TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC

Resource Report No. 2
Water Use and Quality

Leidy Southeast Expansion Project

July 2013

SUMMARY OF FILING INFORMATION		
INFORMATION	**Data Sources**	**Found in Section**
Minimum FERC Requirements		
1. Identify all perennial surface waterbodies crossed by the proposed Project and their water quality classification. (§ 380.12(d)(1)) • Identify by milepost (MP) • Indicate if potable water intakes are within 3 miles downstream of the crossing.	L, DD, FF, GG	2.3.1 2.3.2 Tables 2A-1 and 2A-2
2. Identify all waterbody crossings that may have contaminated waters or sediments. (§ 380.12(d)(1)) • Identify by MP • Include offshore sediments.	DD, GG, J	2.3.2.6 2.3.2.7 Table 2.3-2
3. Identify watershed areas, designated surface water protection areas, and sensitive waterbodies crossed by the proposed Project. (§ 380.12(d)(1)) • Identify by MP	J, DD, L, FF, GG, LL	2.3.1 2.3.2
4. Provide a table (based on NWI maps if delineations have not been done) identifying all wetlands, by MP and length, crossed by the proposed Project (including abandoned pipeline), and the total acreage and acreage of each wetland type that would be affected by construction. (§ 380.12(d)(l&4))	D, L	Tables 2B-1 and 2B-2
5. Discuss construction and restoration methods proposed for crossing wetlands, and compare them to staff's Wetland and Waterbody Construction and Mitigation Procedures. (§ 380.12(d)(2))	D, GG, Z	2.5.2 2.6.2
6. Describe the proposed waterbody construction, impact mitigation, and restoration methods to be used to cross surface waters and compare to the staff's Wetland and Waterbody Construction and Mitigation Procedures. (§ 380.12(d)(2)) • Although the Procedures do not apply offshore, the first part of this requirement does apply. Be sure to include effects of sedimentation, etc. This information is needed on a mile-by-mile basis and will require completion of geophysical and other surveys before filing. (See also Resource Report 3.)	D, GG, Z	2.3.3 2.3.4 2.6.1
7. Provide original NWI maps or the appropriate state wetland maps, if NWI maps are not available, that show all proposed facilities and include MP locations for proposed pipeline routes. (§ 380.12(d)(4))	O	Mapping Supplement, Volume 3
8. Identify all U.S. Environmental Protection Agency (EPA) - or state-designated aquifers crossed. (§ 380.12(d)(9)) • Identify the location of known public and private groundwater supply wells or springs within 150 feet of construction.	D, DD, J, FF	2.2.1 2.2.2 2.2.3 Table 2.2-2

SUMMARY OF FILING INFORMATION		
INFORMATION	**Data Sources**	**Found in Section**
Additional Information Often Missing and Resulting in Data Requests		
• Identify proposed mitigation for impacts on groundwater resources.	D, Z	2.2.6
• Discuss the potential for blasting to affect water wells, springs, and wetlands, and associated mitigation.	D, L	2.2.6 2.3.4.4
• Identify all sources of hydrostatic test water, the quantity of water required, methods for withdrawal, and treatment of discharge, and any waste products generated.	D, DD	2.4 Table 2.4-1
• If underground storage of natural gas is proposed, identify how water produced from the storage field will be disposed.	NA	NA
• If salt caverns are proposed for storage of natural gas, identify the source locations, the quantity required, the method and rate of water withdrawal, and disposal methods.	NA	NA
• For each waterbody greater than 100 feet wide, provide site-specific construction mitigation and restoration plans.	NA	NA
• Indicate mitigation measures to be undertaken to ensure that public or private water supplies are returned to their former capacity in the event of damage resulting from construction.	D	2.2.6.2
• Describe typical staging area requirements at waterbody and wetland crossings.	D, Z	2.3.3.1 2.5.2
• If wetlands would be filled or permanently lost, describe proposed measures to compensate for permanent wetland losses.	D, L, Z	2.5.3
• If forested wetlands would be affected, describe proposed measures to restore forested wetlands following construction.	D, Z, DD	2.5.3
• Describe techniques to be used to minimize turbidity and sedimentation impacts associated with offshore trenching, if any.	NA	NA

Key:

N	FWS	FF	State Drinking Water Division	GG	State Water Quality Division
D	Applicant	O	FWS NWI Map	LL	USGS Topographic Maps
J	EPA	Z	Procedures		
L	Field Surveys	DD	State Agencies		

Table of Contents

List of Tables

List of Acronyms

AOC	Area of Concern
ATWS	additional temporary work space
bgs	below ground surface
BMP	best management practice
CWA	Clean Water Act
CWF	cold-water fishery
dth/d	decatherms per day
E&SCP	Erosion and Sediment Control Plan
EPA	(United) States Environmental Protection Agency
EPH	extractable petroleum hydrocarbons
EV-CWF	exceptional value cold water fishery
FERC	Federal Energy Regulatory Commission
gpm	gallons per minute
HDD	horizontal directional drill
hp	horsepower
HQ	high quality
HQ-CWF	high quality cold water fishery
KCSL	Known Contaminated Sites List
LOI	Letter of Interpretation
LSE	Leidy Southeast Expansion
LUST	leaking underground storage tank
MF	migratory fishery
MP	milepost
NJAC	New Jersey Administrative Code
NJDEP	New Jersey Department of Environmental Protection
NRCS	National Resources Conservation Service
NRI	National Rivers Inventory
ONRW	Outstanding National Resource Waters
PADEP	Pennsylvania Department of Environmental Protection
PAFBC	Pennsylvania Fish and Boat Commission
PCWS	public community water supply
PEM	palustrine emergent wetland

PFO	palustrine forested wetland
PNCWS	public non-community water supply
PSS	palustrine scrub-shrub wetland
RCV	receiving valve
ROW	right-of-way
RR	resource report
SPCC	Spill Prevention Control and Countermeasure
SSA	sole-source aquifer
SDWA	Safe Drinking Water Act
TOC	Total Organic Contaminant Criterion
TPH	Total Petroleum Hydrocarbon
Transco	Transcontinental Gas Pipe Line Company, LLC
TSF	trout-stocked fishery
USACE	United States Army Corps of Engineers
USDOT	United States Department of Transportation
USGS	United States Geological Survey
VCP	Voluntary Clean-up Program
WHPA	wellhead protection areas
WRA	well restriction area
WWF	warm-water fishery

2. WATER QUALITY USE

2.1 INTRODUCTION

Transcontinental Gas Pipe Line Company, LLC (Transco) is proposing to construct and operate the Leidy Southeast Expansion Project (LSE, or Project) in order to provide an additional 525,000 dekatherms per day (dt/day) of incremental firm transportation service from various receipt points on Transco's Leidy Line in Pennsylvania to various delivery points along Transco's Mainline as far south as Compressor Station 85 in Choctaw County, Alabama. The facilities required to provide this service include approximately 29.95 miles of 42-inch diameter pipeline looping, addition of 71,900 horsepower (hp) at four existing compressor stations, and modification of various aboveground facilities. Construction would begin in the fourth quarter of 2014, and facilities would go in to service by the fourth quarter of 2015.

The following background is provided for facilities described in this report.

Transco's Leidy Line originates at Compressor Station 505 in Hunterdon County, New Jersey, and terminates near Wharton, Pennsylvania, in Potter County, stretching for a distance of approximately 200 miles. The existing Leidy pipelines are named "A" (constructed in 1958), "B" (constructed in 1971), "C", and "D" (both still being constructed in segments as the market dictates. Mileposting is a method of measuring distance along a pipeline, and the Leidy mileposting starts at Compressor Station 505 at milepost (MP) 0.00.

Transco's Mainline starts at MP 78.89 north of Harlingen, Texas, and runs northeasterly to New York City for a distance of some 1,775 miles. Up to five lines, "A" through "E", comprise this Mainline system. Mainline "A" was constructed in 1949 and "B" was constructed in 1951. Lines "C" through "E" are still being constructed in segments as the market dictates.

Figure 1.1-1 provides a general overview of facilities proposed as part of this Project. As shown, the Project includes the following components in Pennsylvania and New Jersey:

- 5.29 miles of 42-inch pipe in Luzerne County, Pennsylvania (Dorrance Loop);
- 11.45 miles of 42-inch pipe in Monroe County and Luzerne County, Pennsylvania (Franklin Loop);
- 6.86 miles of 42-inch pipe in Somerset County and Hunterdon County, New Jersey (Pleasant Run Loop);
- 6.35 miles of 42-inch pipe in Mercer County and Somerset County, New Jersey (Skillman Loop);
- A new 20,500-hp compressor unit and two compressor rewheels at Transco's existing Compressor Station 520 in Lycoming County, Pennsylvania;

- A net addition of 33,400 hp and four compressor rewheels at Transco's existing Compressor Station 517 in Columbia County, Pennsylvania. Transco proposes to install a new 30,000-hp (ISO) compressor unit and replace one existing 12,600-hp compressor engine with a new 16,000-hp compressor engine;

- A new 16,000-hp compressor unit and two compressor rewheels at Transco's existing Compressor Station 515 in Luzerne County, Pennsylvania;

- A 1,000-hp uprate and three compressor rewheels at Transco's existing Compressor Station 205 in Mercer County, New Jersey;

- Modifications to various valve sites, meter stations, and compressor stations between Transco's Compressor Station 190 and Compressor Station 165; and

- Installation of back pressure regulators at Compressor Station 145 (Grover Meter Station) in Cleveland County, North Carolina.

The Project will include the four pipeline loops listed in Table 1.1-2 of Resource Report 1, "General Project Description," and depicted on the alignment sheets included in the Mapping Supplement in Volume 3.

Resource Report (RR) 2 describes the existing water resources and water quality in the Project area, evaluates the potential impacts of construction and operation of the proposed Project on these resources, and identifies proposed mitigation measures to avoid or minimize potential impacts to groundwater, surface water, and wetlands. Information contained in this RR was obtained from field surveys, review of available literature, and consultations with various federal, state, and local regulatory agencies. Copies of agency correspondence are presented in Appendix 2E. A checklist showing the status of the Federal Energy Regulatory Commission (FERC) filing requirements for this RR is included in the table of contents.

2.2 GROUNDWATER RESOURCES

Groundwater resources include all waters beneath the earth's surface. In terms of storage at any given time, groundwater represents the largest single supply of freshwater available for human use (USGS 1999). Groundwater is contained in aquifers of various types that vary from high to low permeability and groundwater resources may lie shallow or deep. The following subsections describe groundwater resources within the Project area.

2.2.1 Aquifers Occurring within the Project Area

2.2.1.1 Pipeline Facilities

Dorrance Loop

The Dorrance Loop is located entirely within the Trimmers Rock Formation within the Ridge and Valley Physiographic Province. Aquifers in this formation consist of permeable rocks within a sequence of folded and faulted sedimentary formations (PADCNR Bureau of Topographic and Geological Survey 2001; Trapp and Horn 1997). The Dorrance Loop crosses undifferentiated sedimentary rock aquifers within these geologic formations along its entire length. Surficial aquifers in the vicinity of the loop consist of sand and gravel aquifers at or near the ground surface, alluvium along streams and rivers, and till and glacial lake deposits. Yields from wells located in these glacial-deposit aquifers can range from about 400 to 750 gallons per minute (gpm) to as much as 1,300 gpm. Groundwater quality is suitable for drinking and most other uses. The minerals that compose the undifferentiated sedimentary-rock aquifers in the region consist primarily of fractured sandstone with some fractured shale. The minerals in these rocks result in low dissolved solids concentrations and good groundwater quality (Trapp and Horn 1997).

A review of Pennsylvania's "eMapPA" program indicates that well depths range from 17 to over 100 feet in the vicinity of the Dorrance Loop (PADEP 2013). Groundwater levels recorded by the United States Geological Survey (USGS) in Luzerne County from 2008 to 2013 range from approximately 24 to 34 feet below ground surface (bgs) (USGS 2013). Known data on groundwater wells and springs within 150 feet of the Dorrance Loop workspace are provided in Section 2.2.3. Table 2.2-1 summarizes the aquifer and groundwater data for the Dorrance Loop.

Franklin Loop

The Franklin Loop crosses three formations within the Appalachian Plateaus Physiographic Province: the Pocono Formations, the Spechty Kopf Formation and the Duncannon Member of Catskill Formation. Aquifers in these formations consist of Devonian siltstone, shale, and thin-bedded sandstone (PADCNR Bureau of Topographic and Geological Survey 2001; Trapp and Horn 1997). Aquifers in the vicinity of the loop consist of fine grained sandstone, siltstone, and shale, and are not considered to be principal aquifers, although these beds locally yield as much as 200 gpm where they are fractured. The chemical quality of water in the freshwater parts of the bedrock aquifers of the Appalachian Plateaus Province is somewhat variable but generally is satisfactory for municipal supplies and other purposes

(Trapp and Horn 1997); however, Pennsylvania's "eMapPA" program indicates that groundwater is a primary source of drinking water in the Franklin Loop Project area.

A review of Pennsylvania's "eMapPA" program indicates that well depths range from 15 to approximately 500 feet in the vicinity of the Franklin Loop (PADEP 2013). Groundwater levels recorded by the USGS from 2008 to 2013 in Monroe County ranged from approximately 8 to 16 feet bgs, and levels in Luzerne County ranged from approximately 28 to 35 feet bgs (USGS 2013). Known data on groundwater wells and springs within 150 feet of the Franklin Loop workspace are provided in Section 2.2.3. Table 2.2-1 summarizes the aquifer and groundwater data for the Franklin Loop.

Pleasant Run Loop

The Pleasant Run Loop is fully located within the Brunswick aquifer within the Piedmont Physiographic Province. The underlying bedrock is dense and yields water mostly from fractures. This aquifer is located in early Mesozoic basins (Herman et al. 1999; Trapp and Horn 1997). The groundwater in the lower Mesozoic rocks moves primarily along joints, fractures, and bedding planes. The water-bearing fractures and bedding planes in each aquifer are more or less continuous, but the hydraulic connection across the confining units between individual aquifers is poor. The diabase that intrudes the sedimentary rocks has very low porosity lending to the poor hydraulic connections (Trapp and Horn 1997).

Several factors affect the yields of wells located in the rocks of the Piedmont Province. Variations in yield depend on the type of rock in which a well is completed; the thickness of the regolith; the number, size, and spacing of bedrock fractures and the degree to which the fractures are connected; as well as the topographic setting of the well. Crystalline bedrock is covered by a thick or thin layer of regolith almost everywhere in the province. The thicker the regolith, the greater the volume of water in storage and the more likely well yield can be sustained. Where the regolith is thin, crystalline-rock wells are more likely to go dry during the summer months or periods of drought (Trapp and Horn 1997).

Within these this aquifer, groundwater levels recorded by the USGS in Somerset and Hunterdon counties from 1990 to 2013 range from approximately 11 to 29 feet bgs in early Mesozoic formations (USGS 2013). Water quality is generally suitable for drinking and other uses, but iron, manganese, and sulfate can locally occur in objectionable concentrations. The aquifers in early Mesozoic basins, such as the Brunswick aquifer, are mostly sandstone, siltstone, and shale, with some limestone and conglomerate, which are slightly more soluble than those of the rocks that compose the crystalline-rock aquifers; as such, the water quality in the early Mesozoic basins is typically higher in dissolved solids concentrations; however, most

of the water withdrawn from the aquifers in early Mesozoic basins and the deep-lying carbonate-rock aquifers is used for public supply (Trapp and Horn 1997).

Known data on groundwater wells and springs within 150 feet of the Pleasant Run Loop workspace are provided in Section 2.2.3. Table 2.2-1 summarizes the aquifer and groundwater data for the Pleasant Run Loop.

Skillman Loop

The Skillman Loop is located within the Brunswick and diabase aquifers of the Piedmont Physiographic Province. This site is located over the Brunswick bedrock aquifer, which is what Trapp and Horn (1997) refer to as an aquifer in early Mesozoic basins. This aquifer type and its general water quality are described in the Pleasant Run Loop description above. The NJDEP generally classifies the Brunswick aquifer as Rank C, which typically yields 101 to 250 gpm and the diabase aquifer as Rank E which typically yields less than 25 gpm (Herman et al. 1999).

Groundwater levels recorded by the USGS in Somerset County from 2001 to 2013 in Early Mesozoic basins range from approximately 4 feet to over 60 feet bgs (USGS 2013). Table 2.2-1 summarizes the aquifer and groundwater data for the Skillman Loop.

Table 2.2-1
Aquifers Crossed by Pipeline Facilities

Loop	County	State	Name of Aquifer Crossed[a,e]	Type of Aquifer Crossed[a,e]	Median Well Yields (gpm)[e]	Depth to Groundwater (feet below land surface)[b,f]	Well Depths (feet)[c,f]	General Water Quality[d, g, h, i, j]	Typical Water Use[g, h, i]
Dorrance	Luzerne	PA	Trimmers Rock Formation	Bedrock Aquifer	Unknown	24 to 34	17 to 100	Good	Unknown
Franklin	Monroe Luzerne	PA	Valley and Ridge Physiographic Province	Bedrock Aquifer	Unknown	8 to 16	15 to 500	Good	Unknown
Pleasant Run	Somerset Hunterdon	NJ	Brunswick Aquifer	Fractured Rock - Bedrock Aquifer	>100 to 250	11 to 29	36 to 660	Good	Public Water Supply, Institutional
Skillman	Hunterdon Mercer	NJ	Brunswick Aquifer	Fractured Rock - Bedrock Aquifer	>100 to 250	1 to 29	36 to 660	Good	Public Water Supply, Institutional

Table 2.2-1
Aquifers Crossed by Pipeline Facilities

Loop	County	State	Name of Aquifer Crossed[a,e]	Type of Aquifer Crossed[a,e]	Median Well Yields (gpm)[e]	Depth to Groundwater (feet below land surface)[b,f]	Well Depths (feet)[c,f]	General Water Quality[d, g, h, i, j]	Typical Water Use[g, h, i]
Skillman	Mercer	NJ	Diabase	Fractured Rock - Bedrock Aquifer	<25	Unknown	NA - no wells in vicinity	Unknown	Public Water Supply, Institutional

Key:
gpm = gallons per minute

Sources:

Pennsylvania

[a] PADCNR Bureau of Topographic and Geological Survey. 2001. Digital Bedrock Aquifer Characteristics by Physiographic Section of Pennsylvania. http://www.dcnr.state.pa.us/topogeo/groundwater/dac_data.aspx. Accessed March 11, 2013.

[b] USGS Groundwater Data for Pennsylvania. http://waterdata.usgs.gov/pa/nwis/gw/. Accessed March 11, 2013.

[c] PADEP. 2013. EmapPA Interactive Map. http://www.emappa.dep.state.pa.us/emappa/viewer.htm. Accessed March 11, 2013.

[d] USGS. 2011b. GROUND WATER ATLAS of the UNITED STATES Delaware, Maryland, New Jersey, North Carolina, Pennsylvania, Virginia, West Virginia. HA-730L. http://pubs.usgs.gov/ha/ha730/ch_l/L-text5.html. Accessed March 11, 2013.

New Jersey

[e] NJDEP New Jersey Geological Survey. Aquifers of New Jersey Open-File Map OFM-24. http://www.state.nj.us/dep/njgs/pricelst/ofmap/ofm24.pdf. Accessed March 11, 2013.

[f] USGS New Jersey Water Science Center. Groundwater-Level Network: Listed by Aquifer. http://nj.usgs.gov/infodata/networks/gw_networks_aquifer.html, Accessed March 11, 2013.

[g] USGS New Jersey Water Science Center. Hunterdon County -- Ground-Water-Quality Information. http://nj.usgs.gov/qw-cgi/county.pl?county=19. Accessed November 15, 2011.

[h] USGS New Jersey Water Science Center. Somerset County -- Ground-Water-Quality Information http://nj.usgs.gov/qw-cgi/county.pl?county=35. Accessed March 11, 2013.

