvertent releases of drilling fluid:

- Vacuum truck(s);
- Light tower(s) with appropriate secondary containments as applicable;
- Rubber-Tired/Tracked excavator or skid steer;
- A boat with appropriate personal safety equipment; and
- Floating turbidity curtain for use in large waterbodies.

7.2 CLEAN UP RESPONSE PROTOCOL

Although the DP construction method has a low risk of inadvertent returns at the crossing location, Transco is prepared for the risk, and the actions taken to respond to an IR will be dependent on but not limited to the location of the IR, the site-specific geologic conditions, and

the volume of drilling fluid lost. Transco will coordinate with affected landowners to access if the IR occurs outside of permitted workspace.

As previously described, the limits of disturbance at the DP entry and exit locations have been designed to account for anticipated returns. If an inadvertent return of drilling fluid is identified, the following measures will be employed:

- Work will be stopped;
- Containment and cleanup will be executed by the Contractor who will work to ensure appropriate actions are taken to reduce, eliminate, or control the return. This work will be overseen by the Trenchless Inspector and the EI.
- Agency and landowner notifications will occur as applicable (Section 8);
- Drilling fluid may be recovered, recycled, and reused to the extent practicable. All drilling fluid that cannot be reused will be disposed of in accordance with Section 5.3 of this plan.

7.3 POTABLE WATER SUPPLY

7.3.1 Publicly Available Data Reviews

The Public Water Supply Report was provided as Appendix 1 of the PADEP Chapter 105 Application for Luzerne and Monroe Counties. As part of the permit application, a review of the public water supplies located within one mile of a waterbody or wetland crossing was conducted. Groundwater wells and surface water intakes were identified for each crossing proposed as part of the Project using the PADEP eMapPA online tool. The eMapPA buffer tool was used to create a 1.5-mile buffer around the center a crossing or a group of contiguous crossings. The surface water intakes and groundwater wells within that buffer were identified. Based on the results of this review, no public water supplies were identified within the 1.5-mile buffer of the DP crossing of the Susquehanna River.

In accordance with PADEP's Draft Trenchless Technology Technical Guidance Document (PADEP Guidance Document) and the FERC Guidance for Horizontal Directional Drill, Inadvertent Return Response, and Contingency Plans Document (FERC Guidance), Transco expanded planned groundwater testing of private wells and springs up to 1,000 feet from the location of the planned DP crossing of the Susquehanna River which is beyond the area recommended by the PADEP and FERC Guidance Documents for trenchless installation in a non-karst area. To identify the existence of private water supplies, Transco developed a horizontal

offset of 1,000 feet from the entry and exit points of the planned DP crossing of the Susquehanna River.

Transco conducted a review of the PADEP's eMapPA online tool to identify groundwater wells within a 1,000-foot horizontal offset of the planned DP alignment, and surface water intakes within a 0.5-mile radius of the Susquehanna River, 1 mile upstream and 10 miles downstream of the DP. The planned DP crossing of the Susquehanna River and parcels within approximately 1.5 miles of the DP crossing are located within the public water supply service area of PA American Water Company – Springbrook District, whose water supply reservoirs are more than 8 miles from the Project workspaces (PA American Water 2021). No private or public water supply groundwater wells or surface water intakes were identified per a review of PADEP's eMapPA.

Transco also conducted a review of the Susquehanna River Basin's Water Application and Approval Viewer and determined that there are no groundwater or surface water pending or approved water withdrawals, diversions, or consumptive use projects regulated by the SRBC within 1,000 feet of the planned DP crossing, or within 1 mile upstream or 10 miles downstream of the DP crossing other than Transco's planned consumptive use and surface water withdrawal approvals.

Additionally, Transco utilized the PA Department of Conservation and Natural Resources PA Groundwater Information System to identify private water supply wells and springs located within 1,000 feet of the planned Direct Pipe. No wells or springs were identified through review of the PA Department of Conservation and Natural Resources PA Groundwater Information System.

Supporting information regarding the review of publicly available water supply information can be found in Appendix E.

7.3.2 Landowner Information Requests

Transco inquired about the presence of private water supplies during the initial survey access requests associated with the DP crossing. Additionally, Transco developed a tax parcel mailing list which included all parcel owners within 450 feet of the proposed DP alignment which is consistent with the PADEP Guidance Document's recommendations for a trenchless installation in a non-karst area. The tax parcel mailing list included offline parcels (not directly affected parcels and no surveys were conducted), as well as parcels that are directly affected by the Project. Of the 23 parcels that are within 450 feet of the DP alignment, 12 parcels are directly affected parcels or were reviewed as part of the civil and environmental surveys and the remaining

11 parcels are offline parcels. Transco sent letters to all parcel owners on June 22, 2022, requesting information on the presence of private water supplies on these parcels. A template of the letter sent to landowners is included in Appendix F of the plan. Attachment G includes a summary of landowners contacted and proof of receipt. No private water supplies have been identified by the landowners within 450' of the Direct Pipe crossing.

