

Transcontinental Gas Pipe Line Company, LLC



REQUIREMENT J - ENVIRONMENTAL ASSESSMENT FORM:

MODULE S4 - MITIGATION PLAN

PADEP CHAPTER 105/USACE SECTION 404 JOINT PERMIT APPLICATION

JUNE 2025

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Northeast Supply Enhancement Project – PADEP Chapter 105/USACE Section 404 JPA Transcontinental Gas Pipe Line Company, LLC

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PROJECT OVERVIEW

Transcontinental Gas Pipe Line Company, LLC (Transco) has prepared a Mitigation Plan for the Northeast Supply Enhancement Project – Quarryville Loop (Project) as part of the Joint Permit Application for the United States Army Corps of Engineers (USACE) and Pennsylvania Department of Environmental Protection (PADEP). The Project will take place in Drumore, East Drumore, and Eden Townships, Lancaster County, Pennsylvania. The proposed Mitigation Plan for the Project will be to complete onsite restoration at Crossing 4 in Eden Township, within the temporary workspace associated with forested components of W-T02-001C-1 at Milepost 1685.7.

During construction, impacts to wetland areas will be minimized by employing the wetland construction procedures specified in the Project's Environmental Construction Plan (ECP). The Project's ECP is modeled after the Federal Regulatory Commission (FERC) guidance and meets industry standards.

This plan is being developed to meet the requirements of the USACE and PADEP permit requirements.

1.0 TEMPORARY FORESTED WETLAND IMPACTS

Unavoidable temporary impacts to portions of Wetland W-T02-001C-1, will include palustrine forested (PFO) wetland impacts. The PFO wetland impact within the temporary workspace is 1,657 square feet or 0.04 acres in size. PFO wetland impacts with the permanent right-of-way are 1,139 square feet or 0.03 acres. The location of the Wetland W-T02-001C-1 can be viewed in Figure 1-Location Map.

2.0 W-T02-001C-1 WETLAND PLANTING

PFO portions of wetland W-T02-001C-1 that are located within the temporary workspace (0.04 acres) will be planted with trees (herein referred to as the replanting area). The replanting area will be planted at a density 435 stems per acre, which is equivalent to 18 trees, using a variety of trees from the list below. Sheet 1 of 2 – Crossing 4: W-T02-001C-1 Planting Plan outlines the location where the planting is to take place. The trees will be provided with shelters and support stakes. Fertilizer and rodenticide tablets may be used at each planting to help jump start growth and protect against predation from herbivores. At least three of the following species should be planted in the restoration area:

- Pin Oak (Quercus palustris)
- Swamp White Oak (Quercus bicolor)
- Boxelder (*Acer negundo*)
- Eastern Hemlock (Tsuga canadensis)
- Blackgum (*Nyssa sylvatica*)
- American Sycamore (Platanus occidentalis)

Should the above plants be unavailable at the time of planting to obtain a mix of three separate species, an alternative will be proposed for the site and approved by the USACE prior to planting.

4.0 PLANTING MONITORING

Transco will conduct follow-up inspections during the first and second growing seasons to determine the success of planting, in accordance with the Transco Plan and Procedures, as well as any other applicable permit conditions. For at least two years following construction, Transco will submit quarterly reports to the Federal Energy Regulatory Commission that document any problems identified by Transco or landowners and describe the corrective actions taken to remedy those problems.

5.0 WETLAND SEEDING PLAN

Wetlands impacted by the project will be seeded upon final restoration with Ernst PA Piedmont Province FACW Mix (ERNMX-261) at a rate of 20 pounds per acre. This seed mix has been selected as it provides a variety of native, herbaceous species to promote vegetative diversity within the wetlands. Below are the details of the seed mix, and their relative percentages within the mix:

TABLE S	4-1 - PA PIEDMONT PROVINCE FAC	W MIX	
PERCENTAGE OF MIX COMPOSITION	SCIENTIFIC NAME Carex vulpinoidea Fox Sedge Panicum anceps Beaked Panicgrass Elymus virginicus Virginia Wildrye Carex lurida Lurid Shallow Sedge Carex scoparia Blunt Broom Sedge Verbena hastata Blue Vervain Juncus effusus Soft Rush Onoclea sensibilis Sensitive Fern Scirpus polyphyllus Asclepias incarnata Swamp Milkweed Aster puniceus Purplestem Aster Bidens cernua Nodding Bur Marigold Carex intumescens Eupatorium perfoliatum Boneset Glyceria canadensis Rattlesnake Grass		
28.00%	Carex vulpinoidea	Fox Sedge	
17.20%	Panicum anceps	Beaked Panicgrass	
12.00%	Elymus virginicus	Virginia Wildrye	
10.00%	Carex Iurida	Lurid Shallow Sedge	
4.00%	Carex lupulina	Hop Sedge	
4.00%	Carex scoparia	Blunt Broom Sedge	
4.00%	Verbena hastata	Blue Vervain	
3.00%	Juncus effusus	Soft Rush	
2.00%	Onoclea sensibilis	Sensitive Fern	
2.00%	Scirpus polyphyllus	Many Leaved Bulrush	
1.00%	Asclepias incarnata	Swamp Milkweed	
1.00%	Aster puniceus	Purplestem Aster	
1.00%	Aster umbellatus	Flat Topped White Aster	
1.00%	Bidens cernua	Nodding Bur Marigold	
1.00%	Carex intumescens	Bladder Sedge	
1.00%	Eupatorium coelestinum	Mistflower	
1.00%	Eupatorium perfoliatum	Boneset	
1.00%	Glyceria canadensis	Rattlesnake Grass	
1.00%	Polygonum pensylvanicum	Pennsylvania Smartweed	
1.00%	Vernonia gigantea	Giant Ironweed	

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TABLE S4-1 - PA PIEDMONT PROVINCE FACW MIX								
PERCENTAGE OF MIX COMPOSITION	SCIENTIFIC NAME	COMMON NAME						
1.00%	Zizia aurea	Golden Alexanders						
0.50%	Symphyotrichum novae-angliae	New England Aster						
0.50%	Eupatorium fistulosum Joe Pye Weed							
0.50%	Helenium autumnale	Common Sneezeweed						
0.50%	Mimulus ringens	Square Stemmed Monkeyflower						
0.50%	Sisyrinchium angustifolium	Narrowleaf Blue Eyed Grass						
0.30%	Ludwigia alternifolia	Seedbox						

6.0 RESTRICTIVE LAYER RESTORATION PLAN

A study of soils containing fragipan layers, bedrock, and other restrictive layers was completed for the pipeline route. All soils located on the pipeline route were first identified and then reviewed to determine which soils contain a restrictive layer utilizing the Natural Resource Conservation Service (NRCS) Web Soil Survey, Soil Survey Geographic Database (SSURGO) data set for the project area. The results of this review are shown below in Table S4-2 – Project Soils Summary Table.

	TABLE S4-2 – PROJECT SOILS SUMMARY TABLE									
Soil Mapping Unit	SOIL SERIES NAME	FRAGIPAN PRESENT	FRAGIPAN DEPTH	DEPTH TO BEDROCK	SOIL TEXTURE					
Ва	Baile silt loam	No	-	5 to 10 feet	Silty Clay Loam, Loam					
CbA	Chester silt loam, 0 to 3 percent slopes	No	-	6 to 10 feet	Silt Loam, Silty Clay Loam					
CbB	Chester silt loam, 3 to 8 percent slopes	No	-	6 to 10 feet	Silt Loam, Silty Clay Loam					
CbC	Chester silt loam, 8 to 15 percent slopes	No	-	6 to 10 feet	Silt Loam, Silty Clay Loam					
GbB	Glenelg silt loam, 3 to 8 percent slopes	No	-	6 to 10 feet	Clay Loam, Loam					
GbC	Glenelg silt loam, 8 to 15 percent slopes	No	-	6 to 10 feet	Clay Loam, Loam					
GbD	Glenelg silt loam, 15 to 25 percent slopes	No	-	6 to 10 feet	Clay Loam, Loam					
GdB	Glenville silt loam, 3 to 8 percent slopes	Yes	15 to 30 inches	> 60 inches	Silt Loam, Channery Loam					
MaB	Manor silt loam, 3 to 8 percent slopes	No	-	> 72 inches	Loam, Sandy Loam					
MaC	Manor silt loam, 8 to 15 percent slopes	No	-	> 72 inches	Loam, Sandy Loam					