[i] USGS New Jersey Water Science Center. Mercer County -- Ground-Water-Quality Information. http://nj.usgs.gov/qw-cgi/county.pl?county=21. Accessed March 11, 2013.

[j] NJDEP. 2007 New Jersey's Ambient Ground Water Quality Network Data. http://www.state.nj.us/dep/njgs/geodata/dgs05-2.htm. Accessed March 11, 2013.

2.2.1.2 Aboveground Facilities

Compressor Station 520

Compressor Station 520 is located within the Catskill geologic formation within the Valley and Ridge Physiographic Province in Lycoming County, Pennsylvania. Aquifers in the Valley and Ridge Physiographic Province consist of permeable rocks within a sequence of folded and faulted sedimentary formations as described under the Dorrance Loop in Section 2.2.1.2. Surficial aquifers in the vicinity of Compressor Station 520 are undifferentiated sedimentary rock aquifers. USGS depth to groundwater data in Lycoming County from 2008 to 2013 ranges from approximately 97 to 105 feet bgs (USGS 2013).

Compressor Station 517

Compressor Station 517 is located over the Catskill geologic formation in the Appalachian Plateaus Physiographic Province in Columbia County, Pennsylvania. Aquifers in

the Appalachian Plateaus Physiographic Province consist of permeable rocks within a sequence of folded and faulted sedimentary formations as described under the Franklin Loop in Section 2.2.1.2. The USGS depth to groundwater data in Columbia County from 2008 to 2013 ranges from approximately 22 to 37 feet bgs (USGS 2013).

Compressor Station 515

Compressor Station 515 is located within the Pocono geologic formation within the Appalachian Plateaus Physiographic Province in Luzerne County, Pennsylvania. Aquifers in the Appalachian Plateaus Physiographic Province consist of permeable rocks within a sequence of folded and faulted sedimentary formations as described under the Franklin Loop in Section 2.2.1.2. USGS depth to groundwater data in Luzerne County from 2008 to 2013 ranges from approximately 24 to 34 feet bgs (USGS 2013).

Compressor Station 205

Compressor Station 515 is located within the Brunswick aquifer of the Piedmont Physiographic Province. This site is located over the Brunswick bedrock aquifer, which is what Trapp and Horn (1997) refer to as an aquifer in early Mesozoic basins. This aquifer type and its general water quality are described in the Pleasant Run Loop in Section 2.2.1.2. USGS depth to groundwater data in Mercer County from 1990 to 2013 ranges from approximately 12 to 99 feet bgs (USGS 2013).

Compressor Station 190, 180, 175, and 170

Compressor Stations 190, 180, 175, and 170 are located within the igneous and metamorphic rock aquifers of the Piedmont Physiographic Province. The crystalline-rock and undifferentiated sedimentary-rock aquifers consist primarily of metamorphic and igneous rocks but include small areas of sedimentary rocks, principally conglomerate, sandstone, and shale. In crystalline-rock areas, the regolith and fractures in the bedrock serve as the principal places for the storage transmission of water, and groundwater movement is generally along short flow paths from interstream recharge areas to the nearest stream. Well yields for all types of crystalline rocks generally are small; a recent study showed an average yield of 18 gallons per minute for wells completed in these rocks (Trapp and Horn 1997).

Compressor Station 185 and 165

Compressor Stations 185 and 165 are located within the early Mesozoic sandstone aquifers on the Piedmont Physiographic Province. The early Mesozoic aquifers in the Piedmont Physiographic Province are described in Pleasant Run Loop in Section 2.2.1.2.

Other Aboveground Facilities

Other aboveground facilities would only require minimal ground disturbance, if any. Therefore, the underlying aquifers for these facilities are not discussed in detail.

2.2.2 Sole Source Aquifers

The United States Environmental Protection Agency (EPA) defines sole-source aquifers (SSAs) or principal SSAs as those aquifers "which supply at least 50 percent of the drinking water consumed in the area overlying the aquifer." These areas characteristically have no alternative drinking water source(s) that could "physically, legally, and/or economically supply all those who depend on the aquifer for drinking water" (USEPA 2010). Based on review of the EPA's designated SSA maps for Region 2, various Project components are located within one SSA (USEPA 1988).

Northwest New Jersey 15 Basin SSA

The Pleasant Run Loop, Skillman Loop and Compressor Station 205 in New Jersey are located entirely within an area designated by the EPA in 1988 as the Northwest New Jersey 15 Basin SSA (EPA 1988). This SSA occurs at depths of 20 to 40 feet bgs on hilltops and intersects with the ground surface in the streams and wetlands (EPA 1988). Drinking water within the Northwest New Jersey 15 Basin SSA is primarily from surface water sources that provide drinking water to 114 municipalities in eight counties (Warren, Sussex, Mercer, Somerset, Middlesex, Hunterdon, and South Passaic counties in New Jersey, and Orange County, New York). The SSA provides the primary source of drinking water to the townships that are crossed by the Pleasant Run Loop and Skillman Loop.

2.2.3 Public and Private Water Supply Wells

Throughout the Project area, both groundwater and surface water resources are utilized for public and private water supplies; however, groundwater is the primary source of drinking water across the project as a whole. State drinking water agencies and state databases were consulted to identify the location of potable wells and springs within 150 feet of construction workspace (PADCNR Bureau of Topographic and Geological Survey 2005, NJDEP 2010, PADEP 2013,). In addition, Transco will identify private wells and springs within 150 feet of construction workspace not listed in publicly available databases through civil survey, as well as by directly contacting landowners. Any springs observed in the environmental survey corridor will also be recorded by field teams during waterbody and wetland surveys. The locations or known presence of wells and springs identified within 150 feet of the construction workspaces are provided in Table 2.2-2. Transco is currently consulting with existing resources to determine

the locations of public and private water supply wells within 150 feet of the Project's compressor stations. This information will be provided by Transco in the FERC Application.

Table 2.2-2
Potable Water Supply Wells and Springs within 150 feet of Construction Workspaces

County	Nearest MP (if known)	Township	Approximate Distance (feet) / Direction from Construction Workspaces (if known)[1]	Data Source[2] / Supply Type[3]
Dorrance Loop				
Luzerne County, PA	22.17	Slocum	145/ South	Transco Survey/ Private
Franklin Loop				
Monroe County, PA	61.63	Tobyhanna	44/ Northeast	Transco Survey/ Private
	62.19	Tobyhanna	9/ Southwest	Transco Survey/ Private
	62.48	Tobyhanna	4/ Northeast	Transco Survey/ Private
	62.49	Tobyhanna	6/ Northeast	Transco Survey/ Private
	62.60	Tobyhanna	0/ Located within the workspace	Transco Survey/ Private
	63.67	Tobyhanna	0/ Located within the workspace	Transco Survey/ Private
Luzerne County, PA	68.47	Buck	0/ Located within the workspace	Transco Survey/ Private
Pleasant Run Loop				
Hunterdon County, NJ	1.36	Readington	71/ Northeast	Transco Survey/ Private
	1.49	Readington	20/ Northeast	Transco Survey/ Private
	1.55	Readington	101/ Southwest	Transco Survey/ Private
	1.58	Readington	108/ Southwest	Transco Survey/ Private
	2.69	Readington	0/ Located within the workspace	Transco Survey/ Private
	3.46	Readington	28/ Northeast	Transco Survey/ Private
	5.15	Readington	0/ Located within the workspace	Transco Survey/ Private
Skillman Loop				
Mercer County, NJ	1777.3	Princeton	8/ East	Transco Survey/ Private
	1777.3	Princeton	23/ West	Transco Survey/ Private
Somerset County, NJ	1779.82	Montgomery	8/ East	Transco Survey/ Private
	1779.84	Montgomery	128/ West	Transco Survey/ Private
	1780.31	Montgomery	0/ Located within the workspace	Transco Survey/ Private

Notes:
[1] Approximate distance to and location of wells within 150 feet of construction workspaces.
[2] Transco Survey indicates that the well locations were verified in the field during civil survey or through landowner consultation.
[3] Municipal = Municipal source water well
Private = Privately owned well
PNCWS = Public non-community water system well

State agencies have certain restrictions on well data obtained from the agencies that limit how the data may be used. For example, the Pennsylvania Department of Environmental Protection (PADEP) has instituted a policy that classifies the location of water sources serving public water systems as "sensitive information." As such, the exact location or coordinates of water source locations cannot be obtained; instead, a blind search of Pennsylvania's eMapPA can be conducted for these water sources by using a set buffer distance. The blind search

provides contact information for potential water systems within the mapped buffer (PADEP 2013). The New Jersey Department of Environmental Protection (NJDEP) has a similar policy where they will not disclose the precise location of water sources serving public or private water systems, but will provide general information on the location of the vicinity of these resources when provided project information and data needs. As such, in most cases, general location information is provided for public and private water supply wells identified using these methods. Review of available mapping and follow-up with owners of public water supplies was used to narrow the results of agency blind searches to the extent practicable and the results of narrowing that data are reflected in Table 2.2-2. Transco will continue to verify exact locations of wells and springs in the vicinity of the right-of-way (ROW) during ongoing discussions with landowners.

2.2.4 Wellhead Protection Areas

Under a 1986 amendment to the Safe Drinking Water Act (SDWA), each state is required to develop and implement a wellhead protection program in order to identify the land and recharge areas contributing to public supply wells, and prevent the contamination of drinking water supplies. The SDWA was later updated in 1996 with an amendment requiring the development of a broader-based Source Water Assessment Program, which includes the assessment of potential contamination to both groundwater and surface water through a watershed approach. States assess and delineate groundwater protection areas under a combination of these mandates.

A search for wellhead protection areas (WHPAs) crossed by the Project was conducted using state resources (PADEP; NJDEP and NJGS 2004; NJDEP and NJGS 2010). The state of Pennsylvania considers this sensitive information and uses the same blind search process used to identify public and private water supply wells. Transco will supply this information within its FERC Application.

The location of WHPAs is available in New Jersey, although non-community wellhead protection areas have not been updated since 2004. The locations or known presence of WHPAs within 150 feet of the construction workspaces are listed in Table 2.2-3. Transco will consult with the Project Managers of these WPAs to establish guidelines to protect any potential hydrostatic test water or storm water intrusion into the WPAs.

Table 2.2-3
Wellhead Protection Areas within Construction Workspaces

Approximate MP (when applicable)	Township	Approximate Direction of Associated Well from Construction Workspaces	Notes[1]
Pleasant Run Loop, Somerset County, New Jersey			
0.12	Branchburg	Southwest	Tier 3 wellhead protection area for a PNCWS well
Between 0.13 and 0.21	Branchburg	East	Tier 1, 2 and 3 wellhead protection areas for three PNCSW wells
Skillman Loop, Somerset County, New Jersey			
Between 1781.90 and 1782.02	NE	Northeast	Tier 3 wellhead protection area for a PNCWS well
Between 1782.64 and 1783.00	Montgomery	West	Tier 1, 2 and 3 wellhead protection areas for five PNCSW wells

Note:
1. Tier 1 two-year time of travel to the well.
Tier 2 five-year time of travel to the well.
Tier 3 12-year time of travel to the well.

Key:
MLV = Mainline Valve
N/A = Not applicable
PCWS = Public Community Water Supply Well
PNCWS = Public Non-Community Water Supply Well
WHPA = Wellhead Protection Area

Proposed Project workspaces in New Jersey cross WHPAs at the locations noted in Table 2.2-3; as such, the remainder of this section addresses New Jersey WHPAs only.

In New Jersey, a WHPA is a mapped area around a public non-community water supply (PNCWS) well or public community water supply (PCWS) well that delineates the calculated horizontal extent of groundwater captured by a well pumping at a specific rate over a 2-, 5-, and 12-year period of time. The WHPAs are divided into tiers (Tiers 1 to 3) based upon the time of travel to the well (Spayd and Johnson 2003), with Tier 1 representing the 2-year time of travel, Tier 2 representing the 5-year time of travel and Tier 3 representing the 12-year time of travel. A PNCWS well is a public water supply well used by individuals other than year-round residents for at least 60 days of the year. A non-community water supply well can be either a transient or non-transient well. A non-transient, non-community water supply well serves at least 25 of the same people over a period of six months during the year, such as schools, factories, and office buildings. A transient, non-community water supply well is a well that serves people year-round for at least 60 days of the year, but does not serve the same individuals during that one-year period. Transient, non-community water supply wells include rest stop areas, restaurants, and motels (NJAC 2011a). A PCWS well is a public water supply well that serves at least 15 service connections used by year-round residents or regularly serves at least 25 year-round residents

(NJAC 2011a). The NJDEP, Division of Water Quality, operates these systems under the guidelines of the Federal Safe Drinking Water Act.

The Pleasant Run Loop and Skillman Loop are located within a WHPA. The Pleasant Run Loop crosses Tiers 1, 2, and 3 of PNCWS wells. The Skillman Loop crosses Tiers 1, 2, and 3 of PNCWS wells, and Tier 3 of a PCWS well. Land use within WHPAs is not regulated by the state of New Jersey; however, individual municipalities may have ordinances regulating activities within WHPAs. A search of the town codes for Branchburg, Clinton, Readington, Princeton, and Montgomery did not reveal such ordinances; therefore, Transco has not identified any additional land use regulations in WHPAs (Township of Branchburg 2012; Township of Clinton 1983; Township of Readington 1992; Township Princeton 2011; Township of Montgomery 1985).

2.2.5 Potential for Contaminated Groundwater

A search of various federal and state databases including the EPA's Regulated Facility dataset (USEPA 2013), and data layers available through PADEP's Water Monitoring Report (PADEP 2012), and New Jersey's GeoWeb program were conducted to determine potential groundwater contamination areas in the vicinity of the Project. The search area extended outward and perpendicular from the proposed Project centerline (for pipeline loops) and the temporary workspace (for compressor stations) a total distance of 0.25 miles in each direction. Table 2.2-4 provides a summary of sites identified within this search area that have the potential to pose groundwater hazards. Each site listed in Table 2.2-4 was identified, where possible, with respect to the type of the reported release, relevant case status, and proximity to the Project. To date, no potential sites have been identified within 0.25 miles of any compressor station. In the event Transco identifies a potential site, the information will be provided in a future submittal.

In addition to the sites identified in Table 2.2-4, multiple underground storage tanks regulated by the PADEP were identified within 0.25 mile of the Dorrance Loop and Franklin Loop (PADEP 2012a). Some of these underground storage tanks are still operational, while others are documented as leaking underground storage tanks (LUSTs). The presence of these tanks presents further potential for groundwater contamination in the vicinity of these sites.

Table 2.2-4
Potential Groundwater Contamination Sites Near the Leidy Southeast Expansion Project

Site Name	Site Address	Database[1]	Distance from site (miles) and Direction	Notes Based on Review of Data[2]
Dorrance Loop, Luzerne County, Pennsylvania – No sites identified within 0.25 mile of the center line				
Franklin Loop, Monroe and Luzerne Counties, Pennsylvania – No sites identified within 0.25 mile of the center line				
Pleasant Run Loop, Somerset and Hunterdon Counties, New Jersey				
TGPL Station 0505	300 Case Road Branchburg, NJ	NJDEP KCSL	0.14 Northeast	C3: Multi-Phased RA - Unknown or Uncontrolled Discharge to Soil or GW, site status is active Station 505 has received a "No Further Action" letter from NJDEP and clean-up has been completed.
918 ROUTE 523	918 Route 523 Readington, NJ	NJDEP KCSL	0.22 East	C1: No Formal Design - Source Known or Identified-Potential GW Contamination, site status is active
138 STANTON ROAD	138 Stanton Rd, Redington, NJ	NJDEP KCSL	0.14 West	C1: No Formal Design - Source Known or Identified-Potential GW Contamination, site status is active
Skillman Loop, Mercer and Somerset Counties, New Jersey				
125 KILDEE ROAD I/B/O	125 Kildee Road Montgomery, NJ	NJDEP KCSL	0.02 West	B: Single Phase RA - Single Contamination Affecting Only Soils, site status is pending

Notes:

1. Database IDs:

CEA - Classification Exception Area database. Identifies sites in New Jersey where groundwater contamination has been identified and the NJDEP has established a Classification Exception Area. CEAs are institutional controls in geographically defined areas within which the New Jersey Ground Water Quality Standards (NJGWQS) for specific contaminants have been exceeded. When a CEA is designated for an area, the constituent standards and designated aquifer uses are suspended for the term of the CEA (NJDEP SRP 2010).

LUST - New Jersey State Database of Leaking Underground Storage Tanks (NJDEP 2010a)

NJDEP KCSL - New Jersey Department of Environmental Protection Known Contaminated Site List

C1 remedial levels are associated with simple sites with one or two contaminants localized to soil and the immediate spill or discharge area.

C2 remedial levels are associated with more complicated contaminant discharges, multiple site spills and discharges, and/or more than one contaminant, with both soil and groundwater impacted or threatened.

C3 remedial levels are associated with high complexity and threatening sites. Multiple contaminants, some at high concentrations with unknown sources continuing to impact soils, groundwater, and possibly surface waters and potable water resources. Dangerous for direct contact with contaminated soils.

D remedial levels are typically the same conditions as C3 remedial levels except that D levels are also usually designated federal Superfund sites.

RCRA - Resource Conservation and Recovery Act - Facilities that generate or transport hazardous waste or meet other RCRA requirements from the EPA-regulated sites database (USEPA 2011a).

TRI - Toxic Release Inventory from EPA-regulated sites database (USEPA 2011a).

2. Notes based on review of data – summary of site-specific information obtained from available agency data.

2.2.6 Groundwater Impacts and Mitigation

Short-term and highly localized impacts to groundwater could potentially occur during various stages of construction, particularly during clearing and grading, trench excavation and dewatering, hydrostatic testing, and blasting (if required). A summary of these impacts is provided below. Standard and specialized construction techniques to minimize or avoid these impacts are discussed in Section 2.2.6.3. A Groundwater Mitigation Plan has been developed to address potential impacts (see Appendix 2H).

Clearing and Grading

Shallow (perched) aquifers could sustain minor impacts from temporary changes in overland water flow and recharge caused by clearing and grading of the proposed ROW and temporary workspaces. In forested areas, water infiltration, which is normally enhanced by vegetation, will be reduced until vegetation is reestablished. Vegetation will be cleared only where necessary, and will be allowed to regenerate (with certain controls) upon completion of construction. RR 3 provides more information on vegetation impacts and mitigation. The workspace for the Dorrance, Franklin, Pleasant Run, and Skillman loops is collocated with the existing, maintained Transco ROW, which will be utilized for workspace to the extent practicable. The aboveground facility workspaces will be located within existing cleared areas to further minimize the need for new areas to be cleared and graded.

To avoid long-term changes in water table elevation and subsurface hydrology, excavated topsoil and sub-soils will be segregated, where appropriate, in accordance with the Project-specific Plan (see Appendix 7B), and returned as nearly as possible to their original soil horizon. In addition, near-surface soil compaction caused by heavy construction vehicles could temporarily reduce the soil's ability to absorb water. These minor impacts would be temporary and would not significantly affect groundwater resources.

Trench Excavation and Dewatering

For pipeline construction, a trench will be excavated by a backhoe to the proper depth to allow for the burial of the pipe. The trench excavation will be approximately 7 feet deep for the 42-inch diameter pipeline loops. Based on the groundwater levels identified in the region of these pipeline routes, trenching activities may intersect the water table, particularly in wetlands and adjacent to streams corridors. Dewatering may be required in areas where groundwater is encountered. Removal of the water from the trench may result in a temporary fluctuation in local groundwater levels. Trench dewatering activities are usually completed in a few days within a particular location; therefore, potential impacts are expected to be temporary.

