

## Erosion and Sediment Control Plan Narrative

### Atlantic Sunrise Project Proposed Central Penn Line South Ralpho, Coal, East Cameron, and Upper Mahanoy Townships Northumberland County Pennsylvania

Prepared For:

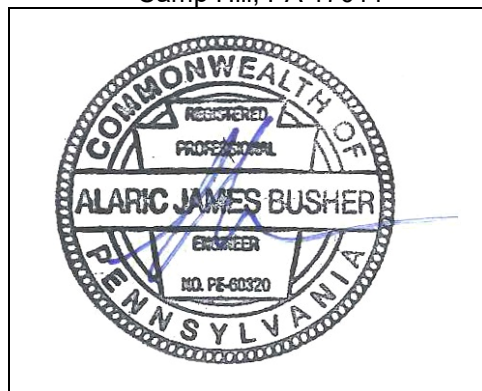


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BL Project No. 14C4909

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## **1.0 GENERAL INFORMATION**

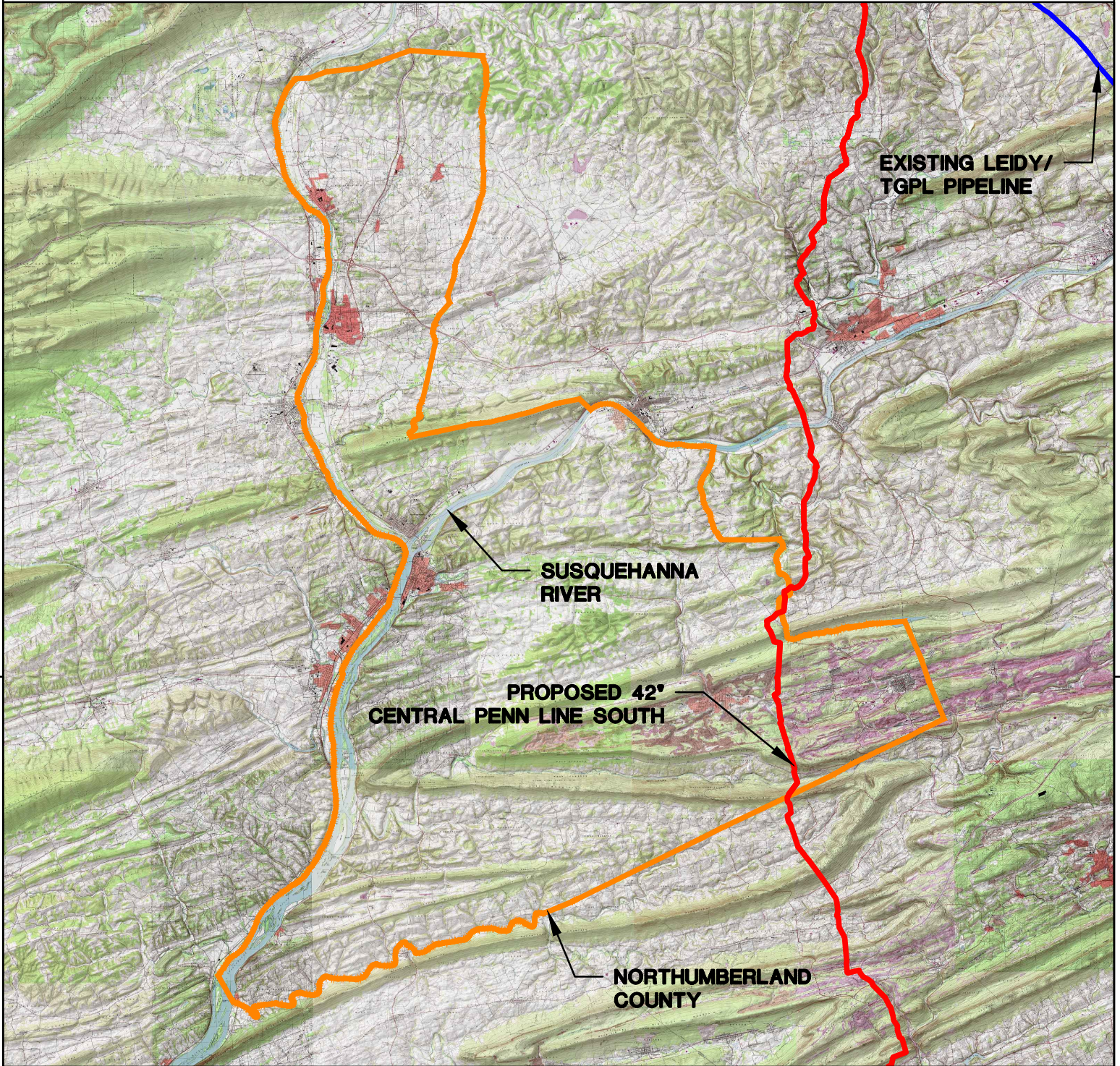
The following narrative was prepared as a supplement to the Transcontinental Gas Pipe Line Company, LLC (Transco) Environmental Construction Plan (ECP), provided as **Section 4 of the Erosion and Sediment Control General Permit 2 (ESCGP-2) Notice of Intent (NOI)** which was prepared for the Atlantic Sunrise Project (Project). The portion of the Project proposed as part of this ESCGP-2 Permit Application consist of a proposed 30-inch Central Penn Line North (CPL North), 42-inch Central Penn Line South (CPL South), associated temporary and permanent facilities, and access roads. This Erosion and Sediment Control (E&SC) Narrative is intended to describe the erosion and sediment control design for the pipeline right-of-way (ROW) corridor to be constructed as part of the proposed CPL South pipeline within Northumberland County, Pennsylvania. Similar E&SC narratives were prepared, under separate cover, for each county within the Commonwealth in which the Project is located.

The proposed CPL South pipeline consists of the installation of a 42-inch natural gas (steel) pipeline. The portion of the CPL South pipeline within Northumberland County will be approximately 47,829 linear feet (9.06 miles) in length, with a Project Area of approximately 255.3 acres and a Limit of Disturbance of approximately 176.67 acres. The total CPL South pipeline has a Project Area of approximately 3,380.8 acres and a Limit of Disturbance of approximately 2,387.86 acres. There are seven (7) temporary access roads and four (4) permanent access roads within Northumberland County, totaling approximately 47,160 linear feet, being utilized for access to/from the CPL South pipeline ROW and workspaces. Of the 47,160 linear feet of roadway, approximately 46,290 linear feet is utilizing or modifying existing roads and 870 linear feet are proposed access roads or portions of proposed access roads through virgin land. Tree clearing will occur within the entire pipeline LOD.

The E&SC Plans and the Best Management Practices (BMPs) and Quantities Plans are based on the standards and specifications in the Pennsylvania Department of Environmental Protection's (PADEP's) "Erosion and Sediment Pollution Control (E&S) Program Manual," Technical Guidance No. 363-2134-008, as amended and updated (Manual), and will be applied during construction.

Please refer to the following sections of the **ESCGP-2 NOI** for supporting documents and plan sets:

- **Section 2:** Erosion and Sediment Control Plan Narratives and Drawings, including Best Management Practices and Quantities Plan Set
- **Section 4:** Environmental Control Plan for overall project information
- **Section 5:** Wetland Delineation Report



EXISTING LEIDY/  
TGPL PIPELINE

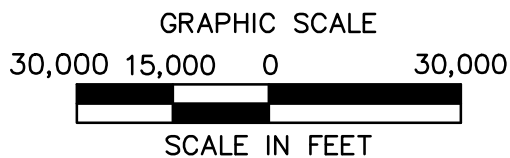
SUSQUEHANNA  
RIVER

PROPOSED 42"  
CENTRAL PENN LINE SOUTH

NORTHUMBERLAND  
COUNTY

MOUNT CARMEL, SHAMOKIN, TREMONT, AND VALLEY VIEW QUADRANGLES

**BL** ARCHITECTURE  
ENGINEERING  
ENVIRONMENTAL  
LAND SURVEYING  
Companies



TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC  
ATLANTIC SUNRISE PROJECT  
PROPOSED 42" CENTRAL PENN LINE SOUTH  
USGS LOCATION MAP  
RALPHO, COAL, EAST CAMERON &  
UPPER MAHONoy TOWNSHIPS  
NORTHUMBERLAND COUNTY, PENNSYLVANIA



NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.	DRAWN BY:	TLD	DATE:	06/26/15	ISSUED FOR BID:	SCALE: 1"=30,000'
0	08/28/2015	BL	ISSUED FOR PADEP SUBMITTAL	572385	DAK	AJB	CHECKED BY:	JLK	DATE:	06/29/15	ISSUED FOR CONSTRUCTION:	
1	12/02/2015	BL	ISSUED FOR PADEP RESUBMITTAL	572385	DAK	AJB	APPROVED BY:	AJB	DATE:	06/30/15	DRAWING NUMBER:	USGS SITE LOCATION MAP SHEET
2	02/04/2016	BL	ISSUED FOR PADEP RESUBMITTAL	572385	DAK	AJB	WO:	572385				1 OF 1
3	03/28/2016	BL	ISSUED FOR PADEP RESUBMITTAL	572385	DAK	AJB						
4	10/2016	BL	ISSUED FOR PADEP RESUBMITTAL	572385	DAK	AJB						
5	April 2017	BL	ISSUED FOR PADEP RESUBMITTAL	572385	DAK	AJB						

# NORTHUMBERLAND COUNTY, PENNSYLVANIA



LEGEND	
	PROPOSED 42" CENTRAL PENN LINE SOUTH
	EXISTING TRANSCO PIPELINES
	STATE BOUNDARY
	LANCASTER COUNTY
	COUNTY BOUNDARY
	TOWNSHIP BOUNDARY
	EXISTING TRANSCO COMPRESSOR STATIONS



DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
A	06/25/14	IAM	ISSUED FOR INFORMATION	1161503	EL	MJH
B	10/30/14	SHL	ISSUED FOR INFORMATION	1161503	EL	MJH
C	03/10/15	JTN	ISSUED FOR INFORMATION	1161503	EL	MJH
D	05/11/15	LMC	ISSUED FOR INFORMATION	1161503	EL	MJH
E	09/23/16	JTN	ISSUED FOR INFORMATION	1161503	EL	MJH
F	04/12/17	JTN	ISSUED FOR INFORMATION	1161503	EL	MJH

**TRANSCONTINENTAL GAS PIPE LINE COMPANY LLC**  
**AERIAL COUNTY MAP**  
**ATLANTIC SUNRISE PROJECT**  
**PROPOSED 42" CENTRAL PENN LINE SOUTH**  
**M-0247 M.P. 0.36 TO M.P. 91.76**  
**NORTHUMBERLAND COUNTY, PENNSYLVANIA**

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CHECKED BY: EL	DATE: 06/25/14	ISSUED FOR CONSTRUCTION:	REVISION: F
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## 1.2 Soil Characteristics

Soil Types and Limitations, including the identification of hydric soils are as follows:

MAP UNIT NAME	MAP UNIT DESIGNATION	CUTBANKS CAVE	CORROSIVE TO CONCRETE/ STEEL	DROUGHTY	EASILY ERODIBLE	FLOODING	DEPTH TO SATURATED ZONE/ SEASONAL HIGH WATER TABLE	HYDRIC/ HYDRIC INCLUSIONS	LOW STRENGTH/ LANDSLIDE PRONE	SLOW PERCOLATION	PIPING	POOR SOURCE OF TOPSOIL	FROST ACTION	SHRINK - SWELL	POTENTIAL SINKHOLE	PONDING	WETNESS
AbB	ALBRIGHTS SILT LOAM, 3 TO 8 PERCENT SLOPES	X	C/S	X	X		X	X	X	X	X	X	X				X
BxB	BUCHANAN VERY STONY LOAM, 0 TO 8 PERCENT SLOPES	X	C/S	X	X		X	X	X	X	X	X	X				X
BxD	BUCHANAN VERY STONY LOAM, 8 TO 25 PERCENT SLOPES	X	C/S	X	X		X	X	X	X	X	X	X				X
CaB	CALVIN-KLINESVILLE SHALY SILT LOAMS, 3 TO 8 PERCENT SLOPES	X	C/S	X	X			X		X	X	X	X				
CaC	CALVIN-KLINESVILLE SHALY SILT LOAMS, 8 TO 15 PERCENT SLOPES	X	C/S	X	X			X		X	X	X	X				
CaD	CALVIN-KLINESVILLE SHALY SILT LOAMS, 15 TO 25 PERCENT SLOPES	X	C/S	X	X			X		X	X	X	X				
DeF	DEKALB EXTREMELY STONY SANDY LOAM, STEEP	X	C	X					X	X	X	X	X				
Du	DUMPS, MINE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HuB	HAZLETON AND CLYMER EXTREMELY STONY SANDY LOAMS, 0 TO 8 PERCENT SLOPES	X	C	X	X			X	X	X	X	X	X				
HuD	HAZLETON AND CLYMER EXTREMELY STONY SANDY LOAMS, 8 TO 25 PERCENT SLOPES	X	C	X	X			X	X	X	X	X	X				

MAP UNIT NAME	MAP UNIT DESIGNATION	CUTBANKS CAVE	CORROSIVE TO CONCRETE/ STEEL	DROUGHTY	EASILY ERODIBLE	FLOODING	DEPTH TO SATURATED ZONE/ SEASONAL HIGH WATER TABLE	HYDRIC/ HYDRIC INCLUSIONS	LOW STRENGTH / LANDSLIDE PRONE	SLOW PERCOLATION	PIPING	POOR SOURCE OF TOPSOIL	FROST ACTION	SHRINK - SWELL	POTENTIAL SINKHOLE	PONDING	WETNESS
HuF	HAZLETON AND CLYMER EXTREMELY STONY SANDY LOAMS, 25 TO 80 PERCENT SLOPES	X	C	X	X			X	X	X	X	X	X				
Hv	HOLLY SILT LOAM	X	C/S			X	X	X	X	X	X	X	X			X	X
KkE	KLINESVILLE AND LECK KILL SHALY SILT LOAMS, 35 TO 70 PERCENT SLOPES	X	C/S	X	X			X		X		X	X				
LdD	L Aidig and Meckesville extremely stony soils, 8 to 25 percent slopes	X	C/S	X	X		X	X	X	X	X	X	X				
LdF	Laidig and Meckesville extremely stony soils, steep	X	C/S	X	X		X	X	X	X	X	X	X				
LIB2	Leck Kill Channery silt loam, deep, 3 to 12 percent slopes, moderately eroded	X	C						X	X	X	X	X				X
LkB2	Leck Kill Channery silt loam, 3 to 12 percent slopes, moderately eroded	X	C						X	X	X	X	X				X
LkC3	Leck Kill Channery silt loam, 12 to 20 percent slopes, severely eroded	X	C						X	X	X	X	X				X
LkD3	Leck Kill Channery silt loam, 20 to 35 percent slopes, severely eroded	X	C						X	X	X	X	X				X
LnB	Leck Kill shaly silt loam, 3 to 8 percent slopes	X	C						X	X	X	X	X				X