	TABLE S4-2 – PROJECT SOILS SUMMARY TABLE									
Soil Mapping Unit	SOIL SERIES NAME	FRAGIPAN PRESENT	FRAGIPAN DEPTH	DEPTH TO BEDROCK	SOIL TEXTURE					
MaD	Manor silt loam, 15 to 25 percent slopes	No	-	> 72 inches	Loam, Sandy Loam					
MbD	Manor very stony silt loam, 15 to 25 percent slopes	No	-	> 72 inches	Loam, Sandy Loam					
MdF	Manor very stony silt loam, 25 to 60 percent slopes	No	-	> 72 inches	Loam, Sandy Loam					
Nd	Newark silt loam	No	-	> 60 inches	Silt Loam					
Ud	Udorthents, loamy	No	-	Varies	Varies					
W	Water	No	-	N/A	-					

No soils were identified as a clay within the Project area. Bedrock was identified within each of the soils series to be located at a minimum of 5 feet (60 inches) below the surface, with a range indicating its location of greater than 5 feet deep. A fragipan was identified in only one soil series, the Glenville Silt Loam. Below is a description of the Glenville soil series, as defined by National Cooperative Soil Survey (NCSS, 2008):

Glenville silt loam – 3 to 8% slopes, extremely stony (GdB): The Glenville soil consists of very deep moderately well drained or somewhat poorly drained soils formed primarily in colluvium or residuum affected by soil creep that is weathered from phyllite, micaceous schist, granitic gneiss and other acid crystalline rocks. A fragipan is located from 15 to 30 inches from the soil surface. The depth to bedrock is more than 60 inches. The taxonomic class is a Fine-loamy, mixed, active, mesic Aquic Fragiudults. A representative Glenville soil profile includes:

Ap--0 to 9 inches, dark yellowish brown (10YR 4/4) silt loam; weak fine granular structure; friable, nonsticky, nonplastic; slightly acid; abrupt smooth boundary. (7 to 10 inches thick)

Bt1--9 to 16 inches, yellowish brown (10YR 5/6) silt loam; moderate medium subangular blocky structure; friable, slightly sticky, slightly plastic; common distinct clay films on faces of peds and in pores; 5 percent channers; very strongly acid; clear wavy boundary.

Bt2--16 to 19 inches; yellowish brown (10YR 5/6) silt loam; moderate medium subangular blocky structure; friable, slightly sticky, slightly plastic; common distinct light brownish gray (10YR 6/2) iron depletions on faces of peds and common many prominent strong brown (7.5YR 5/8) masses of oxidized iron between peds; common distinct clay films on faces of peds; 5 percent gravel channers; very strongly acid; clear wavy boundary. (Combined thickness of Bt is 15 to 50 centimeters thick)

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Btx--19 to 25 inches, brown (10YR 5/3) silt loam; weak coarse prismatic structure parting to moderate thick platy structure; very firm, brittle, slightly sticky, slightly plastic; common distinct clay films throughout; many distinct light brownish gray (10YR 6/2) iron depletions on vertical faces of peds and common many prominent strong brown (7.5YR 5/8) masses of oxidized iron between peds; 10 percent gravel; moderately acid; gradual wavy boundary. (15 to 40 centimeters thick)

Btgx--25 to 33 inches; light brownish gray (10YR 6/2), and brown (10YR 5/3) silt loam; weak coarse prismatic structure parting to moderate very thick platy structure; very firm and brittle; slightly sticky and slightly plastic; common distinct clay films on bottom faces of peds; few distinct gray (10YR 6/1) iron depletions and common distinct yellowish brown (10YR 5/4) masses of oxidized iron on vertical faces of peds; 10 percent quartzite channers; common mica flakes; moderately acid; gradual wavy boundary. (0 to 40 centimeters thick)

BC--33 to 39 inches, yellowish brown (10YR 5/4) silt loam; weak coarse subangular blocky structure parting to weak medium subangular blocky; firm, slightly sticky and slightly plastic; many faint pale brown (10YR 6/3) iron depletions on vertical faces of peds; 10 percent quartzite channers common fine mica flakes; moderately acid; gradual wavy boundary.

C--39 to 82 inches; yellowish brown (10YR 5/4) channery loam; massive; friable, nonsticky and nonplastic; many prominent strong brown (7.5YR 5/8) masses of oxidized iron on vertical faces of peds and common distinct grayish brown (10YR 5/2) iron depletions on vertical faces of peds; many fine mica flakes; 15 percent quartzite channers; moderately acid.

Based on the soils summarized above, impacted wetlands were then reviewed to determine which soil series each wetland is within and to determine if a restrictive layer bedrock layer is present. The results of this review are shown below in Table S4-3 – Wetlands with Restrictive Layers Summary. Data represented in the table below is based on the SSURGO data and wetland delineation data, as indicated.