7.3.3 Potable Water Supply Summary

As outlined above, Transco has not identified public or private water supplies within 450' of the DP crossing and does not anticipate impacts to public or private water supplies. However, in the unlikely event that DP installation temporarily affects the water quality or yield of a public or private well/spring, Transco will provide alternative water sources or other compensation to the well owner(s). In the unlikely event that a well/spring is permanently affected due to construction activities, Transco will repair, replace, or provide alternative sources of potable water.

8 NOTIFICATIONS

8.1 PRE-CONSTRUCTION LANDOWNER NOTIFICATION

Transco has developed communication procedures to ensure proper coordination with affected landowners and abutters. Day to day communication management will be conducted by the Land Department's Right of Way Agents. The Land Department will work with the project team to ensure accurate up-to-date information is available for distribution to the appropriate recipients. The specific landowner notification procedures include, but are not limited to:

- Transco will notify affected landowners in writing prior to the start of DP activities. This notice will include:
 - A description of the proposed work, including any nighttime work proposed;
 - The name and phone number of Transco Representatives that the landowner can contact if there are any questions or concerns regarding the proposed work;
 - A toll-free phone number to contact Transco that can be used as an alternative to contacting the Right of Way Agents; and
 - A toll-free phone number to contact FERC if the landowner believes that Transco has not resolved their concerns.

8.2 AGENCY NOTIFICATION

8.2.1 Pre-Construction Notification

Transco will notify FERC, the USACE, PADEP, and PFBC of the proposed construction start date prior to commencing DP operations.

8.2.2 Condition 2: Loss of Slurry Fluid Circulation or Loss of Lubrication Fluid

If loss of circulation or lubrication fluid is detected as described in Section 6.2, the ECM will contact PADEP immediately via e-mail, phone, or electronically delivered letter. After completing site investigations, the Trenchless Engineer will follow up a written report including the steps taken to restore circulation.

8.2.3 Condition 3: Inadvertent Returns

If an IR is detected as described in Section 6.3, the ECM will contact FERC, the USACE, and PADEP immediately via e-mail, phone, or electronically delivered letter. Additional notification

could be needed for USFWS and PFBC if an IR is identified within a waterbody. In addition, a Restart Report will be submitted to PADEP for review and approval prior to restarting DP operations.

8.2.4 Impact to Water Supply

Transco does not anticipate impacts to public or private water supplies; however, in the unlikely event of impact to public or private water supply, Transco will notify PADEP with immediate verbal notification of any citizen complaint it receives of an impact to a private or public water supply upon becoming aware of an impact to a private or public water supply, and when an alternate water supply is provided. This notification includes a detailed description of the incident using the best currently available information which, for Oil and Gas Projects, shall also be reported to PADEP's online Oil and Gas Reporting Electronic (OGRE) application within 24 hours. The OGRE application is accessed via the PADEP Greenport login in system at <https://www.depgreenport.state.pa.us>.

9 RESTORATION

Areas affected by IRs will be restored to pre-existing conditions and contours to the extent practicable in accordance with the FERC Plan and Procedures and applicable permits. Upland areas will be restored through typical right-of-way restoration procedures, such as grading, seeding, and temporary and permanent erosion control devices, as necessary. Similarly, wetlands and waterbodies will be restored to the extent practicable.

Transco will continue to monitor for post-construction restoration issues, track issues identified, and correct these issues during this post-construction phase of the Project.

10 CONTINGENCY PLANNING

10.1 DIRECT PIPE® COMPONENTS AND LIMITATIONS

The DP method is one pass trenchless pipe installation method consisting of two integral parts:

- Pipe Thruster
- Microtunneling Boring Machine (MTBM)

This section briefly describes the integral parts of the DP process and describes some potential causes of failure associated with the method.

10.1.1 Pipe Thruster

The pipe thruster is the structural component housing hydraulic cylinders used to grip and push the MTBM machine, product pipe or casing forward. The pipe thruster serves to distribute jacking loads to the installed pipe and reaction loads to the pipe thruster foundation system. The Pipe Thruster Structural foundation transfers and distributes the thrust loads from the Pipe Thruster to the surrounding soil and/or rock. The foundation may be incorporated into the launching pit design. The pipe thruster foundation shall be designed to withstand the anticipated jacking force and safely transmit the applied jacking forces to the soil and rock in the vicinity of the entry pit without excessive deflection or displacement.

10.1.2 Microtunneling Boring Machine (MTBM)

Remote-controlled, guided slurry shield that provides continuous support to the excavation face. The MTBM is operated from a control module located on the ground surface and the excavation process is achieved by a rotating cutter wheel. Excavated tunnel cuttings enter a slurry/crushing chamber where they are mixed with fluid (typically water mixed with bentonite or other additives) to form a slurry. Pumps transport the slurry to the surface where a separation plant removes the solids from the slurry. The recycled slurry is then returned to the tunnel face in a closed loop system of pumps and hoses.