Transco proposes to discharge water from dewatering activities into well-vegetated upland areas. If vegetation is insufficient or if water must be discharged to flow into wetland areas, Transco will use straw bale/silt fence filtering structures, as described in the Project-specific Plan and Procedures (see Appendices 7B and 2C, respectively). The straw bale structure will capture a significant volume of solids during discharge, as well as decrease the erosive forces of the water and the likelihood of associated impacts. Implementation of these procedures and use of dewatering structures at stream crossings will minimize turbidity and erosion and reduce the risk of groundwater impacts during dewatering operations. To allow the water table to return to original conditions, Transco will minimize the amount of time that the trench will remain open to the extent practicable.

Horizontal Directional Drilling

The horizontal directional drilling (HDD) method is not proposed for pipeline installation; at this time. In event HDD is proposed, a HDD Contingency Plan would be developed and submitted to FERC.

Hydrostatic Testing

Hydrostatic test water is not anticipated to be a potential source of groundwater contamination. Pipeline segments will be new, ensuring a high level of water quality used for testing. Impact minimization measures related hydrostatic tests are discussed in Section 2.4 of this RR.

Blasting

Based on previous construction experience, existing information about subsurface geologic formations, and preliminary geotechnical survey results, Transco does not anticipate that controlled blasting will be required along the proposed Project area. However, if conditions are encountered that warrant the use of controlled blasting, the appropriate permits and regulatory requirements would be met prior to blasting. If hard bedrock is encountered during construction and blasting is required, seismically controlled blasting techniques will be used to protect against possible impacts on nearby water supply wells. Temporary changes in water level and increased turbidity may occur in well systems located in proximity to the proposed pipeline construction ROW. However, the use of controlled blasting techniques will limit rock fracture to the immediate vicinity of detonation, thereby minimizing potential impacts associated with blasting. Additional details regarding blasting mitigation, should blasting become necessary, are in RR 6.

2.2.6.1 Sole Source Aquifers

Potential sources of impact to SSAs associated with pipeline, compressor station, and aboveground facility construction are related to: construction activities, discharge of hydrostatic test water, and the pipeline itself. At stream and wetland crossings and areas with shallow groundwater within each of the three designated areas, it is likely that trenching and excavation activities could intersect an SSA recharge zone.

The Pleasant Run Loop, Skillman Loop, and Compressor Station 205 in New Jersey are located entirely within the Northwest New Jersey 15 Basin SSA (EPA 1988). This SSA intersects with the ground surface in streams and wetlands. The pipeline loops cross several streams and wetlands, and will likely encounter perched areas and/or recharge areas of the aquifer. Minor impacts to the groundwater quality are expected when trench excavation and crossing of water resources temporarily disturb groundwater resources and recharge areas. However, the length of time that the trench is left open in areas of shallow groundwater will be minimized to the extent practicable and best management practices (BMPs) will be implemented during construction of waterbody and wetland crossings to reduce the likelihood of water quality impact as discussed in Section 2.3.4 and 2.5.3 of this RR. Also, the disturbance footprint associated with the proposed workspaces is minor in comparison to the geographic extent of the SSA resource; as such, impacts would be localized and minimal. Waterbodies and wetlands will be restored to their preconstruction conditions, except forested wetlands within the permanent ROW, which will require mitigation off-site. No impacts to water quantity or quality are expected within the Northwest New Jersey 15 Basin SSA.

The EPA is required to review all federally funded projects that have the potential to impact a designated SSA (EPA 2010). Proposed projects that are funded entirely by state, local, or private entities are not subject to EPA review (EPA 2010). The proposed Project is not federally funded, so EPA's review is not required for the Project's SSA crossings.

2.2.6.2 Public and Private Water Supply Wells and Wellhead Protection Areas

Prior to construction, Transco will seek landowner permission to test all wells within 150 feet of the construction footprint before and after construction. With the well-owner's permission, Transco will conduct pre- and post-construction monitoring of water quality and yield using a qualified, independent contractor to conduct well sampling. Prior to sampling, wells will be purged for 10 minutes. Discharge flow rates (gpm) will be measured during purging. Samples then will be collected and sent to an approved laboratory for analysis. Water samples will typically be analyzed for total dissolved solids, total coliform, nitrates and nitrites, chloride, pH, specific conductance, iron, and sulfate. Sampling methods will be finalized with Transco personnel conducting the sampling and a state-certified laboratory conducting the

water analysis. All samples will be collected such that properly preserved water samples are delivered to the laboratory and tested within the holding times required by the EPA, the American Public Health Association, and applicable state groundwater quality standards. Samples will be analyzed in accordance with parameters outlined by New Jersey and Pennsylvania drinking water standards.

In the unlikely event that construction activities adversely affect a water supply, Transco will make the necessary repairs to restore the water supply system to its preconstruction capacity. If necessary, Transco will re-work the existing well or install a comparable replacement. If the water supply is off-line for any repair, reworking, or replacement, Transco will provide a temporary source of water (e.g., contracting with a local water supply firm to deliver potable water). Within 30 days of placing the pipeline in service, Transco will file with FERC a report discussing any complaints received concerning well yield or water quality and how each was resolved.

Potable well construction in New Jersey requires that steel casing be installed to a minimum depth of 50 feet bgs. The purpose of the casing is to prevent the infiltration of shallow groundwater into deeper water bearing zones. As a result, infiltrating surface water must typically extend greater than 50 feet bgs to contribute to aquifer recharge or potentially be captured by a potable well (NJAC 2007). Trenching activities along the Pleasant Run and Skillman loops will vary in depth. Typical construction depth will vary between 8 to 11 feet bgs and typical depth of a road bore 16 feet bgs and typical crossover depth varying from 13 to 16 feet bgs. Excavation at compressor stations and other aboveground facilities is not expected to extend beyond 4 to 7 feet bgs. It is expected that the static water table will be intersected by trenching activities in wetlands, streams, and other areas where shallow bedrock occurs, but impacts to the shallow water table will not be expected to impact the quality of well water in the vicinity of the Project.

The Pleasant Run and Skillman Loops Tier 1 WHPAs, indicate that construction will take place within a 2-year time of travel zone for a public or public non-community water supply well. Trenching and/or excavation within WHPAs could potentially intersect groundwater resources in a WHPA. In these areas, the groundwater could be subject to higher than normal sediment discharges associated with ground work; however, impacts will be minimized and localized through the implementation of BMPs as indicated in Section 2.3.4.

Trenching and excavation activities at Pennsylvania facilities are expected to encounter groundwater, but will likely not impact groundwater wells. No wellhead protection areas were identified in the vicinity of Pennsylvania facilities. Surficial aquifer sources are not expected to intrude into potable wells and impact water resources, and any impact to these resources would

be localized and temporary due to the implementation of BMPs and restoration of waterbodies and wetlands.

2.2.6.3 Groundwater Contamination

No sites with a high potential for groundwater contamination were identified within 0.25 miles of the Dorrance Loop, Franklin Loop, or Compressor Stations 520, 517, 515, and 205. Based on this data, Transco does not anticipate encountering contaminated groundwater during construction of these loops nor compressor stations. Transco is currently conducting analysis to determine if sites with a high potential for groundwater contamination are within 0.25 miles of Compressor Stations 190, 185, 180, 175, 170, 165, and 145. Transco will provide this information in its FERC Application.

As shown in Table 2.2-4, sites with contaminated groundwater have been identified within 0.25 miles of the Pleasant Run Loop and Skillman Loop. Transco is currently consulting with the project managers for these sites to determine if Project activities are likely to impact these areas.

Pleasant Run Loop

Three sites were identified which have adversely affected the soil within 0.25 miles of the Pleasant Run Loop. These sites were identified in the NJDEP Known Contaminated Sites List (KCSL) database. The first site is located at 918 Route 523, located approximately 0.22 mile east of the loop. The site is currently undergoing C1: No Formal Design, Source Known or Identified-Potential Ground Water Contamination, and the site status remains active (NJDEP KCSL).

The second site is located at 138 Stanton Road, located approximately 0.14 mile west of the loop. The site is currently undergoing C1: No Formal Design, Source Known or Identified-Potential Ground Water Contamination, and the site status remains active (NJDEP KCSL).

The third site is located at Transco's Compressor Station 505, located approximately 0.14 mile northeast of the loop. The site is currently under C3: Multi-Phased Remedial Action, Unknown or Uncontrolled Discharge to Soil or Ground Water. The plan was designated in July of 1989..

None of the sites are either crossed or immediately upgradient of the Pleasant Run such that Transco expects to encounter groundwater contamination during construction. Transco will implement its Unanticipated Discovery of Contamination Plan (see Appendix 7C) during construction and BMPs will be implemented if contaminated groundwater is encountered.

Skillman Loop

One site has been identified which potentially adversely affected the groundwater within 0.25 miles of the Skillman Loop. The site is located at 138 Stanton Road, located approximately 0.02 mile west of the loop. The site is currently undergoing B: Single Phase RA - Single Contamination Affecting Only Soils, and the site is pending (NJDEP KCSL).

2.2.6.4 Implementation of BMPs

In order to minimize the overall potential for impacts to groundwater, Transco will implement standard BMPs throughout the duration of construction. For example, at streams and wetlands where the aquifer may be at or near the surface, Transco will implement safeguards in accordance with FERC guidance and the Project-specific Plan and Procedures (see Appendices 7B and 2C, respectively); Erosion and Sediment Control Plans (E&SCPs); and the Spill Prevention, Control, and Countermeasure (SPCC) Plan (see Appendix 2D). The potential for contaminants entering recharge zones will be precluded to the extent practicable by implementing BMPs including providing setback distances from water resources. Transco will prohibit refueling or the storage of fuel or other hazardous liquids within 200 feet of private drinking-water wells and within 400 feet of public water supply wells and WHPAs. If any modifications to these setbacks will be required, they will be requested as part of the Implementation Plan for the Project.

The SPCC Plan outlines procedures to be followed to minimize impact and remedy the source of spills as quickly as possible in the event that contaminants, such as hydraulic fluid, gasoline, diesel fuel, or other hazardous materials, are spilled or leaked during construction. During Project construction, construction equipment and vehicles will be washed in appropriate facilities containing grit traps prior to coming on site. No cleaning of equipment and vehicles will occur near the trench, aboveground facility excavations, wetlands, or waterbodies.

The impact minimization measures identified in the SPCC Plan (see Appendix 2D) will be implemented to prevent any discharged fluids from leaving the ROW and/or leaching into the groundwater. Several additional construction practices and requirements that are addressed more completely in the SPCC Plan include the following:

- Using absorbent pads/booms to remove any product from the ground surface or trench should a spill occur;
- Pumping out impacted groundwater from the trench and storing it in water storage tanks for proper treatment or disposal should a spill occur; and
- Excavating soils impacted by any such release and properly storing and disposing of them so that contaminants will not spread.

2.3 SURFACE WATER RESOURCES

Surface water resources documented in the LSE Project area include rivers, streams, and associated tributaries. These surface water resources were identified during field surveys conducted in April and June 2013. This section describes the surface water resources crossed by the Project and measures proposed by Transco to mitigate impacts to those resources.

2.3.1 Waterbody Crossings

The Project will cross a total of 73 surface waterbodies: 34 in Pennsylvania and 39 in New Jersey. During site investigations, no surface waterbodies were found at any of the proposed workspaces for existing aboveground facilities. Waterbody crossings are identified and described by MP in Tables 2A-1 and 2A-2 in Appendix 2A. All perennial and intermittent waterbodies to be crossed by the Project have been identified; however, additional field surveys were conducted in June 2013 for workspaces not previous identified. Complete wetland and waterbody crossing information will be submitted with subsequent filings. For each waterbody crossing, the table includes the MP location, the waterbody identification number, waterbody name, the state water use quality or classification, FERC classification, flow regime (intermittent or perennial), the approximate width at the crossing point, the proposed crossing method, and any seasonal crossing restrictions. Seasonal crossing restrictions were obtained through consultation with the PADEP and NJDEP and are detailed in RR 3 "Vegetation and Wildlife," Section 3.2.5. Waterbody locations are shown on the FERC alignment sheets in the Mapping Supplement (Volume 3).

Surface water resources associated with the pipeline are described below. The Wetland Delineation Reports for Project components in Pennsylvania and New Jersey (see Appendix 2F and Appendix 2G) include additional information for individual surface water features.

2.3.1.1 Pipeline Facilities

Dorrance Loop

The Dorrance Loop is located within the Upper Susquehanna-Lackawanna watershed. The Dorrance Loop crosses eight perennial streams and one intermittent stream (see Table 2A-1). The streams are either minor or intermediate waterbodies (FERC classification). With a crossing width of approximately 35 feet, Little Wapwallopen Creek is the largest streams crossed by the loop. Little Wapwallopen Creek and its tributaries are designated coldwater fisheries in Pennsylvania (see Section 2.3.2.2).

Franklin Loop

The Franklin Loop is located in the Lehigh River watershed. The Franklin Loop crosses 17 perennial streams, three intermittent streams and five ephemeral streams (see Table 2A-1). The streams are either minor or intermediate waterbodies (FERC classification). With a crossing width of 70 feet, Tobyhanna Creek is the largest stream crossed by the Loop. Stony Run and its tributaries, Two Mile Run, Tobyhanna Creek and its tributaries and the Lehigh River and its tributaries are designated High Quality cold-water fisheries in Pennsylvania (see Section 2.3.2.2).

Pleasant Run Loop

The Pleasant Run Loop is located in the Raritan River watershed. The Pleasant Run Loop crosses 17 perennial streams, four intermittent streams and five ephemeral streams (see Table 2A-2). The streams are either minor or intermediate waterbodies (FERC classification). With a crossing width of 30 feet, Pleasant Run is the largest stream crossed by the loop. No streams considered sensitive are crossed by the Pleasant Run Loop (see Section 2.3.2.2).

Skillman Loop

The Skillman Loop is located in the Raritan River watershed. The Skillman Loop crosses nine perennial streams and four intermittent streams (see Table 2A-2). The streams are either minor or intermediate waterbodies (FERC classification). With crossing widths of 45 feet and 40 feet, respectively, Beden Brook and Rock Brook are the largest streams crossed by the loop. No streams considered sensitive are crossed by the Pleasant Run Loop (see Section 2.3.2.2).

2.3.1.2 Aboveground Facilities

Compressor Stations

Table 2.3-1 provides watershed information for the Compressor Stations 520, 517, 515, and 205. Transco is currently gathering watershed information for Compressor Stations 190, 185, 180, 175, 170, 165, and 145. Transco will provide this information in its FERC Application.

Table 2.3-1
Watershed Information for Compressor Stations of the Leidy Southeast Expansion Project

Facility Name	Location (county, state)	Watershed	Major Drainages within Watershed
Compressor Station 520	Lycoming County, PA	Lower West Branch Susquehanna	West Branch of Susquehanna River
Compressor Station 517	Columbia County, PA	Upper Susquehanna-Lackawanna	Susquehanna River Lackawanna River
Compressor Station 515	Luzerne County, PA	Lehigh	Lehigh River
Compressor Station 205	Mercer County, NJ	Raritan	Raritan River

Other Aboveground Facilities

All modifications at other aboveground facilities would require minimal workspace requirements and, therefore, watershed information for each individual facility will not be discussed.

2.3.2 Sensitive Surface Waters

Sensitive surface waters include those that:

- Are designated as national or state wild and scenic rivers;
- Are state-designated high-quality or outstanding natural resource waters;
- Provide habitat for threatened and/or endangered species or critical habitat;
- Are located in sensitive and protected watershed areas or source water protection areas;
- Have potable surface water intakes located within 3 miles downstream of the pipeline crossing; and/or
- Have impaired segments or contaminated sediments.

A total of 36 waterbodies crossed by the LSE Project could be considered sensitive because they possess one or more of the above characteristics. Sensitive waterbodies traversed are discussed below.

Transco should also note that it received numerous comments regarding impacts to the Raritan River in New Jersey. Transco does agree with commenters that the Raritan River is a sensitive surface water. Although the Project would cross some tributaries of known tributaries to the Raritan River, special construction crossing techniques and adherence to all required permits would avoid and minimize any potential long distance effects to the Raritan River.

2.3.2.1 National or State Wild and Scenic Rivers

The National Rivers Inventory (NRI) designates free-flowing river segments in the U.S. that possess outstandingly remarkable natural or cultural values, which are considered to be of national significance (NPS 2007). The NRI is maintained by the National Park Service as a list of river segments that potentially qualify as national wild, scenic, or recreational river areas. All federal agencies must seek to avoid or mitigate actions that would adversely affect any NRI segments. There are no federal wild and scenic rivers identified in the NRI within the LSE Project area.

2.3.2.2 State-Designated High Quality Waters

Pennsylvania Facilities

In Pennsylvania, streams are classified by water quality or biotic health according to Pennsylvania Code Title 25, Chapter 93.4b by the PADEP with designations, such as EV-CWF (exceptional value cold-water fishery), HQ-CWF (high quality cold-water fishery), TSF (trout stocked fishery), and WWF (warm-water fishery). The highest quality streams are rated as "EV" and PADEP testing must show a high biotic integrity and health with test data from over a year period to obtain this rank. The Lehigh River and Kendall Creek are the only EV streams within the Project area. The high quality (HQ) streams are the next level of quality (slightly degraded) and must show a macro-invertebrate community score of 83 percent or better, or be a state-designated Class A trout stream. HQ streams are defined as streams that can sustain cold-water fisheries. The EV streams are mostly found in undeveloped areas of a watershed and represent, perhaps, some of the more pristine streams remaining in the state (PAC 2013a). Additionally, the Pennsylvania Code Title 25, Chapter 93.3 states that water uses will be protected based on the following designations regarding aquatic life: cold-water fisheries (CWF), WWF, migratory fisheries (MFs), and trout-stocked fisheries (TSFs) (PAC 2013b).

The Pennsylvania Fish and Boat Commission (PAFBC) also classifies streams according to the existence of self-sustaining wild trout populations. Class A wild trout streams are in excellent condition with a standing stock of wild trout according to Pennsylvania Code 58, Chapter 57.8a.

Little Wapwallopen Creek and its tributaries are located between MP 18.44 and MP 21.78 along the proposed Dorrance Loop in Pennsylvania. This perennial waterbody is a designated CWF. This encompasses all streams crossed by the Dorrance Loop.

Stony Run and its tributaries, Two Mile Run and its tributaries, Tunkhannock Creek and its tributaries, and Stony Run and its tributaries along the proposed Franklin Loop are designated HQ-CWF in Pennsylvania. The Lehigh River and Kendall Creek and the tributaries associated with those streams are classified as exceptional value (EV) waters. All streams crossed by the Franklin Loop are associated with these waterbodies and, thus, are designated HQ-CWF or EV. In addition, the Lehigh River and Kendall Creek are wild trout streams (WTS).

New Jersey Facilities

In New Jersey, Outstanding National Resource Waters (ONRW) are high quality waters that constitute an outstanding national resource (e.g., waters of National/State Parks and Wildlife Refuges and waters of exceptional recreational or ecological significance). Waters classified as "FW1" (fresh waters that are to be maintained in their natural state of quality and not subjected to any man-made wastewater discharges or increases in runoff from

anthropogenic activities) are ONRWs. These waters receive the highest protection possible in New Jersey. No waterbodies with an FW1 classification are crossed by New Jersey facilities. All other surface freshwaters (excluding the Delaware River and those in the Pinelands) are classified as FW2.

The FW1 and FW2 waters are further classified according to their suitability to support trout as follows:

- TP – Trout Production: Waters designated for use by trout for spawning or nursery purposes during their first summer;
- TM – Trout Maintenance: Waters designated for the support of trout throughout the year;
- NT – Nontrout: Freshwaters that have not been designated as trout production or trout maintenance. These waters are generally not suitable for trout because of their physical, chemical, or biological characteristics, but are suitable for a wide variety of other fish species.