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			1	TABLE S4-3 – WETLAND SO	DILS AN	D RESTRIC	TIVE LAYER	RS		
WETLAND NAME	MILEPOST	CROSSING NUMBER	SOIL MAPPING UNIT	SOIL SERIES	FRAGIPAN PRESENT?	FRAGIPAN DEPTH	RESTRICTIVE LITHIC/PARALITHIC BEDROCK PRESENT	DEPTH TO BEDROCK	SOIL TEXTURES WITHIN PROFILE	DRAINAGE CLASS
W-T02- 006	1681.5	1	GdB	Glenville silt loam, 3 to 8 percent slopes	Yes	15 to 30 inches	No	> 60 inches	Silt Loam, Channery Loam	Moderately Well Drained
W-T02- 012	1683.5	2	MbF¹	Manor very stony silt loam, 25 to 60 percent slopes	No	-	Yes	> 72 inches	Loam, Sandy Loam	Well Drained
W-T02- 008	1685	3	GbB	Glenelg silt loam, 3 to 8 percent slopes	No	-	No	6 to 10 feet	Clay Loam 0 - 30", Loam	Well Drained
W-T02-	1685.7	4	GdB	Glenville silt loam, 3 to 8 percent slopes	Yes	15 to 30 inches	No	> 60 inches	Silt Loam, Channery Loam	Moderately Well Drained
001³	1685.6	4	CbB	Chester silt loam, 3 to 8 percent slopes	No	-	No	6 to 10 feet	Silt Loam, Silty Clay Loam	Well Drained
W-T02- 005⁴	1687.4	7	GdB	Glenville silt loam, 3 to 8 percent slopes	Yes	15 to 30 inches	No	> 60 inches	Silt Loam, Channery Loam	Moderately Well Drained
W-T02- 009	1688.1	8	Ba²	Baile silt loam	No	-	Yes	5 to 10 feet	Silty Clay Loam, Loam	Poorly Drained
W-T02-	1688.4 5	9	GdB	Glenville silt loam, 3 to 8 percent slopes	Yes	15 to 30 inches	No	> 60 inches	Silt Loam, Channery Loam	Moderately Well Drained
010	1688.5	9	Ba²	Baile silt loam	No	-	Yes	5 to 10 feet	Silty Clay Loam, Loam	Poorly Drained
W-T06-	1688.7	10	GdB	Glenville silt loam, 3 to 8 percent slopes	Yes	15 to 30 inches	No	> 60 inches	Silt Loam, Channery Loam	Moderately Well Drained
0015	1688.7	10	Ba²	Baile silt loam	No	-	Yes	5 to 10 feet	Silty Clay Loam, Loam	Poorly Drained
W-T06-	1689.3	11	GdB	Glenville silt loam, 3 to 8 percent slopes	Yes	15 to 30 inches	No	> 60 inches	Silt Loam, Channery Loam	Moderately Well Drained
003	1689.3	11	GbC	Glenelg silt loam, 8 to 15 percent slopes	No	-	No	6 to 10 feet	Clay Loam 0 - 30", Loam	Well Drained
W-T02- 011	1690.5	12	GdB	Glenville silt loam, 3 to 8 percent slopes	Yes	15 to 30 inches	No	6 to 10 feet	Silt Loam, Channery Loam	Moderately Well Drained
W-T06- 004 ⁶	1690.9	13	GdB	Glenville silt loam, 3 to 8 percent slopes	Yes	15 to 30 inches	No	6 to 10 feet	Silt Loam, Channery Loam	Moderately Well Drained

TABLE S4-3 – WETLAND SOILS AND RESTRICTIVE LAYERS										
WEILAND NAME	MILEPOST	CROSSING NUMBER	SOIL MAPPING UNIT	SOIL SERIES	FRAGIPAN PRESENT?	FRAGIPAN DEPTH	RESTRICTIVE LITHIC/PARALITHIC BEDROCK PRESENT	DEPTH TO BEDROCK	SOIL TEXTURES WITHIN PROFILE	DRAINAGE CLASS
	1690.9		Ba²	Baile silt loam	No	-	Yes	5 to 10 feet	Silty Clay Loam, Loam	Poorly Drained

¹ Manor very stony silt loam, 25 to 60 percent slopes is listed by NRCS as having a paralithic bedrock layer present.

