



PennEast Pipeline Company, LLC

PENNEAST PIPELINE PROJECT

Project Description

Revised March 2020



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Acronym List

ac	acres
Adelphia	Adelphia Gateway, LLC
Algonquin	Algonquin Gas Transmission, LLC
ANSI	American National Standards Institute
API	American Petroleum Institute
ASME	American Society of Mechanical Engineers
ATWS	additional temporary workspace
Blue Mountain	UGI Central Penn Gas, Inc.
BMP	best management practice
BO	Biological Opinion
CFR	Code of Federal Regulations
Concentric	Concentric Energy Advisors
CWA	Clean Water Act
CWS	construction workspace
dbh	diameter-at-breast-height
Dth/Day	dekatherms per day
E&SCP	Erosion and Sediment Control Plan
ESCGP	Erosion and Sediment Control General Permit
ETG	Elizabethtown Gas
FERC	Federal Energy Regulatory Commission
HDD	horizontal directional drill
hp	horsepower
ISO	International Standards Organization
JPA	Joint Permit Application
LDC	local gas distribution companies
mi	miles
MLV	mainline valve
MP	milepost
NEPA	National Environmental Policy Act
New Jersey Authorizations	Certain governmental authorizations and certain real property rights for the Project facilities proposed to be constructed in New Jersey
NJDEP	New Jersey Department of Environmental Protection
NMFS	National Marine Fisheries Service
O&M	operation and maintenance
PADEP	Pennsylvania Department of Environmental Protection
PADCNR	Pennsylvania Department of Conservation and Natural Resources
PAG-10	Hydrostatic Testing Discharge General Permits
PAR	permanent access road
PPC	Preparedness, Prevention, and Contingency
PennEast	PennEast Pipeline Company, LLC
PCSM	post-construction stormwater management
PFBC	Pennsylvania Fish and Boat Commission
PGC	Pennsylvania Game Commission
PHMC	Pennsylvania Historical and Museum Commission
PNDI	Pennsylvania Natural Diversity Inventory



Project	PennEast Pipeline Project
PSEG	Public Service Enterprise Group
ROW	right-of-way
RQBTS	Recognized Qualified Bog Turtle Surveyor
SCADA	Supervisory Control and Data Acquisition
South Jersey	South Jersey Gas Company
SR	State Route
T&E	threatened and endangered
TAR	temporary access road
Tcf	trillion cubic feet
TCO	Columbia Gas Transmission
Texas Eastern	Texas Eastern Transmission, LP
Transco	Transcontinental Gas Pipe Line Company, LLC
TWS	temporary workspace
UGI-LEH	UGI Utilities, Inc.
UGIES	UGI Energy Services, Inc.
USACE	U.S. Army Corps of Engineers
USEIA	U.S. Energy Information Administration
USDOT	U.S. Department of Transportation
WQC	Water Quality Certification

1.0 GENERAL PROJECT DESCRIPTION

PennEast Pipeline Company, LLC (PennEast) is proposing the PennEast Pipeline Project (Project). The Project will entail the construction of approximately 115 miles of 36-inch diameter pipeline from Luzerne County, Pennsylvania to Mercer County, New Jersey. The Blue Mountain Lateral, an approximately 0.5-mile lateral of 4-inch diameter pipe, will be constructed in Carbon County, Pennsylvania. This lateral will serve as an interconnect with UGI Central Penn Gas, Inc. (Blue Mountain). The Hellertown Lateral, an approximately 2.1-mile lateral of 24-inch diameter pipe, will be constructed in Northampton County, Pennsylvania. This lateral will serve as an Interconnect with UGI Utilities, Inc. (UGI-LEH). The Gilbert Lateral, an approximately 0.6-mile lateral of 12-inch diameter pipe, will be constructed in Hunterdon County, New Jersey. This lateral will serve as an Interconnect with Elizabethtown Gas (ETG) and Gilbert (NRG REMA, LLC). The Lambertville Lateral, an approximately 1.4-mile lateral of 36-inch diameter pipe, will be constructed in Hunterdon County, New Jersey. This lateral will serve as an Interconnect with Algonquin Gas Transmission, LLC (Algonquin) and Texas Eastern Transmission, LP (Texas Eastern). Additionally, the Church Road Interconnects will be installed on the PennEast Mainline Pipeline in Northampton County, Pennsylvania, to provide service to Columbia Gas Transmission (TCO) and Adelphia Gateway, LLC (Adelphia). The associated aboveground infrastructure for the Project will consist of interconnect meter stations, mainline valves (MLV), and a single compressor station and their appurtenant facilities and equipment (e.g., pig launchers/receivers, milepost markers, cathodic protection test posts, etc.).

The Federal Energy Regulatory Commission (FERC) is the designated lead agency for the Project. On September 24, 2015, PennEast filed an application with the FERC for a Certificate of Public Convenience and Necessity. FERC, through its National Environmental Policy Act (NEPA) guidelines, has consulted with appropriate agencies on endangered species, historic properties, essential fish habitat, and migratory birds. FERC also evaluated alternatives for the Project, including the No Action alternative, system alternatives, and route alternatives. An Order Issuing Certificate was issued by FERC on January 19, 2018, granting the requested authorizations based on their determination that the Project meets the requirements of their guidelines. PennEast filed an Amendment Application in February 2019 that included route and workspace changes, which were included in PennEast's December 2018 JPAs and ESCGP Application. FERC issued a Certificate Order for the 2019 Amendment Application on March 19, 2020. PennEast filed an additional Amendment Application in January 2020 for a new aboveground facility and staging Project construction, changes which are discussed in PennEast's March 2020 JPA Supplements. As of March 2020, this application is still under FERC's review.

On February 5, 2016, PennEast submitted a Water and Obstruction Encroachment Permit [Joint Permit Application (JPA)] to the Pennsylvania Department of Environmental Protection (PADEP) for review and coordination of the Title 25 Chapter 105 Dam Safety and Waterway Management and to the U.S. Army Corps of Engineers (USACE) Philadelphia and Baltimore Districts for compliance with the Clean Water Act (CWA) Section 404. Since February 2016, the Project design has evolved to further avoid and minimize impacts to sensitive resources and to address stakeholder requests. An October 2019 revision to the Project Description included details regarding the components of the Project located within the state of Pennsylvania. This Project Description, revised March 2020, provides details on the proposed staging of Project construction and addition of the Church Road Interconnects. Impacts associated with the New Jersey portion of the Project will be reviewed by the New Jersey Department of Environmental Protection (NJDEP) as part of separate permit applications.

1.1 PROPOSED FACILITIES

1.1.1 Purpose and Need (for the entire Project)

PennEast proposes to construct, install, and operate the Project facilities to provide approximately 1.1 million dekatherms per day (Dth/Day) of year-round transportation service from northern Pennsylvania to markets in New Jersey, eastern and southeastern Pennsylvania, and surrounding states.

The Project facilities include a 36-inch diameter, 115-mile mainline pipeline, extending from Luzerne County, Pennsylvania, to Mercer County, New Jersey. The Project will extend from various receipt point interconnections in the eastern Marcellus region including interconnections with: Transcontinental Gas Pipe Line Company, LLC (Transco) and gathering systems operated by Williams Partners L.P., Energy Transfer Partners, L.P. (formerly Regency Energy Partners, LP), and UGI Energy Services, LLC (UGIES), all in Luzerne County, Pennsylvania, to various delivery point interconnections in the heart of major northeastern natural gas-consuming markets, including interconnections with UGI Central Penn Gas, Inc. in Carbon County, Pennsylvania; UGI-LEH, TCO, and Adelphia in Northampton County, Pennsylvania; and ETG, NRG REMA, LLC, Texas Eastern, and Algonquin in Hunterdon County, New Jersey. The terminus of the proposed PennEast system will be located at a delivery point with Transco in Mercer County, New Jersey.

The Project was developed in response to market demands in New Jersey and Pennsylvania, and interest from shippers that require transportation capacity to accommodate increased demand and greater reliability of natural gas in the region. The Project will include a new pipeline and aboveground facilities that will provide a new source of natural gas supply from the Marcellus Shale producing region to New Jersey, Pennsylvania and surrounding states, enhancing the region's supply diversity. The Project is designed to serve markets in the region with firm, reliable access to the Marcellus supplies versus the traditional, more costly Gulf Coast regional supplies and pipeline pathways. An additional supply of natural gas to the region will provide a benefit to consumers, utilities, and electric generators by providing enhanced competition among suppliers and pipeline transportation providers. The Project will satisfy the needs of shippers seeking (i) additional supply flexibility, diversity and reliability; (ii) liquid points for trading in locally produced gas from the Marcellus Shale and the Utica Shale; (iii) direct access to premium markets in the northeast and mid-Atlantic regions; (iv) the ability to capture pricing differentials between the various interconnected market pipelines; (iv) enhanced natural gas transportation system reliability to the region with modern, state-of-the art facilities and (v) firm access to currently the most affordable long-lived dry gas reserves. The Project will provide shippers additional opportunities to buy and sell supplies and to transport natural gas to where it is needed and valued most. The Project also offers shippers a reliable, short-haul transportation option for direct access to Marcellus Shale natural gas supplies absent several risks associated with long-haul pipelines originating and traversing other regions of the country.