MAP UNIT NAME	MAP UNIT DESIGNATION	CUTBANKS CAVE	CORROSIVE TO CONCRETE/ STEEL	DROUGHTY	EASILY ERODIBLE	FLOODING	DEPTH TO SATURATED ZONE/ SEASONAL HIGH WATER TABLE	HYDRIC/ HYDRIC INCLUSIONS	LOW STRENGTH / LANDSLIDE PRONE	SLOW PERCOLATION	PIPING	POOR SOURCE OF TOPSOIL	FROST ACTION	SHRINK - SWELL	POTENTIAL SINKHOLE	PONDING	WETNESS
MkB	MECKESVILLE SILT LOAM, 3 TO 8 PERCENT SLOPES	X	C/S				X		X	X	X	X	X				X
MkC	MECKESVILLE SILT LOAM, 8 TO 15 PERCENT SLOPES	X	C/S				X		X	X	X	X	X				X
SmB	SHELMADINE VERY STONY SILT LOAM, 0 TO 8 PERCENT SLOPES	X	C/S	X			X	X	X	X	X	X	X				
Ts	TIOGA SILT LOAM	X	C		X	X	X	X		X							
Uf	UDIFLUVENTS, COAL OVERWASH	X	C/S			X	X	X		X	X		X				
Ug	UDIFLUVENTS AND FLUVAQUENTS, GRAVELLY	X	C/S			X	X	X		X	X		X				
Uh	UDORTHEMS, SANDSTONE AND SHALE	X	C/S	X	X				X	X		X	X				
W	WATER	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
WcB2	WEIKERT CHANNERY SILT LOAM, 3 TO 12 PERCENT SLOPES, MODERATELY ERODED	X	C/S	X				X	X	X	X	X	X				
WcC2	WEIKERT CHANNERY SILT LOAM, 35 TO 80 PERCENT SLOPES, MODERATELY ERODED	X	C/S	X				X	X	X	X	X	X				
WcD2	WEIKERT CHANNERY SILT LOAM, 20 TO 35 PERCENT SLOPES, MODERATELY ERODED	X	C/S	X				X	X	X	X	X	X				
WcF2	WEIKERT CHANNERY SILT LOAM, 12 TO 20 PERCENT SLOPES, MODERATELY ERODED	X	C/S	X				X	X	X	X	X	X				
WeC	WEIKERT SHALY SILT LOAM, 8 TO 15 PERCENT SLOPES	X	C/S	X				X	X	X	X	X	X				

MAP UNIT NAME	MAP UNIT DESIGNATION	CUTBANKS CAVE	CORROSIVE TO CONCRETE/ STEEL	DROUGHTY	EASILY ERODIBLE	FLOODING	DEPTH TO SATURATED ZONE/ SEASONAL HIGH WATER TABLE	HYDRIC/ HYDRIC INCLUSIONS	LOW STRENGTH / LANDSLIDE PRONE	SLOW PERCOLATION	PIPING	POOR SOURCE OF TOPSOIL	FROST ACTION	SHRINK - SWELL	POTENTIAL SINKHOLE	PONDING	WETNESS
WeD	WEIKERT SHALY SILT LOAM, 15 TO 25 PERCENT SLOPES	X	C/S	X				X	X	X	X	X	X				
WkE	WEIKERT AND KLINESVILLE SHALY SILT LOAMS, STEEP	X	C/S	X				X	X	X	X	X	X				

Legend:

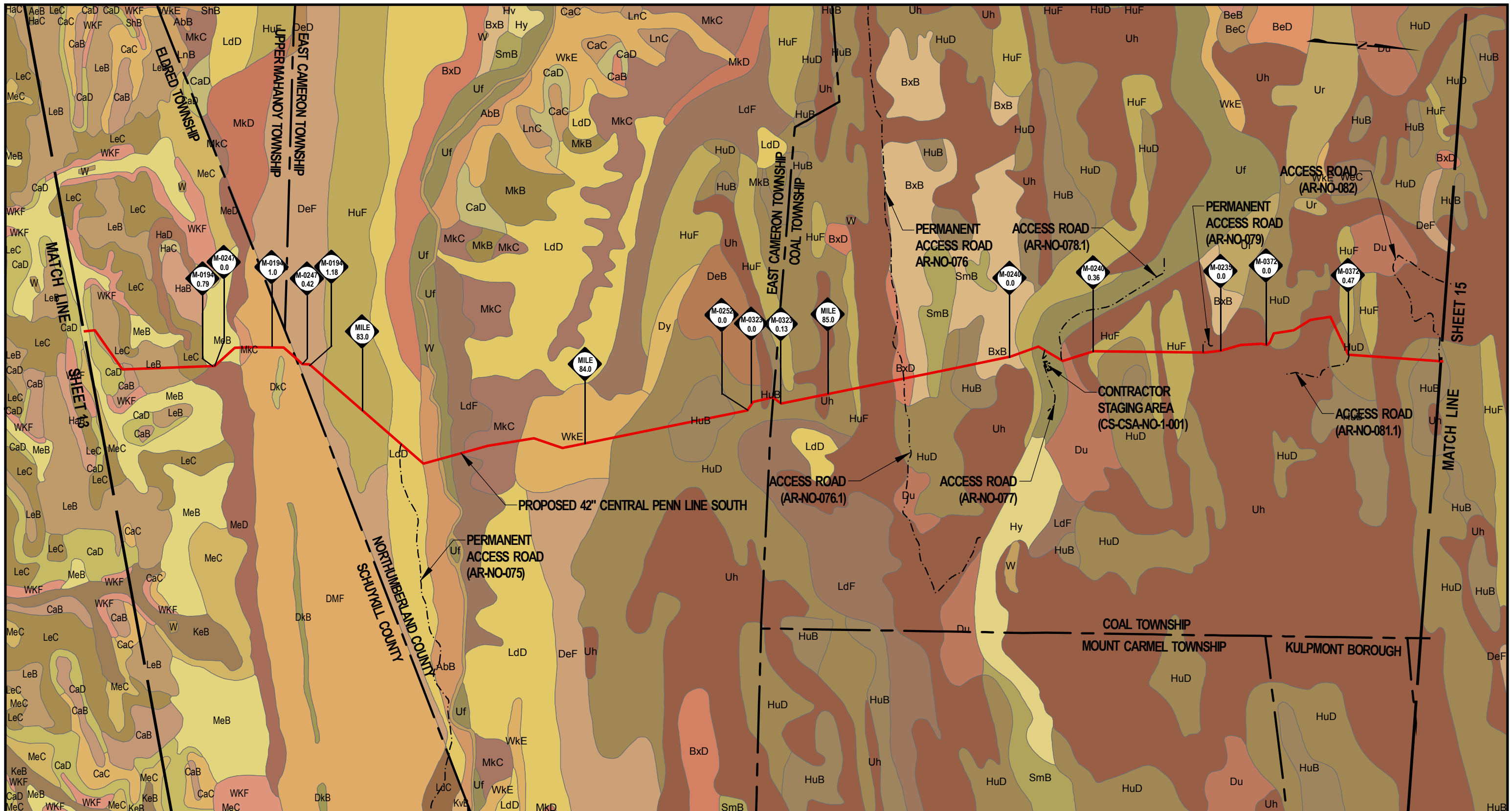
- X Applies to soil
- S Corrosive to steel
- C Corrosive to concrete
- C/S Corrosive to steel and concrete

Soil type use limitations and resolutions can be found in the ECP (provided as **Section 4 of the ESCGP-2 NOI**) and as follows:

1. Slopes – Excavations should be stabilized to prevent erosion and contractor should employ proper construction techniques to ensure safety on steep slope areas.
2. Depth of Rock – If bedrock is encountered, remove as necessary in accordance with project specifications.
3. Frost Action – Contractor shall consult project geotechnical engineer / inspector regarding any special measures to be taken for earthwork which is to occur during periods of frost.
4. Soil pH Levels – Contractor shall have soil pH tested to determine correct fertilizer application rates.
5. Flooding Potential – Ensure that the site has proper drainage.
6. High Groundwater Level – Contractor shall employ dewatering techniques as approved by the conservation district. Pumped water filter bags shall be used to dewater utility trenches and below grade excavations.

7. Erosion – Any erosion that occurs that cannot be addressed by measures found in the plans the contractor shall contact the site design engineer and the conservation district.
  
8. Basin Areas and Embankments – Fill for basin embankments shall be compacted in 8-inch lifts to 98% maximum dry density (standard proctor) +/- 2% moisture content per ASTM D-1557. Anti-seep collars shall be installed on a basin discharge piping to prevent seepage of water from the basin. Consult with site design engineer for the specific anti-seep collar size requirements.

The following Soil Association Maps identify the soil types within the ESCGP-2 permit boundary for the portion of the CPL South pipeline within Northumberland County.



**LEGEND**

- PROPOSED 42" CENTRAL PENN LINE SOUTH
- PROPOSED 30" CENTRAL PENN LINE NORTH
- EXISTING PIPELINE
- X — FENCE LINE
- - - ACCESS ROADS
- - - PROPOSED EASEMENT
- - - COUNTY/TOWNSHIP BOUNDARY
- CONTRACTOR STAGING AREA
- CONTRACTOR YARD/ PIPE YARD

NOTES:  
SOIL GEOGRAPHIC  
DATABASE BY USDA



DRAWING NO.		REFERENCE TITLE				
NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	03/31/15	JTN	ISSUED FOR FERC FILING	1161503	DP	MJH
1	05/26/15	JTN	ISSUED FOR SUPPLEMENTAL FILING #1	1161503	CLR	MJH
2	12/18/15	JTN	ISSUED FOR SUPPLEMENTAL FILING #3	1161503	CLR	MJH
3	09/23/16	JTN	EXHIBITS FOR PADEP	1161503	CLR	MJH
4	04/12/17	JTN	EXHIBITS FOR PADEP	1161503	CLR	MJH

**TRANSCONTINENTAL GAS PIPE LINE COMPANY LLC**  
SOIL ASSOCIATION MAP  
ATLANTIC SUNRISE PROJECT  
PROPOSED 42" CENTRAL PENN LINE SOUTH  
M-0352 M.P. 0.00 TO M-0353 M.P. 0.11  
SCHUYLKILL & NORTHUMBERLAND COUNTIES, PENNSYLVANIA

**Williams**

DRAWN BY: JHD	DATE: 9/22/14	ISSUED FOR BID:	SCALE: 1"=2,000'
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## 1.3 Earth Disturbance Activity

### Pipeline Facilities

This section identifies the land requirements for construction and operation of the proposed CPL North, CPL South, and Associated Facilities. Table 1.3.1 summarizes the proposed CPL North and CPL South land requirements. Table 1.3.2 summarizes the land requirements for the proposed aboveground facilities associated with the CPL North and CPL South mainlines.

The characterization of land use within the proposed CPL North, CPL South, and Associated Facilities project areas is based on interpretation of aerial photographs taken in the spring of 2014 and information gathered from field surveys conducted from 2014 - 2017. Transco classified land uses within the proposed CPL North, CPL South, and Associated Facilities project areas into the following eight broad types:

- Agricultural Land – land associated with active cultivation of row and field crops; areas of grasses planted for livestock grazing or for the production of hay crops; orchards; and specialty crops, including vineyards, Christmas trees, and fruits and vegetables.
- Upland Forest/Woodland – includes upland deciduous forest, evergreen forest, and mixed (deciduous and evergreen) forest, but does not include forested wetlands.
- Industrial/Commercial Land – land used for mines or quarries and associated processing plants; manufacturing or other industrial facilities; and land developed for commercial or retail uses, including malls, strip plazas, business parks, and medical facilities.
- Transportation Land – land used for transportation purposes, including interstate highways; state, county, and local highways and roads; and railroad lines.
- Residential Land – residential areas, including yards of individual residences.
- Open Land – non-forested and undeveloped land not classified for another use, including land maintained as utility ROWs for overhead and underground electric transmission, natural gas transmission, and oil transmission facilities.

- Wetlands – includes wetlands covered with emergent, scrub-shrub, and forested vegetation.
- Open Water – include rivers, streams, creeks, canals, and other linear waterbodies, as well as lakes, ponds, and other non-flowing waterbodies.

New Main Line Valves (MLVs) will be wholly located within the permanent ROWs for the proposed CPL North and CPL South mainlines. Construction will primarily occur within the proposed CPL North and CPL South construction ROWs. **Design of E&S controls associated with the MLVs will be shown on the Pipeline Soil Erosion & Sediment Control Plans / Site Restoration Plans.**

**Table 1.3.1  
Land Use Acreage Affected by Construction and Operation of CPL North and CPL South Pipeline Facilities<sup>a</sup>**