10.1.3 Direct Pipe® Limitations and Potential Causes of Failure

A mechanical failure occurs if there is a major mechanical breakdown of one or more pieces of equipment involved in the DP operation. If the tunneling process remains idle for an extended time, the material in the hole can seize the pipe string in place and prevent further movement such that the pipe may not continue to move in either direction. If this occurs, the

contractor will be required to change the alignment of the crossing to miss the abandoned hole and start the tunneling process from the beginning.

DP installation also may be considered a failure if after either repairing or replacing the broken equipment or vital piece of ancillary equipment, the pipeline cannot be thrust or pulled.

Another potential failure is the buckling of the pipe during installation. This could happen if the thrust force applied to the pipe during tunneling operations yields the pipe. If this happens, an attempt will be made to extract the pipe. If that is not possible, the site will be evaluated to see if a rescue shaft would be possible to retrieve the MTBM.

Encountering of subsurface obstructions or voids is another potential cause of failure. If a large boulder or other subsurface obstruction is encountered, it could impede the progress of the DP leading to a potential failure. If the obstruction is shallow enough and beneath an accessible location, it may be possible to excavate the obstruction. But if it is inaccessible, the DP may need to be redesigned to avoid the obstruction. If a void is encountered, depending on the size, the MTBM could lose the ability to steer and if damaged, the pipe behind it could become damaged.

10.2 ALTERNATE CROSSING MEASURES

During the design phase of the Project, Transco conducted geotechnical studies at the proposed DP crossing to design a crossing that minimized risk exposure. Should the DP technology fail during construction as discussed in Section 10.1, Transco would consider shifting the alignment within the proposed workspace and attempt to re-perform the DP crossing. If alignment shifts do not yield a successful DP, an evaluation of the failed attempt will be performed to determine the appropriate contingency methods to complete the crossing.

Transco will contact the applicable permitting agencies to notify them of the status of the project and provide details of the evaluation of the failure that has occurred. Transco will then consult with the agency regarding the appropriate contingency method to complete the crossing, and obtain any permits required.

10.3 ABANDONMENT

If for any reason a DP hole must be abandoned, the Contractor will fill the entirety of the abandoned hole with a cement grout to completely seal it off. The top 5 feet of the abandoned hole will be filled with compacted soil to allow vegetation to reestablish.

The grout mixture used to abandon a borehole will consist of either a cement grout or cement/bentonite grout mixture that can be pumped downhole through the slurry lines used to

tunnel the hole. The grout mix (e.g., water/cement/bentonite ratios) will be designed generally for each DP location based on the geologic formation(s) along the abandoned portion of the hole. Additional modifiers, such as those used in structural concrete, may be used to modify the flowability and/or set time of the grout. To grout the abandoned hole, the Contractor will extract all tooling (i.e., MTBM, product/casing pipe) from the hole, while pumping the grout mixture as the MTBM is extracted from the hole. The rate at which the MTBM is extracted during grouting operations will be regulated to match the rate of grout placement.

11 REFERENCES

Federal Energy Regulatory Commission (FERC). 2019. Guidance for Horizontal Directional Drill Monitoring, Inadvertent Return Response, and Contingency Plans. October 2019. Available at: <https://www.ferc.gov/natural-gas/environmental-overview/guidance-horizontal-directional-drill-monitoring-inadvertent-return-response-and-contingency-plans>. Accessed October 2020.

Pennsylvania American Water. 2021. 2021 Water Quality Report; Source Water Information. Available at: <https://www.amwater.com/ccr/nesbitthuntsville.pdf>. Accessed June 10, 2022.