Based on this assessment, the following was identified:

- 1. All wetlands are at a minimum 5 feet (60 inches) above bedrock, with wetlands at crossings 2, 8, 9,10, and 13 containing a restrictive layer of bedrock associated with the Baile silt loam and the Manor very stony loam soil series;
- 2. No clays were identified within the wetlands, only some have soils with clay components;
- 3. A fragipan may be present between 15 and 30 inches at Crossings 4, 7, 9, 10, and 12 associated with the Glenville Soil Series.

To mitigate for any potential lateral loss of hydrology within all wetlands, trench plugs will be placed in the pipeline trench, at the borders of each wetland. If bedrock is encountered, the trench plugs will contain the wetlands hydrology and no vertical hydrology loss is anticipated due to the bedrock continuing to act as a restrictive layer. When constructing thru the wetlands, top soil and sub soils will be segregated, if conditions are suitable, as described in the Wetland and Waterbody Construction and Mitigation Procedures. The soils will be placed back into the trench line in the same manner during pipeline restoration.

In addition to the trench plug installation to prevent lateral hydrology loss, the fragipans will be restored at the identified crossings. To complete the construction in these resources, the environmental inspector (EI) shall investigate the soils to determine at what depth the fragipan is located, within the provided 15-30 inch range. Once identified, a triple lift trench line technique will be employed to prevent the mixing of the fragipan soils with overlying soil. The lifts will include 1) topsoil, 2) B horizons not including Bx (fragipan), and 3) remainder of the trenching depth. This technique will ensure fragipan material is not incorporated into the near surface non-fragipan B horizon soil material. Excavated soils will be replaced in the opposite order as they were removed. Proper handling during excavation within fragipan soil units will be closely monitored by the EI to prevent unintentional mixing of the fragipan horizons with the overlying soil horizons.

² Baile silt loam is listed by NRCS as having a lithic bedrock layer present.

³ A shallow aguitard and a textural restrictive layer was identified during the wetland delineation (W-T02-011).

⁴ A shallow aquitard and a textural change was identified during the wetland delineation (W-T02-005).

⁵ The fragipan was found during the wetland delineation (W-T06-001).

⁶ A shallow aguitard and a fragipan were identified during the wetland delineation (W-T06-004).

7.0 VERNAL POOL RESTORATION PLAN

A vernal pool (WB-T02-012) was identified at Crossing 2 and will be impacted by the Project. The feature is approximately 65 feet long and 17 feet wide and 1 foot deep, in its deepest location. The feature is generally an open water portion of a larger wetland complex, W-T02-012. The feature retains its hydrology due to its concave, depression shape. It is located within the Fishing Creek floodplain, the likely groundwater hydrologic source for the vernal pool. Impacts to the vernal pool have been minimized to the extent possible during the route development process by co-locating the Quarryville Loop alongside an existing Transco pipeline right-of-way. A total of 184 square feet of the vernal pool will be impacted. The pipeline trench is not located within the vernal pool, only the Project's workspace. Sheet 2 of 2 – WB-T02-012 Restoration provides detail on the feature, including a plan view and cross sections.

To mitigate for impacts to the resource, Transco will minimize soil compaction by utilizing timber mats to cross the vernal pool and the surrounding wetland. The vernal pool is oval shaped, 17' wide at its widest point within the LOD and approximately 65 feet long. The timber mats (generally 12-16 feet long and 4-8 feet wide) will be placed across the vernal pool, in a manner that the long portions of the mat cross the depression (i.e. the 16-foot wide portion of the mat is placed over the short side of the vernal pool, minimizing compaction within the deepest portions). Pipeline excavation is not proposed within the vernal pool portion of the wetland, only Project workspace is sited here. When completing final restoration and removing the timber matting within the vernal pool, the El will be onsite to ensure the site is restored to pre-construction elevations and contours, as shown on the provided Sheet 2 of 2. Non-disturbed portions of the vernal pool habitat should be utilized for reference during restoration, along with the pre-construction survey data. The undisturbed portions of the vernal pool make it an adequate reference resource. Disturbed areas will be reseeded with the wetland seed mix. Erosion and sediment controls will be installed surrounding the wetland to prevent sedimentation within the resource.

8.0 REFERENCES

National Cooperative Soil Survey (NCSS). "Web Site for Official Soil Series Descriptions and Series Classification." *USDA-NRCS Official Soil Series Description View By List*, United States Dept. of Agriculture - Natural Resources Conservation Service, Feb. 2008, soilseries.sc.egov.usda.gov/.