Facility/County/ Workspace Type	Agricultural Land		Upland Forest		Industrial / Commercial Land		Transportation		Residential Land		Open Land		Wetlands		Open Water		Total <sup>b</sup>	
	Cons <sup>c</sup>	Op <sup>d</sup>	Cons <sup>c</sup>	Op <sup>d</sup>	Cons <sup>c</sup>	Op <sup>d</sup>	Cons <sup>c</sup>	Op <sup>d</sup>	Cons <sup>c</sup>	Op <sup>d</sup>	Cons <sup>c</sup>	Op <sup>d</sup>	Cons <sup>c</sup>	Op <sup>d,e</sup>	Cons <sup>c</sup>	Op <sup>d</sup>	Cons <sup>c</sup>	Op <sup>d</sup>
<b>CPL North</b>																		
<b>Columbia County</b>																		
Pipeline	2.2	0.7	28.2	8.3	0.0	0.0	0.8	0.2	0.7	0.2	18.7	5.3	3.3	1.2	0.7	0.2	54.6	16.1
ATWS	1.4	0.0	5.6	0.0	0.0	0.0	0.1	0.0	2.3	0.0	1.3	0.0	<0.1	0.0	<0.1	0.0	10.6	0.0
Mainline valves and tie-in	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Access roads	<0.1	<0.1	0.3	0.3	0.0	0.0	<0.1	<0.1	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.4	0.4
Contractor staging areas	5.2	0.0	<0.1	0.0	<0.1	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.7	0.0
Contractor and pipe yards	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<b>Columbia County Subtotal</b>	<b>8.8</b>	<b>0.7</b>	<b>34.1</b>	<b>8.6</b>	<b>&lt;0.1</b>	<b>0.0</b>	<b>0.9</b>	<b>0.2</b>	<b>3.4</b>	<b>0.2</b>	<b>20.1</b>	<b>5.4</b>	<b>3.3</b>	<b>1.2</b>	<b>0.7</b>	<b>0.2</b>	<b>71.3</b>	<b>16.5</b>
<b>Luzerne County</b>																		
Pipeline	24.3	9.4	149.6	67.7	1.6	0.8	4.7	1.7	7.1	2.6	37.8	9.4	11.6	5.3	1.9	1.0	238.6	97.9
ATWS	9.0	0.0	17.7	0.0	1.2	0.0	1.0	0.0	1.8	0.0	4.6	0.0	0.5	0.0	0.1	<0.1	35.8	0.0
Mainline valves	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.10.1
Access roads	0.2	0.0	0.72	0.1	0.3	0.0	1.0	0.2	0.3	0.0	0.5	0.4	0.0	0.0	<0.1	0.0	2.9	0.7
Contractor staging areas	10.1	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.3	0.0
Contractor and pipe yards	0.0	0.0	0.0	0.0	33.8	0.0	0.0	0.0	0.0	0.0	9.6	0.0	0.0	0.0	0.0	0.0	43.4	0.0
<b>Luzerne County Subtotal</b>	<b>43.6</b>	<b>9.4</b>	<b>168.2</b>	<b>67.8</b>	<b>36.9</b>	<b>0.8</b>	<b>6.7</b>	<b>1.9</b>	<b>9.2</b>	<b>2.6</b>	<b>52.6</b>	<b>9.9</b>	<b>12.1</b>	<b>5.3</b>	<b>2.0</b>	<b>1.0</b>	<b>331.2</b>	<b>98.5</b>
<b>Wyoming County</b>																		
Pipeline	80.1	45.2	146.5	79.9	<0.1	<0.1	2.8	1.6	5.8	3.2	34.9	20.8	8.6	6.0	2.6	2.0	281.2	158.7
ATWS	33.1	0.0	18.7	0.0	0.2	0.0	0.76	0.0	2.8	0.0	10.5	0.0	0.2	0.0	0.2	0.0	66.5	0.0
Mainline valves	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Access roads	0.8	<0.1	1.1	0.0	<0.1	0.0	1.1	<0.1	0.6	0.0	1.1	0.5	0.0	0.0	0.0	0.0	4.7	0.5
Contractor staging areas	6.9	0.0	<0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0	0.0	0.0	0.0	0.0	7.6	0.0
Contractor and pipe yards	0.0	0.0	0.0	0.0	7.9	0.0	0.0	0.0	0.0	0.0	6.6	0.0	0.0	0.0	0.0	0.0	14.5	0.0
<b>Wyoming County Subtotal</b>	<b>120.9</b>	<b>45.2</b>	<b>166.3</b>	<b>79.9</b>	<b>8.1</b>	<b>&lt;0.1</b>	<b>4.7</b>	<b>1.6</b>	<b>9.2</b>	<b>3.2</b>	<b>53.7</b>	<b>21.3</b>	<b>8.8</b>	<b>6.0</b>	<b>2.8</b>	<b>2.0</b>	<b>374.4</b>	<b>159.2</b>

**Table 1.3.1  
Land Use Acreage Affected by Construction and Operation of CPL North and CPL South Pipeline Facilities<sup>a</sup>**

Facility/County/ Workspace Type	Agricultural Land		Upland Forest		Industrial / Commercial Land		Transportation		Residential Land		Open Land		Wetlands		Open Water		Total <sup>b</sup>	
	Cons <sup>c</sup>	Op <sup>d</sup>	Cons <sup>c</sup>	Op <sup>d</sup>	Cons <sup>c</sup>	Op <sup>d</sup>	Cons <sup>c</sup>	Op <sup>d</sup>	Cons <sup>c</sup>	Op <sup>d</sup>	Cons <sup>c</sup>	Op <sup>d</sup>	Cons <sup>c</sup>	Op <sup>d,e</sup>	Cons <sup>c</sup>	Op <sup>d</sup>	Cons <sup>c</sup>	Op <sup>d</sup>
<b>Susquehanna County</b>																		
Pipeline	24.6	12.5	28.0	15.5	0.0	0.0	0.6	0.4	3.8	2.2	11.4	7.5	3.0	2.0	0.4	0.2	71.8	40.3
ATWS	9.3	0.0	3.6	0.0	<0.1	0.0	0.6	0.0	1.4	0.0	2.4	0.0	<0.1	0.0	0.0	0.0	17.2	0.0
Mainline valves	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Access roads	0.7	0.7	<0.1	0.0	<0.1	<0.1	0.6	0.5	0.1	0.1	1.0	0.0	0.0	0.0	0.0	0.0	2.5	1.3
Contractor staging areas	8.8	0.0	0.0	0.0	0.0	0.0	<0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.8	0.0
Contractor and pipe yards	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<b>Susquehanna County Subtotal</b>	<b>43.4</b>	<b>13.2</b>	<b>31.6</b>	<b>15.5</b>	<b>&lt;0.1</b>	<b>&lt;0.1</b>	<b>1.8</b>	<b>0.9</b>	<b>5.3</b>	<b>2.3</b>	<b>14.8</b>	<b>7.5</b>	<b>3.0</b>	<b>2.0</b>	<b>0.4</b>	<b>0.2</b>	<b>100.3</b>	<b>41.6</b>
<b>Subtotal CPL North<sup>a</sup></b>	<b>216.7</b>	<b>68.5</b>	<b>400.2</b>	<b>171.8</b>	<b>45.0</b>	<b>0.8</b>	<b>14.1</b>	<b>4.6</b>	<b>27.1</b>	<b>8.3</b>	<b>141.2</b>	<b>44.1</b>	<b>27.2</b>	<b>14.5</b>	<b>5.9</b>	<b>3.4</b>	<b>877.2</b>	<b>315.7</b>
<b>CPL South</b>																		
<b>Lancaster</b>																		
Pipeline	355.5	180.9	55.8	28.5	0.5	0.3	6.7	3.4	10.1	5.3	10.9	5.8	1.6	1.1	2.3	1.5	443.5	226.5
ATWS	131.7	0.0	10.7	0.0	0.1	0.0	2.2	0.0	3.5	0.0	4.9	0.0	0.1	0.0	<0.1	0.0	153.2	0.0
Mainline valves	0.4	0.4	1.8	1.8	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3	0.0	0.0	0.0	0.0	2.6	0.4
Access roads	3.6	2.0	0.2	<0.1	0.0	0.0	1.2	0.8	0.4	0.3	0.9	0.3	0.0	0.0	0.0	0.0	6.3	3.4
Contractor staging areas	37.3	0.0	0.4	0.0	0.0	0.0	<0.1	0.0	0.0	0.0	0.6	0.0	0.0	0.0	0.0	0.0	38.3	0.0
Contractor and pipe yards	22.4	0.0	0.0	0.0	0.0	0.0	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	23.0	0.0
<b>Lancaster County Subtotal</b>	<b>550.9</b>	<b>181.7</b>	<b>68.9</b>	<b>30.3</b>	<b>0.6</b>	<b>0.3</b>	<b>10.7</b>	<b>4.2</b>	<b>14.0</b>	<b>5.6</b>	<b>17.6</b>	<b>6.4</b>	<b>1.7</b>	<b>1.1</b>	<b>2.3</b>	<b>1.5</b>	<b>666.9</b>	<b>232.5</b>
<b>Lebanon</b>																		
Pipeline	222.8	112.4	91.8	46.6	0.4	0.2	5.9	3.0	4.0	1.7	10.3	5.2	3.0	2.0	2.2	1.3	340.4	172.3
ATWS	78.6	0.0	15.6	0.0	0.1	0.0	3.8	0.0	2.1	0.0	4.3	0.0	0.1	0.0	0.2	0.0	104.9	0.0
Mainline valves	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2
Access roads	0.9	0.3	1.2	0.5	<0.1	0.0	2.4	0.6	0.2	0.2	0.6	0.4	0.0	0.0	0.0	0.0	5.3	2.0
Contractor staging areas	26.4	0.0	0.1	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	27.0	0.0
Contractor and pipe yards	50.2	0.0	<0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	50.2	0.0
<b>Lebanon County Subtotal</b>	<b>379.1</b>	<b>112.9</b>	<b>108.7</b>	<b>47.1</b>	<b>0.5</b>	<b>0.2</b>	<b>12.6</b>	<b>3.6</b>	<b>6.3</b>	<b>1.9</b>	<b>15.2</b>	<b>5.6</b>	<b>3.1</b>	<b>2.0</b>	<b>2.4</b>	<b>1.3</b>	<b>528.0</b>	<b>174.5</b>
<b>Schuylkill</b>																		
Pipeline	73.6	37.4	100.2	50.9	0.4	0.2	4.6	2.2	3.3	1.6	36.0	18.6	2.6	1.6	1.4	0.8	222.2	113.2
ATWS	30.9	0.0	28.5	0.0	0.4	0.0	3.5	0.0	2.2	0.0	25.1	0.0	0.2	0.0	0.0	0.0	90.8	0.0
Mainline valves	0.2	0.2	<0.1	<0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2
Access roads	0.7	0.1	2.4	0.8	0.0	0.0	2.8	1.1	0.1	0.0	9.5	1.5	0.0	0.0	0.0	0.0	15.6	3.5

**Table 1.3.1  
Land Use Acreage Affected by Construction and Operation of CPL North and CPL South Pipeline Facilities<sup>a</sup>**

Facility/County/ Workspace Type	Agricultural Land		Upland Forest		Industrial / Commercial Land		Transportation		Residential Land		Open Land		Wetlands		Open Water		Total <sup>b</sup>		
	Cons <sup>c</sup>	Op <sup>d</sup>	Cons <sup>c</sup>	Op <sup>d</sup>	Cons <sup>c</sup>	Op <sup>d</sup>	Cons <sup>c</sup>	Op <sup>d</sup>	Cons <sup>c</sup>	Op <sup>d</sup>	Cons <sup>c</sup>	Op <sup>d</sup>	Cons <sup>c</sup>	Op <sup>d,e</sup>	Cons <sup>c</sup>	Op <sup>d</sup>	Cons <sup>c</sup>	Op <sup>d</sup>	
Contractor staging areas	21.7	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	21.9	0.0	
Contractor and pipe yards	0.0	0.0	0.0	0.0	45.6	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	45.7	0.0	
<b>Schuylkill County Subtotal</b>	<b>127.1</b>	<b>37.7</b>	<b>131.3</b>	<b>51.7</b>	<b>46.4</b>	<b>0.2</b>	<b>11.0</b>	<b>3.3</b>	<b>5.6</b>	<b>1.6</b>	<b>70.6</b>	<b>20.3</b>	<b>2.8</b>	<b>1.6</b>	<b>1.4</b>	<b>0.8</b>	<b>396.3</b>	<b>116.9</b>	
<b>Northumberland</b>																			
Pipeline	7.0	3.5	88.4	45.5	1.4	0.8	2.0	1.0	3.0	1.5	7.5	3.7	0.3	0.2	0.7	0.4	110.4	56.6	
ATWS	2.3	0.0	26.4	0.0	4.5	0.0	6.0	0.0	1.4	0.0	4.2	0.0	0.0	0.0	<0.1	0.0	44.8	0.0	
Mainline valves	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	
Access roads	0.1	0.1	2.5	1.2	1.5	0.1	9.8	6.3	0.1	0.0	0.8	0.6	0.0	0.0	0.0	0.0	14.7	8.2	
Contractor staging areas	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	
Contractor and pipe yards	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
<b>Northumberland County Subtotal</b>	<b>9.5</b>	<b>3.7</b>	<b>117.4</b>	<b>46.7</b>	<b>7.4</b>	<b>0.9</b>	<b>17.8</b>	<b>7.3</b>	<b>4.8</b>	<b>1.5</b>	<b>12.5</b>	<b>4.3</b>	<b>0.3</b>	<b>0.2</b>	<b>0.7</b>	<b>0.4</b>	<b>170.4</b>	<b>64.9</b>	
<b>Columbia</b>																			
Pipeline	237.6	122.7	113.3	56.2	1.3	0.7	6.7	3.6	5.9	3.2	34.0	17.9	2.3	1.6	3.8	2.7	405.0	208.5	
ATWS	83.4	0.0	18.8	0.0	0.7	0.0	2.1	0.0	4.8	0.0	7.8	0.0	0.2	0.0	<0.1	0.0	117.7	0.0	
Mainline valves	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.1	
Access roads	1.6	0.0	0.7	0.0	0.1	0.0	1.5	<0.1	0.6	0.0	0.9	0.1	0.0	0.0	0.0	0.0	5.4	0.1	
Contractor staging areas	13.7	0.0	0.3	0.0	0.9	0.0	0.2	0.0	0.9	0.0	1.6	0.0	0.0	0.0	0.0	0.0	17.5	0.0	
Contractor and pipe yards	27.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	27.6	0.0	
<b>Columbia County Subtotal</b>	<b>363.9</b>	<b>122.7</b>	<b>133.1</b>	<b>56.2</b>	<b>3.0</b>	<b>0.7</b>	<b>10.5</b>	<b>3.6</b>	<b>12.2</b>	<b>3.2</b>	<b>44.4</b>	<b>18.1</b>	<b>2.5</b>	<b>1.6</b>	<b>3.8</b>	<b>2.7</b>	<b>573.4</b>	<b>208.7</b>	
<b>Subtotal CPL South<sup>b</sup></b>	<b>1430.5</b>	<b>460.3</b>	<b>559.4</b>	<b>231.8</b>	<b>57.9</b>	<b>2.2</b>	<b>62.7</b>	<b>21.8</b>	<b>42.9</b>	<b>13.8</b>	<b>160.3</b>	<b>54.4</b>	<b>10.4</b>	<b>6.4</b>	<b>10.8</b>	<b>6.6</b>	<b>2,335.0</b>	<b>797.5</b>	
<b>PROJECT TOTAL<sup>b</sup></b>	<b>1647.1</b>	<b>528.7</b>	<b>959.5</b>	<b>403.5</b>	<b>103.0</b>	<b>3.0</b>	<b>76.9</b>	<b>26.5</b>	<b>70.1</b>	<b>22.1</b>	<b>301.3</b>	<b>98.4</b>	<b>37.6</b>	<b>20.8</b>	<b>16.6</b>	<b>10.0</b>	<b>3,212.5</b>	<b>1,113.1</b>	

Notes:  
<sup>a</sup> Land use acreages for construction and operation are provided for reference only. Acreages provided were calculated by using ESRI shapefiles. Refer to plans and ESCGP-2 NOI for actual site conditions.  
<sup>b</sup> All values rounded to the nearest tenth; numbers may not sum exactly due to rounding.  
<sup>c</sup> Construction impacts include area within permanent ROW.  
<sup>d</sup> Operation impacts associated with maintenance of permanent ROW  
<sup>e</sup> Includes all wetlands within the permanent ROW.