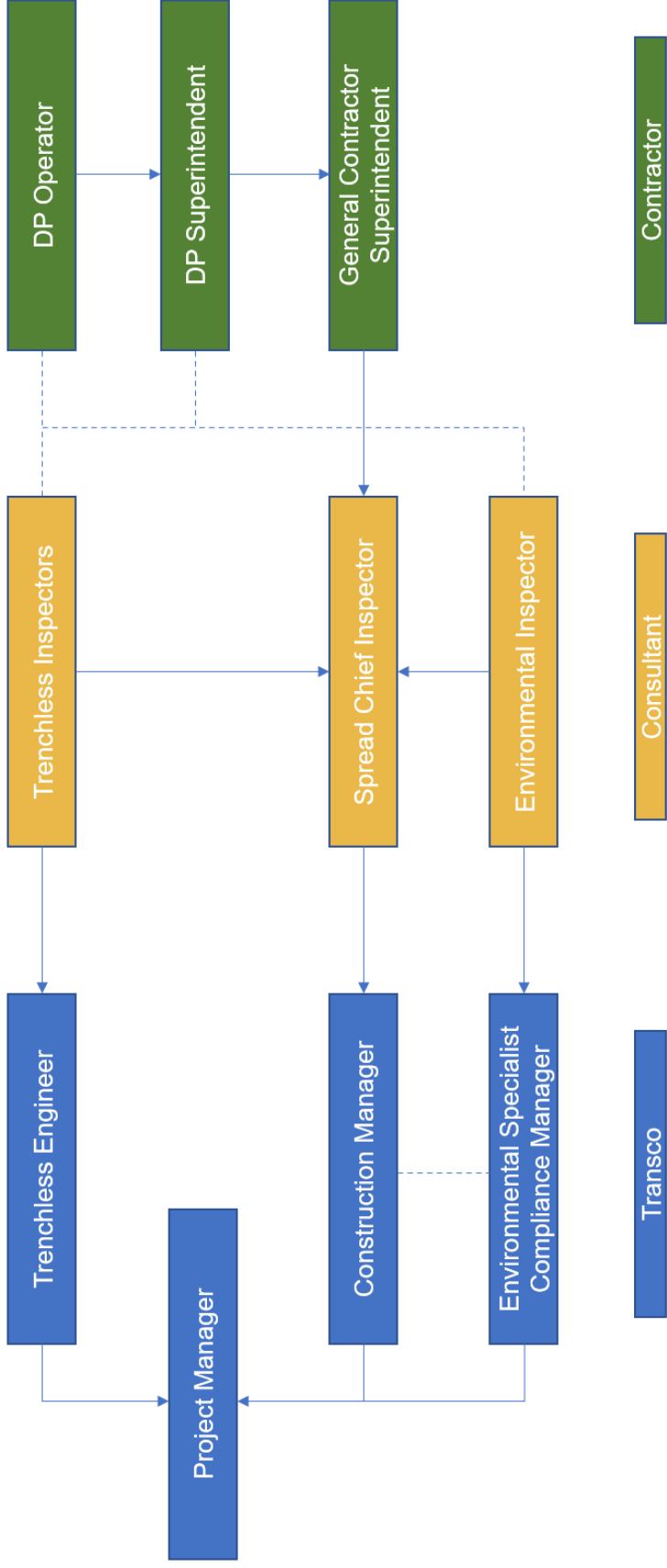
Transcontinental Gas Pipe Line Company, LLC

**Direct Pipe® Monitoring,
Inadvertent Return Response, and Contingency Plan
Appendix A Direct Pipe® Organizational Chart**

Regional Energy Access Expansion

July 2022

Regional Energy Access Expansion Direct Pipe Oversight Plan



Reports To
 Communicates With



Transcontinental Gas Pipe Line Company, LLC

**Direct Pipe® Monitoring,
Inadvertent Return Response, and Contingency Plan
Appendix B Direct Pipe® Design Reports**

Regional Energy Access Expansion

July 2022

The design reports are included in Requirement S
- Alternative Analysis of the Regional Energy
Lateral Joint Permit Application.



Transcontinental Gas Pipe Line Company, LLC

**Direct Pipe® Monitoring,
Inadvertent Return Response, and Contingency Plan
Appendix C Drilling Fluids List and SDS**

Regional Energy Access Expansion

July 2022

The drilling fluids list and safety data sheets will be included with the plan once a contractor is selected.



Transcontinental Gas Pipe Line Company, LLC

**Direct Pipe® Monitoring,
Inadvertent Return Response, and Contingency Plan**

Appendix D Disposal Tracking Log

Regional Energy Access Expansion

July 2022

The Disposal Tracking Log will be managed
and updated during construction.




Transcontinental Gas Pipe Line Company, LLC

**Direct Pipe® Monitoring,
Inadvertent Return Response, and Contingency Plan
Appendix E Publicly Available Water Supply Information**

Regional Energy Access Expansion

July 2022

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eMapPA

Layers
Legend
Tasks

▸ Buffer a Layer

▾ Buffer Sensitive Layer (Data Only)

Buffer a
 Point Polyline Polygon

Enter buffer distance
 Miles

Layer to buffer

Create Buffer
Clear

▸ Extract Data


▸ Locate

▸ Measurement


▸ Print

Map
eFacts Query
Advanced Query

ESRI Streets & Imagery
 Topographic
 National Geographic




Streets
 Imagery



0 features in buffer.