PennEast has encountered regulatory and property rights acquisition delays in New Jersey (the New Jersey Authorizations), which has the potential to delay completion of the Project and prevent natural gas providers from meeting market demands. To mitigate these delays, PennEast will construct the Project in two stages to allow PennEast to provide up to 650,000 Dth/Day of firm transportation service through approximately MP 68.2R3 in Northampton County, Pennsylvania. By staging the construction, PennEast will be able to construct and operate the portion of the pipeline and associated facilities and appurtenances north of MP

68.2R3, independent of those proposed as part of the construction of the second stage of construction south of MP 68.2R3, and meet its long-term firm service commitments. As such, the proposed construction activities for the first construction phase are a stand-alone project and are not dependent on construction of the second stage. Upon receipt of the New Jersey Authorizations, PennEast will construct and operate the pipeline and associated facilities and appurtenances south of MP 68.2R3.

1.1.1.1 Energy Market Outlook

The U.S. Energy Information Administration (USEIA) issues annual outlook assessments that provide modeled projections of domestic energy markets into the future. The EIA develops these projections using several scenarios; the “Reference case” projections assume trend improvement in known technologies along with a view of economic and demographic trends reflecting the current views of leading economic forecasters and demographers. The Reference case generally assumes that current laws and regulations affecting the energy sector, including sunset dates for laws that have them, are unchanged throughout the projection period. The potential impacts of proposed legislation, regulations, and standards are not included. EIA addresses the uncertainty inherent in energy projections by developing side cases with different assumptions of macroeconomic growth, world oil prices, technological progress, and energy policies. A review of the Annual Energy Outlook 2018 (EIA 2018) Reference case indicates that natural gas consumption is projected to rise from 27.50 trillion cubic feet (Tcf) in 2016 to 34.48 Tcf in 2050.

The pipeline capacity that PennEast will create will not simply provide additional supply to the nearby markets; it will provide new supply sources as well. The winters of 2013/2014 and 2017/2018 demonstrated that there were significant constraints in the natural gas supply system created by a combination of increased demand from residential, commercial and industrial conversions; cold weather affecting traditional demand; lower than average storage inventories; and new natural-gas fired power generation. While natural gas prices have steeply declined over the last several years, constraints between supply and demand areas due to lack of sufficient pipeline capacity, particularly on days where demand is highest, led to unprecedented spikes in the cost of natural gas and electricity for the market region as illustrated in Figures 1.1-1 and 1.1-2. The region would therefore benefit from additional pipeline capacity to mitigate the higher and volatile pricing.

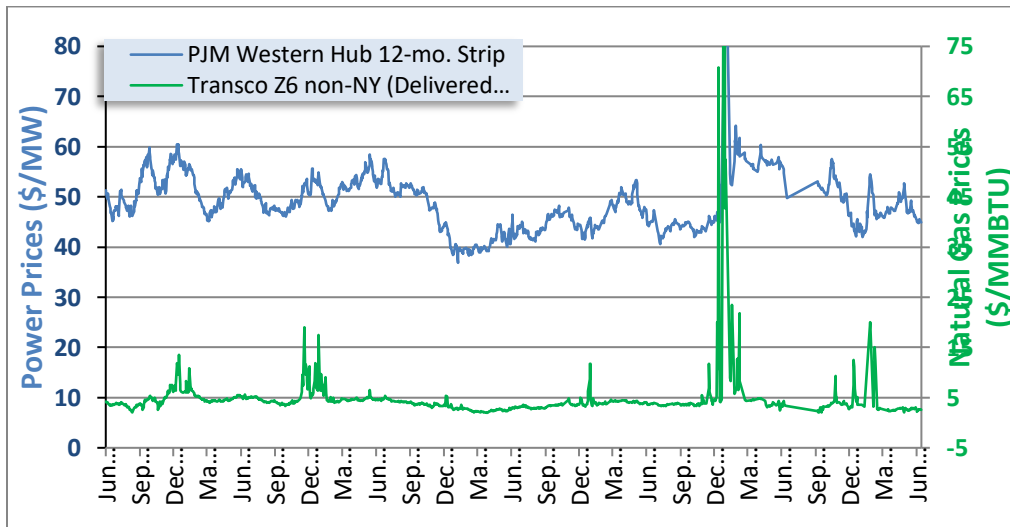
Concentric Energy Advisors (Concentric) performed a study titled “Estimated Energy Market Savings from Additional Pipeline Infrastructure Serving Eastern Pennsylvania and New Jersey¹” that conservatively estimates the energy consumers in New Jersey and Pennsylvania could have saved approximately \$890 million annually if 1 billion cubic feet per day (1 Bcf/d) of additional capacity, such as that offered by PennEast, had been available to deliver additional natural gas supplies to the region in the 2013/2014 winter. Concentric updated the analysis after the 2017/2018 winter and estimated that Pennsylvania and New Jersey energy consumers could have saved an additional \$435 million in the winter of 2017/2018, had an additional

¹ Concentric, March 2015, Estimated Energy Market Savings from Additional Pipeline Infrastructure Serving Eastern Pennsylvania and New Jersey.

Bcf/d of pipeline capacity been available². These savings would take form by way of increased disposable income to families and businesses.

Concentric evaluated four primary areas where energy cost savings could have been achieved due to the availability of an additional 1 Bcf/d of pipeline capacity during the 2013/2014 and 2017/2018 winters. These areas of saving included gas-fired power generation, oil-fired power generation displacement, industrial gas transportation, and local gas distribution companies (LDC). As shown in Figure 1.1-3, electric consumers in Pennsylvania and New Jersey could have saved approximately \$246 million during the 2017/2018 winter, and natural gas consumers could have saved approximately \$189 million.

**Figure 1.1-1
Regional Power and Natural Gas Price Spike in Winter 2013/2014³**



² Concentric, April 2018, Estimated Energy Market Savings from Additional Pipeline Infrastructure Serving Eastern Pennsylvania and New Jersey

³ Concentric, March 2015, Estimated Energy Market Savings from Additional Pipeline Infrastructure Serving Eastern Pennsylvania and New Jersey.

Figure 1.1-2
Daily Spot Natural Gas Prices – Winter 2017/2018⁴

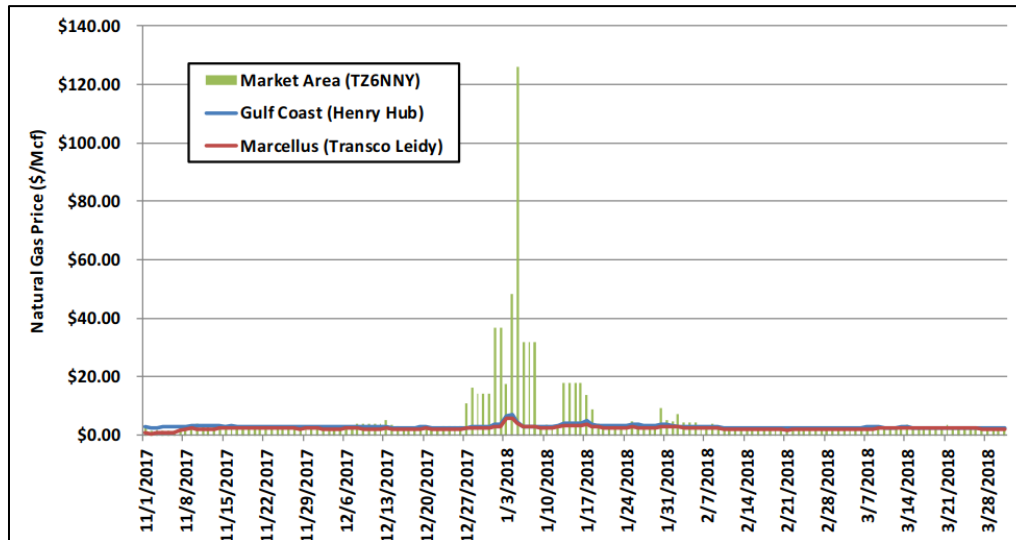


Figure 1.1-3
Estimated Savings if an Additional 1 Bcf/d of Pipeline Capacity Had Been Available for the Winter of 2017/2018⁵