Key:  
ATWS = additional temporary workspace  
Cons = Construction  
Op = Operation

**Table 1.3.2  
Land Requirements for the New Aboveground Facilities<sup>a</sup>**

Facility	Milepost	County	Agricultural Land (acres)		Upland Forest / Woodland (acres)		Open Land (acres)		Total (acres) <sup>b</sup>	
			Cons	Op	Cons	Op	Cons	Op	Cons	Op
<b>Susquehanna County</b>										
Zick Meter Station with pig launcher and receiver	CPL North 57.3	Susquehanna	9.7	5.3	0.0	0.0	0.0	0.0	9.7	5.3
<b>Susquehanna County Subtotal</b>			<b>9.7</b>	<b>5.3</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>9.7</b>	<b>5.3</b>
<b>Wyoming County</b>										
New Compressor Station 605	CPL North 44.9	Wyoming	44.9	36.1	5.0	3.1	0.0	0.0	49.9	39.2
Springville Meter Station	CPL North 31.5	Wyoming	0.0	0.0	4.1	2.4	0.8	0.7	4.9	3.1
<b>Wyoming County Subtotal</b>			<b>44.9</b>	<b>36.1</b>	<b>9.1</b>	<b>5.5</b>	<b>0.8</b>	<b>0.7</b>	<b>54.8</b>	<b>42.3</b>
<b>Luzerne County</b>										
North Diamond Regulator Station	L92.7	Luzerne	0.0	0.0	1.6	1.5	0.7	0.3	2.3	1.8
<b>Luzerne County Subtotal</b>			<b>0.0</b>	<b>0.0</b>	<b>1.6</b>	<b>1.5</b>	<b>0.7</b>	<b>0.3</b>	<b>2.3</b>	<b>1.8</b>
<b>Columbia County</b>										
West Diamond Regulator Station with pig launcher and receiver	L114.0	Columbia	2.2	2.2	0.9	0.9	1.7	1.5	4.8	4.5
New Compressor Station 610	CPL South 112.5	Columbia	33.3	33.3	0.8	0.8	0.0	0.0	34.1	34.1
<b>Columbia County Subtotal</b>			<b>35.5</b>	<b>35.5</b>	<b>1.7</b>	<b>1.7</b>	<b>1.7</b>	<b>1.5</b>	<b>38.9</b>	<b>38.6</b>

**Table 1.3.2  
Land Requirements for the New Aboveground Facilities<sup>a</sup>**

Facility	Milepost	County	Agricultural Land (acres)		Upland Forest / Woodland (acres)		Open Land (acres)		Total (acres) <sup>b</sup>	
			Cons	Op	Cons	Op	Cons	Op	Cons	Op
<b>Lancaster County</b>										
River Road Regulator Station with pig receiver	Transco Mainline 1683.3	Lancaster	0.0	0.0	2.1	2.1	0.3	0.3	2.4	2.4
<b>Lancaster County Subtotal</b>			<b>0.0</b>	<b>0.0</b>	<b>2.1</b>	<b>2.1</b>	<b>0.3</b>	<b>0.3</b>	<b>2.4</b>	<b>2.4</b>
<b>New Aboveground Facilities Total</b>			<b>90.1</b>	<b>76.9</b>	<b>14.5</b>	<b>10.8</b>	<b>3.5</b>	<b>4.5</b>	<b>107.9</b>	<b>90.5</b>
Notes:										
<sup>a</sup> Land use acreages for construction and operation are provided for reference only. Acreages provided were calculated by using kmz files and prepared as part of the June 8, 2015 FERC Supplement. Refer to plans and ESCGP-2 NOI for actual site conditions.										
<sup>b</sup> All values rounded to the nearest tenth; numbers may not sum exactly due to rounding.										
Key:										
Cons = Construction										
L = Leidy Line system milepost										
Op = Operation										

## 1.4 Project Site Runoff

Construction of the CPL South pipeline proposes no permanent change or net increase in rate and/or volume of stormwater runoff; nor is the project expected to increase the concentration of pollutants in the runoff and affect water quality. Disturbed areas will be restored and maintained in an existing herbaceous state or meadow in good condition for the operational life of the pipelines. Therefore, the volume and rate of runoff from the CPL South pipeline project area and its upstream watershed areas will not be increased.

### 1.4.1 Off-Site Discharge Analysis

The approximate original contours of the CPL South pipeline will be restored to pre-construction contours, which will maintain the pre-construction drainage patterns. With the exception of permanent access roads, all disturbed areas will be restored and maintained in an existing herbaceous state or meadow in good condition. An increase in stormwater runoff rate and volume is not anticipated to occur as a result of the CPL South pipeline.

## 1.5 Surface Water Classification

The table in **Appendix D of this E&SC Narrative** identifies the Resource IDs and corresponding Chapter 93 classifications for existing streams and wetlands located within the CPL South pipeline project area. Refer to the E&SC Plans (provided in **Section 2 of the ESCGP-2 NOI**) for location of each resource and identification of siltation-impaired waters.

## 1.6 BMP Description Narrative

During construction, a combination of E&SC BMPs will be implemented to stabilize and prevent advanced erosion from critical areas. Also, the amount of disturbed soils shall be kept to a minimum and, whenever possible, a suitable vegetative buffer will be maintained around construction areas. Refer to the E&SC Plans and BMP Plan Set (provided in **Section 2 of the ESCGP-2 NOI**), and Attachment 2 - Best Management Practice Figures and Typical Cross-Section Drawings of the ECP (provided as **Section 4 of the ESCGP-2 NOI**).

Measures will be taken to remove sediment from stormwater leaving the pipeline ROW corridor. Where applicable, Silt Fence or Compost Filter Sock will be installed downslope of excavated areas, in order to prevent sediment-laden stormwater from entering local waterways, adjacent properties and roadways. E&S Worksheet #1

(Compost Filter Sock Design) in **Appendix A of this E&SC Narrative** outlines the location and sizing of compost filter sock within this portion of the project area.

Waterbars with a 24-inch x 96-inch sump and compost filter sock at the discharge end of the waterbar will be used to control stormwater runoff across the pipeline ROW corridor in accordance with the PADEP approved alternate detail (refer to the Compost Filter Sock and Sump at Waterbar Discharge detail, WB.2, in **Appendix C of this E&SC Narrative**).

In general, the disturbed area within the ROW to the proposed sumps will be a maximum of 20,000 square feet, per PADEP's approved alternative detail for discharges from waterbars. The waterbars will be spaced in accordance with Table 13.2 of the Manual and installed at a maximum of 2% gradient across the ROW corridor to convey surface flow to a stable area without causing water to pool behind the waterbar. As necessary, compost filter sock or silt fence will be installed between waterbars to treat runoff leaving the ROW corridor that is not collected and treated by the waterbars. All waterbars are permanent except for those located in agricultural areas, wetlands, transportation facilities, and lawns. All waterbars in these areas are to be removed during final restoration.

Trench Plugs will be installed in accordance with the Manual, at a maximum spacing of 1,000 feet, in order to block the flow of groundwater along the path of the pipeline trench, as well as to maintain the natural groundwater path. Trench Plugs will also be provided on both sides of every stream and wetland crossing in order to prevent draining of the features and changes to the stream and/or wetland hydrology.

Temporary diversion channels are proposed to divert runoff from undisturbed upslope areas and convey the runoff around areas of earth disturbance within the pipeline ROW corridor. Two types of temporary diversion channels are proposed for the Project – Filter Sock Diversions and Diversion Swales. All temporary diversion channels will outlet to either a temporary **slope** pipe(s) (clean water) crossing, which is installed across the right-of-way, or a riprap apron, which discharges directly to a waterbody.

***The temporary slope pipe(s) (clean water crossing) will be 12" or 18" in diameter and will discharge to a level spreader or an outlet basin (PADEP Standard Construction Detail #8-6) in areas of concentrated flow. The maximum headwater proposed for each slope pipe (or series of slope pipes) is 24". Sand bags will be placed around the discharge of the diversion swales to the slope pipes such that overtopping will not occur. Design calculations for the capacity of the temporary slope pipe(s) with the maximum headwater of 24" are provided in Appendix C of this Narrative.***

***Calculations for the sizing of the level spreaders in order to diffuse flow rates (i.e. velocity) based on the type of down slope vegetation / ground cover after the level spreader are provided in the Temporary Perforated Pipe Level Spreader Calculations Table of the Pennsylvania Best Management Practices and Quantities Plan Set.***

The clean water diversions are being limited to 5 acres in accordance with the PA DEP BMP manual, except in areas where existing drainage channels exist or in order to minimize impacts to wetlands. The clean water diversions collect clean stormwater above the disturbance, the slope pipe transports the clean water across the disturbance, and the level spreader connected to the slope pipe outlet discharges the clean water below the disturbance.

The clean water diversions are temporary in nature and will remain in place from disturbance to after vegetation is established and BMP are removed. The clean water diversions collect and discharge stormwater in the same drainage area and do not take stormwater from one drainage area and discharge to different drainage areas. The clean water diversions do not change cover types resulting in no change to the calculated runoff rates or volumes and the clean water diversion discharge is returned to sheet flow at the level spreader, a flow condition similar or better than the existing flow condition.

The discharge areas of the clean water diversions will be monitored in accordance with the ESCGP-2 permit required inspections. In the unlikely event that erosion is caused by the discharge, the erosion will be mitigated by Transco or their designee.

Discharges to existing waterways are proposed wherever possible, and riprap lining will be provided at the end of the Temporary Diversion Channels. Refer to the E&SC Plans (provided in Section 2 of the ESCGP-2 NOI) for locations of riprap aprons where Temporary Diversion Channels discharge to existing waterways. Additional Temporary Pipe sizing and Diversion Channel Riprap design and can be found in **Appendix C of this E&SC Narrative**.

Temporary Diversion Channels were designed based on the Manual and Worksheet #11. The required capacity for each channel was determined by multiplying the drainage area tributary to the channel by a “multiplier” of 1.6 cfs/acre within non-special protection watersheds and 2.25 cfs/acre within special protection watersheds. Since the project area is located within areas of non-special protection and special protection watersheds, all swales were designed to withstand the shear stress resulting from the flow generated by the contributing drainage areas with the applicable aforementioned “multiplier” applied. E&S Worksheet #11 (Channel Design) and an associated drainage

area map for each diversion channel is provided in **Appendix B of this E&SC Narrative**.

Temporary diversion channels are designed using material specifications for North American Green (NAG) products. As previously mentioned, shear stresses are analyzed for the proposed temporary diversion channels, which are expected to be in place for a maximum of 12 months. Therefore, NAG channel linings with a 24-month design life, or greater, are considered permanent linings when analyzing shear stresses. It should be noted that published design shear strengths are valid for the design life of the lining. As a result, no decrease in shear strength is expected over the life of the proposed swale linings. Published design shear strengths and design lives for individual linings are provided in **Appendix G of this E&SC Narrative**. Where NAG products do not specify Manning's 'n' for linings reinforced by grass (ie. S75, SC150, and C125), Table 6.3 on Page 131 of the Manual was used. An iterative approach was used in the design of all proposed channels to calculate Manning's 'n' based on the slope and depth of water within the channel.

The Preparedness Prevention and Contingency (PPC) Plan to address inadvertent spills during the duration of construction can be found in Attachment 8 – Unanticipated Discovery of Contamination Plan and Attachment 9 – Spill Plan for Oil and Hazardous Materials of the ECP (provided as **Section 4 of the ESCGP-2 NOI**).

The following E&SC BMPs are based on those found in the Manual, and will be utilized as part of the proposed CPL North pipeline:

- **Silt Fence:** Silt Fence (SF), Reinforced Silt Fence (RSF), and Super Silt Fence (SSF) are sediment barriers constructed from filter fabric attached to support stakes or poles. SF, RSF, and/or SSF will be placed to control runoff from small disturbed areas when it is in the form of sheet flow.
- **Compost Filter Sock:** Compost Filter Sock (CFS) is a sediment barrier consisting of a mesh sock and coarse compost. CFS will be placed to control runoff and collect sedimentation. CFS is Antidegradation Best Available Combination of Technologies (ABACT) for HQ and EV watersheds.
- **Waterbars:** Waterbars will be constructed at an angle across the ROW of a pipeline to direct runoff away from the ROW onto a well-vegetated area. Energy dissipaters will be installed at the outlet of the waterbar.

- **Trench Plugs:** Trench Plugs will be constructed from foam, clay, bentonite or concrete filled sacks, placed in a trench to prevent flow along the pipe either prior to or after backfilling a trench.
- **Erosion Control Blanket:** Erosion Control Blanket (ECB) is a soil covering made from straw, coir, excelsior, or synthetic material used to minimize the potential for erosion of an exposed soil until a suitable vegetative cover can be established. It will be placed in the CPL North pipeline area within 50 feet of streams and wetlands (100 feet of a special protection waters), as well as in the CPL North pipeline area ***where slopes equal to 3:1 or greater exist*** (unless located in an agricultural area).
- **Hydraulically Applied Erosion Control Blanket:** A Hydraulically Applied ECB is Bonded Fiber Matrix (BFM) that can be used in place of ECB where necessary. For slopes up to 3H:1V, the BFM will be applied at a rate of 3,000 pounds per acre. Slopes steeper than 3H:1V will need to be applied at a rate of 4,000 pounds per acre. In any case, manufacturer's recommendations should be followed.
- **Rock Construction Entrance:** A Rock Construction Entrance (RCE) is a method of stabilizing a temporary construction entrance to the CPL North pipeline ROW from a paved roadway by placement of AASHTO #1 stone. RCEs will be placed at all entrances to the CPL North pipeline area.
- **Rock Construction Entrance with Wash Rack:** RCEs with wash racks shall be installed in any HQ or EV watershed from any public road, as shown on the E&SC Plans and Detail Sheets (provided in **Section 2 of the ESCGP-2 NOI**). Upon Site stabilization, the RCEs shall be removed along with any unsuitable material, and the area restored.
- **Vacuum Sweeping:** Vacuum Sweeping may be used to mitigate the spread of sediment beyond the RCEs. RCEs will be inspected for sediment tracking onto public roadways. If sediment is observed in the public roadway, the roadway shall be vacuum swept upon discovery. Any large clumps of dirt that accumulate on the road surface will need to be hand cleared before vacuum sweeping. All vehicles leaving the RCE shall be inspected for large clumps of debris. If debris, larger than 4" diameter is observed, it shall be manually removed from the vehicle. Dirt roads shall be inspected weekly for rutting. There shall be no more than a maximum of 4" of rutting on access roads. If rutting in excess of 4" is observed, the road shall be rolled as soon as feasible. Dump trucks hauling material from RCEs in special protection watersheds will be covered with a tarpaulin.