PWS_ID	SYSTEM_NAME	AREA_CITY	RESPONSIBLE_OFFICIER

Export all to CSV
X



Imagery: Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community; ESRI Streets: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

pennsylvania
DEPARTMENT OF ENVIRONMENTAL
PROTECTION

eMapPA

Layers Legend Tasks

► Buffer a Layer

▼ Buffer Sensitive Layer (Data Only)

Buffer a
 Point Polyline Polygon

Enter buffer distance
0.5 Miles

Layer to buffer
Surface Water Intakes

Create Buffer Clear

► Extract Data

► Locate

► Measurement

► Print

Map eFacts Query Advanced Query

ESRI Streets & Imagery Topographic National Geographic

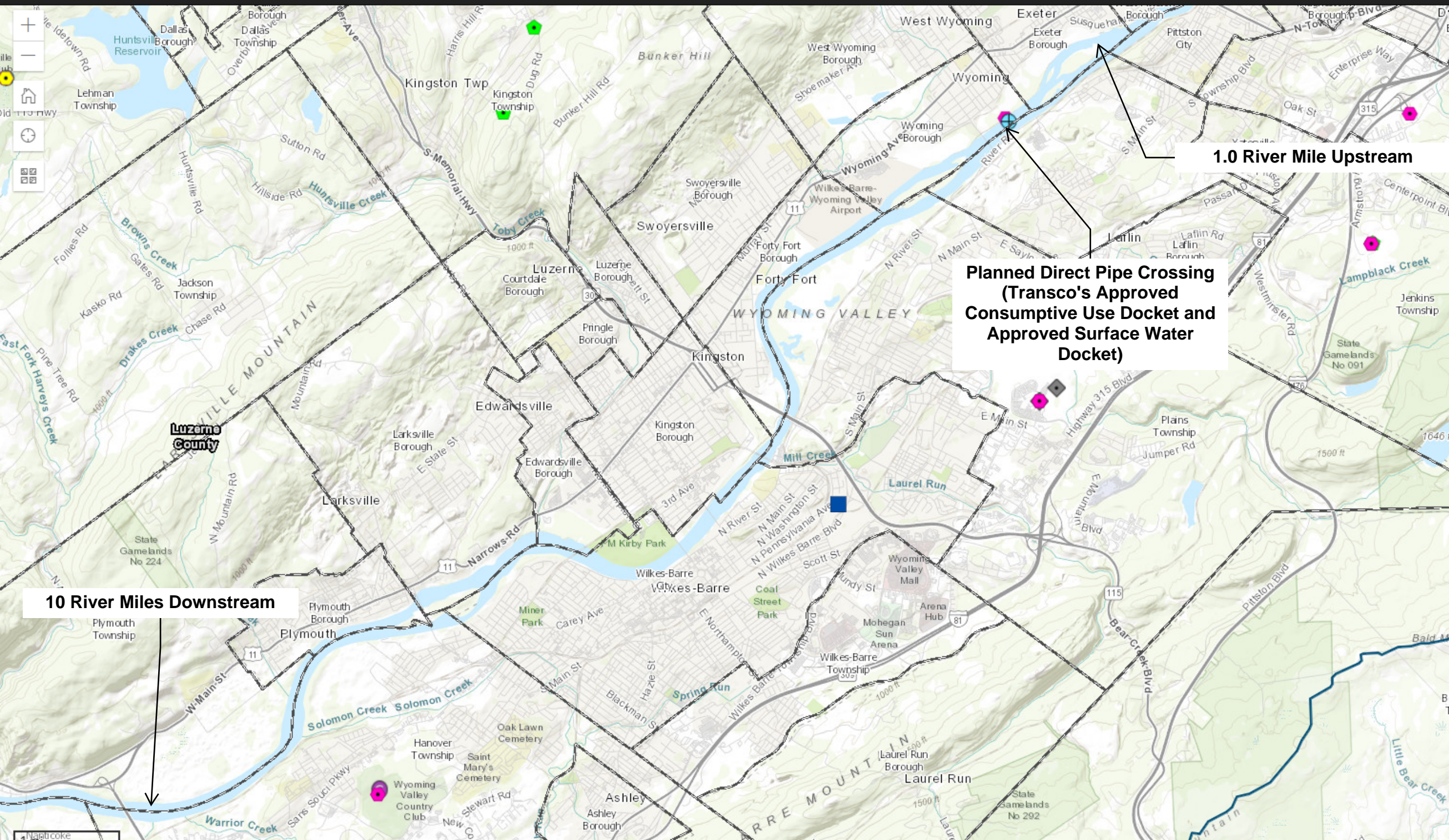
Streets Imagery



0 features in buffer. Export all to CSV X

PWS_ID	SYSTEM_NAME	AREA_CITY	RESPONSIBLE_OFFICER





**Planned Direct Pipe Crossing
(Transco's Approved
Consumptive Use Docket and
Approved Surface Water
Docket)**

1.0 River Mile Upstream

10 River Miles Downstream

Tools

Search Zoom Clear

SRBC Projects

Notice of Intent (NOI) Application (ABRf)
 ▲ Pending CU - Gas Pad

Pending Docket / ABRe
 ● Pending Withdrawal or Consumptive Use

Approved Consumptive Use Docket
 ● Consumptive Use

Approved Surface Water Docket
 ⊕ Withdrawal

Approved Groundwater Docket
 ◆ Withdrawal

Approval By Rule (ABRf)
 ■ Approved CU - Gas Pad

Approval By Rule (ABRe)
 ■ Approved CU - Non-Gas

Diversion
 ➡ Into Basin or Out of Basin

Grandfathered Certificate of Registration
 ● Grandfathered Water Use

Other
 ◆ Non-categorized

Reference Layers

Political Boundaries
 □ State
 □ County

Wells Springs

Data Packages: General Info Site Info Well Construction Hydrogeologic Geologic

ZIP/city/address...