FW2 waters can be further designated as Category One waters (C1 waters) or Category Two waters (C2 waters). C1 waters include those waters with an exceptional ecological significance, exceptional recreational significance, exceptional water supply significance, or exceptional fisheries resource. C1 waters are protected from measurable changes in water quality through the implementation of antidegradation policies set forth at New Jersey Administrative Code (NJAC) 7:9B-1.5(d) of the New Jersey Surface Water Quality Standards (NJAC 2011b). C2 waters are waters not designated as outstanding national waters. No waterbody with a C1 classification is crossed by the New Jersey facilities. All waterbodies crossed by the Project in New Jersey are classified as FW2-NT, C2 waters. Appendix 2A, Table 2A-2 lists all waterbodies crossed by the Project and their associated classification.

2.3.2.3 Waters Containing Federally or State-listed Threatened or Endangered Species or Critical Habitat

Agency consultation and field surveys were completed for threatened and endangered species and critical habitat. To date, no waterbodies crossed by the LSE Project are thought to have presence of federal or state listed threatened and endangered species and critical habitat. Additional details regarding these agency consultations on this subject are provided in RR 3.

2.3.2.4 Surface Water Protection Areas

Pennsylvania Facilities

Transco is currently in consultations with the PADEP to determine whether any streams identified during field surveys that would be crossed by the Project are within 3 miles downstream of any surface water protection areas. Transco will provide the results of these consultations in a future filing.

New Jersey Facilities

According to the NJDEP, a community water system has at least 15 service connections used by year-round residents, or regularly serves at least 25 year-round residents. Community water systems in New Jersey receive drinking water from both groundwater and surface water.

Transco is currently in consultations with the NJDEP to determine whether any streams identified during field surveys that would be crossed by the Project are within 3 miles downstream of any community water system. Transco will provide the results of these consultations in a future filing.

2.3.2.5 Potable Water Intakes

Pennsylvania Facilities

Transco is currently in consultations with the PADEP to determine whether any streams identified during field surveys that would be crossed by the Project are within 3 miles downstream of any potable water intakes. Transco will provide the results of these consultations in a future filing.

New Jersey Facilities

Transco is currently in consultations with the NJDEP to determine whether any streams identified during field surveys that would be crossed by the Project are within 3 miles downstream of any potable water intakes. Transco will provide the results of these consultations in a future filing.

2.3.2.6 Impaired Surface Waters

As part of state water quality assessments, Section 303(d) of the federal Clean Water Act (CWA) mandates that states must also prepare a list of all waters that do not meet the water quality criteria for their designated uses, and develop for each a Total Maximum Daily Load (TMDL), which establishes the maximum allowable discharge into a waterbody to better control pollutant levels. To determine whether any impaired waterbodies will be affected by the Project, the 303(d) lists were reviewed for Pennsylvania and New Jersey that are included in EPA Categories 4 and 5. Category 4 includes waterbodies where TMDLs have been completed or cannot be completed due to the nature of the contamination, and Category 5 includes waterbodies where TMDLs need to be developed by the state.

A total of three waterbody crossings along the Project pipeline loops occur along stream segments listed as impaired on the Pennsylvania and New Jersey 303 (d) lists (PADEP 2012b; NJDEP 2012). Table 2.3-2 provides a summary of impaired waterbody segments for each pipeline loop.

Table 2.3-2
Impaired Waterbodies Identified Near the Leidy Southeast Expansion Project

Waterbody Name	Milepost	Impaired Designated Use(s) – 305(b) List	Pollutant(s) – 303(d) List
Franklin Loop			
Tobyhanna Creek	61.03	Fish Consumption	Mercury
Skillman Loop			
Rock Brook	1780.27	Aquatic Life (general),	Pathogens
Back Brook	1781.08	Aquatic Life (general)	Pollutant unknown

2.3.2.7 Waterbodies with Contaminated Sediments

The Section 303(d) impaired waterbodies described in Section 2.3.2.6 and Table 2.3-2 provided the basis for determining waterbody crossings that may have the potential for encountering contaminated sediments. Based on information available from the Section 303(d) lists, it is not expected that any of the waterbodies crossed by the Project have sediment contamination.

2.3.3 Waterbody Crossing Methods

Proposed waterbody crossing methods for each waterbody are listed in Tables 2A-1 and 2A-2 in Appendix 2A and described in this section. The crossing methods, along with Transco's *Wetland and Waterbody Construction and Mitigation Procedures* (see Appendix 2C), are designed to maintain water flow and minimize changes in waterbody flow characteristics. Typical drawings for the waterbody crossings are provided in Appendix 1A.

2.3.3.1 Non-flowing, Intermittent Streams

For any intermittent waterbodies that are less than 10 feet wide and/or any stream without flow at the time of construction, Transco will evaluate the use of standard upland construction methods. However, Transco will be prepared for water flow during construction. Intermittent or ephemeral waterbodies that are identified as having the potential to carry flow during construction based on precipitation forecasts will be crossed using the conventional stream crossing techniques described in Section 2.3.3.2.

For any open cut crossings, the pipeline will be placed deep enough to meet the minimum cover requirement of 5 feet, provided rock is not encountered. The following additional stipulations will apply to all open-cut stream crossings:

- Use of equipment operating in the waterbody will be limited to that needed to construct the crossing;

- Material excavated from the trench will be stockpiled in the construction ROW at least 10 feet from the water's edge or in additional extra work areas (located at least 50 feet from the water's edge);
- Material excavated from the trench will generally be used as backfill unless required permits specify otherwise;
- Any excess material will be removed from the body of water; and
- The stream bed and banks will be returned to their original contours.

2.3.3.2 Perennial and Flowing Streams

To cross perennial streams and intermittent streams that are flowing at the time of construction, Transco will use the dry-ditch method, which consists of the "dam and pump" or "dry-flumed" crossing method. This method temporarily diverts stream flow around or through the work area in order to minimize contact between stream water and excavation and to minimize sediment suspension during trench excavation, pipeline installation and backfill activities. Typical drawings for these waterbody crossing methods are provided in Appendix 1A.

Dam and Pump Method

The "dam and pump" crossing method proposed consists of diversion structures used to dam the waterbody, which can consist of one or more of the following: imported riprap, concrete jersey barriers, water bladder, port-a-dams, steel plates and/or sand bags. The selection of the dam type or material depends on the stream or waterbody depth, flow velocity, channel width, and type.

This method for crossing streams and waterbodies temporarily diverts stream flow around construction area activities. One of these damming structures will be installed upstream and downstream of the proposed trench. Pumps and hoses will be used to convey flow around the in-stream work area, discharging the water downstream of the construction site and creating a dry work area (multiple discharge pumps may be required to keep the area dry and maintain adequate flow to avoid flooding of the waterbody upstream). Construction crews also will have additional pumps on standby for use should they encounter a high-flow event during construction. The trench then will be excavated, and the pipeline will be installed in the dry ditch.

At the time the upstream and downstream dams will be installed, the pumps will be started to divert water around the pipeline crossing and associated workspaces. Water will be discharged to the downstream area through an energy dissipating (or similar) device to prevent erosion and scouring and minimize turbidity. Once the pipeline is installed, the trench will be backfilled to pre-construction contours, and stream banks will be restored prior to restoring water flow.

There may be some relatively minor turbidity issues associated with this type of crossing method resulting from the installation of the diversion dams. This method may also require equipment to work in the stream to install, rearrange, and remove the diversion dams. In some cases, stream bottom preparation to place the diversion dams may be required, such as in the case of boulder relocation with a riprap dam. Any turbidity associated with these activities will be incidental, short-term, and minor.

Dry–flumed Method

The "dry-flumed" crossing method may be applied to intermittent waterbodies that are dry during the initial installation but may flow should an unforeseen storm event cause the waterbody to suddenly flood due to storm water runoff. Flume pipe(s) will be installed over the trenchline prior to trenching (or during trenching should an unforeseen event create flow), which will remain in place and maintained until restoration of the waterbody is complete. The size and number of flumes will be sufficient for maximum anticipated flows. Excavation equipment located on the stream banks will work around the flume pipe during excavation. The pipe will be threaded under the flume pipe and the ditch will be backfilled while flows are maintained through the flume pipe(s) and downstream. If topographic conditions do not permit the pipe to be threaded under the flume, then the flow may be temporarily pumped while the flume is pulled to lower the pipe into the ditch. Flume pipes will be permanently removed as part of restoration.

2.3.4 Surface Water Impacts and Mitigation

Construction of the Project across waterbodies may result in minor, short-term impacts. These impacts could occur as a result of in-stream construction activities or construction on slopes adjacent to stream channels. Clearing and grading of stream banks, blasting (if required although not expected), in-stream trenching, trench dewatering, and backfilling could result in modification of aquatic habitat, increased sedimentation, turbidity, decreased dissolved oxygen concentrations, releases of chemical and nutrient pollutants from sediments, and introduction of chemical contaminants, such as fuel and lubricants. Transco is currently identifying the locations of any surface water intakes near any waterbody crossing locations. If any surface waters intakes are identified, Transco will identify the crossing methods proposed to minimize impacts to these surface water intakes.]

To minimize adverse impacts at stream crossings, Transco proposes to implement Transco's Project-specific Plan and Procedures during the construction, post-construction restoration, and operation of the Project (see Appendices 7B and 2C, respectively). Construction activities at stream crossings will also be in accordance with all regulations specified in the necessary permit requirements. As part of the required permitting process,

Transco will develop a Restoration Plan to address temporary waterbody impacts associated with construction of the Project (see Appendix 2I). The Restoration Plan contains a summary of elements of Transco's E&SCP and Procedures, and is intended to satisfy the waterbody restoration requirements of all resource protection agencies with jurisdiction over the Project.

Depending on the overall construction schedule, pipeline construction at stream crossings will be conducted during low- or no-flow periods whenever possible. Construction during low- or no-flow conditions will minimize sedimentation and turbidity, minimize stream bed and bank disturbances, and limit the time it takes to complete in-stream construction. Specific impacts and proposed mitigation measures are discussed in the following subsections.

2.3.4.1 Stream Bank Protection

During construction, clearing and grading of vegetative cover could increase erosion along stream banks. Alteration of the natural drainage or compaction of soils by heavy equipment near stream banks during construction may accelerate erosion of the banks and the transportation of sediment carried by overland flow into the waterbodies. The extent of the impact would depend on sediment loads, stream velocity, turbulence, stream bank composition, and sediment particle size. To minimize these impacts, equipment bridges, equipment pads, and pads will be used (as described below under Sedimentation Control). To the extent possible, at least 15 feet of vegetation will be preserved along the stream banks at the pipeline crossings. Extra workspaces for spoil storage and pipe staging will be set back from the bank as discussed in Section 2.3.4.2, and temporary sediment barriers will be installed around disturbed areas, in accordance with Transco's Procedures (see Appendix 2C). Upon completion of construction, Transco will restore and properly armor the stream banks to prevent erosion and washouts and the associated turbidity and sedimentation.

2.3.4.2 Sedimentation Control

Turbidity and sedimentation could occur as a result of in-stream construction activities, trench dewatering, and/or storm water runoff. In slow moving waters, increases in suspended sediments could increase the biological oxygen demand and reduce levels of dissolved oxygen in localized areas during construction. Suspended sediments also could alter the chemical and physical characteristics of the water column on a temporary basis. All turbidity and sedimentation that occurs will be composed of on-site materials; no foreign sediments will be introduced.

Most of the waterbodies crossed by the Project are minor and intermediate streams, which have food chains that are driven by detrital input from riparian vegetation, rather than phytoplankton. Therefore, temporary increases in sediment load will not have an adverse

impact on the trophic structure of the streams. It is unlikely that temporary increases in turbidity will have an adverse impact on aquatic biota of the area, especially due to the fact that these waterbodies are already turbid and the biota are adapted to living in turbid conditions. Oxygen levels will begin to return to normal within hours of the completion of in-stream construction as the sediment settles. In general, impacts will be limited to the short period of in-stream construction, and conditions are expected to return to normal after stream restoration activities. Potential effects on fisheries due to increased turbidity and sedimentation resulting from in-stream construction activities are addressed in RR 3.

Transco will install temporary equipment bridges to reduce the potential for turbidity caused by construction equipment and vehicular traffic crossing waterbodies. Equipment bridges will be constructed of clean rock or gravel and culverts, timber mats, portable prefabricated bridges, or railcars, depending on stream conditions (e.g., if excessively soft soils are encountered in the streambed, or if high water flows occur, portable bridges would be used at minor stream crossings instead of rock and culverts). Equipment bridges will be maintained throughout construction. Equipment bridges will be designed to accommodate normal to high stream flow and will be maintained to prevent restriction of flow during the period of time the bridge is in use.

To minimize sedimentation during pipeline construction across each minor or intermediate waterbody, as specified in Transco's Project-specific Plan and Procedures (see Appendices 7B and 2H, respectively), trench spoil will be placed at least 10 feet away from the top of the bank, unless impractical due to topography. Silt fences and/or straw bales will be placed around the spoil piles to prevent spoil from flowing into waterbodies. Additional temporary workspace (ATWS), staging areas and spoil storage areas that will not be set back 50 feet from the waterbody boundary are identified in Volume C – Mapping Supplement. Once the pipe is placed in the trench, the excavated material will be replaced immediately, and the stream banks and streambed will be restored to pre-construction contours. To further stabilize the banks, stream banks and riparian areas will be re-vegetated using approved seed mixes.

2.3.4.3 Trench Dewatering

During construction, the open trench could accumulate water, either from the seepage of groundwater or from precipitation. This water must be removed from the trench for construction to proceed. During trench dewatering, water will be pumped from the trench and discharged into vegetated upland areas after first being filtered through a straw bale structure or filter bag. The rate of flow from the pump will be regulated to prevent scouring from runoff. Dewatering will be conducted in a manner designed to prevent the flow of heavily silt-laden water directly into adjacent waterbodies and will be in accordance with state permitting requirements.

2.3.4.4 Blasting

Based on previous construction experience, existing information about subsurface geologic formations, and preliminary geotechnical survey results, Transco does not anticipate controlled blasting will be required at any waterbody crossings along the proposed Project area (see RR 6, "Geologic Resources and Hazards," and RR 7, "Soils"). However, if conditions are encountered that warrant the use of controlled blasting, the appropriate permits and regulatory requirements will be met prior to blasting.

In general, if blasting is required at a waterbody crossing, the preparation of the rock for blasting (i.e., drilling shot holes) will cause sufficient disturbance to displace most aquatic organisms from the immediate vicinity of the blast and temporarily increase stream turbidity. Before resorting to blasting, every effort will be made to mechanically remove rock, using backhoes equipped with rippers. If in-water blasting is deemed necessary, Transco will implement site-specific discussions into a Project blasting plan to specifically address in-water blasting. The blasting plan would outline proper precautions and necessary pre-blast planning to be implemented to minimize potential impacts. To reduce the potential for impacts, Transco would use scare charges or other scare techniques before the primary blast to chase aquatic organisms from the area. Immediately following blasting, Transco would remove rock that impedes stream flow. These steps would avoid or minimize the impact of blasting on aquatic organisms. The required permits, licenses, and approvals would be obtained, and agencies would be notified per permit requirements.

2.3.4.5 Spill Control

Fuel spills, although unlikely, could result in toxicity to aquatic organisms and associated modifications of aquatic habitat, as well as decreased oxygen concentrations. Increased sediment loads can decrease light penetration in the water column, thus decreasing the primary productivity of the waterbody.

Transco has developed an SPCC Plan that describes measures to be implemented by Transco personnel and contractors to prevent and, if necessary, control any inadvertent spill of hazardous materials that could impact soil or water quality (see Appendix 2D). The SPCC Plan will be updated with site-specific information prior to the initiation of construction activities. As required in the Project-specific Plan and Procedures (see Appendices 7B and 2H, respectively), hazardous material, chemicals, lubricating oils, and fuels used during construction will be stored in upland areas at least 100 feet from wetlands and waterbodies, unless otherwise noted. Refueling of construction equipment will be conducted at least 100 feet from wetlands and waterbodies unless otherwise noted in the Project-specific Procedures. If refueling within 100 feet of an associated stream or wetland is needed, an environmental inspector or an appropriate

governmental authority will first determine that there is no reasonable alternative and Transco and its contractors will take appropriate steps including use of secondary containment structures to prevent spills and provide for prompt cleanup in the event of a spill. Additional precautions, such as continual monitoring of fuel transfer and utilization of spill kit readiness, will be employed. All hazardous materials will be handled in accordance with Transco's SPCC Plan (see Appendix 2D).

2.3.4.6 Tree Removal, Infiltration, and Related Surface

Following construction, disturbed areas will be reseeded in accordance with the seeding recommendations of the local soil conservation district or the landowner. Trees and other woody vegetation will be allowed to reestablish naturally within the temporary ROW and other temporary workspaces that were cleared for construction of the pipeline. Use of soil conservation techniques and adherence to the Project's E&SCP will avoid and minimize erosion and runoff that would potentially affect surface water quality.

Temporary alteration of the ROW and construction areas is expected to be relatively insignificant compared to the size of drainage areas and sub-watersheds for surface water systems across the Project area. Considering the Project's plans for runoff management and site stabilization during construction, as well as re-vegetation, changes in the quality of the vegetative cover are expected to be relatively minor. Restoration of forested riparian buffers along waterbodies will be completed in accordance with the Restoration Plan (see Appendix 2I) and all applicable required permit authorizations.

In New Jersey, the amount of clearing in the riparian zone adjacent to surface waters is regulated according to the Flood Hazard Area Control Act Rules in NJAC 7:13 (NJAC 2011c). The width of the riparian zone adjacent to a waterbody is determined by the characteristics of that regulated water. The riparian zone is 300 feet wide along both sides of any Category One water, and any upstream tributaries within the same watershed. The riparian zone is 150 feet wide along both sides of waters that are not C1, but are trout production waters (and waters upstream), trout maintenance waters (and upstream waters and tributaries within 1 linear mile), waters that contain documented threatened or endangered species habitat (and upstream waters and tributaries within 1 linear mile), and waters that flow through an area that contains acid producing soils. All other regulated waters have a 50-foot-wide riparian zone on either side. Requirements for regulated activities within the riparian zone are outlined in NJAC 7:13-10.2 (NJAC 2011c).

Construction of the New Jersey facilities will disturb approximately 42.59 acres of regulated riparian zone (based on defined regulatory widths). Table 2A-2 in Appendix 2A lists the riparian zone impacts for each facility. Riparian zone impacts are subject to mitigation under the New

Jersey Flood Hazard Area Control Act. Under the Act, removal of forested vegetation is considered a permanent impact and is subject to mitigation. Forested habitat, defined as upland and wetland forested habitat, within the impacted riparian zone will be determined by Transco after NJDEP issues its Letter of Interpretation (LOI) for delineated waterbodies and their associated riparian zones. To calculate the mitigation debt, the total forested riparian zone area impacts will be subtracted from the maximum allowable area of vegetation disturbance, and the area remaining will become the mitigation debt, or area subject to mitigation. This area will also be determined by Transco after receipt of NJDEP's issuance of an LOI.

The temporary change in vegetative cover during construction is expected to result in some changes in the portioning of precipitation via transpiration (plant water use) and a decrease in interception (evaporation of precipitation that wets the foliage). As a result, infiltration and aquifer recharge is expected, but there may be some related temporary increase to surface runoff. The Project's E&SCP will provide runoff management controls during construction and the ensuing site stabilization and re-vegetation period; for example, slope breakers will direct runoff from the construction ROW to well vegetated areas. It is also critical to recognize that the temporary changes in runoff and infiltration will be short-lived. Within three months of re-seeding and as a grass cover is re-established, the original water flux will be largely re-established to approximately those of preconstruction conditions. A grassland area uses 80 percent or more water than a forested area as a result of published run-off coefficients typically used by the NJDEP for measuring run-off. Specifically, the existing ROW is maintained in a non-forested condition and some of the additional areas to be impacted are forested. ROW in good condition provides a curve number of 48 for Hydrologic Soil Group (HSG) B soils and 65 for HSG C soils. Forests in good condition provides for a curve number of 58 for HSG B soils and 72 for HSG C soils. Any permanently impacted forest areas will be maintained in a ROW condition. As a result, no measurable change in runoff toward surface waters is anticipated (USDA 1986) and infiltration of precipitation to the groundwater table will not be expected to change significantly, given the relatively minor hydrologically related changes in vegetation and plant cover in the construction areas. Ongoing consultations with relevant agencies will determine the areas that may require additional planting of temporary workspaces. Tree seedlings will not be planted in the permanent ROW.