- **Pumped Water Filter Bag:** If required, sediment laden water that collects during excavation shall be pumped into a Pumped Water Filter Bag. The means and methods of construction by the Contractor will dictate the location and placement of this control, but the Contractor must conform to the manufacturer's recommendations for use. Pumped Water Filter Bags will be replaced once they are half full of sediment. This device is not an ABACT for special protection watersheds unless surrounded by a CFS ring or operated in conjunction with a sump pit.
- **Rock Filter Outlets:** Rock Filter Outlets (RFOs) may be used to control runoff; they may also be used below construction work while flow is being diverted past the work area. RFOs may be used to control sediment either during construction or during temporary disturbance. RFOs should be constructed according to the specifications shown in the Standard Detail Sheets. RFOs should be inspected weekly and needed repairs should be initiated within 72 hours after inspection. Anchored compost layer shall be used on upslope face in HQ and EV watersheds.
- **Rock Filters:** Rock Filters will be installed as shown on the E&SC Plan Drawings and according to the Standard Detail Sheets. Rock Filters help dissipate energy from the concentrated flow in roadside ditches and channels to prevent erosion of the channel and at the outlet. Rock Filters may be used in HQ watersheds if a 6-inch layer of compost is layered on the upgradient side.
- **Straw Bales:** Straw Bales are a sediment barrier constructed from straw attached to support stakes or poles. Straw Bales will be placed to control runoff from small disturbed areas when it is in the form of sheet flow.
- **Outlet Protection:** Outlet Protection shall be installed as shown on E&SC Plan Drawings and according to the Standard Detail Sheets.

### **1.7 BMP Installation Sequence Narrative**

Refer to the E&SC Plans (provided in **Section 2 of the ESCGP-2 NOI**) for the location of the proposed work and the associated E&SC BMPs. Necessary parts for proper and complete execution of work pertaining to this sequence, whether specifically mentioned or not, are to be performed by the Contractor. It is not intended that the drawings and this narrative show every detailed piece of material or equipment. The Contractor may be required to alter controls based on effectiveness of controls or differing conditions encountered in the field. The following is the overall E&SC BMP Installation Sequence:

***Due to the length of the project (in miles) it is anticipated that the contractor will construct the project in discrete segments, typically using waterbodies and road crossings as break points. In addition, it is expected that multiple segments will be in construction at one time, some being cleared and prepared, some in active pipeline construction and some in restoration.***

***Road and waterbody crossings may be conducted by separate crews, in parallel with main line crews. See 'Pipeline Work Sequence in Wetlands' and 'Pipeline Work Sequence at Stream Crossings' for applicable wetland and stream crossings.***

1. At least 7 days prior to starting any earth disturbance activities, including clearing and grubbing, the owner and/or operator shall invite all contractors, environmental inspectors, the landowner, appropriate municipal officials, the E&S Plan preparer, the PCSM Plan preparer, the licensed professional responsible for oversight of critical stages of implementation of the PCSM Plan, and a representative from the local conservation district to an on-site preconstruction meeting.
2. At least 3 days prior to starting any earth disturbance activities, or expanding into an area previously unmarked, the Pennsylvania One Call Inc. Shall be notified at 1-800-242-1776 for the location of existing underground utilities.
3. Hold pre-construction conference with the environmental inspectors, local county conservation district (CCD), PADEP, and design engineer.
4. Locate staging areas and access points including construction entrances.
5. Field locate **and stake** the LOD.
6. Locate, stake and/or install orange construction fence around special areas of concern (i.e. wetlands, streams, cultural resources...)
7. Perform non-mechanized tree cutting where required.
8. Install construction entrances.
9. ***Install bridge equipment crossings, timber matting construction, timber matting air bridges, and sediment barrier at waterbody crossings as indicated on the plans.***
10. All off-site waste and borrow areas must have an E&s Plan approved by the local county conservation district or dep and be fully implemented prior to being

activated. The contractor will be responsible for the removal of any excess material and to develop a plan that meets the conditions of Chapter 102, NPDES permit conditions, and/or other state and federal regulations.

11. Remove brush, including stumps, only in areas necessary to effectively install perimeter sediment barriers, upslope temporary filter sock diversions and temporary diversion swales. Level side cuts required to grant access for vehicles and workers to safely perform the installation of sediment barriers as shown on the E&SC plans.
12. Install perimeter controls (sediment barriers). Access requirements for perimeter controls along private drives within the LOD shall be in accordance with the landowner agreements.
13. Install permanent and temporary access roads and associated BMPs (vegetated roadside ditches, ditch relief culverts, and riprap outlet protection). See access road sequence of construction for specific construction steps associated with road construction (provided in section 2 of the ESCGP-2 NOI). **Specific access road construction sequence notes are included in the access road E&S plan sets.**
14. The compliance manager shall provide PADEP at least three days' notice prior to bulk earth disturbance and upon completed installation of perimeter erosion controls.
15. Have survey crews locate and re-stake as needed, if any stakes are damaged, in all special areas of concern (i.e., wetlands, streams, etc.)
16. Upon temporary cessation of an earth disturbance activity or any stage of an activity where the cessation of earth disturbance activities will exceed four days, the site shall be immediately seeded, mulched, or otherwise protected from accelerated **erosion and sedimentation** pending future earth disturbance activities. For an earth disturbance activity or any stage of an activity to be considered temporarily stabilized, the disturbed areas shall be covered with one of the following: a minimum uniform coverage of mulch and seed, with a density capable of resisting accelerated **erosion and sedimentation**, or an acceptable **erosion and sedimentation** BMP which temporarily minimizes accelerated **erosion and sedimentation**. Temporary stabilization will not occur on active vehicular travel ways within the row.
17. Proceed with major clearing and grubbing.
18. Begin construction staking for temporary grading.

19. **Clear, grub, and construct stream and wetland crossings in accordance with Chapter 105, Section 404, 401, and related permits. Install stream flumes, and/or dam and pump as specified in Chapter 105 permit documents for crossing of stream and wetland areas. Contractor shall place pipe, install trench plugs, backfill trench, and temporarily stabilize within 48 hours of excavating trench in resource crossing locations.**
20. **Install clean water crossings, including temporary slope pipes, level spreaders, and rip rap apron energy dissipaters.**
21. As the grubbing operation commences, install rock filters and waterbars along the **pipeline** alignment.
22. Strip and stockpile topsoil; install sediment barriers around stockpiles.
23. Haul pipe to right-of-way. Bend, place on supports, align, and weld. Lay pipe in ditch.
24. Contractor shall place pipe and install trench plugs.
25. Perform non-destructive testing (NDT) inspection of welds and apply coating to weld area.
26. Backfill pipe trench **within 30 days of excavating**, repair permanent waterbars, remove temporary waterbars, return temporarily graded areas to pre-development grade, repair/install erosion control blanket as needed, replace topsoil and immediately seed and stabilize disturbed areas (slopes, ditches and channels) as they are returned to final grade. Refer to planting plans and riparian buffer plantings, as applicable, in the BMP Plan set and **E&S** narrative. Any area that used stone and/or timber mats for temporary stabilization and/or access will be completely removed. **Decompact soils in accordance with the environmental construction plan (ECP) (Section 4 of the NOI). The subsoil will be fractured by deep ripping to a depth of not less than 16 inches below the surface of the subsoil with the appropriate agricultural ripper (i.e., parabolic or bent off-set). Subsurface features (i.e., drain tiles, other utilities) may warrant shallower depth. If subsurface features are within 16 inches of the surface deep ripping will occur to a depth not to exceed 4 inches of the expected depth of the subsurface feature. In areas of major compaction (i.e. heavy traffic areas not protected by timber mats), subsoil will be fractured by deep ripping to a depth of not less than 24 inches below the surface of the subsoil.** Re-establish preconstruction contours, and replace topsoil to a minimum

of 4-8 inches deep and seed and mulch areas. Vehicular traffic should be restricted from areas to prevent soil compaction.

27. Transco will complete upland final grading, topsoil replacement, installation of permanent E&S measures within 20 days after backfilling the trench in all areas except residential areas, which will be completed within 10 days.
28. Perform hydrostatic pressure test of pipeline.
29. Dewater pipeline utilizing appropriate BMPs, complete final tie-ins, and dry pipeline.
30. An area shall be considered to have achieved final stabilization when it has a minimum uniform 70% perennial vegetative cover or other permanent non-vegetative cover with a density sufficient to resist accelerated surface erosion and subsurface characteristics sufficient to resist sliding and other movements. When controls are to be removed in agricultural non-sensitive areas (streams/ wetlands), agricultural landowners shall maintain agricultural BMPs per PADEP regulations.
31. Upon completion of all earth disturbance activities and permanent stabilization of all disturbed areas, the permittee and/or operators shall contact the local CCD and/or PADEP for an inspection prior to the removal of the E&SC BMPs. Removal of temporary wetland and stream crossings, temporary BMPs including sediment barriers, temporary filter sock diversion swales, temporary clean water diversion swales (and associated grading), clean water crossing outfall protection and level spreaders, rock filters, and temporary waterbars along the alignment.
32. All graded areas shall be permanently stabilized immediately upon reaching finished grade. Cut slopes in competent bedrock and rock fills need not be vegetated. Seeded areas within 100 feet of a HQ/EV surface water and within 50 feet of non-HQ/EV surface water, or as otherwise shown on the plan drawings, shall be blanketed according to the standards of this plan.
33. Complete site restoration and stabilization, including soil aeration, soil treatment, seed application and mulching in areas disturbed by E&SC BMP removal. Install riparian buffer plantings per the riparian buffer planting plans.
34. Remove and properly dispose of/recycle E&SC BMPs. Remove stakes and orange construction fence. Repair and permanently stabilize areas disturbed during E&SC BMP removal.

## 1.8 Supporting Calculations and Measurements

Supporting calculations are provided in **Appendix A through Appendix C of this E&SC Narrative.**

## 1.9 Plan Drawings

Refer to the E&SC Plans and the BMP Plans are included in **Section 2 of the ESCGP-2 NOI.**

## 1.10 Maintenance Program

E&SC BMPs shall be maintained properly throughout construction of the CPL South pipeline. Operation and maintenance, including repair and replacement guidelines to ensure effective and efficient operation, can be found in the BMP Plans and Attachment 17 – Upland Erosion Control, Revegetation and Maintenance Plan of the ECP (provided as **Section 4 of the ESCGP-2 NOI**). The following inspection and maintenance shall be implemented to maintain E&SC BMPs.

- Maintenance and inspection of E&SC BMPs shall conform to the following:
  - Federal Energy Regulatory Commission (FERC) regulations, Attachment 17 of the ECP as provided in **Section 4 of the ESCGP-2 NOI**;
  - Transco’s project-specific Upland Erosion Control, Revegetation, and Maintenance Plan (Transco Plan) included as Attachment 17 of the ECP as provided in **Section 4 of the ESCGP-2 NOI**;
  - Transco’s project-specific Wetland and Waterbody Construction and Mitigation Procedures, and Procedures (Transco Procedures) included as Attachment 18 of the ECP as provided in **Section 4 of the ESCGP-2 NOI**; and
  - PA Code Chapter 102 and 105 regulations, including all conditions of the ESCGP-2.
- Until the site is stabilized, all E&SC BMPs shall be maintained properly. Maintenance shall include inspections of all E&SC BMPs after each runoff event and on a weekly basis. All preventative and remedial maintenance work, including clean out, repair, replacement, regrading, reseeding, remulching, and renetting must be initiated immediately. If the E&SC BMPs fail to perform as expected, replacement E&SC BMPs, or modifications of those installed will be required.
- Immediately upon discovering unforeseen circumstances posing the potential for accelerated erosion and/or sediment pollution, the Operator shall implement

appropriate E&SC BMPs to minimize the potential for erosion and sediment pollution and notify the local CCD and/or the regional office of the PADEP.

- A log showing dates that E&SC BMPs were inspected as well as any deficiencies found and the date they were corrected shall be maintained with the Environmental Inspector's records on the site and be made available to regulatory agency officials at the time of inspection.
- The reviewing agency (PADEP or local CCD) shall be notified of any changes to the approved E&SC Plan prior to implementation of those changes. The reviewing agency may require a written submittal of those changes for review and approval at its discretion.
- Refer to E&SC BMP Detail Sheets for inspection and maintenance procedures specific to each E&SC BMP (provided in **Section 2 of the ESCGP-2 NOI**).
- Sediment removed from E&SC BMPs shall be properly disposed of off-site or placed on-site up gradient of E&SC BMPs.
- All site entrance and exit points will be inspected on a daily basis for evidence of off-site tracking of mud. The Contractor shall clean streets and roads of mud and/or dust and keep the streets and roads in a clean and dust-free condition.
- Access road gravel thickness shall be constantly maintained. A stockpile shall be maintained on-site for this purpose.
- E&SC BMPs shall remain functional as such until all areas tributary to them are permanently stabilized or until they are replaced by another E&SC BMP approved by the local CCD or PADEP.
- Erosion & sedimentation controls shall be left in place until such time as the disturbed areas have permanent stabilization. An area shall be considered to have achieved final stabilization when it has a minimum uniform 70% perennial vegetative cover or other permanent non-vegetative cover with a density sufficient to resist accelerated surface erosion and subsurface characteristics sufficient to resist sliding and other movements. When controls are to be removed in agricultural non-sensitive areas (streams/wetlands), agricultural landowners shall maintain agricultural BMPs per PADEP regulations.

## 1.11 Material Recycling and Disposal

Transco has prepared a Spill Plan for Oil and Hazardous Materials to assist in prevention of any spills that may occur during the construction of the CPL South pipeline and to respond to any spills that do occur. The Contractor will be required to become familiar with the Spill Plan for Oil and Hazardous Materials and its contents prior to commencing any construction-related activities. The Spill Plan for Oil and Hazardous Materials is included as **Attachment 9 of the ECP** provided as **Section 4 of the ESCGP-2 NOI**.

Contractors are required to inventory and manage their construction site materials. The goal is to be aware of the materials on-site; ensure they are properly maintained, used, and disposed of; and to make sure the materials are not exposed to stormwater.

### Materials Covered

The following materials or substances are expected to be present on-site during construction. **Please note that this list is not necessarily all-inclusive and the Materials Management Plan or Practices can be modified to address additional materials used on-site.**

- Acids
- Detergents
- Fertilizers (nitrogen/phosphorus)
- Hydroseeding mixtures
- Petroleum based products
- Sanitary wastes
- Soil stabilization additives
- Solder
- Solvents

These materials must be appropriately stored and shall not come into contact with stormwater or non-stormwater discharges. The Contractor shall provide a weather proof container to store chemicals or erodible substances that must be kept on-site. The Contractor is responsible for reading, maintaining, and ensuring that employees and subcontractors are aware and familiar with the safety data sheets (SDSs).