Go

40

-79

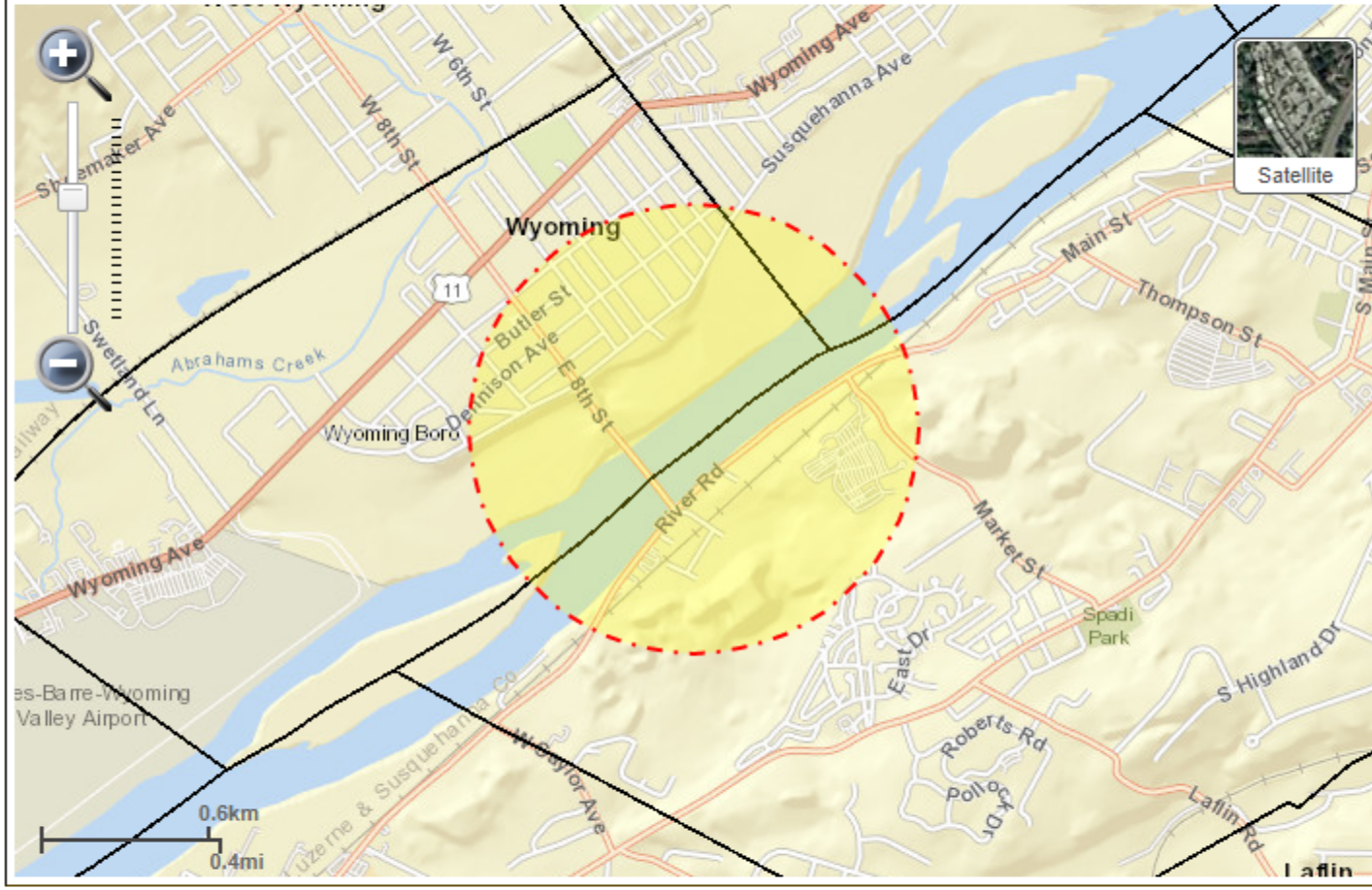
Jump to Point

39.000, -78.683



Include unlocated wells within intersected municipalities

[Explain](#)



[Download Data Package](#)

[Clear Selections](#)

[Contact Us](#)

'Download Data Package' creates a data package-specific CSV file that you may open or download. If you choose to open the file, it may open in Excel (if you have Microsoft Office installed). Because of the relational nature of the database, there may be more than 1 line per well in the downloaded data. For data on public water supply wells, or water quality data, please see instructions.