Additional impervious surfaces will be added at Compressor Stations 515, 517, and 520. The addition of impervious surfaces can alter the natural hydrology in a watershed by increasing the volume of stormwater runoff and reducing groundwater recharge. The result is more frequent flooding, higher flood peaks, lower base flow in streams, and lower water table levels. A Stormwater Management Plan is being developed for disturbances at existing compressor

stations and will include measures to manage the quality and quantity of storm water runoff from the site. The plan will be submitted concurrently to the NJDEP with the Individual Freshwater Wetland and Flood Hazard permit applications.

2.3.4.7 Contaminant Suspension and Migration

The Section 303(d) impaired waterbodies described in Section 2.3.2.6 and Table 2.3-2 provided the basis for determining waterbody crossings that may have the potential for encountering contaminated sediments. Based on information available from the Section 303(d) lists, it is not expected that any of the waterbodies crossed by the Project have sediment contamination.

Transco will continue to consult with appropriate federal and state agencies regarding the potential to encounter contaminated sediments in the Pennsylvania and New Jersey Project areas. In the event that contaminated sediment areas are confirmed, Transco will work with federal and state agencies to develop appropriate mitigation.

2.3.5 Construction Permits

Table 1.7-1 of RR 1, "General Project Description," summarizes the permits anticipated for the construction of the proposed Project. Transco will obtain the required permits, licenses, and approvals from agencies having jurisdiction and permit issuance authority over the proposed facilities prior to initiating construction activities.

2.4 HYDROSTATIC TEST WATER

In compliance with United States Department of Transportation (USDOT) requirements, Transco will perform hydrostatic testing of the new pipeline segments prior to placing them into service. Transco will follow necessary permit requirements with regard to water withdrawal and discharge.

As part of the hydrostatic test procedures, Transco will appropriate approximately 11.4 million gallons of water to test the new pipeline. Transco plans to obtain water for hydrostatic testing from surface waterbodies. Water withdrawals from surface waterbodies will be conducted in a manner that will not reduce water flow to a point that would impair flow and impact fish and recreational uses. In cooperation with local providers, water withdrawals will be conducted in a manner that will not reduce water availability to a point that would affect public usage. Table 2.4-1 provides hydrostatic test details for each pipeline segment.

Following testing, each test section will be depressurized, and the water will be allowed to discharge directly to the source waterbody or into a well-vegetated upland, at low enough discharge rates so as to not impact waterbodies. When discharging directly to receiving waters,

Transco will employ the use of diffusers to minimize the potential for stream scour. If hydrostatic test water is discharged to upland and other areas, Transco would use a large dewatering structure of straw bales, stone, and geotextile fabric, in compliance with applicable permits and the Project-specific Plan and Procedures located in Appendices 7B and 2C, respectively.

Table 2.4-1
Anticipated Hydrostatic Test Water Source Locations

Pipeline Segment	Begin MP	End MP	Water Source	Withdrawal Location	Approximate Volume (gallons)	Discharge Location (MP)	Discharge Rate (gal/min)
Dorrance Loop	17.70	22.26	Little Wapwallopen Creek	20.84	1,700,000	20.84	2,000
Franklin Loop	57.51	68.95	Tobyhanna Creek	65.50	2, 300,000	65.50	2,000
			Lehigh River	61.05	2,300,000	61.05	2,000
Pleasant Run	0.12	6.91	Pleasant Run	3.00	2,750,000	3.00	2,000
Skillman Loop	1776.79	1783.00	Beden Brook	1779.67	2,600,000	1779.67	2,000

No significant water quality impacts are anticipated as a result of discharge from hydrostatic testing. New proposed pipeline loops will consist of new steel pipe that will be free of chemicals or lubricant and no additives will be used.

2.5 WETLANDS

Wetland surveys were performed for all project components during April 2013. In Pennsylvania, wetland delineations were conducted in accordance with the 1987 United States Army Corps of Engineers (USACE) Wetlands Delineation Manual as well as the regional USACE supplements for the Northcentral and Northeast region, and Eastern Mountains and Piedmont region. These two supplements were utilized as the Project locations are located along the boundary for these two regions. While the boundary between the regions is depicted as a sharp line, the locations can, in practice, be considered transition zones between the two regions. Wetland boundaries are not likely to differ between the two supplements in these transition areas; however, one supplement may provide more detailed information with how to proceed when a problem area is encountered at a site. Both supplements can be applied in this case, and the results between the two can be compared for any differences. In New Jersey, wetland delineations were conducted in accordance with the 1989 *Federal Interagency Manual for Identifying and Delineating Jurisdictional Wetlands*.

To verify wetland boundaries delineated along pipeline loops and at the aboveground facilities associated with the Project, Transco is currently coordinating with the USACE, PADEP,

and NJDEP to schedule site visits. Wetland boundaries will be adjusted, if necessary, according to direction provided by the USACE, PADEP, and NJDEP staff.

Transco submitted a Freshwater Wetlands LOI application for to NJDEP for facilities in New Jersey. On June 10, 2013, separate LOI application packages for the Skillman Loop and the Pleasant Run Loop were submitted. Transco is currently awaiting NJDEP input to schedule site visits before LOIs can be approved and issued.

2.5.1 Wetlands Crossed by the Project

Based on field surveys, 63 wetlands would be crossed by the Project: 40 in Pennsylvania and 23 in New Jersey. A list of individual wetlands crossed by the Project is included in Appendix 2B, Tables 2B-1 and 2B-2. A detailed description of wetland habitats is included in the wetland delineation reports for Project components in Pennsylvania and New Jersey (Appendix 2F and 2G). The following is an overview of wetland communities within the Project area.

Wetlands crossed by the Project include a combination of palustrine emergent (PEM), palustrine scrub-shrub (PSS), and palustrine forested (PFO) cover types. Emergent wetlands typically were found to be dominated by low-growing sedges, rushes, and other herbaceous vegetation and were located within the existing maintained ROW, as well as in open areas outside of the ROW. Scrub-shrub areas typically were located along the margins of the ROW or within/adjacent to forested areas outside of the existing ROW. Scrub-shrub wetlands consisted of low woody vegetation, and were dominated by species, such as spicebush (*Lindera benzoin*), dogwood (*Cornus spp*.) and tree saplings. Forested wetlands were located outside of the existing maintained ROW and included a variety of mature tree species, such as green ash (*Fraxinus pennsylvanica*), red maple (*Acer rubrum*), and pin oak (*Quercus palustris*).

Within Transco's existing maintained ROW, vegetation has been altered by routine maintenance mowing, agricultural activities, and by livestock, where the survey corridor crossed pastureland. More detailed information about these wetland features (i.e., soils, hydrology, and vegetation) is provided in the wetland delineation reports (see Appendix 2G).

2.5.2 Wetland Crossing Procedures

Transco has developed Project-specific Procedures that address construction mitigation in wetlands (see Appendix 2C). Transco's E&SCP will identify the erosion control devices (e.g., silt fence) that will be used at each wetland crossing depending upon site-specific conditions. Transco will also adhere to Section 404 and 401 of the CWA or other applicable state requirements and conditions under any USACE, PADEP, and NJDEP permits granted. Typical drawings for the wetland crossings are provided in Appendix 1A.

Clearing

Clearing involves the removal of all trees and brush from the construction workspace. Vegetation will be cut just above ground level. Stumps will not be removed from the wetland with the exception of those directly over the trench line. Stumps will be ground to ground level leaving existing root systems in place. Debris will be removed from the wetland and stockpiled within an upland area of the ROW for disposal.

Unsaturated Wetlands

Construction procedures across wetlands found to be unsaturated at the time of construction will be similar to those used in upland areas. Topsoil will be segregated in unsaturated wetlands in the same manner as in agricultural lands. Pipe stringing and fabrication may occur within the wetland adjacent to the trench or adjacent to the wetland in a designated extra workspace.

Wetlands with Saturated Soils

If saturated wetlands with standing water or unstable soils are encountered, stable temporary work surfaces of timber will be constructed adjacent to the pipeline trench. Construction will proceed as in unsaturated wetlands, except topsoil segregation will not be possible because of saturation. Pipe stringing and fabrication may occur within the wetland adjacent to the trench or adjacent to the wetland in a designated extra workspace.

Temporary Erosion and Sediment Control

Erosion control measures to be implemented at wetland crossings are described in Section 2.5.3.4.

Cleanup and Restoration

After the pipeline is lowered into the trench, wide track bulldozers or backhoes supported on timber mats will be used for backfill, grading, and final cleanup. This method will minimize the amount of equipment and travel in wetland areas.

2.5.3 Wetland Impacts and Mitigation

2.5.3.1 Pipeline Facilities

The LSE pipeline facilities will impact a total of 63 wetlands, including 40 in Pennsylvania and 23 in New Jersey. This will result in a total of 22.22 acres of wetland impacts, including temporary impacts to 8.20 acres of PEM and 10.58 acres of PSS wetlands. An additional 2.05 acres of PFO wetlands will be allowed to revert to a forested state following construction and restoration of the ROW. Approximately 1.39 acres of PFO wetlands will be permanently

converted to non-forested wetland cover types and maintained by means of mechanical cutting and mowing as part of pipeline operation. No wetlands would be permanently filled as a result of construction of the Project. Table 2.5-1 provides a summary of wetland impacts for the LSE Project. Transco is aware that, as the design currently stands, some workspaces such as ATWSs are located in wetland areas. However, Transco is currently updating workspace design to ensure that no ATWSs would be located within wetlands.

2.5.3.2 Aboveground Facilities

The Project's aboveground facilities will not impact wetlands. Transco was able to design facility modifications to avoid wetlands.

2.5.3.3 Access Roads

Transco completed field surveys for wetland and waterbodies along most access roads in June 2013; however, some access roads were surveyed in April 2013. The access road survey results from April 2013 are reflected in Table 2.5-1 as part of the pipeline loops. Transco will provide completed access road survey information in subsequent filings.

Table 2.5-1
Summary of Wetland Impacts for the Leidy Southeast Expansion Project

Project Component	Number of Wetlands Impacted	Total Wetland Disturbance (acres)[a]	Emergent Wetland Disturbance (acres)[b]	Permanent Forested Wetland Disturbance (acres)[c]	Temporary Forested Wetland Disturbance (acres)[d]	Scrub-Shrub Wetland Disturbance (acres)[e]
Pipeline Facilities (included Access Roads associated with loops)						
Dorrance Loop[1]	9	1.86	0.80	0.51	0.55	0.00
Franklin Loop	31	16.24	4.37	0.64	0.65	10.58
Pleasant Run Loop	10	1.31	1.31	0.00	0.00	0.00
Skillman Loop	13	2.81	1.72	0.24	0.85	<0.01
Pipeline Facilities Subtotal	**63**	**22.22**	**8.20**	**1.39**	**2.05**	**10.58**
Aboveground Facilities – No wetland identified at aboveground facilities						

[1] Impacts for Dorrance Loop represent 4.11 miles not the current 5.29 miles of the current alignment. These impact numbers will be revised in future filing when workspaces are finalized.

Notes:

[a] Total Wetland Disturbance = combined impacts of all cover types in full workspace footprint

[b] Emergent Wetland Disturbance = total impacts to emergent wetlands in full workspace footprint (no differentiation between existing and new permanent ROW)

[c] Permanent Forested Wetland Disturbance = forested wetlands within new proposed ROW

[d] Temporary Forested Wetland Disturbance = forested wetlands within workspace footprint OUTSIDE of new proposed ROW (so allowed to revert back to forested wetland after construction)

[e] Temporary Scrub-Shrub Wetland Disturbance = scrub-shrub wetlands within workspace footprint OUTSIDE of new proposed ROW (so allowed to revert back to scrub-shrub wetland after construction)

2.5.3.4 Wetland Impact Minimization Measures

Transco proposes to implement the Project-specific Plan and Procedures during construction and operation of the Project. Copies of the Project-specific Plan and Procedures are provided in Appendices 7B and 2C, respectively. As part of the required wetland permitting process, Transco will develop a Restoration Plan to address temporary wetland impacts associated with construction of the Project (see Appendix 2I). The Restoration Plan contains a summary of elements of Transco's E&SCP and Procedures, and is intended to satisfy the wetland restoration requirements of all resource protection agencies with jurisdiction over the Project.

In general, impacts to wetlands will be minimized by implementing specialized construction and restoration procedures, by preventing sedimentation of the wetlands during construction, and by allowing re-establishment of native wetland vegetation after construction following restoration of the ROW and all temporary workspace areas.

Erosion and Sedimentation Controls

Construction activities can disturb the surface soils and cause subsequent sedimentation into adjacent wetlands. Sedimentation will be minimized by the installation of temporary sediment control devices between the upland construction areas and the wetlands. Permanent erosion controls including slope breakers, interceptor diversion devices, riprap, and vegetative cover will be used in adjacent upland areas to minimize long-term sedimentation into the wetlands. Energy dissipation devices may be installed at the down-slope end of surface water diversion devices to prevent erosion off the ROW into wetlands. Trench plugs will be installed in upland slopes adjacent to wetlands to prevent trench erosion. Trench plugs also will be installed at the edges of the wetland to prevent subsurface drainage along the pipeline.

To minimize erosion and promote revegetation within the wetland, removal of the root mats for woody vegetation will be allowed only directly over the trench area or where required for safety. This serves to enhance regeneration on the construction and permanent ROW. Permanent erosion control structures that may alter hydrology will not be installed within wetland boundaries, but will be used in the adjacent upland areas to control erosion and sedimentation (e.g., slope breakers).

Compaction

Compaction of wetland soils and rutting within wetlands will be minimized by using low-ground-pressure equipment and installing temporary equipment mats. Transco is currently consulting relevant agencies and landowners in regard to BMPs that would further minimize the

potential for soil compaction. Any BMPs adopted as a result of these consultations will be reflected in Transco's Project-specific Plan and Procedures.

Topsoil Mixing

Soil characteristics can be changed during construction because of inadvertent mixing of topsoil and subsoils. To prevent such mixing in unsaturated wetlands, topsoil will be removed from directly over the trench and stockpiled for restoration as close as feasible to its original horizon.

Potential Spills

Inadvertent spills of fluids used during construction, such as fuels, lubricants, and solvents, could contaminate wetland soils and vegetation. To minimize the potential for spills, and minimize impacts from spills, a SPCC Plan will be implemented. In general, hazardous materials, chemicals, fuels, lubricating oils, and concrete-coating activities will be located away from wetlands. Where construction equipment is refueled within 100 feet of a wetland boundary, fueling and lubricating will be done in areas designated for such purposes.

Hydrology

Permanent changes in surface and subsurface hydrology through a wetland can have a long-term impact on the habitat type and quality. To minimize these impacts in areas where the pipeline might divert drainage or block the normal flow of water through a wetland, cross-drainage will be provided to maintain the hydrologic characteristics of the wetland. Trench plugs will be installed at the entrance and exit of the pipeline through the wetland to ensure that the wetland is not drained along the pipeline. Any confining layers that were breached during the construction will be restored during backfilling. Restoration of each wetland will involve returning contours to pre-construction levels and removing temporary control measures.

Revegetation

Some wetland vegetation will be cut, removed, or crushed during construction. After the completion of construction, wetland areas within the ROW will be allowed to revegetate naturally. Emergent wetlands, dominated primarily by low-growing sedges, rushes, and other herbaceous vegetation, and scrub-shrub wetlands, dominated by low woody vegetation, will revert to pre-existing conditions following construction, resulting in no permanent impacts to these wetland types. These wetlands will be monitored for a period of three to five years after the completion of construction to ensure successful revegetation of the Project area. Revegetation will be considered successful when the vegetative cover returns to at least 80

percent of the type, density, and distribution of the vegetation in adjacent undisturbed portions of the wetland.

Replanting of forested wetlands located outside of the permanent ROW will be completed in accordance with the Restoration Plan (see Appendix 2I, Section T) and all applicable permit authorizations. In general, trees and shrub species used for restoration will be the same as those found within the impacted wetland or adjacent wetlands.

2.5.3.5 Wetland Mitigation

For PEM wetland that will be temporarily disturbed, restoration and revegetation upon completion of construction is expected to be sufficient mitigation, and no additional mitigation is anticipated to be required for these impacts. Transco is consulting with the appropriate agencies to create approved mitigation plan(s) for the permanent wetland impacts (e.g., forested wetland conversion and scrub-shrub wetland conversion) resulting from the Project. The following discussion provides an overview of the mitigation required by state and federal regulations, as well as the types of acceptable mitigation that are available to Transco.

Pennsylvania

In Pennsylvania, mitigation is defined in the Pennsylvania Code Title 25 (Environmental Protection), Chapter 105 (Dam Safety and Waterway Management), as an action undertaken to accomplish one or more of the following:

- Avoid and minimize impacts by limiting the degree or magnitude of the action and its implementation;
- Rectify the impact by repairing, rehabilitating, or restoring the impacted environment;
- Reduce or eliminate the impact over time by preservation and maintenance operation during the life of the action; and
- If impact cannot be eliminated by the above, compensate for the impact by replacing the environment or by providing substitute resources or environments.

In addition to the state mitigation requirements, which are administered by the PADEP, the USACE also requires mitigation for wetland impacts. Mitigation for impacts within the area of the Dorrance and Franklin loops will be determined in consultation with the USACE and PADEP. The USACE has published its own mitigation and monitoring guidelines, dated April 2008, and mitigation for the wetlands impacted by this Project will comply with those guidelines, pursuant to Section 404 of the CWA. Compensatory mitigation is defined by the USACE as the restoration, enhancement, creation, or, in exceptional circumstances, preservation of wetlands and/or other aquatic resources for the purpose of compensating for unavoidable impacts. Mitigation options also may include mitigation banking. The wetland replacement ratios utilized

by the USACE for mitigation consists of a 2:1 ratio for forested wetlands,1.5:1 for scrub-shrub wetlands, and 1:1 for emergent wetlands.

Transco will be required to provide mitigation for the permanent conversion of PFO and PSS wetlands to PEM wetlands located within the permanent ROW. Approximately 1.15 acres of PFO wetlands and 5.75 acres of PSS wetlands would be permanently converted to PEM in Pennsylvania. In addition, Transco expects that mitigation will not be required for the 1.20 acres of PFO wetland and 4.83 acres of PSS wetland within the construction ROW that will be allowed to revert back to PFO or PSS wetland. As discussed in the Restoration Plan (see Appendix 2I), PFO wetlands located outside of the new permanent ROW that have been cleared as a result of construction activities will be replanted with like woody vegetation to ensure reestablishment of tree cover. However, since these areas will be allowed to revert back to their pre-existing conditions mitigation ratios will be less than those required for permanent conversion.

Currently, Transco is in consultation with USACE and PADEP to develop a mitigation plan, including mitigation sites, to satisfy permit requirements.

New Jersey

In New Jersey, mitigation is defined under NJAC 7:7A-15 as activities carried out in accordance with NJAC 7:7A-15 in order to compensate for the loss or disturbance of freshwater wetlands or state open waters. Mitigation is intended to compensate for impacts to a freshwater wetland and/or state open water resulting from activities authorized under individual or general freshwater wetlands or open water fill permit, or a violation of the Freshwater Wetlands Protection Act.