### Material Management Practices

The following are material management practices that will be used to reduce the risk of spills or other accidental exposure of materials and substances to stormwater runoff.

## 1. Good Housekeeping Practices

The following good housekeeping practices will be followed on-site during construction:

- Store only enough material required to do the job.
- Store materials in a neat, orderly manner.
- Store chemicals in watertight containers or in a storage shed, under a roof, completely enclosed, with appropriate secondary containment to prevent spill or leakage. Drip pans shall be provided under dispensers.
- Substances will not be mixed with one another unless recommended by the Manufacturer.
- Manufacturer's recommendations for proper use and disposal will be followed.
- Inspections will be performed to ensure proper use and disposal of materials.
- Cover and berm loose stockpiled construction materials that are not actively being used (i.e. soil, spoils, aggregate, etc.).
- Minimize exposure of construction materials to precipitation.
- Minimize the potential for off-site tracking of loose construction and landscape materials.

## 2. Hazardous Products

These practices will be used to reduce the risks associated with hazardous materials. SDSs for each substance with hazardous properties that is used on the job site(s) will be obtained and used for the proper management of potential wastes that may result from these products. A SDS will be posted in the immediate area where such product is stored and/or used and another copy of each SDS will be maintained in a file at the job site construction trailer office. Each employee who must handle a substance with hazardous properties will be instructed on the use of SDS and the specific information in the applicable SDS for the product he/she is using, particularly regarding spill control techniques.

- Products will be kept in their original containers with the original labels in legible condition.
- Original labels and SDSs will be produced and used for each material.
- If surplus product must be disposed of, the Contractor shall follow all applicable local, state, and/or federal regulations, as well as the manufacturers' recommended methods for proper disposal.

### 3. Hazardous Wastes

All hazardous waste materials will be disposed of by the Contractor in the manner specified by local, state, and/or federal regulations and by the manufacturer of such products. Site personnel will be instructed.

### 4. Concrete and Other Wash Waters

Prevent disposal of rinse, wash waters, or materials on impervious or pervious surfaces into streams, wetlands and other water bodies.

Concrete trucks will be allowed to wash out or discharge surplus concrete or drum wash water on the Site, but only in (1) specifically designated diked areas which have been prepared to prevent contact between the concrete and/or washout and soil and stormwater having the potential to be discharged from the Site; or (2) locations where waste concrete can be poured into forms to make riprap or other useful concrete products.

The hardened residue from the concrete washout diked areas will be disposed of in the same manner as other non-hazardous construction waste materials, or may be broken up and used on the Site as deemed appropriate by the Contractor and Owner or Owner's representative. The Contractor will be responsible for ensuring that these procedures are followed.

All concrete washout areas will be located in an area where the likelihood of the area contributing to stormwater discharge is negligible. If required, additional E&SC BMPs must be implemented to prevent concrete wastes from contributing to stormwater discharges. The location of the concrete washout area(s) must be identified, by the Contractor/Job Site Superintendent, on the job site copy of the E&SC Plans (provided in **Section 2 of the ESCGP-2 NOI**) and in this E&SC Narrative.

## 5. Sanitary Wastes

All sanitary waste units will be located in an area where the likelihood of the unit contributing to stormwater discharges is negligible. Additional E&SC BMPs must be implemented, such as containment trays (provided by the rental company) or special containment created with 2-inch x 4-inch lumber, impervious plastic, and gravel. The location of the sanitary waste units must be identified on the job site copy of the E&SC Plans (provided in **Section 2 of the ESCGP-2 NOI**), in this E&SC Narrative, by the Contractor/Job Site Superintendent.

## 6. Solid and Construction Wastes

All waste materials will be collected and stored in a securely lidded metal dumpster. The dumpster will comply with all local and state solid waste management regulations. The dumpster/container lids shall be closed at the end of every business day and during rain events. Appropriate measures shall be taken to prevent discharges from waste disposal containers to the receiving water.

## 7. Construction Access

A stabilized construction exit will be provided to help reduce vehicle tracking of sediments. The paved roads adjacent to the Site entrance will be inspected daily and swept as necessary to remove any excess mud, dirt, or rock tracked from the Site. Dump trucks hauling material from the construction site will be covered with a tarpaulin as necessary.

## 8. Petroleum Products

On-site vehicles will be monitored for leaks and receive regular preventative maintenance. Petroleum products will be stored in tightly sealed containers which are clearly labeled. Petroleum storage tanks on-site will have a dike or berm containment structure constructed around it to contain spills which may occur (containment volume to be 110% of volume stored). The dike or bermed area shall be lined with an impervious material such as a heavy duty plastic sheet. Drip pans shall be provided for all dispensers. Any asphalt substances used on the Site will be applied according to the manufacturer's recommendations.

## 9. Fertilizers and Landscape Materials

Fertilizers will be applied only in the minimum amounts recommended by the manufacturer. Once applied, fertilizer will be worked into the soil to minimize the potential for exposure to stormwater. Storage will be under cover. The contents of

any partially used bags of fertilizer will be transferred to a sealable plastic bin to minimize the potential for spills. The bin shall be labeled appropriately.

Contain stockpiled materials, such as but not limited to, mulches, top soil, rocks and gravel, and decomposed granite, when they are not actively being used.

Apply erodible landscape material at quantities and application rates according to the manufacturer's recommendations or based on written specifications by knowledgeable and experienced field personnel. Discontinue the application of any erodible landscape material within two days prior to a forecasted rain event or during periods of precipitation.

#### 10. Paints, Paint Solvents and Cleaning Solvents

Containers will be tightly sealed and stored when not in use. Excess paint and solvents will be properly disposed of according to the manufacturer's recommendations or local, state, and federal regulations.

#### 11. Contaminated Soils

Any contaminated soils (resulting from spills of materials with hazardous properties) which may result from construction activities will be contained and cleaned up immediately in accordance with applicable local, state and federal regulations.

### 1.12 Soil Conditions and Geologic Formations

#### Geologic Formations or Soil Conditions with Potential to Cause Pollution

AECOM conducted a desktop review of the proposed CPL North and CPL South pipelines for the potential of geologic formations which may cause pollution if disturbed or exposed during construction. Historical geologic surveys and a custom soils resource report from the Natural Resources Conservation Service (NRCS) were reviewed (provided in **Appendix E of this E&SC Narrative**).

#### Karst Bedrock Formations

As identified by AECOM, naturally-occurring bedrock formations and soil types that may cause pollution may be present along portions of CPL North and CPL South.

Bedrock formations that may cause pollution are associated with karst conditions include the following:

- Annville Formation
- Catskill
- Conestoga Formation
- Diabase Formation
- Hamburg
- Hammer Creek
- Hershey-Myerstown Formation
- Mauch Chunk
- New Oxford
- Pocono
- Pocono/Spechty Kopf
- Stonehenge Formation
- Trimmers Rock
- Turscarora/Clinton
- Vintage Formation

Two bedrock formations, Hamburg Sequence/limestone unit and Hamilton Group/Tully limestone unit do not form significant karst terrain along the proposed CPL North and CPL South alignments

### **Acid-Producing Sulfide Bedrock Formations**

In the review of the NRCS data for the proposed CPL North and CPL South pipeline routes, several acid-producing sulfide bedrock formations are located along the proposed routes. These formations are as follows:

- Pottsville Group Formation (anthracite coal-bearing)
- Llewelyn Formation (anthracite coal bearing)

Formations containing variable amounts of pyrite or other sulfide minerals that may only locally be acid-producing are also found along the proposed CPL North and CPL South pipeline alignments. These formations can only be determined by site-specific acid-drainage investigations, and are identified as follows:

- Antietam-Harpers schist
- Cocalico shale
- Conestoga phyllite

- Hamburg/Martinsburg shale
- Kinzers shale
- Octoraro schist

## Acidic Soils

For the proposed CPL North and CPL South pipelines, based on review of the NRCS Custom Soil Resource Report (provided in **Appendix E of this E&SC Narrative**), the quantity of acidic soils potentially found along the proposed CPL North and CPL South routes may be sufficiently high such that their potential for pollution should be mitigated. Table 5 and Table 6 in the BMP Plan (provided in **Section 2 of the ESCGP-2 NOI**) provides the locations of the acidic soils and their respective acidity levels.

### 1.13 Thermal Impacts

Thermal impacts associated with the proposed CPL South pipeline will be avoided to the maximum extent practicable through implementation of provisions and best management practices detailed within the ECP and E&SC Plans. It is anticipated that if the Project results in any thermal impacts to streams and wetlands, the impacts will be negligible. A summary of minimization measures designed to protect against thermal impacts resulting from Project-related activities are summarized below:

- Permanent changes in vegetation cover and land use will be minimized to that necessary to construct and operate the pipeline. Transco focused route selection to co-locate with existing utility infrastructure and avoid large contiguous tracts of forested land where possible. Refer to Attachment P of the Chapter 105 permit application for a detailed discussion of route alternatives and resource crossing methods.
- The removal of vegetation, especially tree/canopy cover, will be limited to only that necessary for construction. Reduced workspaces are proposed in areas where impacts to environmentally sensitive areas such as streams and wetlands are unavoidable. This reduction in overstory clearing will reduce shade loss near streams and wetlands, thereby preserving as much of the cooling properties of shade as is practicable. Any tree canopy clearing at individual resource crossings will be minimal relative to the watershed size of the affected streams and wetlands. Additionally, temporary workspaces within riparian buffer areas will be allowed to revert to existing vegetative cover. The proposed permanent conversion of forested riparian buffer to herbaceous riparian buffer affects a relatively small fraction of the overall riparian buffer for each affected watercourse and the larger watershed. In addition, the remaining herbaceous

riparian vegetation will continue to provide beneficial functions related to water quality. Therefore, any potential changes in riparian area thermal functions will be minor and isolated to the 10-foot area centered over the pipeline within the permanent easement and are not expected to result in the degradation of the existing stream uses or associated water quality. However, as an additional protection measure, Transco is proposing to replant riparian forest buffers crossed by the Project. Replanting will occur within the regulated floodplain (Federal Emergency Management Agency [FEMA] mapped 100-year floodplain or 50-foot-wide floodway, whichever is greater). In Special Protection waters, replanting of the riparian forest buffer will be an average minimum of 150 feet. Transco is also proposing to replant in areas where Chapter 102 riparian buffer waivers are being requested. The “Riparian Buffer Impact Assessment and Restoration Plan” is provided for additional guidance on restoration measures, including reseeding and plantings within riparian buffer corridors (see Appendix H of this Narrative). Refer to Attachment P of the Chapter 105 permit application for a detailed discussion of proposed workspace width reductions at environmental features.

- No new impervious areas are proposed as part of the CPL pipeline. Refer to site specific PCSM / SR plans, narratives and calculations for proposed permanent access roads and permanent facilities, including main line valves, that require new permanent impervious improvements.
- Infiltration will be promoted through restoration of the pipeline ROW in accordance with the requirements presented in Attachment 14 of the ECP. Restoration will include but is not limited to restoration of existing contours, surface aeration or decompaction, re-seeding, and replanting to achieve meadow in good condition. Refer to Attachment 14 of the ECP (Restoration) and Section 1.17 (Site Restoration) of this Narrative for additional detail on proposed restoration measures.
- Compaction of soils within the ROW will be minimized to the extent practicable. Decompaction efforts will include the use of matting in sensitive areas, segregation of topsoil stockpiles in sensitive areas, and scarification of soils during restoration. Refer to Section 1.17 Site Restoration of this Narrative for additional information regarding soil decompaction.
- Temporary restoration will occur within 48 hours of completion of construction activities within streams and wetlands. Temporary restoration will occur within 21 days for non-stream and wetland areas that are not being trenched, backfilled, or otherwise actively disturbed.

- Gravel will be used instead of asphalt for new access roads wherever practicable to minimize the extent of new impervious area and promote infiltration of stormwater. The minimum width, based on individual road use requirements, is proposed for each access road. Additionally, existing roads were utilized where practicable. Refer to Permanent Access Roads and Facilities for individualized thermal impact analyses.

The proposed Project is not expected to result in increases to runoff rate or volume, or change existing drainage patterns. The aforementioned practices are intended to minimize and mitigate thermal impacts associated with the pipeline and to maintain suitable stream temperatures so as to not significantly modify stream and wetland functions.

#### **1.14 E&S Plan and PCSM/SR Plan Consistency**

The construction workspace and permanent ROW associated with the CPL South pipeline will be restored to pre-construction surface elevations and revegetated. The E&S Plans and Narrative have been designed to also serve as site restoration of the ROW back to existing or meadow in good condition following completion of construction. Disturbed areas shall be stabilized and the long-term maintenance of the SR BMPs as outlined in the BMP Plan will begin. Refer to **Attachment 22 of the ECP** (provided as **Section 4 of the ESCGP-2 NOI**) for seeding mixtures.

#### **1.15 Riparian Forest Buffers**

Based on the linear nature of the Project, watercourse and associated riparian buffer crossings are unavoidable. Transcontinental Gas Pipe Line Company, LLC. (Transco), through its intensive routing process, has attempted to minimize the number and extent of watercourse and riparian buffer crossings to the extent practicable. To that effect, Transco has prepared this Avoidance and Minimization Summary for the Atlantic Sunrise Project (Project) which provides an overview of the development of the CPL North and CPL South pipeline alignments, and Associated Facilities including the route alternatives, routing surveys, route deviations and wetland and watercourse crossing methodologies that were used to avoid and minimize Project-related impacts to wetlands, watercourses, and riparian buffers.

As indicated within PA Code Chapter 102.14 Riparian Buffer Requirements, a waiver is required for earth disturbance activities within riparian buffers associated with watercourses designated as High Quality or Exceptional Value (HQ/EV). A waiver is not required for earth disturbance outside of these areas or for trenchless crossings

which do not involve earth disturbance within the riparian buffer of an HQ/EV watercourse.

## Request for Waivers

As stated in Chapter 102.14 of the Pennsylvania Code, unless authorized by exceptions, earth disturbance activities are not permitted within 150 feet of a perennial or intermittent river, stream, or creek; or lake, pond, or reservoir when the Project site is located in an EV or HQ watershed (PADEP 2010b). Applicants for linear projects, such as the proposed Project, may request a waiver from the Chapter 102.14 requirements, provided the existing riparian buffer is undisturbed to the extent practicable, and the activity will otherwise meet the requirements of the Chapter.

The PADEP, in a conference call held on January 28, 2016, provided guidance that a riparian buffer waiver request is not required if the pipeline crosses an HQ/EV stream and riparian buffer at an approximate right angle. Furthermore, the PADEP indicated that a riparian buffer waiver request is only required for an HQ/EV stream if:

1. The pipeline or its associated construction workspace, including contractor staging areas, contractor/pipe yards, and/or access roads, do not cross an HQ/EV stream, but are located within the riparian buffer to that HQ/EV waterbody; or,
2. Any portion of the pipeline is located parallel to an HQ/EV stream and within the 150' riparian buffer located on either side of the HQ/EV stream (so the full 150-foot buffer on each side of the HQ/EV stream and the stream itself must be crossed at approximate right angle).