[Instructions](#)

Total Records To Download : 0 Records

PaGWIS Map Search

You must be zoomed to the level where municipality names appear to search.

Multiple Criteria Map

Wells Springs

Data Packages: General Info Site Info Well Construction Hydrogeologic Geologic

ZIP/city/address...

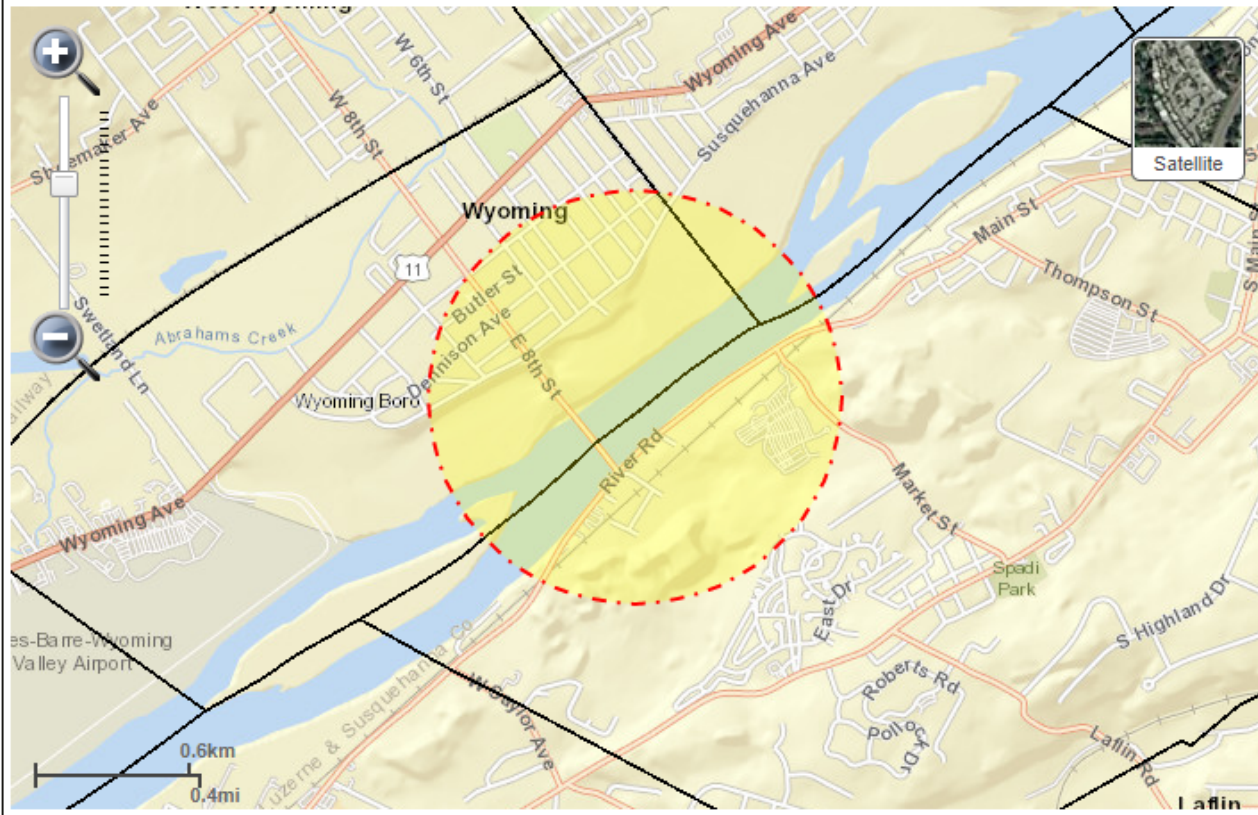
Go

40

-79

Jump to Point

39.188, -77.134



[Download Data Package](#)

[Clear Selections](#)

[Contact Us](#)

'Download Data Package' creates a data package-specific CSV file that you may open or download. If you choose to open the file, it may open in Excel (if you have Microsoft Office installed). Because of the relational nature of the database, there may be more than 1 line per well in the downloaded data. For data on public water supply wells, or water quality data, please see instructions.

[Instructions](#)

Total Records To Download : 0 Records



Transcontinental Gas Pipe Line Company, LLC

**Direct Pipe® Monitoring,
Inadvertent Return Response, and Contingency Plan
Appendix F Landowner Letter Template**

Regional Energy Access Expansion

July 2022

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WE MAKE CLEAN ENERGY HAPPEN®

PO Box 1789

Plains, Pennsylvania 18705

VIA FEDERAL EXPRESS

June 22, 2022

Re: Proposed Regional Energy Access Expansion Project (Project)
Federal Energy Regulatory Commission (FERC) Docket Number CP21-94
Transcontinental Gas Pipe Line Company, LLC
Parcel ID:

To Whom It May Concern,

The Williams Companies, Inc. (Williams) owns and operates an interstate natural gas transmission pipeline system known as Transcontinental Gas Pipe Line Company, LLC (Transco), which transports natural gas from production areas to customers such as utility companies and power plants located throughout the northeastern and southeastern United States. As a part of its proposed Project on the Transco system, Williams intends to cross underneath the Susquehanna River by means of a Direct Pipe® (DP) construction technique, a single pass horizontal directional drilling construction method. Williams is sending this letter to inform you that its proposed DP installation is located within 450 feet of your property boundary. DP activities include construction site work to set-up DP equipment and operations (e.g., tree felling, grading, erosion and sediment controls), and tunnelling and pipe thrusting activities.