(All figures in \$Millions)	Eastern Pennsylvania	New Jersey	Total
Electric Market Savings			
Gas-Fired Generation	\$ 138	\$ 100	\$ 238
Oil-Fired Generation Displacement	\$ 5	\$ 3	\$ 8
Subtotal	\$ 143	\$ 104	\$ 246
Gas Market Savings			
LDC Gas Supply Procurement	\$ 15	\$ 30	\$ 45
Industrial Transportation Customer	\$ 106	\$ 37	\$ 144
Subtotal	\$ 121	\$ 67	\$ 189
Total Estimated Savings:	\$ 264	\$ 171	\$ 435

The lack of a new pipeline with access to supply sources in Pennsylvania combined with increasing demand throughout the region will continue to create dramatic seasonal price fluctuations in New Jersey,

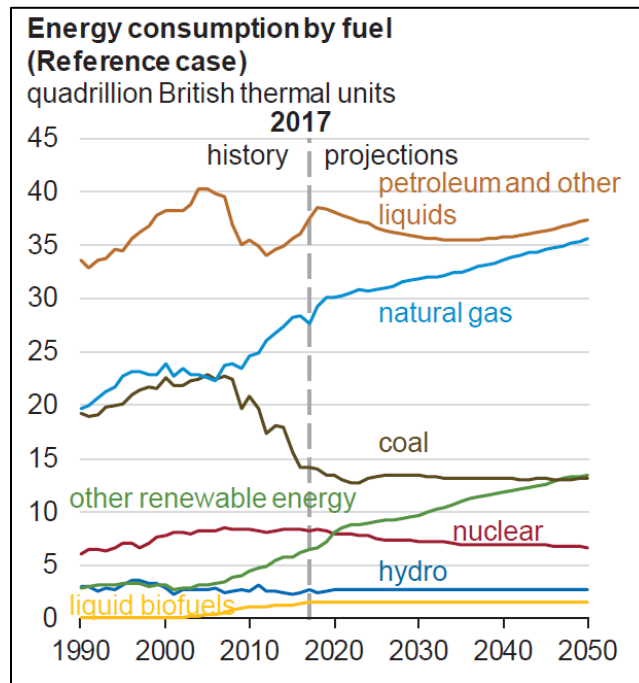
⁴ Concentric, April 2018, Estimated Energy Market Savings from Additional Pipeline Infrastructure Serving Eastern Pennsylvania and New Jersey

⁵ Concentric, April 2018, Estimated Energy Market Savings from Additional Pipeline Infrastructure Serving Eastern Pennsylvania and New Jersey

Pennsylvania, and surrounding states with higher gas and electric rates and an increased potential for energy shortages during peak demand, resulting in threats to business continuity, public safety and national security. Failure to add critical new infrastructure will also prevent these markets from fully realizing the economic benefit of lower-cost energy supply. Continued increases in demand for natural gas across all market sectors, particularly for natural gas-fired power generation, conversions from other fossil fuels and increased usage in the transportation markets will further exacerbate this problem or otherwise not be met if new infrastructure is not constructed. Higher energy prices reduce disposable income for residents and increase operating costs. This decreases competitiveness for businesses and upward pressure on personal income tax rates resulting from lower business income tax base. Accordingly, the Project is designed to bring the lowest cost natural gas available in the country to homes and businesses and to provide low-cost fuel to power generation that supplies New Jersey, Pennsylvania and surrounding states well beyond the Project footprint.

Figures 1.1-4 and 1.1-5 illustrate the continued increasing importance of natural gas as part of the country’s overall fuel mix as well as the continued increase of natural gas fired generation expected between 2018 and 2050. Figure 1.1-6 shows the PJM generation fuel mix as of July 2018. As shown in the graphic, natural gas represents the largest fuel type utilized for electric generation in the PJM region.

Figure 1.1-4⁶
Energy Consumption by Fuel – Projected to 2050 (Reference Case)

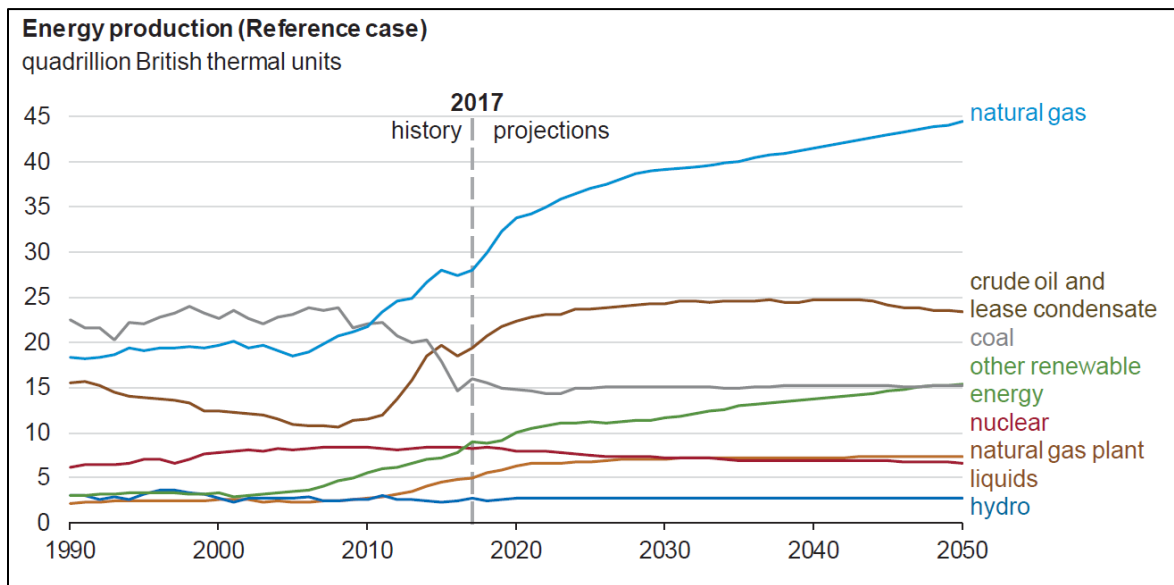


⁶ Energy Information Administration, Annual Energy Outlook 2018

Figure 1.1-4 highlights the projected increase in natural gas on an absolute basis (non-hydroelectric renewables are projected to grow the most on a percentage basis) across all market sectors (i.e., electric power, industrial, transportation, residential, and commercial). According to the Annual Energy Outlook 2018, the industrial sector accounts for the most growth in natural gas consumption, with expanding use in the chemical industries; for industrial heat and power; and for liquefied natural gas production. Natural gas consumption also increases significantly in the power sector as a result of the scheduled expiration of renewables tax credits in the mid-2020s (EIA 2018).

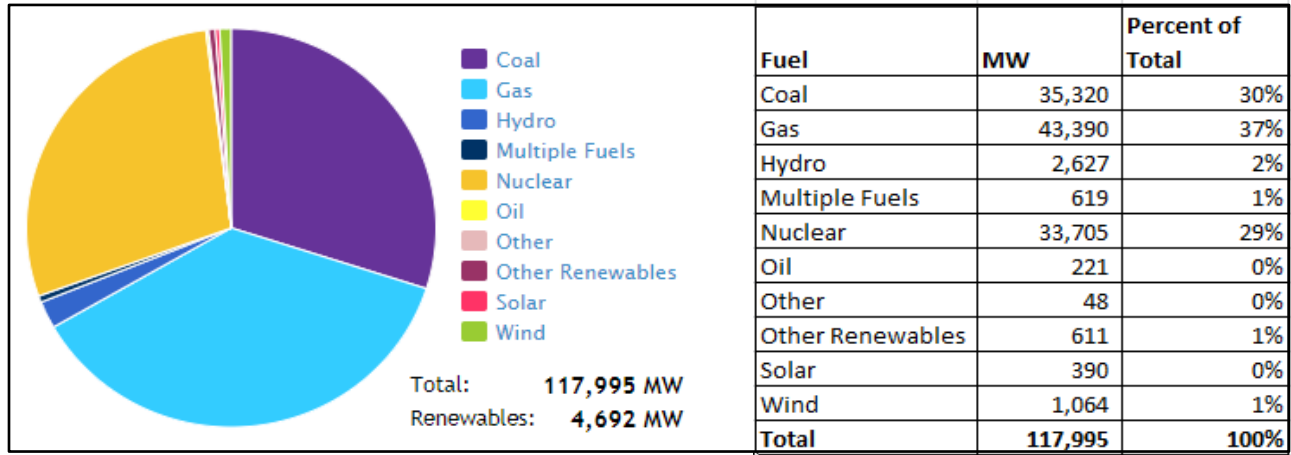
Figure 1.1-5, below, displays the projected energy production by fuel. Again, natural gas accounts for the largest share of total energy production, while renewables other than hydropower are projected to grow the most on a percentage basis. According to the Annual Energy Outlook 2018, natural gas production accounts for nearly 39% of U.S. energy production by 2050 in the Reference case. Production from shale gas and tight oil plays as a share of total U.S. natural gas production is projected to continue to grow because of the large size of the associated resources (EIA 2018).