The portion of the proposed Project in Northumberland County is subject to the requirements of Chapter 102.14. Based on the above guidance by the PADEP, waiver requests for two (2) riparian buffer crossings, as detailed in **Table 1.15.-1**.

**Table 1.15-1  
Proposed Riparian Buffer Waiver Requests in Northumberland County**

Stream ID	Chapter 93 Designation	Stream Type	Length of Waiver Request <sup>a</sup> (feet)	Area of Waiver Request <sup>b</sup> (acres)	Mile-post	Impairment/ TMDL	E&S/SR Plan Sheet No.
WW-T44-11002	HQ-CWF, MF	Perennial	450	1.03	88.89	None	6 of 9
WW-T44-11001A	HQ-CWF, MF	Intermittent	115	0.32	M-0437 0.03	None	9 of 9

<sup>a</sup> Length of the waiver request based on the length of the riparian buffer crosses the pipe centerline.  
<sup>b</sup> Area of waiver requested based on total area of riparian buffer within workspace.

Key:  
 HQ-CWF = High Quality – Cold Water Fishes, Migratory Fishes

Transco has developed a Riparian Area Impact Assessment and Restoration Plan for the Atlantic Sunrise Project for Northumberland County, which is included in **Appendix H of this Narrative**. The purpose of this plan is to describe the condition of the existing riparian buffers located in the Project workspace; evaluate riparian functions; quantify riparian impacts from construction and operation of the Project; and present Best Management Practices (BMPs) proposed to avoid and minimize impacts on riparian buffers. The report also includes Riparian Buffer Replanting Area Diagrams, a Tree and Shrub Planting List, and Typical Planting Details.

**Route Selection**

Throughout the development of the Project, Transco identified certain engineering and construction constraints as well as sensitive areas along the CPL pipeline alignment requiring detailed analysis to ensure avoidance or minimization of impacts to watercourses. The results of Transco’s review, as well as route and LOD modifications to avoid and minimize impacts to watercourses and wetlands are discussed in detail within the Alternatives Analysis, which is provided as Attachment P of the Northumberland County Chapter 105 Application (E49-336).

These following constraints influenced the development of the proposed pipeline route:

- Identifying crossing locations of the Susquehanna River where, based on terrain, horizontal directional drilling (HDD) appeared to be technically feasible;
- Minimizing visual impacts on the Appalachian Trail;

- Crossing areas of significant topographic relief where technically feasible;
- Avoiding state lands, including state parks, state forests, and state game lands to the maximum extent practicable;
- Avoiding densely populated areas to the extent practicable; and
- Minimizing wetland and watercourse crossing impacts.

Based on these parameters, Transco narrowed its analysis to 600-foot-wide study corridors for both the CPL North and CPL South pipeline alignments, which were initially determined based on desktop analysis and aerial reconnaissance (helicopter overflights). Transco then conducted field routing surveys within these study corridors and developed the October 2014 proposed routes that were subsequently compared to potential alternative routes during the Federal Energy Regulatory Commission (FERC) pre-filing process which ended in March 2015 with the filing of the Section 7(C) application. Major alternatives to the CPL North and CPL South pipeline routes that were presented in Transco's application and Environmental Report (ER) filed with the FERC on March 31, 2015 (Docket# CP15-138), are discussed below.

The objective of Project alternatives analysis was to develop proposed pipeline routes that will be constructible, accomplish the Project's purpose and need, as well as avoid or minimize potential adverse environmental impacts. The alternatives analysis was also developed to be consistent with the FERC and PADEP's regulatory requirements as set forth in 18 Code of Federal Regulations 380.15 and 25 PA. Code § 105.13(e)(viii). Thus, it contains a detailed analysis of the proposed action, including alternative locations, routings, or designs to avoid or minimize environmental impacts.

The locations that Transco evaluated for start and endpoints of the CPL pipeline were based on the locations necessary to meet the stated purpose of the Project (Attachment E of the USACE Application and Section 1.1.1 of RR 1 of the FERC ER) while maximizing the use of existing Transco infrastructure for efficiency and reliability and to minimize the amount of incremental facilities required. Using these parameters, Transco designed the Project to have the capacity to receive up to 1.7 million dekatherms per day of natural gas from both new receipt points on CPL North and from existing receipt points along the Leidy Line system. These routing efforts established the Project alignment and associated workspace areas that were then further modified to minimize impacts to wetlands, watercourses and associated riparian buffers.

### **Riparian Buffer Impact Alternatives**

This section describes the alternatives considered or currently under consideration for the Project and how these alternatives affected the extent of potential riparian buffer

impacts associated with construction and operation of the pipeline. Per the comment provided by PADEP in its October 5, 2015 administrative deficiency letter, Transco has separated the alternatives analysis into several categories including the complete avoidance alternative, the 'do-nothing' alternative (no provisions made for impact avoidance / minimization), and the Project Alternative which is the currently proposed pipeline alignment. The Project alternative represents an intermediary between the complete avoidance and 'do-nothing' alternatives. The Project alternative, as detailed within Attachment P of the Northumberland County Chapter 105 Application (E49-336), represents the end result of Transco's extensive routing and impact avoidance measures, and the discussion of that alternative includes information on system alternatives, route alternatives, and construction alternatives considered for the Project.

### **Complete Avoidance Alternative**

The Complete Avoidance Alternative considers two scenarios: not constructing the Project and complete avoidance of resource impacts. Transco does not construct the Project, temporary and permanent impacts to wetlands, watercourses and riparian buffers associated with construction and operation would be avoided. However, by not constructing the Project, Transco would not be able to provide the natural gas transportation service requested by the customers that have executed binding agreements for Transco to provide 1.7 million dekatherms per day (MMDth/d) of incremental firm transportation of natural gas from the Marcellus Shale production areas in northern Pennsylvania to its existing market areas, extending to as far south as the Station 85 Pooling Point 1 in Choctaw County, Alabama.

The Complete Avoidance Alternative would not result in increased access to reliable, domestic natural gas supplies from the Marcellus Shale production areas. Transco's review of existing and available energy sources indicates that natural gas is the best fuel source to provide clean, reliable energy necessary to meet existing and future demand while minimizing environmental impacts.

The existing Transco facilities in or near the Project area are not currently designed to transport natural gas from north to south and do not provide adequate pipeline takeaway capacity for transportation of natural gas to meet current transportation demand. If the Complete Avoidance Alternative is selected, Transco's customers will need to:

- Seek other transportation services;

- Forgo meeting their natural gas demand until energy conservation measures stabilize or decrease demand, possibly limiting their growth and the growth of the local economies they serve; and,
- Depend on other future development projects with unpredictable schedules and undetermined environmental impacts.

In addition to the inability to meet the Project purpose and need, the Complete Avoidance Alternative would not be technically feasible from a routing or constructability perspective. The linear nature of the Project is such that complete avoidance of wetlands, watercourses and riparian buffers is not feasible. Many of the watercourses crossed by the Project extend east to west such that the pipeline could not be configured to avoid them. The number of watercourses and associated riparian buffers is such that an attempt to cross them via trenchless technology such as HDD would result in significantly greater impacts to upland forest and would dramatically increase the length of time required to complete the Project. HDDs and other trenchless methods are generally not feasible or practical for a based on elevation and geotechnical constraints. A Trenchless Crossing Analysis is provided within Attachment P of the Northumberland County Chapter 105 Application (E49-336).

The Complete Avoidance Alternative is not technically feasible for a linear pipeline and does not meet the Project objectives of providing the additional transportation capacity of natural gas requested by its customers within the time frame required.

### **'Do-Nothing' Alternative**

The 'Do-Nothing' Alternative represents the worst-case scenario where no attempts were made to avoid or minimize impacts to environmental resources including riparian buffers. Under this alternative, the full construction workspace would be used without any reduction or setbacks for additional temporary workspace. In addition, during operation of the pipeline, the full-width of the permanent ROW would be maintained in herbaceous vegetation without allowance for regrowth of any shrubs or trees. While construction and post-construction BMPs would be required by FERC, the Project would be constructed in a manner that meets the minimum performance standards required for coverage under ESCGP-2.

The Project alignment includes the crossing of 440 watercourses with associated riparian buffers. Based on a 110-foot average construction corridor without accounting for additional temporary workspace areas, a 50-foot wide permanent ROW without accounting for co-location, and an average riparian buffer width of

125 feet (average of 100 feet for non-EV/HQ waters and 150 feet for EV/HQ waters), construction of the Project under the 'Do-Nothing' Alternative would result in approximately 278 acres of riparian buffer impact with approximately 126 acres being permanently maintained in herbaceous condition. This alternative would also eliminate any proposed trenchless crossings of watercourses such as the HDDs at the two Susquehanna River crossings and the Conestoga River crossing. Under this scenario, Transco would seek to use the 'wet open cut' crossing methodology on a significantly greater number of watercourses which would result in potentially greater water quality impacts.

The 'Do-Nothing' Alternative is not viable from Transco's perspective for a number of reasons. First and foremost, Transco does not design, construct or operate its Projects and facilities in a manner that does not account for minimization of environmental impacts to the extent practicable. This alternative would not meet the regulatory performance standards under either the federal Clean Water Act or the PADEP 105 and ESCGP-2 implementing regulations. Lastly, Transco is required to construct and operate the Project in accordance with the FERC *Plan and Procedures* which would not allow for the extent of temporary or permanent impacts associated with this alternative.

### **Project Alternative**

The Project Alternative, which is comprised of the facilities and associated workspace areas presented under the current application, represents the pipeline alignment that minimizes impacts to wetlands, watercourses and riparian buffers to the extent practicable while maintaining a safe and constructible Project that meets the stated purpose and need. As previously stated, Transco has conducted an exhaustive evaluation of alternatives which began during initial Project development and extended through the FERC pre-filing process. PADEP has been an active participant in the process and has provided substantive direction and comment which has contributed to the final alignment presented within the ESCGP-2 application. The following sections provide detailed information on the alternatives evaluated for the Project, the construction methods being used to avoid and minimize impacts and the BMPs and restoration / operation measures being implemented to ensure that there are no Project-related adverse impacts to riparian buffers or surface water quality.

A route alternative was identified as a linear segment of pipeline that diverges from the currently proposed alignment, extends for a distance generally parallel to the proposed alignment and may or may not converge back into the proposed alignment prior to the terminus. The objective of Transco's alternatives analysis is to develop proposed pipeline routes that will be constructible, accomplish the

Project's purpose while avoiding or minimizing potential adverse environmental impacts to the greatest extent practicable, and be consistent with the Commission's guidelines as set forth in 18 Code of Federal Regulations 380.15.

Transco designed minor alternatives in response to landowner and other stakeholder comments and site-specific conditions identified during field surveys and desktop analyses. These minor alternatives and the results of Transco's review, as well as route and LOD modifications to avoid and minimize impacts to wetlands, are discussed in detail within Attachment P of the Northumberland County Chapter 105 Application (E49-336).

During design of the Project, Transco attempted to avoid and minimize wetland, watercourse and riparian buffer impacts that would result from construction and installation of the Project by reducing the construction ROW to 75 feet in most wetlands and by proposing to maintain the right-of-way in accordance with Transco's Wetland and Watercourse Construction and Mitigation Procedures (**Attachment 18 of the ECP, provided as Section 4 of the ESCGP-2 NOI**).

Transco developed and implemented a comprehensive routing process to identify constructible pipeline alignments that minimized effects on sensitive resources to the extent practicable. The routing process was conducted by interdisciplinary teams comprised of engineering, construction, and environmental specialists.

Major factors utilized in the selection and development of the Project alignments and workspace configurations included the following:

- Initial Corridor Selection – National Wetland Inventory data was used to avoid potentially large wetland complexes to the extent possible when identifying the initial 600-foot-wide CPL North, CPL South, and Associated Facilities study corridor;
- Selection of Final Study Corridor – National Wetland Inventory data was used to compare major route alternatives to the preferred routes and was utilized as one of the primary tools for the selection of the preferred routes;
- Centerline Routing for the CPL North, CPL South, and Associated Facilities Corridors - Field routing surveys of 600-foot-wide corridors were conducted. One of the primary field-routing analytical tools utilized in the identification of the preferred routes was avoidance and minimization of impacts to regulated areas.

- Construction Workspace – Transco developed the construction workspace for CPL North, CPL South, and Associated Facilities as follows:
  - A 90-foot-wide construction ROW for installation of the 30-inch-diameter CPL North pipeline. For the approximately 21.3 miles of CPL North that are co-located with the Transco Leidy Line system ROW, Transco will utilize 30 feet of its existing maintained ROW and an additional 60 feet of new construction ROW. Approximately 5.0 miles of CPL North are co-located with several Williams Field Services (midstream) pipelines and 0.3 mile of existing powerline ROW. Transco will utilize 5 feet of existing ROWs and an additional 85 feet of new construction ROWs for these areas.
  - A 100-foot-wide construction ROW for installation of the 42-inch-diameter CPL South pipeline. For the approximately 14.9 miles of CPL South that are co-located with existing pipelines and powerline ROWs, Transco will utilize 10 feet of the existing ROWs and an additional 90 feet of new construction ROW.
- Surface Water Avoidance and Minimization - Construction at wetland and watercourse crossings will be conducted in accordance with applicable federal, state, and local regulatory requirements. The Transco Procedures (provided as Attachment 18 of the ECP, provided as Section 4 of the ESCGP-2 NOI) will also be implemented during construction, post construction restoration, and operation of the proposed CPL North, CPL South, and Associated Facilities to minimize adverse impacts to surface waters. Within wetlands, the proposed construction ROW will be reduced to 75 feet wherever feasible.

Due to the nature of linear projects such as this, complete avoidance of watercourse and riparian buffer crossings is not feasible; however, through co-location with portions of the existing Leidy system and utilization of specialized construction techniques to further reduce the watercourse, wetland and riparian buffer impacts associated with construction, Transco has avoided and minimized CPL North, CPL South, and Associated Facilities-related impacts to wetlands, watercourses and riparian buffers to the extent practicable.

- Temporary Construction Right-of-Way Impacts and Restoration

Temporary alteration of regulated areas within the Project workspace is expected to be relatively insignificant compared to the overall size of drainage areas and sub-watersheds of surface water systems across the Project area. The use of E&SC BMPs (**Attachment 2B of the ECP**, provided as **Section 4 of the ESCGP-2 NOI**) such as temporary and permanent slope breakers, compost filter sock, sediment traps, and revegetation, will minimize the effects of erosion and sedimentation during construction. Temporary changes in the type of the vegetative cover and shading of watercourses will vary by crossing; however, the affected riparian buffer areas along watercourses will be restored in accordance with the E&SC Plan (**Section 2 of the ESCGP-2 NOI**) and ECP (**Section 4 of the ESCGP-2 NOI**).