Transco will be required to provide mitigation for the permanent conversion of PFO and PSS wetlands to PEM wetlands located within the permanent ROW. Approximately 0.24 acre of PFO wetlands will be permanently converted to PEM in New Jersey. In addition, Transco expects that mitigation will not be required for the 0.85 acre of PFO wetland within the construction ROW that will be allowed to revert back to PFO or PSS wetland. As discussed in the Restoration Plan (see Appendix 2I), PFO wetlands located outside of the new permanent ROW that have been cleared as a result of construction activities will be replanted with similar woody vegetation to ensure reestablishment of tree cover. However, since these areas will be allowed to revert back to their pre-existing conditions mitigation ratios will be less than those required for permanent conversion.

Currently, Transco is in consultation with NJDEP to develop a mitigation plan, including mitigation sites, to satisfy permit requirements.

2.6 MODIFICATIONS TO THE FERC PROCEDURES

Transco is providing Project-specific Procedures (that have been modified from the FERC Procedures) in Appendix 2C. Substantial departures from the FERC Procedures have been highlighted as bold text, and minor additions made by Transco have been highlighted as italicized text. Modifications to setback requirements for wetland and waterbody crossings and ROW widths for wetland crossings are proposed to account for site-specific conditions in the Project area and are listed in Tables 2C-1 and 2C-2 in Appendix 2C of this RR.

2.6.1 Modifications at Waterbody Crossings

In general, ATWS is typically required at the adjacent uplands on both sides of a waterbody crossing to stage construction equipment, to fabricate the pipe, to store materials, and for temporary storage of trench spoil. These work areas will be located at least 50 feet away from the waterbody edge, topographic and other site-specific conditions permitting. If conditions do not permit a 50-foot setback, Transco is proposing modifications to this FERC requirement in their Project-specific Procedures. In a future filing, as Transco develops its waterbody crossing plans, Table 2C-3 will identify the locations where ATWS waterbody setback modifications are required along the pipeline loops.

2.6.2 Modifications at Wetland Crossings

FERC requires that the standard construction ROW through wetlands is no greater than 75 feet wide. As stated in RR 1, Section 1.2.1, Transco is proposing to use a 75-foot-wide corridor through a wetland plus 15 feet of ATWS along with normal workspace widths on the adjacent upland areas at each wetland crossing. As described below, soil structure and presence of water commonly found in wetlands along with the large surface loads of construction equipment and materials to construct the 42-inch diameter pipeline contribute to the need to have the 15 feet of additional work space.

Soil survey information obtained from the National Resources Conservation Service (NRCS) and field visual observations indicates the wetland soils crossed by the pipeline loops are loam, silt loam, or clay, often with organic content. The shear strength of these soils is typically low and becomes weaker when saturated. The topography and subsurface conditions of the wetlands crossed by the pipeline loops often result in soils with higher moisture content and periodic saturation.

The handling of this weak material during the excavation/stockpile process further reduces strength of the soil mass by disturbance/remolding/mixing. The ability to stockpile wetland soils vertically is nearly always less than comparable soils outside a wetland

environment. The volumetric increase from in situ (bank measure) to stockpile (loose measure) can be 15 to 30 percent. Concrete weight coating often required for buoyancy control in wetland environments requires the trench to be excavated larger in width and depth resulting in additional stockpile material subject to volumetric increase during the excavation/stockpile process. Consequently, wetland soils crossed by the pipeline loops have properties contributing to the need for increased workspace for both trenching and stockpiling.

If wetlands were to occur in rock or gravel or other material not subject to low shear strength, then the workspace could possibly be reduced to 75 feet. However, wetland soils along the pipeline loops are under-consolidated silts, clays, loams, fine grained sands or other fine grain material with low strength.

In summary, Transco is requesting 15 feet of ATWS for some wetland crossings along the proposed pipeline loops based on the following:

- Inability to stockpile material within the same area as typical construction due to loose, unconsolidated soils with low shear strength (saturated wetlands); and
- Concrete weight coating is often required for buoyancy control within wetlands, further increasing the overall trench excavation size while simultaneously increasing the amount of loose, unconsolidated material to stockpile within the limited area.

Table 2C-3 provides additional site-specific information regarding Transco's request for 15 feet of ATWS in the wetland crossing along the pipeline loops that contain saturated soils. This table also lists the locations where ATWS wetland setback modifications are required along the pipeline loops.

2.7 REFERENCES

Herman, G.C., R.J. Canace, S.D. Stanford, R.S. Pristas, P.J. Sugarman, M.A. French, J.L Hoffman, M.S. Serfes, and W.J. Mennel. 1999. Aquifers of New Jersey. Digital Compilation by G.C. Herman. N.J. Geological Survey Digital Geodata Series DGS98-5. http://www.njgeology.org/geodata/dgs98-5.htm, Accessed February 26, 2013.

National Park Service (NPS). 2007. "Nationwide Rivers Inventory." Accessed online at: http://www.nps.gov/ncrc/programs/rtca/nri/, accessed March 4, 2013.

New Jersey Administrative Code (NJAC). 2007. "NJAC 7:9 D-2. Well construction and maintenance." http://www.nj.gov/dep/rules/rules/njac7_9d.pdf, accessed March 4, 2013.

_____. 2011a. NJAC 7:10. Safe Drinking Water Act Regulations. http://www.nj.gov/dep/rules/rules/njac7_10.pdf, Accessed March 6, 2013.

_____. 2011b. NJAC 7:9B Surface Water Quality Standards. http://www.nj.gov/dep/rules/rules/njac7_9b.pdf. Accessed March 11, 2013.

_____. 2011c. NJAC 7:13. Flood Hazard Area Control Act Rules. http://www.nj.gov/dep/landuse/7-13.pdf. accessed March 11, 2013.

New Jersey Department of Environmental Protection (NJDEP). 2012. *New Jersey 2012 Integrated Water Quality Monitoring and Assessment Report.* [Includes 305(B) Report and 303(D) List]. http://www.state.nj.us/dep/wms/bwqsa/2010_revised_final_integrated_report_complete.pdf. . Accessed March 8, 2013.

New Jersey Department of Environmental Protection (NJDEP) and New Jersey Geological Survey (NJGS). 2004. Well Head Protection Areas for Non-Community Water Supply Wells in New Jersey, 2004 edition. http://www.state.nj.us/dep/njgs/geodata/dgs04-5md.htm Accessed May 11, 2011.

_____. 2010. Well Head Protection Areas for Public Community Water Supply Wells in New Jersey, 2010 edition. http://www.state.nj.us/dep/njgs/geodata/dgs02-2md.htm. Accessed May 11, 2011.

PADCNR Bureau of Topographic and Geological Survey. 2001. Digital Bedrock Aquifer Characteristics by Physiographic Section of Pennsylvania. http://www.dcnr.state.pa.us/topogeo/groundwater/dac_data.aspx. Accessed February 27, 2013.

_____. 2005. Pennsylvania Groundwater Information System. http://www.dcnr.state.pa.us/topogeo/groundwater/PaGWIS/help.aspx#Data. Accessed May 2, 2011.

Pennsylvania Code (PAC). 2013a. PAC Title 25, Chapter 93.4b. Qualifying as High Quality or Exceptional Value Waters. http://www.pacode.com/secure/data/025/chapter93/chap93toc.html, Accessed March 5, 2013.

_____. 2013b. PAC Title 25, Chapter 93.3. Protected Water Uses. http://www.pacode.com/secure/data/025/chapter93/chap93toc.html, Accessed March 5, 2013.

Pennsylvania Department of Environmental Protection (PADEP). 2012a. Storage Tank Location dataset. Available online at http://www.pasda.psu.edu/uci/FullMetadataDisplay.aspx?file=StorageTankLocations2012_10.xml, Accessed March 2013.

_____. 2012b. *2012 Pennsylvania Integrated Water Quality Monitoring and Assessment Report: Clean Water Act Section 305(b) Report and 303(d) List*. PADEP Division of Water Standards and Facility Regulation. 67 pp. + Appendices.

_____. 2013. EmapPA Interactive Map. http://www.emappa.dep.state.pa.us/emappa/viewer.htm. Accessed on May 4, 2011.

Spayd, Steven E. and S. W. Johnson. 2003. Guidelines for Delineation of Well Head Protection Areas in New Jersey. http://www.state.nj.us/dep/njgs/whpaguide.pdf. Accessed May 5, 2011.

Township of Branchburg. 2012. Land Development Ordinance amended through March 12, 2012. http://clerkshq.com/default.ashx?clientsite=Branchburg-nj. Accessed March 11, 2013.

Township of Clinton. 1983. Land Use Regulations of the Township of Clinton, Ordinance Number 231-83. http://ecode360.com/9547906. Accessed March 11, 2013.

Township of Montgomery. 1985. Land Development, Ordinance Number 85-482. http://clerkshq.com/default.ashx?clientsite=princeton-nj. Accessed March 11, 2013.

Township of Princeton. 2011. Land Use, Ordinance Numbers 2011-16 and 2011-18. http://clerkshq.com/default.ashx?clientsite=princeton-nj. Accessed March 11, 2013.

Township of Readington. 1992. The Land Development Ordinance of the Township of Readington. http://ecode360.com/8741373. Accessed March 11, 2013.

Trapp, H. and M.A. Horn. 1997. *Groundwater Atlas of the United States*, Segment 11, Delaware, Maryland, New Jersey, North Carolina, Pennsylvania, Virginia, and West Virginia. Hydrologic Investigations Atlas 730-L. United States Geological Survey, Reston, VA. 24 pg. http://pubs.usgs.gov/ha/ha730/ch_l/index.html Accessed March 5, 2013.

United States Department of Agriculture (USDA), 1986. *Technical Release 55 (TR-55), Urban Hydrology for Small Watersheds*.

United States Environmental Protection Agency (USEPA). 1988. Northwest New Jersey 15 Basin Aquifer Support Document. June 1988. http://www.epa.gov/region02/water/aquifer/basin/15basin.htm. Accessed April 27, 2011.

_____. 2010. Region 2 Water Sole Source Aquifers. Last revised October 5, 2010. http://www.epa.gov/region2/water/aquifer/. Accessed February 28, 2013.

_____. 2013. EPA Geospatial Data Access Project. http://www.epa.gov/enviro/geo_data.html. Accessed March 2013.

United States Geological Survey (USGS). 1999. *Ground Water, U.S. Geological Survey General Interest Publication, Reston, Virginia, 1999 revision.* http://capp.water.usgs.gov/GIP/gw_gip/index.html. Accessed March 11, 2013.

_____. 2013. Groundwater levels for the nation. http://nwis.waterdata.usgs.gov/nwis/gwlevels?search_criteria=state_cd&submitted_form=introduction. Accessed March 11, 2013.

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC

Appendices to Resource Report No. 2
Water Use and Quality

Leidy Southeast Expansion Project

July 2013

Appendix 2A

Tables 2A-1 and 2A-2 Waterbodies Crossed by the Leidy Southeast Expansion Project

Table 2A-1
Water Bodies Crossed by the Leidy Southeast Expansion Project in Pennsylvania

M.P. [a]	Feature ID	Waterbody Name	Water Quality Classification and/or PAFBC Fishery Type[b]	FERC Classification [c]	Flow Regime	Bankfull Width (feet) [d]	Temporary Stream Disturbance Area (acres)	Proposed Crossing Method	Timing Restriction [e]
Dorrance Loop[1]									
18.44	SS-001-001	Unnamed Tributary to Little Wapwallopen Creek	CWF, MF	Minor	Perennial	8	0.02	Flowing, dry ditch, dam-and-pump, or dry-flumed	October 1 – May 31
18.66	SS-001-002	Unnamed Tributary to Little Wapwallopen Creek	CWF, MF	Minor	Intermittent	6	0.01	Non-flowing Open-Cut	October 1 – May 31
18.67	SS-001-003	Unnamed Tributary to Little Wapwallopen Creek	CWF, MF	Minor	Perennial	3	0.01	Flowing, dry ditch, dam-and-pump, or dry-flumed	October 1 – May 31
18.83	SS-001-004	Little Wapwallopen Creek	CWF, MF	Intermediate	Perennial	35	0.04	Flowing, dry ditch, dam-and-pump, or dry-flumed	October 1 – May 31
18.92	SS-001-005	Unnamed Tributary to Little Wapwallopen Creek	CWF, MF	Intermediate	Perennial	10	0.03	Flowing, dry ditch, dam-and-pump, or dry-flumed	October 1 – May 31
19.10	SS-001-006	Unnamed Tributary to Little Wapwallopen Creek	CWF, MF	Minor	Perennial	4	0.06	Flowing, dry ditch, dam-and-pump, or dry-flumed	October 1 – May 31
19.45	SS-001-007	Unnamed Tributary to Little Wapwallopen Creek	CWF, MF	Minor	Perennial	8	0.02	Flowing, dry ditch, dam-and-pump, or dry-flumed	October 1 – May 31
20.84	SS-001-008	Little Wapwallopen Creek	CWF, MF	Intermediate	Perennial	35	0.06	Flowing, dry ditch, dam-and-pump, or dry-flumed	October 1 – May 31
21.78	SS-001-009	Unnamed Tributary to Little Wapwallopen Creek	CWF, MF	Intermediate	Perennial	15	0.04	Flowing, dry ditch, dam-and-pump, or dry-flumed	October 1 – May 31
						Dorrance Total	**0.29**		
Franklin Loop									
58.40	SS-001-010	Tunkhannock Creek	HQ-CWF, MF	Intermediate	Perennial	30	0.11	Flowing, dry ditch, dam-and-pump, or dry-flumed	October 1 – May 31

Table 2A-1
Water Bodies Crossed by the Leidy Southeast Expansion Project in Pennsylvania

M.P. [a]	Feature ID	Waterbody Name	Water Quality Classification and/or PAFBC Fishery Type[b]	FERC Classification [c]	Flow Regime	Bankfull Width (feet) [d]	Temporary Stream Disturbance Area (acres)	Proposed Crossing Method	Timing Restriction [e]
58.66	SS-001-011	Unnamed Tributary to Tunkhannock Creek	HQ-CWF, MF	Minor	Perennial	9	0.07	Flowing, dry ditch, dam-and-pump, or dry-flumed	October 1 – May 31
58.62	SS-001-011A	Unnamed Tributary to Tunkhannock Creek	HQ-CWF, MF	Minor	Intermittent	4	<0.01	Non-flowing Open-Cut	October 1 – May 31
58.80	SS-001-012	Unnamed Tributary to Tunkhannock Creek	HQ-CWF, MF	Minor	Intermittent	6	0.02	Non-flowing Open-Cut	October 1 – May 31
59.21	SS-001-013	Unnamed Tributary to Tunkhannock Creek	HQ-CWF, MF	Minor	Ephemeral	3	0.01	Non-flowing Open-Cut	October 1 – May 31
59.45	SS-001-014A	Unnamed Tributary to Tunkhannock Creek	HQ-CWF, MF	Minor	Perennial	3	0.07	Flowing, dry ditch, dam-and-pump, or dry-flumed	October 1 – May 31
59.54	SS-001-014B	Unnamed Tributary to Tunkhannock Creek	HQ-CWF, MF	Minor	Ephemeral	4	<0.01	Non-flowing Open-Cut	October 1 – May 31
59.59	SS-001-014	Unnamed Tributary to Tunkhannock Creek	HQ-CWF, MF	Minor	Perennial	10	0.07	Flowing, dry ditch, dam-and-pump, or dry-flumed	October 1 – May 31
60.13	SS-001-020	Unnamed Tributary to Tobyhanna Creek	HQ-CWF, MF	Intermediate	Perennial	11	0.05	Flowing, dry ditch, dam-and-pump, or dry-flumed	October 1 – May 31
61.03	SS-001-015	Tobyhanna Creek	HQ-CWF, MF	Intermediate	Perennial	70	0.24	Flowing, dry ditch, dam-and-pump, or dry-flumed	October 1 – May 31
61.28	SS-001-016	Unnamed Tributary to Tobyhanna Creek	HQ-CWF, MF	Minor	Ephemeral	8	0.10	Non-flowing Open-Cut	October 1 – May 31
62.28	SS-001-018	Unnamed Tributary to Two Mile Run	HQ-CWF, MF	Minor	Perennial	3	0.01	Flowing, dry ditch, dam-and-pump, or dry-flumed	October 1 – May 31
63.09	SS-001-021	Two Mile Run	HQ-CWF, MF	Minor	Perennial	15	0.04	Flowing, dry ditch, dam-and-pump, or dry-flumed	October 1 through April 1
63.25	SS-001-022	Unnamed Tributary to Two Mile Run	HQ-CWF, MF	Minor	Ephemeral	5	0.01	Non-flowing Open-Cut	October 1 through April 1

Table 2A-1
Water Bodies Crossed by the Leidy Southeast Expansion Project in Pennsylvania

M.P. [a]	Feature ID	Waterbody Name	Water Quality Classification and/or PAFBC Fishery Type [b]	FERC Classification [c]	Flow Regime	Bankfull Width (feet) [d]	Temporary Stream Disturbance Area (acres)	Proposed Crossing Method	Timing Restriction [e]
63.74	SS-001-024	Stony Run	HQ-CWF, MF	Minor	Perennial	11	0.02	Flowing, dry ditch, dam-and-pump, or dry-flumed	October 1 through April 1
64.95	SS-001-025	Unnamed Tributary to Lehigh River	EV, MF	Minor	Perennial	9	0.02	Flowing, dry ditch, dam-and-pump, or dry-flumed	March 1 – June 15 and October 1 – December 31
65.50	SS-001-026	Lehigh River	EV, MF/ WTS	Intermediate	Perennial	55	0.30	Flowing, dry ditch, dam-and-pump, or dry-flumed	March 1 – June 15 and October 1 – December 31
65.89	SS-001-027	Unnamed Tributary to Lehigh River	EV, MF	Minor	Perennial	3	0.01	Flowing, dry ditch, dam-and-pump, or dry-flumed	March 1 – June 15 and October 1 – December 31
66.68	SS-001-028	Unnamed Tributary to Kendall Creek	EV, MF	Minor	Ephemeral	4	0.01	Flowing, dry ditch, dam-and-pump, or dry-flumed	March 1 – June 15 and October 1 – December 31
66.70	SS-001-028A	Unnamed Tributary to Kendall Creek	EV, MF	Minor	Perennial	4	0.01	Flowing, dry ditch, dam-and-pump, or dry-flumed	March 1 – June 15 and October 1 – December 31
67.45	SS-001-029	Kendall Creek	EV, MF/ WTS	Minor	Intermittent	5	0.03	Non-flowing Open-Cut	March 1 – June 15 and October 1 – December 31
67.70	SS-001-030	Unnamed Tributary to Kendall Creek	EV, MF	Minor	Perennial	6	0.05	Flowing, dry ditch, dam-and-pump, or dry-flumed	March 1 – June 15 and October 1 – December 31
67.84	SS-001-031	Unnamed Tributary to Stony Run	HQ-CWF, MF	Minor	Perennial	15	0.02	Flowing, dry ditch, dam-and-pump, or dry-flumed	October 1 through April 1
67.95	SS-001-032	Unnamed Tributary to Stony Run	HQ-CWF, MF	Minor	Perennial	9	0.02	Flowing, dry ditch, dam-and-pump, or dry-flumed	October 1 through April 1

Table 2A-1
Water Bodies Crossed by the Leidy Southeast Expansion Project in Pennsylvania

M.P. [a]	Feature ID	Waterbody Name	Water Quality Classification and/or PAFBC Fishery Type [b]	FERC Classification [c]	Flow Regime	Bankfull Width (feet) [d]	Temporary Stream Disturbance Area (acres)	Proposed Crossing Method	Timing Restriction [e]
68.15	SS-001-032	Unnamed Tributary to Stony Run	HQ-CWF, MF	Minor	Perennial	9	0.03	Flowing, dry ditch, dam-and-pump, or dry-flumed	October 1 through April 1
						Franklin Total	**1.32**		

[1] Impacts for Dorrance Loop represent 4.11 miles not the current 5.29 miles of the current alignment. These impact numbers will be revised in future filing when workspaces are finalized.