Figure 1.1-5⁷
Projected Energy Production Fuel Mix – By 2050 (Reference Case)



⁷ Energy Information Administration, Annual Energy Outlook 2014

**Figure 1.1-6
PJM Capacity Fuel Mix – July 2018⁸**



In addition to the long-term benefits offered by the Project, such as enhanced system reliability, supply diversity, modernization of the natural gas infrastructure system, and significant consumer savings, there are also significant short-term benefits provided by the Project. The design, construction, and engineering phases of the Project are expected to produce a significant economic benefit/boom to the region. Drexel University’s highly renowned School of Economics and Econsult Solutions constructed a standard input-output model of the Project’s expenditures. The study, titled “PennEast Pipeline Project Economic Impact Analysis” estimates over \$1.6 billion in economic benefits, 12,160 jobs supported from the investment and \$740 million in labor income generated from Project’s design and construction. Importantly, Drexel and Econsult also estimated for every \$10 million in increased disposable income resulting from reduced energy costs, this would generate a total economic impact of \$13.5 million and support 90 jobs. Therefore, combined with the \$893 million of potential annual energy savings estimated by Concentric as described earlier, PennEast represents a potential ongoing annual economic benefit of \$1.21 billion and 8,041 jobs to the region. Therefore, the proposed Project will help to spur economic growth in New Jersey, Pennsylvania and surrounding states by providing an abundant supply of low-cost energy, making the region more competitive.

1.1.2 Location and Description of Facilities

1.1.2.1 Pipeline Facilities in Pennsylvania

More than half of the 36-inch diameter new pipeline Mainline is located in Pennsylvania as well as the 4-inch diameter Blue Mountain Lateral and the 24-inch diameter Hellertown Lateral. These pipeline facilities are summarized on Table 1.1-2, which provides the proposed Project’s pipeline installations, pipeline diameter, approximate length, milepost (MP), and county. Table 1.1-3 provides the proposed Project’s mainline installations by municipality and county. Table 1.1-4 identifies the latitude / longitude at each

⁸ PJM 2018

point where the pipeline crosses a county boundary. The Project location map in Section I of the JPA shows the regional location of the Project.

- The PennEast mainline route pipeline will be an approximately 115-mile long new pipeline starting in Luzerne County, Pennsylvania and extending to Mercer County, New Jersey. Approximately 77.5 miles of the mainline route pipeline is located in Pennsylvania. Pennsylvania counties traversed include Luzerne, Carbon, Monroe, Northampton, and Bucks.
- The 4-inch diameter Blue Mountain Lateral will be an approximately 0.5-mile new pipeline in Carbon County, Pennsylvania.
- The 24-inch diameter Hellertown Lateral will be an approximately 2.1-mile new pipeline in Northampton County, Pennsylvania.

**Table 1.1-1
Pipeline Facilities in Pennsylvania**

Facility	Pipeline Diameter and Type	Approx. Length* (miles)	Begin MP	End MP ¹	State	County
PennEast Mainline Route	36-inch new pipeline	77.5	0.0	77.7	PA	Luzerne, Carbon, Monroe, Northampton, Bucks
Blue Mountain Lateral	4-inch new pipeline	0.5	0.0	BL-0.51R3	PA	Carbon
Hellertown Lateral	24-inch new pipeline	2.1	0.0	HL-2.14R2	PA	Northampton

¹MP = milepost; MPs shown are based on alignment sheet information. Approximate mileage may be slightly off due to rounding and station equations.

**Table 1.1-2
Mainline Pipeline by Pennsylvania Municipality**

Township	Approximate Mileage ¹	County
<i>PennEast Mainline</i>		
Dallas Twp	1.2	Luzerne
Kingston Twp	3.0	Luzerne
West Wyoming Boro	1.9	Luzerne
Wyoming Boro	1.1	Luzerne
Jenkins Twp	1.0	Luzerne
Plains Twp	4.5	Luzerne
Bear Creek Twp	10.4	Luzerne
Kidder Twp	10.2	Carbon

Township	Approximate Mileage¹	County
Penn Forest Twp	7.7	Carbon
Towamensing Twp	6.4	Carbon
Lower Towamensing Twp	3.7	Carbon
Eldred Twp	1.0	Monroe
Moore Twp	7.6	Northampton
East Allen Twp	0.8	Northampton
Upper Nazareth Twp	3.0	Northampton
Lower Nazareth Twp	3.2	Northampton
Bethlehem Twp	4.1	Northampton
Easton City	0.1	Northampton
Lower Saucon Twp	1.3	Northampton
Williams Twp	3.6	Northampton
Durham Twp	1.5	Bucks
Riegelsville Boro	0.2	Bucks

¹ MPs are shown are based on alignment sheet information. Approximate mileage may be slightly off due to rounding and station equations.

**Table 1.1-3
Mainline Pipeline Latitude/Longitude County Crossings in Pennsylvania**

County Crossings	Approximate Coordinates Associated with the County Crossings	Approximate MP Range within each Pennsylvania County¹
Exit Luzerne / Enter Carbon	41°07'53.09"N 75°41'17.67"W	Luzerne 0.0R1-23.0
Exit Carbon / Enter Monroe	40°49'18.92"N 75°28'41.26"W	Carbon 23.0-50.7R3
Exit Monroe / Enter Northampton	40°48'54.81"N 75°28'17.91"W	Monroe 50.7R3-51.7R3
Exit Northampton / Enter Bucks	N 40° 36' 00.12" W 75° 12' 57.71"	Northampton 51.7R3-75.9
Exit Bucks / Enter New Jersey	N 40° 35' 02.28" W 75° 11' 35.43"	Bucks 75.9-77.7

¹ MPs are shown are based on alignment sheet information. Approximate mileage may be slightly off due to rounding and station equations.

1.1.2.2 Aboveground Facilities in Pennsylvania

The Project will make use of a single compressor station that will serve the entire line, providing sufficient throughput with an aggregate of approximately 47,700 International Organization for Standardization (ISO) horsepower (hp) of compression. PennEast has identified a proposed compressor station site at approximate milepost 26.8R2 in Kidder Township, Carbon County, Pennsylvania. Additional aboveground facilities include meter stations, MLVs, and pig launcher/receivers. The latitude/longitude location coordinates for the facility locations are listed in Table 1.1-5 below.

1.1.2.3 Compressor Station

The Kidder Compressor Station will be a new facility. PennEast has identified a proposed location on an approximately 74-acre undeveloped, forested parcel in Carbon County, Pennsylvania. Approximately 25.8 acres of the parcel will be developed; the remaining acreage will remain undisturbed. The proposed facility components include three gas turbine-driven Solar Mars 100 units rated at 15,900 hp each under ISO conditions (47,700 total ISO hp).

1.1.2.4 Other Facilities

Various associated aboveground facilities including interconnects, launchers, receivers, and MLVs will be constructed to support the pipeline system. Table 1.1-5 provides a list of the associated facilities.

1.1.2.5 Shut-off Provisions

The proposed facilities will be designed and constructed to meet or exceed the safety standards established by the U.S. Department of Transportation (USDOT) Title 49 Code of Federal Regulations (CFR) Part 192. As required by USDOT Title 49 CFR Part 192, valves must be installed along the pipeline at specified intervals to sectionalize the pipeline. The class location of the pipeline, which is based on the population density near the pipeline, determines the maximum MLV spacing along the pipeline. These valves can be used to shut off the flow of natural gas in the event of an emergency or for planned maintenance and repairs.

In addition to meeting or exceeding the minimum requirements of MLV spacing specified in USDOT Title 49 CFR 192, PennEast will install remotely operated valves at each new MLV site. The MLV sites will be monitored and controlled by Gas Control through PennEast's Supervisory Control and Data Acquisition (SCADA) system. Pipeline pressure and valve status will be transmitted from each MLV site to PennEast Gas Control in regular intervals to monitor the overall condition of the pipelines. In the event of an upset condition, Gas Control will have the ability to isolate a segment by sending commands to close the remotely-operated MLVs.