The purpose of this letter is to determine if you own a nearby well or water supply. If so, your interests will be served by allowing us to collect well construction and operation information from you, as well as flow rate, water level and water quality data from your well prior to the DP activity. If you agree we ask that you complete, to the best of your ability, the attached questionnaire, and authorize us to access your property for the purpose of locating your well with GPS and performing well testing and sampling.

Your voluntary cooperation would allow us to detect effects on your well from the DP activity, if any, and to recommend mitigating and/or corrective measures as may be appropriate. Our methods simply involve reviewing the questionnaire, corresponding with you, and then visiting the property for the purpose of locating the well with GPS, and recording the water level and flow rate of your well while pumping the well for 30 minutes (i.e., a specific capacity test). We also would collect water samples for water quality analysis. The work and the results will be provided at no cost to you. Data also will be made available to the Pennsylvania Department of Environmental Protection.

OWNER QUESTIONNAIRE AND WELL DETAILS DP PROJECT: Regional Energy Access Expansion

OWNER / TENANT INFORMATION	
Owner Name _____	Mailing Address _____
Business/Facility Name _____	City _____ State _____ Zip _____
Premises Address _____	Is this a Primary Residence (Y/N)? Is this a Rental Unit (Y/N)?
City _____ State _____ Zip _____	Tenant Name _____
Day Phone _____ Evening Phone _____	Tenant Phone _____
Owner Email _____	Tenant Email _____

WELL CONSTRUCTION INFORMATION (please provide details to best of your ability and leave unknowns blank)	
Location Details (e.g. front of house, etc.) _____	GPS Coordinates _____ Lat _____ Long _____
_____	Well Depth (feet) _____ Well Diameter (inches) _____
Construction Date _____	Casing Type (circle): Concrete, Plastic, Steel, Other _____
Use for Water (circle): Residential, Irrigation / Livestock, Industrial, Public Supply, Monitoring, Geothermal, Dewatering, Other _____	Casing Depth (feet) _____ Was Well Grouted (Y/N) _____
Install Method (circle): Hand Dug, Bored / Augered, Cable, Air Percussion, Other _____	Screen Finish (circle): Steel, Plastic, Open Hole, Other _____
Is This a Replacement Well (Y/N)? _____	Screen from top _____ (feet) to bottom _____ (feet)
_____	Water Bearing Zone(s) _____ (feet) _____ (feet) _____ (feet)
_____	Well Blown Yield (gallons per minute) _____
_____	Unsuccessful Drilling Attempts (Y/N)? If Yes (quantity) _____

QUESTIONNAIRE (please provide details)

- When was the last time the well / spring had work completed on it (date and reason)?
- Was the well / spring pump ever replaced (date and reason)?
- Have you ever had water quality problems (when, what were they, how were they fixed)?
- Have you had problems with yield (when, what were they, how were they fixed)?
- Have you ever had problems with your well or water during a drought?
- Does your water change color when it rains?
- Do you ever smell anything odd from your water or your well?
- Is your water conditioned or treated (type, location)? Is there point-of-use treatment (type, location)?
- Is there an outdoor water sampling tap (type, location)?
- Is there a septic system and where is the septic system in relation to the well / spring / building / facility?
- Check if applicable regarding on-site well (a check YES may mean well is inaccessible for GPS or water level measurements):
 - Located where an un-tethered dog has access
 - Well is buried underground or located in a basement, pit, or other area with limited access
 - Excessive rust is on the outside or inside of the well casing
 - Well casing is less than 6 inches in diameter
 - Well cap is welded shut or cap has rubber, caulking or other material watertight seal
 - Well cap bolts are rusted shut or broken off the well head
 - Well cap is loose or completely off the casing
 - Inside the well, there are open, broken or frayed wires
 - Excessive rusting or material that may be knocked loose into the well is inside the well casing
 - Other (e.g. insects / nests) _____



Transcontinental Gas Pipe Line Company, LLC

Direct Pipe® Monitoring,

Inadvertent Return Response, and Contingency Plan

Appendix G Landowner Private Water Supply Correspondence

Regional Energy Access Expansion

July 2022

Transco requests that the Landowner
Private Water Supply Correspondence be
accorded privileged treatment, and that it be
placed in a non-public file.