Notes:

[a] Mileposting as indicated based on alignment sheet (see Mapping Supplement, Volume 3)

[b] Pennsylvania Chapter 93 Water Quality Classification
- TSF - Trout-stocked Fishery
- CWF - Cold water fishery
- MF - Migratory fishery
- HQ-CWF - High quality, Cold water fishery
- EV – Exceptional Value

Pennsylvania Fish and Boat Commission (PAFBC) Fishery Type
- PAFBC TSF – Included in PAFBC's trout stocking program and subject to timing restriction
- WTS - Wild Trout Stream
- Class A WTS – Class A Wild Trout Stream

c FERC classification

Minor – All waterbodies less than or equal to 10 feet wide at the water's edge at the time of crossing.

Intermediate – All waterbodies greater than 10 feet wide but less than 100 feet wide at the water's edge at the time of crossing.

Major – All waterbodies greater than 100 feet wide at the water's edge at the time of crossing.

d Crossing Width is the distance from top of bank to top of bank

e Timing restrictions will be confirmed through consultation with Pennsylvania Fish & Boat Commission (Shervinsky 2011). Refer to Resource Report 3.

Table 2A-2
Water Bodies Crossed by the Leidy Southeast Expansion Project in New Jersey

M.P. [a]	Feature ID	Waterbody Name	Water Quality Classification and/or NJDEP Fishery Type [b]	FERC Classification	Flow Regime	Bankfull Width (feet)[d]	Temporary Stream Disturbance (acres)	Riparian Zone Width	Riparian Zone Vegetation Disturbance (acres)	Proposed Crossing Method	Timing Restriction
Pleasant Run Loop											
0.39	SS-002-022	Unnamed Tributary to Pleasant Run	FW2-NT	Minor	Perennial	10	0.02	50	1.02	Flowing, dry ditch, dam-and-pump, or dry-flumed	October 1 through April 1
0.66	SS-002-023	Unnamed Tributary to Pleasant Run	FW2-NT	Minor	Perennial	7	0.02	50	1.02	Flowing, dry ditch, dam-and-pump, or dry-flumed	October 1 through April 1
0.73	SS-002-024	Unnamed Tributary to Pleasant Run	FW2-NT	Minor	Perennial	10	0.01	50	0.89	Flowing, dry ditch, dam-and-pump, or dry-flumed	October 1 through April 1
1.05	SS-002-025	Unnamed Tributary to Pleasant Run	FW2-NT	Minor	Perennial	12	0.01	50	1.57	Flowing, dry ditch, dam-and-pump, or dry-flumed	October 1 through April 1
1.21	SS-002-048	Unnamed Tributary to Pleasant Run	FW2-NT	Minor	Perennial	8	<0.01	50	<0.01	Flowing, dry ditch, dam-and-pump, or dry-flumed	October 1 through April 1
1.44	SS-002-026	Unnamed Tributary to Pleasant Run	FW2-NT	Minor	Perennial	6	0.01	50	0.83	Flowing, dry ditch, dam-and-pump, or dry-flumed	October 1 through April 1
1.72	SS-002-027	Unnamed Tributary to Pleasant Run	FW2-NT	Minor	Perennial	9	0.01	50	0.83	Flowing, dry ditch, dam-and-pump, or dry-flumed	October 1 through April 1
1.83	SS-002-028	Unnamed Tributary to Pleasant Run	FW2-NT	Minor	Perennial	15	0.01	50	0.62	Flowing, dry ditch, dam-and-pump, or dry-flumed	October 1 through April 1
2.26	SS-002-030	Unnamed Tributary to Pleasant Run	FW2-NT	Minor	Perennial	12	0.02	50	1.03	Flowing, dry ditch, dam-and-pump, or dry-flumed	October 1 through April 1
2.63	SS-002-031	Unnamed Tributary to Pleasant Run	FW2-NT	Minor	Intermittent	4	<0.01	50	0.44	Non-flowing Open-Cut	October 1 through April 1
2.84	SS-002-032	Unnamed Tributary to Pleasant Run	FW2-NT	Minor	Perennial	11	0.02	50	0.59	Flowing, dry ditch, dam-and-pump, or dry-flumed	October 1 through April 1

Table 2A-2
Water Bodies Crossed by the Leidy Southeast Expansion Project in New Jersey

M.P. [a]	Feature ID	Waterbody Name	Water Quality Classification and/or NJDEP Fishery Type [b]	FERC Classification	Flow Regime	Bankfull Width (feet)[d]	Temporary Stream Disturbance (acres)	Riparian Zone Width	Riparian Zone Vegetation Disturbance (acres)	Proposed Crossing Method	Timing Restriction
3.21	SS-002-033	Unnamed Tributary to Pleasant Run	FW2-NT	Minor	Perennial	12	0.01	50	1.28	Flowing, dry ditch, dam-and-pump, or dry-flumed	October 1 through April 1
3.34	SS-002-029B	Pleasant Run	FW2-NT	Intermediate	Perennial	30	0.08	50	0.44	Flowing, dry ditch, dam-and-pump, or dry-flumed	October 1 through April 1
3.63	SS-002-034	Unnamed Tributary to Pleasant Run	FW2-NT	Minor	Perennial	15	0.02	50	1.19	Flowing, dry ditch, dam-and-pump, or dry-flumed	October 1 through April 1
4.20	SS-002-035	Unnamed Tributary to Pleasant Run	FW2-NT	Minor	Intermittent	7	0.02	50	1.13	Non-flowing Open-Cut	October 1 through April 1
4.23	SS-002-036	Unnamed Tributary to Pleasant Run	FW2-NT	Minor	Perennial	8	0.02	50	0.73	Flowing, dry ditch, dam-and-pump, or dry-flumed	October 1 through April 1
4.46	SS-002-037	Unnamed Tributary to Pleasant Run	FW2-NT	Minor	Intermittent	10	0.02	50	3.62	Flowing, dry ditch, dam-and-pump, or dry-flumed	October 1 through April 1
4.97	SS-002-038	Unnamed Tributary to Pleasant Run	FW2-NT	Minor	Ephemeral	12	0.02	50	1.00	Non-flowing Open-Cut	October 1 through April 1
5.06	SS-002-039	Unnamed Tributary to Pleasant Run	FW2-NT	Minor	Ephemeral	4	0.01	50	0.44	Non-flowing Open-Cut	October 1 through April 1
5.11	SS-002-040	Unnamed Tributary to Pleasant Run	FW2-NT	Minor	Ephemeral	6	0.02	50	0.79	Non-flowing Open-Cut	October 1 through April 1
5.34	SS-002-041	Unnamed Tributary to Pleasant Run	FW2-NT	Minor	Perennial	14	0.02	50	0.98	Flowing, dry ditch, dam-and-pump, or dry-flumed	October 1 through April 1
5.50, 5.55	SS-002-042	Unnamed Tributary to Pleasant Run	FW2-NT	Minor	Perennial	10	0.10	50	2.41	Flowing, dry ditch, dam-and-pump, or dry-flumed	October 1 through April 1

Table 2A-2
Water Bodies Crossed by the Leidy Southeast Expansion Project in New Jersey

M.P. [a]	Feature ID	Waterbody Name	Water Quality Classification and/or NJDEP Fishery Type [b]	FERC Classification	Flow Regime	Bankfull Width (feet)[d]	Temporary Stream Disturbance (acres)	Riparian Zone Width	Riparian Zone Vegetation Disturbance (acres)	Proposed Crossing Method	Timing Restriction
5.73	SS-002-043	Unnamed Tributary to Pleasant Run	FW2-NT	Minor	Intermittent	5	0.01	50	1.16	Non-flowing Open-Cut	October 1 through April 1
5.76	SS-002-044	Unnamed Tributary to Pleasant Run	FW2-NT	Minor	Ephemeral	12	0.02	50	0.61	Flowing, dry ditch, dam-and-pump, or dry-flumed	October 1 through April 1
6.16	SS-002-046	Unnamed Tributary to Pleasant Run	FW2-NT	Minor	Perennial	15	0.03	50	2.25	Flowing, dry ditch, dam-and-pump, or dry-flumed	October 1 through April 1
6.54	SS-002-047	Unnamed Tributary to Pleasant Run	FW2-NT	Minor	Ephemeral	6	0.01	50	1.12	Non-flowing Open-Cut	October 1 through April 1
					Pleasant Run Total		**0.54**		**27.99**		
Skillman Loop											
1776.85	SS-002-001	Unnamed Tributary to Stony Brook	FW2-NT	Minor	Perennial	12	0.02	50	0.77	Flowing, dry ditch, dam-and-pump, or dry-flumed	October 1 through April 1
1777.01	SS-002-002	Unnamed Tributary to Stony Brook	FW2-NT	Minor	Perennial	4	<0.01	50	0.92	Flowing, dry ditch, dam-and-pump, or dry-flumed	October 1 through April 1
1778.32	SS-002-005	Unnamed Tributary to Beden Brook	FW2-NT	Minor	Perennial	3	0.01	50	0.97	Flowing, dry ditch, dam-and-pump, or dry-flumed	October 1 through April 1
1778.43	SS-002-006	Unnamed Tributary to Beden Brook	FW2-NT	Minor	Intermittent	3	0.02	50	0.88	Non-flowing Open-Cut	October 1 through April 1
1778.67	SS-002-007	Unnamed Tributary to Beden Brook	FW2-NT	Intermediate	Perennial	13	0.04	50	0.98	Flowing, dry ditch, dam-and-pump, or dry-flumed	October 1 through April 1
1779.05	SS-002-008	Unnamed Tributary to Beden Brook	FW2-NT	Minor	Perennial	12	0.01	50	1.07	Flowing, dry ditch, dam-and-pump, or dry-flumed	October 1 through April 1

Table 2A-2
Water Bodies Crossed by the Leidy Southeast Expansion Project in New Jersey

M.P. [a]	Feature ID	Waterbody Name	Water Quality Classification and/or NJDEP Fishery Type [b]	FERC Classification	Flow Regime	Bankfull Width (feet)[d]	Temporary Stream Disturbance (acres)	Riparian Zone Width	Riparian Zone Vegetation Disturbance (acres)	Proposed Crossing Method	Timing Restriction
1779.68	SS-002-012	Beden Brook	FW2-NT	Intermediate	Perennial	45	0.09	50	2.73	Flowing, dry ditch, dam-and-pump, or dry-flumed	October 1 through April 1
1780.27	SS-002-017	Rock Brook	FW2-NT	Intermediate	Perennial	40	0.08	50	1.58	Flowing, dry ditch, dam-and-pump, or dry-flumed	October 1 through April 1
1780.44	SS-002-014	Unnamed Tributary to Rock Brook	FW2-NT	Minor	Perennial	8	0.05	50	3.12	Flowing, dry ditch, dam-and-pump, or dry-flumed	October 1 through April 1
1781.08	SS-002-016	Back Brook	FW2-NT	Intermediate	Perennial	20	0.05	50	0.91	Flowing, dry ditch, dam-and-pump, or dry-flumed	October 1 through April 1
1782.05	SS-002-021	Unnamed Tributary to Pike Run	FW2-NT	Minor	Intermittent	6	0.03	50	0.67	Non-flowing Open-Cut	October 1 through April 1
1782.74	SS-002-019	Ditch to Pike Run	FW2-NT	Minor	Intermittent	8	0.02	0	0.00	Non-flowing Open-Cut	October 1 through April 1
1782.76	SS-002-020	Ditch to Pike Run	FW2-NT	Minor	Intermittent	10	0.03	0	0.00	Flowing, dry ditch, dam-and-pump, or dry-flumed	October 1 through April 1
					Skillman Total		**0.45**		**14.60**		

Notes:

[a] Mileposting as indicated based on alignment sheet (see Mapping Supplement, Volume 3)

[b] New Jersey Water Quality Classification
FW2-TMC1 - Freshwater, Trout Maintenance, Category 1 Waters
FW2-TM - Freshwater, Trout Maintenance
FW2-NT - Freshwater, Non-trout fishery

[c] FERC classification
Minor – All waterbodies less than or equal to 10 feet wide at the water's edge at the time of crossing.
Intermediate – All waterbodies greater than 10 feet wide but less than 100 feet wide at the water's edge at the time of crossing.
Major – All waterbodies greater than 100 feet wide at the water's edge at the time of crossing.

d Crossing Width is the distance from top of bank to top of bank

e Timing restrictions will be confirmed through consultation with NJ Division of Fish & Game. Refer to Resource Report 3.

Appendix 2B

Tables 2B-1 and 2B-2 Wetlands Crossed by the Leidy Southeast Expansion Project

Table 2B-1
Wetlands Impacted by the Leidy Southeast Expansion Project in Pennsylvania

Wetland ID	Begin MP[a]	End MP[a]	Crossing Length (feet) [b]	Construction Method / Disturbance Type	NWI Classification[c]	State Wetland Classification	Total Wetland Disturbance (Acre)[d]	Emergent Wetland Disturbance (Acre)[e]	Permanent Forested Wetland Disturbance (Acre)[f]	Temporary Forested Wetland Disturbance (Acre)[g]	Scrub-Shrub Wetland Disturbance (Acre)
Dorrance Loop[1]											
WW-001-001	18.32	18.33	n/a	TBD	PFO	Ordinary	0.01	0.00	0.00	0.02	0.00
WW-001-002	18.39	18.42	n/a	TBD	PEM	Ordinary	0.05	0.05	0.00	0.00	0.00
WW-001-003	18.56	18.56	11.15	TBD	PEM	Ordinary	0.12	0.12	0.00	0.00	0.00
WW-001-004	18.60	18.65	123.50	TBD	PFO	Intermediate	0.43	0.00	0.16	0.28	0.00
WW-001-005	18.82	18.90	368.34	TBD	PFO	Exceptional	0.61	0.00	0.36	0.25	0.00
WW-001-006	19.08	19.10	138.84	TBD	PEM	Ordinary	0.14	0.00	0.00	0.00	0.00
WW-001-008	19.53	19.53	33.34	TBD	PEM	Ordinary	0.11	0.11	0.00	0.00	0.00
WW-001-009	20.84	20.86	73.25	TBD	PEM	Exceptional	0.15	0.15	0.00	0.00	0.00
WW-001-011	21.59	21.65	85.12	TBD	PEM	Intermediate	0.22	0.22	0.00	0.00	0.00
Total Impacts Dorrance Loop							**1.86**	**0.80**	**0.51**	**0.55**	**0.00**
Total Number of Wetlands Impacted by Dorrance Loop = 9											
Franklin Loop											
WW-001-012	58.41	58.42	n/a	TBD	PEM	Intermediate	0.01	0.01	0.00	0.00	0.00
WW-001-013	58.54	58.58	n/a	TBD	PFO	Intermediate	0.06	0.00	0.02	0.04	0.00
WW-001-014	58.86	58.91	274.89	TBD	PSS	Exceptional	0.70	0.00	0.00	0.00	0.70
WW-001-016	59.00	59.05	98.12	TBD	PEM	Intermediate	0.33	0.33	0.00	0.00	0.00
WW-001-019	59.18	59.20	9.12	TBD	PEM	Intermediate	0.13	0.13	0.00	0.00	0.00
WW-001-020	59.29	59.37	410.13	TBD	PSS	Exceptional	1.15	0.00	0.00	0.00	1.15
WW-001-021	59.63	59.63	33.15	TBD	PEM	Intermediate	0.17	0.17	0.00	0.00	0.00
WW-001-022	61.06	61.11	222.43	TBD	PEM	Intermediate	0.22	0.22	0.00	0.00	0.00
WW-001-024	61.25	61.26	105.03	TBD	PEM	Intermediate	0.23	0.23	0.00	0.00	0.00
WW-001-025	61.64	61.69	243.20	TBD	PEM	Ordinary	0.50	0.50	0.00	0.00	0.00
WW-001-026	62.11	62.11	2.95	TBD	PEM	Ordinary	0.16	0.16	0.00	0.00	0.00

Table 2B-1
Wetlands Impacted by the Leidy Southeast Expansion Project in Pennsylvania

Wetland ID	Begin MP[a]	End MP[a]	Crossing Length (feet) [b]	Construction Method / Disturbance Type	NWI Classification[c]	State Wetland Classification	Total Wetland Disturbance (Acre)[d]	Emergent Wetland Disturbance (Acre)[e]	Permanent Forested Wetland Disturbance (Acre)[f]	Temporary Forested Wetland Disturbance (Acre)[g]	Scrub-Shrub Wetland Disturbance (Acre)
WW-001-028	59.77	60.16	2031.56	TBD	PSS	Exceptional	4.19	0.00	0.00	0.00	4.19
WW-001-030	60.54	60.57	123.44	TBD	PFO	Intermediate	0.17	0.00	0.09	0.08	0.00
WW-001-027	62.32	62.34	105.76	TBD	PFO	Intermediate	0.37	0.00	0.16	0.21	0.00
WW-001-031	62.83	63.18	440.68	TBD	PEM	Intermediate	1.04	1.04	0.00	0.00	0.00
WW-001-032	63.43	63.44	39.27	TBD	PFO	Intermediate	0.11	0.00	0.05	0.06	0.00
WW-001-033	63.57	63.57	n/a	TBD	PEM	Ordinary	0.01	0.01	0.00	0.00	0.00
WW-001-035	63.74	63.78	n/a	TBD	PEM	Intermediate	0.08	0.08	0.00	0.00	0.00
WW-001-036	64.17	64.56	1996.76	TBD	PSS	Exceptional	4.21	0.00	0.00	0.00	4.21
WW-001-037	64.94	64.97	138.85	TBD	PSS	Exceptional	0.30	0.00	0.00	0.00	0.30
WW-001-038	65.44	65.45	64.61	TBD	PEM	Intermediate	0.09	0.09	0.00	0.00	0.00
WW-001-040	65.87	65.92	258.23	TBD	PFO	Intermediate	0.52	0.00	0.32	0.20	0.00
WW-001-041	66.83	66.86	135.58	TBD	PEM	Intermediate	0.31	0.31	0.00	0.00	0.00
WW-001-042	66.88	66.90	n/a	TBD	PFO	Intermediate	0.06	0.00	0.00	0.06	0.00
WW-001-043	67.06	67.13	384.63	TBD	PEM	Intermediate	0.65	0.65	0.00	0.00	0.00
WW-001-044	68.06	68.08	n/a	TBD	PEM	Intermediate	0.03	0.03	0.00	0.00	0.00
WW-001-045	68.82	68.88	187.31	TBD	PEM	Intermediate	0.20	0.20	0.00	0.00	0.00
WW-001-050	68.45	68.48	n/a	TBD	PEM	Intermediate	0.12	0.12	0.00	0.00	0.00
WW-001-046	68.72	68.74	n/a	TBD	PSS	Ordinary	0.03	0.00	0.00	0.00	0.03

Table 2B-1
Wetlands Impacted by the Leidy Southeast Expansion Project in Pennsylvania

Wetland ID	Begin MP[a]	End MP[a]	Crossing Length (feet)[b]	Construction Method / Disturbance Type	NWI Classification[c]	State Wetland Classification	Total Wetland Disturbance (Acre)[d]	Emergent Wetland Disturbance (Acre)[e]	Permanent Forested Wetland Disturbance (Acre)[f]	Temporary Forested Wetland Disturbance (Acre)[g]	Scrub-Shrub Wetland Disturbance (Acre)
WW-001-047	68.15	68.15	5.18	TBD	PEM	Intermediate	0.04	0.04	0.00	0.00	0.00
WW-001-049	68.38	68.41	16.54	TBD	PEM	Ordinary	0.05	0.05	0.00	0.00	0.00
						Total Impacts Franklin Loop	**16.24**	**4.37**	**0.64**	**0.65**	**10.58**
Total Number of Wetlands Impacted By Franklin Loop = 31											

[1] Wetland impacts for Dorrance Loop represent 4.11 miles not the current 5.29 miles of the current alignment. These impact numbers will be revised in future filing when workspaces are finalized.