**Table 1.1-4
Aboveground Facilities in Pennsylvania**

Facility Location	Type ¹	New/Modified	MP ²	Municipality	County	Coordinates
PennEast Mainline Pipeline	Wyoming Interconnect (Energy Transfer Partners, LP)	New	0R1	Dallas Twp	Luzerne	41° 20' 49.075" N, 75° 56' 43.511" W
	Springville Interconnect (Williams Partners, LP)	New	0.3R3	Dallas Twp	Luzerne	41° 20' 45.784" N, 75° 56' 27.339" W
	Auburn (UGI Energy Services, LLC) and Leidy Interconnects (Transcontinental Gas Pipe Line Company, LLC)	New	4.6R3	West Wyoming Boro	Luzerne	41° 19' 9.493" N, 75° 52' 27.598" W
	MLV-1	New	8.3R3	Plains Twp	Luzerne	41° 17' 29.002" N, 75° 49' 51.700" W
	MLV-2	New	19.5	Bear Creek Twp	Luzerne	41° 10' 50.892" N, 75° 41' 48.652" W
	Kidder Compressor Station	New	26.7	Kidder Twp	Carbon	41° 4' 52.248" N, 75° 39' 45.597" W
	MLV-3	New	32.3R2	Kidder Twp	Carbon	41° 0' 56.261" N, 75° 37' 2.993" W
	MLV-4	New	46	Towamensing Twp	Carbon	40° 51' 42.002" N, 75° 31' 52.758" W
	MLV-6	New	57	Moore Twp	Northampton	40° 46' 6.690" N, 75° 26' 39.997" W
MLV-7	New	62.4R3	Upper Nazareth Twp	Northampton	40° 43' 48.756" N, 75° 21' 49.920" W	



Facility Location	Type ¹	New/Modified	MP ²	Municipality	County	Coordinates
	Church Road Interconnects	New	68.2R3	Bethlehem Twp	Northampton	40° 40' 33.24" N, 75° 17' 38.04 " W
	Hellertown Launcher & Mainline Launcher/Receiver/MLV-8	New	71.6	Lower Saucon Twp	Northampton	40° 38' 0.947" N, 75° 16' 45.491" W
Blue Mountain Lateral	Blue Mountain Side Valve	New	BL - 0R3	Lower Towamensing Twp	Carbon	40° 49' 10.159" N, 75° 29' 43.875" W
	Blue Mountain Interconnect (UGI Central Penn Gas, Inc)	New	BL-0.51R3	Lower Towamensing Twp	Carbon	40° 49' 6.133" N, 75° 30' 19.535" W
Hellertown Lateral	TCO (Columbia Gas Transmission, LLC) and UGI-LEH Interconnects (UGI Utilities, Inc.)	New	HL - 2.14R2	Lower Saucon Twp	Northampton	40° 36' 29.851" N, 75° 18' 1.167" W

¹ MLV-5 has been removed from the Project scope; however, the subsequent MLV numbers were not revised to reflect the removal.

² MPs shown are based on alignment sheet information and are based on pipeline centerline. Approximate mileage may be slightly off due to rounding and station equations.

1.2 LAND REQUIREMENTS

The construction workspace for the Project will include temporary workspace (TWS), additional temporary workspace (ATWS), permanent right-of-way (ROW), aboveground facilities access roads, staging areas, and wareyards. Table 1.2-1 includes a summary of all land requirements for construction of the Project within Pennsylvania. Additional details regarding the Project’s land requirements follow the table.

The aerial photo-based alignment sheets are included in JPA Section H and depict the location and configuration of temporary and permanent construction workspace required for the Project. The U.S. Geological Survey figure included in JPA Section I depicts the location of all proposed temporary and permanent access roads in their entirety. Typical construction workspace configurations have been provided in the Project-specific Erosion and Sediment Control Plan (E&SCP), which is located in JPA Section M.

**Table 1.2-1
Land Requirements for Project Facilities in Pennsylvania**

Facility ¹	Approximate Length/ No. of Sites	Temporary Workspace for Construction (acres)	Additional Temporary Workspace for Construction (acres)	Permanent Easement for Construction and Operation (acres) ²	Total Workspace for Construction and Operation (acres)
PennEast Mainline	77.5 (mi)/1	418.9	196.9	434.6	1,050.4
Hellertown 24-inch diameter Lateral	2.1 (mi)/1	9.7	6.8	12.4	28.9
Blue Mountain 4-inch diameter Lateral	0.5 (mi)/1	2.6	0.0	3.0	5.6
Total Pipeline	80.1 (mi)/3	431.2	203.7	450.0	1,084.9
Aboveground Facilities	53.0 (ac)/16	5.0	0.3	47.4	52.7
Access Roads ³	31.5 (mi)/80	71.0	0.0	40.4	111.4
Staging Areas	41.6 (ac)/9	41.6	0.0	0.0	41.6
Wareyards	32.9 (ac)/9	32.9	0.0	0.0	32.9
Total Project		581.7	204.0	537.8	1,323.5

1. This table does not specify valves and launcher/receivers that will be constructed on the pipeline segments since the land requirements for these facilities are within the land requirements for the pipeline segments.

2. Includes permanent 50-foot ROW that is outside of the Limits of Disturbances at HDDs.

3. Estimated Temporary Workspace for Construction includes access roads (new and existing).

4. All units in acres and rounded to the nearest 0.1. The totals shown in this table may not equal the sum of addends due to rounding.

1.2.1 Pipeline Facilities

The Project has a typical 50-foot-wide permanent ROW and, on average, an approximately 50-foot-wide temporary construction workspace for a nominal 100-foot-wide construction corridor. This corridor width is based on construction conditions of similar projects in the Northeast U.S. From the center of the ditch, the spoil side of the construction ROW is proposed to be 35 feet. This footprint will accommodate

segregated topsoil and serve as the primary spoil storage area. Thus, the working side of the construction ROW will typically be 65 feet wide from the center of the ditch and will serve to accommodate trench excavation, bank sloping, topsoil segregation and safe construction and restoration activities. Agricultural areas where full topsoil segregation of 12 inches deep will require an additional 25 feet of ATWS; in these areas the construction corridor will be a total of 125 feet wide. Figures that illustrate the typical construction workspace requirements are included in Typical Erosion and Sediment Details (JPA Section H). During project review, conditions evaluated include topography, soils, geologic conditions, steep slopes, bedrock, rock formations, boulders, abandoned mines, wetlands, and watercourses, as well as proximity to existing roads, railroads, and residences. PennEast has considered these conditions along with machinery requirements needed for safe pipeline installation and future operation and maintenance (O&M) activities. PennEast has also reduced workspace to 75 feet, wherever possible, through wetlands, floodways, and riparian areas. Site-specific alternatives analyses describing the workspace reductions at each wetland and watercourse are presented in JPA Section S. The land requirements for pipeline construction and O&M requirements are presented in Table 1.2-1.

1.2.1.1 New Pipeline ROW

Typical construction and operation ROW widths for new pipeline along the PennEast Mainline Pipeline, the Blue Mountain Lateral, and the Hellertown Lateral are shown in the Typical Construction ROW Details (JPA Section H). As noted, the typical construction ROW will be 100 feet wide consisting of new 50-foot permanent easement plus an average temporary workspace of 50 feet.

Where practicable, the construction ROW has been co-located and sited adjacent to, or in proximity with existing linear facilities (pipeline or electric transmission). Approximately 31 miles, or approximately 39%, of the total length of the Project in Pennsylvania (Mainline and laterals) is proposed to be co-located with existing utility ROWs.

1.2.1.2 Access Roads

To the extent practicable, existing public and private road crossings will be used as the primary means to access the ROW. Additional access points are necessary beyond those available by use of existing public roads. Preliminarily, PennEast has identified 80 access roads for use during construction of the Pennsylvania portions of the Project, which are listed in Table 1.2-2. These access roads include a total length of approximately 32 miles. These access roads include use of 50 existing roads and construction or enhancement of 22 partially existing access roads. The following access roads are identified by County:

- 33 access roads – Luzerne County, Pennsylvania
- 18 access roads – Carbon County, Pennsylvania
- 1 access road – Monroe County, Pennsylvania (extends into Northampton County)
- 26 access roads – Northampton County, Pennsylvania
- 2 access roads – Bucks County, Pennsylvania

Temporary access roads (TARs) sited outside an existing roadway will require temporary improvements and will require E&S controls as shown on the plans. Permanent access roads may require permanent improvements (e.g. permanent grading, placement of impervious cover) and are included as part of the post-construction stormwater management (PCSM) design. At all access roads, selective tree limb cutting and placement of temporary stone during construction may be needed. ATWS will be located adjacent to several access roads for temporary vehicle parking, vehicle turn-out passing areas, and/or staging of minor supplies

(e.g., hay bales for erosion control activities). TARs for construction will be restored to original conditions upon project completion. Landowner permission will be obtained for all proposed permanent access roads (PARs).