The width of the proposed construction ROW has been established 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 are based on the Interstate Natural Gas Association of America's (INGAA) workspace guidelines (INGAA 1999). Reductions of the construction ROWs will be made, where practicable, at various locations to address specific environmental or residential issues along the proposed pipelines. For example, the nominal construction ROW width has been reduced to 75 feet at most wetland crossings. Following construction, temporary workspace areas necessary to facilitate construction will be restored to pre-construction contours, stabilized, and revegetated per landowner agreements and applicable agency requirements.

Typically, pipeline construction requires ATWS at road, railroad, wetland, watercourse, and agricultural land crossings, and in areas where specialized construction techniques are required (i.e., on steep slopes). Upon completion of the Project, Transco will restore ATWS areas in accordance with landowner agreements and allow them to revert to prior land uses. The configurations and sizes of ATWS areas are site-specific and vary in accordance with the construction method, feature or land use crossed, and other construction needs.

Transco has developed E&SC Plans to be in compliance with the requirements of the PADEP's Chapter 102, Title 25 of the Pennsylvania Administrative Code created under the Clean Streams Law. The PADEP Erosion and Sediment Pollution Control Program Manual, dated March

2012, was used as a primary reference for design and selection of E&SC BMPs suitable for use in HQ and EV watersheds to be implemented during the Project.

In summary, the E&SC Plans include implementation of the following techniques to protect water quality of the receiving resources through minimization of soil erosion and sediment migration, as required within PADEP Chapter 102:

- E&SC BMPs will be installed prior to commencement of earthwork and will not be removed until after the up-gradient areas are stabilized.
- RCEs will be installed along points of access to the pipeline alignment to mitigate the potential for construction vehicles to transport sediment onto public roadways.
- CFS will be installed along the down-gradient perimeter of the work areas.
- At areas of concentrated flow in natural drainage ways, diversion berms will be installed to intercept and convey upslope stormwater runoff around the work corridor without contacting disturbed surfaces.
- Waterbars will be installed to mitigate the potential for stormwater to erode soils on steep slopes by diverting water away from the pipeline alignment. Diversion terraces will discharge to a well vegetated area, or an outlet structure, to limit the potential for sediment-laden water to flow downgradient from the terrace.
- Diligent maintenance of the E&SC BMPs will be conducted throughout the duration of the project. Routine inspection of E&SC BMPs will be completed by a qualified Environmental Inspector in accordance with Transco's Upland Erosion Control, Revegetation, and Maintenance Plan and Wetland and Watercourse Construction and Mitigation Procedures, as well as the approved E&SC Plan.
- Anti-degradation Requirements: The approximate original contours of the workspace will be maintained and / or restored to their original condition, and all disturbed areas will be revegetated or restored with pervious material. The volume and rate of stormwater runoff from the site in the post-construction condition is not anticipated to exceed that of the existing condition. Increases in

runoff volume or rate are not expected at any of the receiving waters.

- Thermal impacts: The proposed project is not expected to result in increases to runoff rate or volume or change drainage patterns. Impervious cover will not be added, and disturbed areas will be restored to a vegetated condition. No discharges to waters as a result of the Project are expected. Adverse thermal impacts resulting from the project are not anticipated.
  - The E&SC Plan has been prepared to be consistent with the Site Restoration Plan under CH 102.8. Measures proposed for implementation during construction are consistent with those for long term stormwater management. Of note, temporary diversion terraces proposed for use during construction have been located so as to serve as permanent stormwater management measures following site stabilization.
  - Removal of the E&SC BMPs will occur only after the disturbed areas have been stabilized by uniform perennial vegetative coverage (density) of 70 percent 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.
- Permanent ROW Restoration, Operation and Maintenance

Please refer to Section 4 – Riparian Area Restoration and Section 5 – Replanting Plan within the Riparian Area Impact Assessment and Restoration Plan, which is included in **Appendix G of this Narrative**.

A summary of the routing and LOD adjustments that were conducted to avoid and minimize wetland and stream impacts to the maximum extent practicable are provided in table format within Attachment P, Appendix P-1 within the Northumberland County Chapter 105 Application (E49-336).

- **Riparian Buffer Alternatives Summary**

In accordance with the request from PADEP, Transco has evaluated several alternatives with respect to avoidance and/or minimization of riparian buffer impacts associated with construction and operation of the Project. Transco first evaluated the Complete Avoidance Alternative which sought to avoid all impacts to riparian buffers. This was deemed unfeasible by Transco based on the linear

nature of the Project and the inability to technically implement trenchless technology for every watercourse / riparian buffer crossing. This alternative would also not meet the purpose and need of the Project. Under the ‘Do Nothing’ Alternative, Transco would not implement any measures to avoid or minimize impacts to riparian buffers along the pipeline alignment. This would result in the greatest potential adverse impact to riparian buffers and water quality associated with watercourses crossed by the Project and would result in significant acreage being maintained in herbaceous vegetation. Additionally, this alternative would not be feasible under the current FERC *Plan and Procedures* nor would it be constructed in accordance with Transco’s standard practices. Therefore, this alternative was determined to be unviable.

Finally, Transco provided supporting information on its currently proposed Project alignment which represents the end result of a comprehensive routing and workspace analysis based on a multi-disciplinary approach that included engineering, construction and environmental constraints. The proposed Project alignment achieves the stated purpose and need while minimizing watercourse and riparian buffer impacts to the extent practicable by implementing a combination of specialized construction practices, reduced workspace widths, stormwater and construction BMPs and post-construction restoration and operational vegetation management practices.

### 1.16 Antidegradation Requirements

The proposed CPL South pipeline extends through a number of special protection watersheds as well as watersheds that are considered siltation impaired (See table below). As a result, the Project requires an anti-degradation analysis.

**Table 1.16.1 Northumberland County High Quality (HQ), Exceptional Value (EV), and Siltation Impaired Watersheds**

<b>HQ/EV/Siltation Impaired Waters</b>			
<b>Watershed Name</b>	<b>Chapter 93 Designation</b>	<b>Cause of Siltation, if Impaired</b>	<b>Milepost (MP) range within watershed</b>
South Branch Roaring Creek	HQ-CWF, MF	N/A	88.4 to 91.0 & 91.7 to M-0437 0.0

While the pipeline corridor is proposed to cross multiple special protection watersheds, the design approach and proposed BMPs are consistent across the Project. The

following non-discharge alternatives for the Project were considered to minimize accelerated erosion and sedimentation during earth disturbance activities and to maintain pre-development stormwater runoff rate, volume and concentration of pollutants:

- **Alternative Siting:** The objective of Transco’s alternative siting /routing analysis is to develop a pipeline alignment that will be constructible, accomplish the Project’s purpose while avoiding or minimizing potential adverse environmental impacts to the greatest extent practicable in accordance with the Commission’s guidelines as set forth in 18 Code of Federal Regulations 380.15. A complete alternative routing analysis is provided within **Attachment P of the Chapter 105 permit application** and addresses specific route modifications within the special protection watersheds. One of Transco’s primary siting strategies was to collocate the proposed pipeline with existing utility corridors to minimize forest removal and disturbance of established vegetation. A total of 42% of the proposed CPL North and 12% of the proposed CPL South pipeline is collocated with existing utility corridors.
- **Limited Disturbed Area:** The limit of disturbance was minimized to avoid Project-related land impacts. Typical right-of-way widths were reduced in areas where impacts to environmentally sensitive areas were unavoidable. In addition, trenchless crossing methods were incorporated into the Project design at a number of wetlands and waterbodies within special protection watersheds. An alternatives analysis with additional detail on workspace reductions is provided in **Attachment P (Appendix P.1) of the Chapter 105 permit application.**

In areas of disturbance within riparian buffers, the proposed permanent conversion of forested riparian buffer to herbaceous riparian buffer affects a relatively small fraction of the overall riparian buffer for each affected watercourse and the larger watershed. In addition, the remaining herbaceous riparian vegetation will continue to provide beneficial functions related to water quality. Therefore, any potential changes in riparian area thermal functions will be minor and isolated to the 10-foot area centered over the pipeline within the permanent easement and are not expected to result in the degradation of the existing stream uses or associated water quality. However, as an additional protection measure, Transco is proposing to replant riparian forest buffers crossed by the Project. Replanting will occur within the regulated floodplain (Federal Emergency Management Agency [FEMA] mapped 100-year floodplain or 50-foot-wide floodway, whichever is greater). In Special Protection waters, replanting of the riparian forest buffer will be an average minimum of 150 feet. Transco is also proposing to replant in areas where Chapter 102 riparian buffer waivers are being requested. The “Riparian Buffer Impact

Assessment and Restoration Plan,” is provided for additional information on restoration within riparian buffer corridors (**See Appendix H of this Narrative**).

- **Limiting Extent & Duration of Disturbance:** Completed areas will be final graded and permanently stabilized as construction progresses in a linear manner. The expected maximum length of time that any section of trench will be open is 30 days. Additionally, temporary stabilization will occur within 4 days of cessation of any earth disturbance activities in non-wetland and stream areas and 48 hours within areas of wetland and stream disturbance. At wetland and stream crossings, all pipe installation and temporary restoration is proposed to be completed within a 48-hour period.
- **Site Restoration:** Restoration of the pipeline ROW will be conducted in accordance with the restoration requirements discussed in the Attachment 14 of ECP. Restoration will primarily include, but is not limited to, surface decompaction and replanting. Refer to **Section 1.17 of this Narrative and Attachment 14 of the ECP** for additional detail regarding proposed restoration measures.

To supplement the use of non-discharge BMPs within the Project workspace areas, Antidegradation Best Available Combination of Technologies (ABACT) E&SC BMPs are also proposed in the special protection and siltation impaired watersheds. These ABACT E&SC BMPs include the following:

- Compost filter socks
- Rock construction entrances with wash racks
- Compost filter sock and sump at waterbar discharges
- Erosion control blankets
- Rock filter outlets with compost layer
- Horizontal Directional Drilling (HDD)
- Bored waterbody crossings

For locations and typical details of ABACT BMPs, please refer to the BMP Plan Set.

The above analysis is applicable to the pipeline portion of the project. When applicable, separate anti-degradation analyses are provided in the site specific narratives for the relevant access roads and aboveground facilities.

Based on the above non-discharge alternatives and protective BMPs, it is anticipated that the Project will not have a significant impact, thermal or otherwise, to the functions of special protection watersheds.

## 1.17 Site Restoration

Restoration of all disturbed areas shall be in conformance with the specifications identified in Attachment 6, Agricultural and Construction Monitoring Plan, Attachment 14, Restoration, and Attachment 22, Seeding Mixtures, of the ECP (provided as Section 4 of the ESCGP-2 NOI); the E&SC BMP Plan Set (provided in Section 2 of the ESCGP-2 NOI); and the Riparian Buffer Impact Assessment and Restoration Plan (provided in Appendix H of this E&SC Narrative).

Topsoil and subsoil excavated for pipeline installation will be separated and segregated into stockpiles within all agricultural, residential and wetland land use areas. The existing subgrade shall be scarified prior to topsoil placement in all areas, and soil will be returned to the disturbed area in the reverse order. The stockpiled topsoil will be segregated from the subsoil to prevent mixing.

ROW cleanup and permanent restoration operations will commence immediately following backfill operations. Permanent re-establishment of final grades and drainage patterns as well as restoration and revegetation measures serve to minimize post-construction erosion by establishing a vegetative cover, which protects the soil. Post construction erosion will also be minimized by using E&S BMPs (i.e. waterbars) which can divert or slow runoff and trap sediment. When controls are to be removed in agricultural non-sensitive areas (streams/wetlands), agricultural landowners shall maintain agricultural BMPs per PADEP regulations.

Transco will complete upland final grading, topsoil replacement, and installation of permanent E&S measures within 20 days after backfilling the trench in all areas except residential areas, which will be completed within 10 days.

Disturbed areas within the construction ROWs that are not part of the permanent ROWs will be restored following the completion of construction activities per landowner and applicable agency requests. Transco will grade the construction ROW to restore pre-construction contours and leave the soil in the proper condition for planting. Segregated topsoil will be spread across the ROWs evenly and to the same approximate layer depths documented during pre-construction surveys by the Environmental Inspectors (EIs). Where trench compaction has not occurred, the ROWs will be graded to pre-construction contours, as practical, with a small crown of soil left over the trench to compensate for settling, but not to interfere with natural drainage. Openings will be left in the trench-line crown to allow for lateral surface drainage.

Disturbed areas within the construction ROWs that are part of the permanent ROWs will be restored and maintained in accordance with the Transco Plan and Procedures. Non-wetland areas will be restored to pre-construction contours and maintained in an

existing herbaceous state or meadow in good condition for the operational life of the pipelines. Wetland areas (including areas within a 100-foot buffer) will be restored as close to their original contours and flow regimes as practical. Buffer areas will be seeded and mulched as soon after backfilling as practicable.

Replanting of disturbed riparian forest buffer areas will occur within the regulated floodplain of any riparian forest buffers crossed by the Project, including those areas where riparian buffer waivers are being requested. Herbaceous riparian vegetation is proposed for a 10-foot area centered over the pipeline within the permanent easement. In areas within active agricultural fields, Transco will restore to pre-construction contours and provide temporary stabilization within 100' of streams or rivers until farming operations commence (refer to attachment 6, Agricultural and Construction Monitoring Plan of the ECP (provided as Section 4 of the ESCGP-2 NOI). In Special Protection waters, replanting of the riparian forest buffer will be an average minimum of 150 feet. Temporary stabilization will occur within 4 days following backfilling of the trench. Farming within the permanent ROW shall not be limited by the project once disturbed areas have been stabilized.

Trees within 15 feet of the pipeline with roots that could compromise the integrity of pipeline coating may be selectively cut and removed from the permanent ROW within forest wetlands. No routine vegetation mowing or clearing will occur in wetlands that are between HDD entry and exit points.

A travel lane may be temporarily left open to allow access of construction traffic if the temporary E&S measures are installed, inspected and maintained while the access is utilized. When access is no longer required, the travel lane will be removed and the ROW will be restored.

During construction, compaction of soils will be minimized to the maximum extent practicable. This will be accomplished by creating travel lanes and limiting the footprint for disturbance within the ROW. However, land that becomes compacted by heavy equipment will need to be decompacted by deep tillage to alleviate soil compaction upon completion of construction and prior to final site stabilization.

Monitoring after restoration will be performed based on permit requirements.