Notes:

[a] MP = milepost

[b] Crossing Length in feet is based upon distance of wetland crossed by the proposed centerline. This reflects the mileposts between which the wetland would be impacted by Project workspaces. The wetland may not be continuously impacted because the wetland boundary may vary in relation to the workspace limit.

[c] NWI Classification

PEM = Palustrine Emergent Wetland

PSS = Palustrine Scrub-Shrub Wetland

PFO = Palustrine Forested Wetland

[d] Total Wetland Disturbance = combined impacts of all cover types in full workspace footprint

[e] Emergent Wetland Disturbance = total impacts to emergent wetlands in full workspace footprint (no differentiation between existing and new permanently maintained ROW)

[f] Permanent Forested Wetland Disturbance = forested wetlands within new permanently maintained ROW

[g] Temporary Forested Wetland Disturbance = forested wetlands within workspace footprint OUTSIDE of new permanently maintained ROW (allowed to revert back to forested wetland after construction)

Table 2B-2
Wetlands Impacted by the Leidy Southeast Expansion Project in New Jersey

Facility Wetland ID[k]	Begin MP[a]	End MP[a]	Crossing Length (feet)[b]	Construction Method / Disturbance Type	NWI Classification[c]	State Wetland Classification[d]	Wetland Disturbance				
							Total Wetland Disturbance (Acre)[e]	Emergent Wetland Disturbance (Acre)[f]	Permanent Forested Wetland Disturbance (Acre)[g]	Temporary Forested Wetland Disturbance (Acre)[h]	Shrub-scrub Wetland Disturbance (Acre)[k]
Pleasant Run Loop											
WW-002-021	0.37	0.38	n/a	TBD	PEM	Ordinary	0.02	0.02	0.00	0.00	0.00
WW-002-022	0.65	0.66	n/a	TBD	PEM	Intermediate	0.02	0.02	0.00	0.00	0.00
WW-002-023	0.96	1.08	197.55	TBD	PEM	Intermediate	0.23	0.23	0.00	0.00	0.00
WW-002-024	1.84	1.84	n/a	TBD	PEM	Intermediate	<0.01	<0.01	0.00	0.00	0.00
WW-002-026	2.26	2.26	n/a	TBD	PEM	Ordinary	<0.01	<0.01	0.00	0.00	0.00
WW-002-027	2.63	2.64	65.33	TBD	PEM	Ordinary	0.11	0.11	0.00	0.00	0.00
WW-002-028	2.96	3.06	485.04	TBD	PEM	Intermediate	0.84	0.84	0.00	0.00	0.00
WW-002-029	3.63	3.63	14.17	TBD	PEM	Ordinary	0.04	0.04	0.00	0.00	0.00
WW-002-030	5.33	5.34	9.54	TBD	PEM	Ordinary	0.02	0.02	0.00	0.00	0.00
WW-002-031	5.42	5.44	n/a	TBD	PEM	Intermediate	0.03	0.03	0.00	0.00	0.00
Total Wetland Impacts Pleasant Run Loop							**1.31**	**1.31**	**0.00**	**0.00**	**0.00**
Total Number of Wetlands Crossed by Pleasant Run Loop = 10											
Skillman Loop											
WW-002-002	1176.90	1776.93	180.54	TBD	PFO	Intermediate	0.21	0.00	0.07	0.14	0.00
WW-002-003	1777.01	1777.09	353.49	TBD	PEM	Intermediate	0.49	0.49	0.00	0.00	0.00
WW-002-005	1777.29	1777.31	93.40	TBD	PEM	Ordinary	0.09	0.09	0.00	0.00	0.00
WW-002-007	1777.66	1777.74	348.28	TBD	PFO	Intermediate	0.74	0.00	0.12	0.61	0.00
WW-002-008	1778.24	1778.24	27.91	TBD	PEM	Ordinary	0.13	0.13	0.00	0.00	0.00
WW-002-009	1778.37	1778.39	71.44	TBD	PFO	Ordinary	0.14	0.00	0.04	0.10	0.00
WW-002-010	1779.00	1779.00	n/a	TBD	PSS	Intermediate	<0.01	0.00	0.00	0.00	<0.01
WW-002-015	1780.43	1780.48	n/a	TBD	PEM	Ordinary	0.07	0.07	0.00	0.00	0.00
WW-002-016	1781.09	1781.10	74.83	TBD	PEM	Ordinary	0.07	0.07	0.00	0.00	0.00
WW-002-017	1780.23	1780.24	28.87	TBD	PEM	Intermediate	0.08	0.08	0.00	0.00	0.00

Table 2B-2
Wetlands Impacted by the Leidy Southeast Expansion Project in New Jersey

Facility Wetland ID[k]	Begin MP[a]	End MP[a]	Crossing Length (feet)[b]	Construction Method / Disturbance Type	NWI Classification[c]	State Wetland Classification[d]	Wetland Disturbance				
							Total Wetland Disturbance (Acre)[e]	Emergent Wetland Disturbance (Acre)[f]	Permanent Forested Wetland Disturbance (Acre)[g]	Temporary Forested Wetland Disturbance (Acre)[h]	Shrub-scrub Wetland Disturbance (Acre)[k]
WW-002-018	1782.46	1782.48	123.64	TBD	PEM	Intermediate	0.14	0.14	0.00	0.00	0.00
WW-002-019	1782.58	1782.66	348.57	TBD	PEM	Ordinary	0.65	0.65	0.00	0.00	0.00
WW-002-020	1782.01	1782.02	n/a	TBD	PEM	Intermediate	<0.01	<0.01	0.00	0.00	0.00
Total Wetland Impacts Skillman Loop							**2.81**	**1.72**	**0.24**	**0.85**	**<0.01**
Total Number of Wetlands Crossed Skillman Loop = 13											

Notes:

[k] (Permanent)refers to impacts that are due to fill at a site

[a] MP = rounded to the nearest hundredth or two decimal places

[b] Crossing Length in feet is based upon distance of wetland crossed by the proposed centerline. This reflects the mileposts between which the wetland would be impacted by Project workspaces. The wetland may not be continuously impacted because the wetland boundary may vary in relation to the workspace limit.

[c] NWI Classification

PEM = Palustrine Emergent Wetland

PSS = Palustrine Scrub-Shrub Wetland

PFO = Palustrine Forested Wetland

* Some wetlands are listed for more than one facility.

Based on discussions with NJDEP, a wetland transition area waiver is not required for any project components where wetlands will be directly affected. Consequently, wetland transition area impacts have been removed from this table revision.

Wetland Disturbance

[e] Total Wetland Disturbance = combined impacts of all cover types in full workspace footprint

[f] Emergent Wetland Disturbance = total impacts to emergent wetlands in full workspace footprint (no differentiation between existing and new permanent ROW)

[g] Permanent Forested Wetland Disturbance = forested wetlands within new proposed maintained ROW

[h] Temporary Forested Wetland Disturbance = forested wetlands within workspace footprint OUTSIDE of new proposed maintained ROW (so allowed to revert back to forested wetland after construction)

Appendix 2C

Transco Wetland and Waterbody Construction and Mitigation Procedures

and

Summary of Modifications to FERC Procedures

To be submitted with Transco’s FERC Application.

Appendix 2D

Spill Prevention, Control, and Countermeasures Plan

To be submitted with Transco’s FERC Application.

Appendix 2E

Agency Correspondence

From: Heins, Lindsay
To: "Shervinskie, Thomas"
Subject: Transco Leidy SE Expansion Stream Crossing Windows
Date: Thursday, July 18, 2013 4:41:00 PM
Attachments: PA Streams.docx

Mr. Shervinskie,

In the past you have assisted my colleagues with identification of stream crossing windows for projects in Pennsylvania, and I am hoping you can provide me with a similar stream review to make sure I have the correct timing restrictions. The project is Transcontinental Gas Pipe Line Company's Leidy Southeast Expansion Project, and includes two pipeline loops in PA. The loops are the Dorrance Loop in Luzerne County and the Franklin Loop in Luzerne and Monroe Counties.

Attached is a table listing the stream crossings, and topographic maps showing the locations of the loops. I would appreciate your feedback on these timing restrictions.

Please let me know if you would like any additional information.

Thanks,

Lindsay Heins
Ecology and Environment, Inc.
368 Pleasant View Drive
Lancaster, NY 14086
Phone: 716-684-8060 Ext: 2606 | Cell: 801-875-2589
lheins@ene.com | www.ene.com

Table 2A-1
Water Bodies Crossed by the Leidy Southeast Expansion Project in Pennsylvania

M.P. [a]	Feature ID	Waterbody Name	Water Quality Classification and/or PAFBC Fishery Type [b]	FERC Classification [c]	Flow Regime	Bankfull Width (feet) [d]	Temporary Stream Disturbance Area (acres)	Proposed Crossing Method	Timing Restriction [e]
Dorrance Loop									
18.44	SS-001-001	Unnamed Tributary to Little Wapwallopen Creek	CWF, MF	Minor	Perennial	8	0.02	Flowing, dry ditch, dam-and-pump, or dry-flumed	October 1 – May 31
18.66	SS-001-002	Unnamed Tributary to Little Wapwallopen Creek	CWF, MF	Minor	Intermittent	6	0.01	Non-flowing Open-Cut	October 1 – May 31
18.67	SS-001-003	Unnamed Tributary to Little Wapwallopen Creek	CWF, MF	Minor	Perennial	3	0.01	Flowing, dry ditch, dam-and-pump, or dry-flumed	October 1 – May 31
18.83	SS-001-004	Little Wapwallopen Creek	CWF, MF	Intermediate	Perennial	35	0.04	Flowing, dry ditch, dam-and-pump, or dry-flumed	October 1 – May 31
18.92	SS-001-005	Unnamed Tributary to Little Wapwallopen Creek	CWF, MF	Intermediate	Perennial	10	0.03	Flowing, dry ditch, dam-and-pump, or dry-flumed	October 1 – May 31
19.10	SS-001-006	Unnamed Tributary to Little Wapwallopen Creek	CWF, MF	Minor	Perennial	4	0.06	Flowing, dry ditch, dam-and-pump, or dry-flumed	October 1 – May 31
19.45	SS-001-007	Unnamed Tributary to Little Wapwallopen Creek	CWF, MF	Minor	Perennial	8	0.02	Flowing, dry ditch, dam-and-pump, or dry-flumed	October 1 – May 31
20.84	SS-001-008	Little Wapwallopen Creek	CWF, MF	Intermediate	Perennial	35	0.06	Flowing, dry ditch, dam-and-pump, or dry-flumed	October 1 – May 31
21.78	SS-001-009	Unnamed Tributary to Little Wapwallopen Creek	CWF, MF	Intermediate	Perennial	15	0.04	Flowing, dry ditch, dam-and-pump, or dry-flumed	October 1 – May 31
						Dorrance Total	**0.29**		
Franklin Loop									

Table 2A-1
Water Bodies Crossed by the Leidy Southeast Expansion Project in Pennsylvania

M.P. [a]	Feature ID	Waterbody Name	Water Quality Classification and/or PAFBC Fishery Type [b]	FERC Classification [c]	Flow Regime	Bankfull Width (feet) [d]	Temporary Stream Disturbance Area (acres)	Proposed Crossing Method	Timing Restriction [e]
58.40	SS-001-010	Tunkhannock Creek	HQ-CWF, MF	Intermediate	Perennial	30	0.11	Flowing, dry ditch, dam-and-pump, or dry-flumed	October 1 – May 31
58.66	SS-001-011	Unnamed Tributary to Tunkhannock Creek	HQ-CWF, MF	Minor	Perennial	9	0.07	Flowing, dry ditch, dam-and-pump, or dry-flumed	October 1 – May 31
58.62	SS-001-011A	Unnamed Tributary to Tunkhannock Creek	HQ-CWF, MF	Minor	Intermittent	4	<0.01	Non-flowing Open-Cut	October 1 – May 31
58.80	SS-001-012	Unnamed Tributary to Tunkhannock Creek	HQ-CWF, MF	Minor	Intermittent	6	0.02	Non-flowing Open-Cut	October 1 – May 31
59.21	SS-001-013	Unnamed Tributary to Tunkhannock Creek	HQ-CWF, MF	Minor	Ephemeral	3	0.01	Non-flowing Open-Cut	October 1 – May 31
59.45	SS-001-014A	Unnamed Tributary to Tunkhannock Creek	HQ-CWF, MF	Minor	Perennial	3	0.07	Flowing, dry ditch, dam-and-pump, or dry-flumed	October 1 – May 31
59.54	SS-001-014B	Unnamed Tributary to Tunkhannock Creek	HQ-CWF, MF	Minor	Ephemeral	4	<0.01	Non-flowing Open-Cut	October 1 – May 31
59.59	SS-001-014	Unnamed Tributary to Tunkhannock Creek	HQ-CWF, MF	Minor	Perennial	10	0.07	Flowing, dry ditch, dam-and-pump, or dry-flumed	October 1 – May 31
60.13	SS-001-020	Unnamed Tributary to Tobyhanna Creek	HQ-CWF, MF	Intermediate	Perennial	11	0.05	Flowing, dry ditch, dam-and-pump, or dry-flumed	October 1 – May 31
61.03	SS-001-015	Tobyhanna Creek	HQ-CWF, MF	Intermediate	Perennial	70	0.24	Flowing, dry ditch, dam-and-pump, or dry-flumed	October 1 – May 31
61.28	SS-001-016	Unnamed Tributary to Tobyhanna Creek	HQ-CWF, MF	Minor	Ephemeral	8	0.10	Non-flowing Open-Cut	October 1 – May 31
62.28	SS-001-018	Unnamed Tributary to Two Mile Run	HQ-CWF, MF	Minor	Perennial	3	0.01	Flowing, dry ditch, dam-and-pump, or dry-flumed	October 1 – May 31

Table 2A-1
Water Bodies Crossed by the Leidy Southeast Expansion Project in Pennsylvania

M.P. [a]	Feature ID	Waterbody Name	Water Quality Classification and/or PAFBC Fishery Type [b]	FERC Classification [c]	Flow Regime	Bankfull Width (feet) [d]	Temporary Stream Disturbance Area (acres)	Proposed Crossing Method	Timing Restriction [e]
63.09	SS-001-021	Two Mile Run	HQ-CWF, MF	Minor	Perennial	15	0.04	Flowing, dry ditch, dam-and-pump, or dry-flumed	October 1 through April 1
63.25	SS-001-022	Unnamed Tributary to Two Mile Run	HQ-CWF, MF	Minor	Ephemeral	5	0.01	Non-flowing Open-Cut	October 1 through April 1
63.74	SS-001-024	Stony Run	HQ-CWF, MF	Minor	Perennial	11	0.02	Flowing, dry ditch, dam-and-pump, or dry-flumed	October 1 through April 1
64.95	SS-001-025	Unnamed Tributary to Lehigh River	EV, MF	Minor	Perennial	9	0.02	Flowing, dry ditch, dam-and-pump, or dry-flumed	March 1 – June 15 and October 1 – December 31
65.50	SS-001-026	Lehigh River	EV, MF/ WTS	Intermediate	Perennial	55	0.30	Flowing, dry ditch, dam-and-pump, or dry-flumed	March 1 – June 15 and October 1 – December 31
65.89	SS-001-027	Unnamed Tributary to Lehigh River	EV, MF	Minor	Perennial	3	0.01	Flowing, dry ditch, dam-and-pump, or dry-flumed	March 1 – June 15 and October 1 – December 31
66.68	SS-001-028	Unnamed Tributary to Kendall Creek	EV, MF	Minor	Ephemeral	4	0.01	Flowing, dry ditch, dam-and-pump, or dry-flumed	March 1 – June 15 and October 1 – December 31
66.70	SS-001-028A	Unnamed Tributary to Kendall Creek	EV, MF	Minor	Perennial	4	0.01	Flowing, dry ditch, dam-and-pump, or dry-flumed	March 1 – June 15 and October 1 – December 31
67.45	SS-001-029	Kendall Creek	EV, MF/ WTS	Minor	Intermittent	5	0.03	Non-flowing Open-Cut	March 1 – June 15 and October 1 – December 31
67.70	SS-001-030	Unnamed Tributary to Kendall Creek	EV, MF	Minor	Perennial	6	0.05	Flowing, dry ditch, dam-and-pump, or dry-flumed	March 1 – June 15 and October 1 – December 31
67.84	SS-001-031	Unnamed Tributary to Stony Run	HQ-CWF, MF	Minor	Perennial	15	0.02	Flowing, dry ditch, dam-and-pump, or dry-flumed	October 1 through April 1

Table 2A-1
Water Bodies Crossed by the Leidy Southeast Expansion Project in Pennsylvania

M.P. [a]	Feature ID	Waterbody Name	Water Quality Classification and/or PAFBC Fishery Type [b]	FERC Classification [c]	Flow Regime	Bankfull Width (feet) [d]	Temporary Stream Disturbance Area (acres)	Proposed Crossing Method	Timing Restriction [e]
67.95	SS-001-032	Unnamed Tributary to Stony Run	HQ-CWF, MF	Minor	Perennial	9	0.02	Flowing, dry ditch, dam-and-pump, or dry-flumed	October 1 through April 1
68.15	SS-001-032	Unnamed Tributary to Stony Run	HQ-CWF, MF	Minor	Perennial	9	0.03	Flowing, dry ditch, dam-and-pump, or dry-flumed	October 1 through April 1
						Franklin Total	**1.32**		

Notes:

[a] Mileposting as indicated based on alignment sheet (see Mapping Supplement, Volume 3)

[b] Pennsylvania Chapter 93 Water Quality Classification
- TSF - Trout-stocked Fishery
- CWF - Cold water fishery
- MF - Migratory fishery
- HQ-CWF - High quality, Cold water fishery
- EV – Exceptional Value

Pennsylvania Fish and Boat Commission (PAFBC) Fishery Type
- PAFBC TSF – Included in PAFBC's trout stocking program and subject to timing restriction
- WTS - Wild Trout Stream
- Class A WTS – Class A Wild Trout Stream

c FERC classification

Minor – All waterbodies less than or equal to 10 feet wide at the water's edge at the time of crossing.

Intermediate – All waterbodies greater than 10 feet wide but less than 100 feet wide at the water's edge at the time of crossing.

Major – All waterbodies greater than 100 feet wide at the water's edge at the time of crossing.

d Crossing Width is the distance from top of bank to top of bank

e Timing restrictions will be confirmed through consultation with Pennsylvania Fish & Boat Commission Refer to Resource Report 3.

From: Heins, Lindsay
To: "Shervinskie, Thomas"
Subject: Transco Leidy SE Expansion Stream Crossing Windows
Date: Thursday, July 18, 2013 4:41:00 PM
Attachments: PA Streams.docx

Mr. Shervinskie,

In the past you have assisted my colleagues with identification of stream crossing windows for projects in Pennsylvania, and I am hoping you can provide me with a similar stream review to make sure I have the correct timing restrictions. The project is Transcontinental Gas Pipe Line Company's Leidy Southeast Expansion Project, and includes two pipeline loops in PA. The loops are the Dorrance Loop in Luzerne County and the Franklin Loop in Luzerne and Monroe Counties.

Attached is a table listing the stream crossings, and topographic maps showing the locations of the loops. I would appreciate your feedback on these timing restrictions.

Please let me know if you would like any additional information.

Thanks,

Lindsay Heins
Ecology and Environment, Inc.
368 Pleasant View Drive
Lancaster, NY 14086
Phone: 716-684-8060 Ext: 2606 | Cell: 801-875-2589
lheins@ene.com | www.ene.com

Appendix 2F

Wetland Delineation Report – Pennsylvania Facilities

To be submitted with Transco’s FERC Application.

Appendix 2G

Wetland Delineation Report – New Jersey Facilities

To be submitted with Transco’s FERC Application.

Appendix 2H

Groundwater Mitigation Plan

To be submitted with Transco’s FERC Application.

Appendix I

Wetland Restoration Plan

To be submitted with Transco’s FERC Application.