PennEast delineated wetlands, watercourses, and floodways within an approximately 50-foot wide corridor along existing and proposed access roads. In many instances, where a watercourse crosses an access road, there is an existing culvert or bridge that maintains stream flow under the road. PennEast surveyed the culvert locations, assessed the culvert and bridge conditions, and reduced workspace to avoid impacts to culverted and bridged watercourses. As a result of this assessment, PennEast proposes to replace just two existing culverts – one in Luzerne County and one in Carbon County. The associated impacts are discussed in greater detail in the Environmental Assessments in JPA Section L and the Hydrology and Hydraulics Analyses in JPA Section N for Luzerne and Carbon counties, respectively. Along some access roads, streams flow openly across the existing roads and appear to be forded by road users. PennEast proposes to construct temporary equipment bridges over these streams and impacts to the streams and floodways are addressed in the Aquatic Resources Impact Tables in JPA Section A-1 and the Environmental Assessments in JPA Section L. PennEast also reduced workspace to avoid or minimize impacts to wetlands along access roads wherever possible. Where wetlands cannot be avoided, PennEast will install temporary mats across wetlands to minimize impacts from equipment and truck traffic. Table 1.2-3 summarizes the aquatic resources that have been identified along each proposed access road and whether any impacts are proposed at those resource crossings.

1.2.1.3 Wareyards and Staging Areas

In Pennsylvania, the Project requires 9 wareyards and 9 staging areas to construct the pipeline in a safe and environmentally responsible manner. Wareyards are sited along the pipeline alignment and will be used for contractor field offices, equipment, and materials staging. Staging areas, which are required to stage equipment, assemble and fabricate pipe, and other activities that are necessary to construct the pipeline in a safe and environmentally responsible manner, are sited at the beginnings and ends of construction spreads and near river crossings. Temporary impacts for these wareyards and staging areas are presented in Table 1.2-1 above.

**Table 1.2-2
Access Roads for the Project**

Road No.	Milepost ¹	County	Length (ft) ²	New/Existing ³	Nominal LOD Width (ft) ⁴	Existing Condition	Improvement Needed ⁵	Improvement Distance (ft) ⁶	Temporary/Permanent ⁷	Justification
AR-001 ⁸	0R1	Luzerne	1,634	Existing	30	Gravel	Yes	480	Temporary	Wyoming Interconnect access
AR-002A	0.2R3	Luzerne	3,192	Existing	30	Paved and gravel	No	0	Permanent	Springville Interconnect access
AR-003	4.6R3	Luzerne	2,388	Existing	30	Paved and gravel	No	0	Permanent	Access to Auburn and Leidy Interconnect
AR-003B	4.5R3	Luzerne	351	Existing	30	Gravel	No	0	Temporary	Temporary access to Auburn and Leidy Interconnect
AR-005	6.4R4	Luzerne	361	Existing	30	Paved	No	0	Temporary	Light vehicle access prior to clearing and construction
AR-006	6.9	Luzerne	1,000	New	30	Field	Yes	1,000	Temporary	Access for open cut of Susquehanna River
AR-006A	7.1	Luzerne	1,067	New	30	Grass and forest	Yes	1,067	Temporary	Access for open cut of Susquehanna River
AR-007	7.3R3	Luzerne	871	Existing	30	Paved	No	0	Temporary	Access to south side of Susquehanna River crossing
AR-008	8.2R2	Luzerne	366	Partially Existing	30	Grass and gravel	Yes	166	Temporary	Access for major equipment North of Lakewood Drive
AR-009	8.2R2	Luzerne	50	New	30	Grass and forest	Yes	50	Temporary	Access around guard rails on N Main Street
AR-009A	8.3R3	Luzerne	132	New	30	Grass and gravel	Yes	132	Temporary	Access for major equipment
AR-013	8.9R3	Luzerne	251	Existing	30	Gravel	No	0	Temporary	Access for heavy construction equipment
AR-015	9.4R3	Luzerne	3,112	Partially Existing	30	Paved, gravel, grass and dirt	Yes	112	Temporary	Access to ROW for materials and major equipment. Access to west side of railroad.
AR-015A	9.6R2	Luzerne	394	Partially Existing	30	Gravel, dirt and grass	Yes	255	Temporary	Access to ROW for materials and major equipment. Access to west side of railroad.
AR-015B	9.8R2	Luzerne	1,347	Existing	30	Paved	No	0	Temporary	Access to ROW for materials and major equipment. Access to quarry area.
AR-015CN	10.3R2	Luzerne	504	Partially Existing	20	Grass and gravel	Yes	174	Temporary	Access to support I81 HDD
AR-016	9.4R3	Luzerne	2,398	Existing	30	Paved and gravel	No	0	Temporary	Access for light and major equipment for construction through the existing quarry
AR-017A	9.4R3	Luzerne	1,174	Existing	30	Dirt and gravel	No	0	Temporary	Access for light and major equipment to the pipeyard
AR-017B	9.4R3	Luzerne	500	Existing	30	Paved and gravel	No	0	Temporary	Access for light and major equipment to the pipeyard and for construction through the existing quarry
AR-017C	9.4R3	Luzerne	62	Existing	30	Paved	No	0	Temporary	Access for light and major equipment to the pipeyard and for construction through the existing quarry
AR-017DN	9.4R3	Luzerne	205	Existing	30	Gravel	No	0	Temporary	Access to Wareyard
AR-023A	10.6R2	Luzerne	3,956	Existing	30	Dirt and gravel	No	0	Temporary	Access to south side of Hwy 315 and Interstate 81 HDD
AR-025	12.9	Luzerne	1,987	Existing	30	Gravel	No	0	Temporary	Clearing crew access for heavy equipment
AR-025A	12.4R2	Luzerne	548	Existing	30	Gravel	No	0	Temporary	Clearing crew access for heavy equipment
AR-028	13	Luzerne	1,055	Partially Existing	30	Paved and grass	Yes	705	Temporary	Access for light and major equipment from the west for construction of the crossing of highway 476 while avoiding a major wetland
AR-029 ⁹	13.3	Luzerne	2,502	Existing	30	Gravel and dirt	Yes	450 / 10	Temporary / Permanent	Access to south side of Interstate 476 crossing
AR-030	14.4	Luzerne	11,047	Existing	30	Gravel	No	0	Temporary	Access to ROW in remote area. Would minimize clearing.
AR-031B	16.6	Luzerne	116	New	30	Grass and forest	Yes	116	Temporary	Access to ROW in remote area.
AR-031C	15.7	Luzerne	11,171	Partially Existing	30	Matted, forest and gravel	Yes	1,811	Temporary	Access for heavy equipment
AR-031DN	19.6	Luzerne	94	New	15	Grass	Yes	94	Permanent	Access to mainline valve
AR-033	21.8	Luzerne	11,979	Existing	30	Gravel	No	0	Temporary	Access to ROW in remote area. Access to north side of Lehigh River crossing.
AR-033A	22.4	Luzerne	3,756	Partially Existing	30	Forest and dirt	Yes	881	Temporary	Access to ROW in remote area. Access to north side of Lehigh River crossing.



Road No.	Milepost ¹	County	Length (ft) ²	New/Existing ³	Nominal LOD Width (ft) ⁴	Existing Condition	Improvement Needed ⁵	Improvement Distance (ft) ⁶	Temporary/Permanent ⁷	Justification
AR-033B	22.8	Luzerne	13,435	Partially Existing	30	Gravel, dirt and forest	Yes	1,368	Temporary	Access to ROW in remote area. Access to north side of Lehigh River crossing.
AR-034 ¹⁰	25	Carbon	12,148	Partially Existing	30	Paved, gravel, dirt and field	Yes	620 / 10	Temporary / Permanent	Access to ROW in remote area. Access to south side of Lehigh River crossing.
AR-034A	24.9	Carbon	4,064	Partially Existing	30	Forest and gravel	Yes	100	Temporary	Access to ROW in remote area. Access to south side of Lehigh River crossing.
AR-034B	26.3	Carbon	6,330	Existing	30	Gravel and paved	No	0	Temporary	Access to ROW in remote area. Access to south side of Lehigh River crossing.
AR-034C	23.4	Carbon	11,159	Partially Existing	30	Forest, grass, and dirt	Yes	50	Temporary	Access to ROW in remote area. Access to south side of Lehigh River crossing.
AR-034EN	25.4	Carbon	604	Existing	30	Gravel	No	0	Temporary	Access for a turnaround for construction equipment
AR-036A	29.2R2	Carbon	15,873	Existing	30	Paved and gravel	No	0	Temporary	Access to ROW in remote area. Access to south side of wetlands.
AR-037	32R2	Carbon	433	Existing	30	Gravel	No	0	Temporary	Access to Spread 2 Preferred Contractor Yard
AR-037A	32R2	Carbon	320	Existing	30	Gravel	No	0	Temporary	Access to Spread 2 Preferred Contractor Yard
AR-037BN	32.3R2	Carbon	73	New	15	Grass	Yes	73	Permanent	Access to mainline valve
AR-040	35.8	Carbon	1,061	Partially Existing	30	Paved and grass	Yes	361	Temporary	Access for light and major equipment from the north for construction to the south
AR-045	44.8R2	Carbon	175	Existing	30	Dirt	No	0	Temporary	Access to west side of creek crossing at Sei Pike Ln
AR-046	45R2	Carbon	287	Partially Existing	30	Gravel, grass, and forest	Yes	137	Temporary	Access for light and major equipment for construction to the east and through the wetland to the south
AR-046AN	46	Carbon	89	New	15	Grass	Yes	46	Permanent	Access to mainline valve
AR-047	46.6	Carbon	1,196	Existing	30	Gravel	No	0	Temporary	Access to ROW in remote area
AR-048	48.1	Carbon	202	New	30	Grass and forest	Yes	202	Temporary	Access around guard rails to south side of Little Gap Rd crossing
AR-048AN	49R3	Carbon	541	Existing	30	Dirt and gravel	No	0	Temporary	Access to adjacent wareyard
AR-048CN	51.4R3	Monroe & Northampton	2,757	Existing	30	Dirt	No	0	Temporary	Access to facilitate crossing of Appalachian Trail
AR-048DN	52.6R3	Northampton	1,007	Existing	15	Dirt and gravel	No	0	Temporary	Access to facilitate crossing of Appalachian Trail
AR-048EN	51.8R3	Northampton	2,222	Partially Existing	30	Dirt, grass, and forest	Yes	72	Temporary	Access to facilitate crossing of Appalachian Trail
AR-050	0.51R3	Carbon	4,828	Existing	30	Paved and gravel	No	0	Permanent	Access for light and major equipment from the north for construction to the east and west
AR-050AN	0R3	Carbon	3,110	Existing	30	Dirt and gravel	No	0	Temporary	Access for Blue Mountain Side Valve
AR-054	55.9	Northampton	169	New	30	Grass	Yes	169	Temporary	Access for light and major equipment from the east for construction to the north to support crossing Mountain View Drive and multiple stream crossings
AR-054AN	57	Northampton	52	New	15	Grass	Yes	52	Permanent	Access to mainline valve
AR-055	60.2	Northampton	730	Existing	30	Paved	No	0	Temporary	Access to ROW that minimizes impact to Monocacy Creek
AR-056A	60.5	Northampton	578	New	30	Field	Yes	578	Temporary	Access to ROW
AR-056BN	62.4R3	Northampton	28	New	15	Grass	Yes	28	Permanent	Access to mainline valve
AR-057	62.8R3	Northampton	1,379	Existing	30	Gravel	No	0	Temporary	Access to south side of railroad crossing
AR-057AN	62.7	Northampton	302	Existing	20	Paved and gravel	No	0	Temporary	Access to Wareyard
AR-057BN	62.6	Northampton	1,996	Partially Existing	20	Paved, gravel, grass and forest	Yes	546	Temporary	Access to Wareyard
AR-058	63.4	Northampton	1,371	Existing	30	Gravel	No	0	Temporary	Access for light and major equipment from the south for construction to the east and west
AR-059	64R3	Northampton	519	Partially Existing	30	Gravel and grass	Yes	44	Temporary	Access for light and major equipment from the east for construction to the north and south and to access the proposed ATWS



Road No.	Milepost ¹	County	Length (ft) ²	New/Existing ³	Nominal LOD Width (ft) ⁴	Existing Condition	Improvement Needed ⁵	Improvement Distance (ft) ⁶	Temporary/Permanent ⁷	Justification
AR-061	64.4R3	Northampton	222	Partially Existing	30	Paved and grass	Yes	52	Temporary	Access for light and major equipment for construction to the east and south and to support crossing Route 946
AR-066N	68.2R3	Northampton	19	Partially Existing	30	Paved	Yes	19	Permanent	Access to Church Road Interconnects
AR-067	68.4R3	Northampton	21	New	30	Grass	Yes	21	Temporary	Access for light and major equipment to support crossing State Route 33 and construction to the south
AR-068	68.8	Northampton	243	Existing	30	Paved	No	0	Temporary	Access for light and heavy equipment to support crossing William Penn Highway and construction to the north
AR-069	69.6R4	Northampton	284	Existing	30	Paved	No	0	Temporary	Access to North side of plaza and berm crossing. Access for light and heavy equipment to support access ATWS and support construction through the existing shopping mall parking lots
AR-070	70R4	Northampton	632	Existing	30	Paved	No	0	Temporary	Access for light and heavy equipment to support access ATWS and support HDD construction through the existing shopping mall parking lots
AR-071	70.7R3	Northampton	1,746	Partially Existing	30	Paved, grass and field	Yes	1,726	Temporary	Access for light and heavy equipment to support access from staging area and support construction to the south
AR-071A	70.6R3	Northampton	920	Existing	30	Paved	No	0	Temporary	Access to Wareyard
AR-072DN	71.4	Northampton	656	Partially Existing	30	Gravel and forest	Yes	406	Temporary	Access to Wareyard
AR-072EN	71.5	Northampton	28	New	N/A	Grass	Yes	28	Temporary	Access to Wareyard
AR-074	72.2	Northampton	429	Existing	30	Gravel	No	0	Temporary	Access for light and heavy equipment to support construction of the wetland and stream crossing to the north as well as construction to the south
AR-075	72.9	Northampton	56	New	30	Grass	Yes	56	Temporary	Access for light and heavy equipment to support construction of the large wetland crossing to the north as well as construction to the east
AR-078	74.8	Northampton	522	Existing	30	Dirt	No	0	Temporary	Access for light and heavy equipment to support construction of the Durham Road crossing from the east as well as construction to the west
AR-079	76.5	Bucks	1,081	Partially Existing	30	Gravel, dirt and forest	Yes	100	Temporary	Access for light and heavy equipment to support construction to the west.
AR-080	77.4	Bucks	1,093	Partially Existing	30	Dirt and field	Yes	993	Temporary	Access for light and heavy equipment to support construction of the Delaware River HDD to the east as well as construction to the west
AR-200N	2.14R2	Northampton	162	Existing	30	Paved	Yes	77	Permanent	TCO & UGI-LEH Interconnects access



Road No.	Milepost ¹	County	Length (ft) ²	New/Existing ³	Nominal LOD Width (ft) ⁴	Existing Condition	Improvement Needed ⁵	Improvement Distance (ft) ⁶	Temporary/Permanent ⁷	Justification
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Notes:

1. Mileposts are approximate. All route deviations implemented after the September 2015 FERC Filing are denoted with an "R" and indicate a milepost equation. Mileposts with an "R1" indicate route deviations implemented and provided to FERC prior to the issuance of the Draft Environmental Impact Statement. Mileposts with an "R2" indicate route deviations implemented as part of the September 2016 Supplemental Filing. Mileposts with an "R3" indicate route deviations implemented post-FERC Certificate issuance. Mileposts with an "R4" indicate route deviations implemented since the previous PADEP Submission. All mileposts without an "R" indicate that the route has not changed since the September 2015 application.
2. Length of the proposed access road.
3. New = proposed road sited where there is no existing roadway; Existing = proposed road sited fully along an existing roadway; Partially Existing = proposed road sited partially along an existing roadway and partially outside of an existing roadway
4. Nominal LOD Width is the Limits of Disturbance width along a proposed access road. The width shown in the column is stated as nominal, as there may be workspace reductions along the road to avoid culverts and other existing features.
5. "Yes" indicates that a proposed access road is sited where there is no existing roadway, or an existing roadway is being expanded within a wetland or stream requiring mats or temporary equipment bridges. "No" indicates that a proposed access road is sited fully along an existing roadway and no BMPs are required. At all access roads, selective tree limb cutting and placement of temporary stone during construction may be needed.
6. For temporary access roads, improvement distance represents the linear footage of a proposed access road sited outside an existing road and linear footage of proposed access road within an existing road that is temporarily expanded within a wetland or stream during construction. For permanent access roads, improvement distance represents the linear footage of a proposed access road where permanent post construction improvements (e.g. permanent grading, placement of impervious cover) and are included as part of the PCSM design.
7. Temporary access roads will be restored to original conditions following construction. Permanent access roads may require permanent post construction improvements (e.g. permanent grading, placement of impervious cover) and are included as part of the PCSM design.
8. Access road AR-001 improvements are temporary and consist of the placement of timber mats in wetlands during construction. No permanent improvements are planned at this access road.
9. Access road AR-029 temporary improvements include matting and bridging at streams and wetlands. Permanent improvements include permanent culvert replacement as shown in the Culvert Sizing Report.
10. Access road AR-034 temporary improvements include siting of a proposed temporary access road outside of an existing roadway. Permanent improvements include permanent culvert replacement as shown in the Culvert Sizing Report.

**Table 1.2-3
Resources Crossed by Access Roads for the Project**

Resource ID	MP	County	Resource Type	Temporary Equipment Crossing	Instream support needed?	Comments
AR-001						
053117_MB_1001_PEM	0R1	Luzerne	Wetland	Matted	N/A	
053117_MB_1001_PSS	0R1	Luzerne	Wetland	Matted	N/A	
010716_GM_1002_PEM	0R1	Luzerne	Wetland	Matted	N/A	
010716_GM_1001_PSS	0R1	Luzerne	Wetland	Matted	N/A	
010716_GM_1001_PEM	0R1	Luzerne	Wetland	Matted	N/A	
AR-002A						
No Resources Delineated	0.5	Luzerne				
AR-003						
No Resources Delineated	4.5R3	Luzerne				
AR-003B						
No Resources Delineated	4.5R3	Luzerne				
AR-005						
No Resources Delineated	6.4R2	Luzerne				
AR-006						
102315_WA_1001_P_MA	6.9	Luzerne	FEMA Floodway	Matted	N/A	This temporary access road is within an agricultural field on the right bank of the Susquehanna River and will be used to travel between the diversion dam and the cofferdam. These impacts are accounted for within the Susquehanna River floodway impact calculations.
AR-006A						
102315_WA_1001_P_MA	7.1	Luzerne	FEMA Floodway	Matted	N/A	This temporary access road is along the northern tip of Monocanock Island and will be used to travel between the diversion dam and the cofferdam. These impacts are accounted for within the Susquehanna River floodway impact calculations.
AR-007						
No Resources Delineated	7.3R3	Luzerne				
AR-008						
No Resources Delineated	8.1R3	Luzerne				
AR-009						
No Resources Delineated	8.2R2	Luzerne				
AR-009A						
No Resources Delineated	8.3R3	Luzerne				
AR-013						
No Resources Delineated	8.9R3	Luzerne				
AR-015						
No Resources Delineated	9.4R3	Luzerne				



Resource ID	MP	County	Resource Type	Temporary Equipment Crossing	Instream support needed?	Comments
AR-015A						
No Resources Delineated	9.6R2	Luzerne				
AR-015B						
No Resources Delineated	9.8R2	Luzerne				
AR-015CN						
No Resources Delineated	10.2R2	Luzerne				
AR-016						
No Resources Delineated	9.4R2	Luzerne				
AR-017A						
No Resources Delineated	9.4R3	Luzerne				
AR-017B						
No Resources Delineated	9.4R3	Luzerne				
AR-017C						
No Resources Delineated	9.4R3	Luzerne				
AR-017DN						
No Resources Delineated	9.4R3	Luzerne				
AR-023A						
032818_WA_1002_E_MI	10.6R2	Luzerne	Watercourse floodway	None	N/A	Existing gravel road that will have no additional improvements that affect the floodway
AR-025						
No Resources Delineated	12.9	Luzerne				
AR-025A						
121514_JC_1001_E_MI	12.4R2	Luzerne	Watercourse floodway	None	N/A	Existing gravel road that will have no additional improvements that affect the floodway
AR-028						
121814_JC_1010_P_MI	13.2	Luzerne	Watercourse channel and watercourse floodway	None	No	Existing culvert under paved portion of the access road, which will not require improvement or replacement
121814_JC_1011_P_MI	13.2	Luzerne	Watercourse channel and watercourse floodway	None	No	Existing culvert under paved portion of the access road, which will not require improvement or replacement
081215_MK_019_PEM	13.2	Luzerne	Wetland	Matted	N/A	Wetland within existing travel lane on a residential lot will be matted
AR-029						
121814_JC_1008_P_MI - 2	13.3	Luzerne	Watercourse channel and watercourse floodway	Mat or bridge or equivalent	No	Currently forded crossing along a dirt and gravel road. Temporary equipment bridge will be installed.
081215_MK_017_P_IM	13.3	Luzerne	Watercourse channel and watercourse floodway	In kind culvert replacement	No	Existing culvert will be replaced.
081215_MK_022_PEM	13.3	Luzerne	Wetland	Matted	N/A	Wetland within existing dirt and gravel road will be matted.
081215_MK_021_PEM	13.3	Luzerne	Wetland	Matted	N/A	Wetland within existing dirt and gravel road will be matted.



Resource ID	MP	County	Resource Type	Temporary Equipment Crossing	Instream support needed?	Comments
081215_MK_013_I_MI	13.3	Luzerne	Watercourse channel and watercourse floodway	Mat or bridge or equivalent	Yes	Currently forded crossing along a dirt and gravel road. Temporary equipment bridge will be installed.
081215_MK_014_P_IM	13.3	Luzerne	Watercourse channel and watercourse floodway	Mat or bridge or equivalent	Yes	Currently forded crossing along a dirt and gravel road. Temporary equipment bridge will be installed.
081215_MK_020_PEM	13.3	Luzerne	Wetland	Matted	N/A	Wetland within existing dirt and gravel road will be matted.
081215_MK_015_I_MI	13.3	Luzerne	Watercourse channel and watercourse floodway	Mat or bridge or equivalent	No	Currently forded crossing along a dirt and gravel road. Temporary equipment bridge will be installed.
121814_JC_002_PEM	13.3	Luzerne	Wetland	Matted	N/A	Wetland within existing dirt and gravel road will be matted.
081215_MK_016_E_MI	13.3	Luzerne	Watercourse channel and watercourse floodway	Mat or bridge or equivalent	No	Currently forded crossing along a dirt and gravel road. Temporary equipment bridge will be installed.
AR-030						
041717_WA_1001_E_MI	14.4	Luzerne	Watercourse channel and watercourse floodway	Mat or bridge or equivalent	No	Ephemeral channel and watercourse at road apron may be temporarily matted to accommodate the turning radii of construction equipment.
041717_WA_1002_E_MI	14.4	Luzerne	Watercourse channel and watercourse floodway	None	No	Existing culvert under gravel access road, which will not require improvement or replacement
041717_WA_1003_E_MI	14.4	Luzerne	Watercourse channel and watercourse floodway	None	No	Existing culvert under gravel access road, which will not require improvement or replacement
041717_WA_1004_E_MI	14.4	Luzerne	Watercourse floodway	None	N/A	Existing gravel road that will have no additional improvements that affect the floodway
041717_WA_1005_E_MI	14.4	Luzerne	Watercourse floodway	None	N/A	Existing gravel road that will have no additional improvements that affect the floodway
041717_WA_1006_E_MI	14.4	Luzerne	Watercourse channel and watercourse floodway	None	No	Existing culvert under gravel access road, which will not require improvement or replacement
041717_WA_1007_E_MI	14.4	Luzerne	Watercourse floodway	None	N/A	Existing gravel road that will have no additional improvements that affect the floodway
AR-031B						
No Resources Delineated	16.6	Luzerne				
AR-031C						
042417_GM_1002_PEM	15.9	Luzerne	Wetland	Matted	N/A	Wetland within existing dirt and gravel road will be matted
042417_GM_1002_PSS	15.9	Luzerne	Wetland	Matted	N/A	Wetland within existing dirt and gravel road will be matted
112114_JC_003B_PSS - 2	16.1	Luzerne	Wetland	Matted	N/A	Wetland within existing dirt and gravel road will be matted
112114_JC_003B_PSS - 3	16.1	Luzerne	Wetland	Matted	N/A	Wetland within existing dirt and gravel road will be matted
112114_JC_1003_P_IM - 2	16.1	Luzerne	Watercourse channel and watercourse floodway	Mat or bridge or equivalent	Yes	Currently forded crossing along a dirt and gravel road. Temporary equipment bridge will be installed.
112114_JC_003A_PSS - 2	16.2	Luzerne	Wetland	Matted	N/A	Wetland within existing dirt and gravel road will be matted



Resource ID	MP	County	Resource Type	Temporary Equipment Crossing	Instream support needed?	Comments
112114_JC_1002_P_MI	16.2	Luzerne	Watercourse floodway	None	N/A	Existing gravel road that will have no additional improvements that affect the floodway
112114_JC_1001_P_MI - 2	16.4	Luzerne	Watercourse channel and watercourse floodway	Mat or bridge or equivalent	No	Currently forded crossing along a dirt and gravel road. Temporary equipment bridge will be installed.
112114_JC_002A_PSS - 1	16.4	Luzerne	Wetland	Matted	N/A	Wetland within existing dirt and gravel road will be matted
112114_JC_002A_PSS - 2	16.4	Luzerne	Wetland	Matted	N/A	Wetland within existing dirt and gravel road will be matted
112014_JC_1003_P_IM - 2	16.7	Luzerne	Watercourse channel and watercourse floodway	Mat or bridge or equivalent	Yes	Currently forded crossing along a dirt and gravel road. Temporary equipment bridge will be installed.
112014_JC_002_PSS	16.9	Luzerne	Wetland	Matted	N/A	Wetland within existing dirt and gravel road will be matted
112014_JC_001_PSS	17.7	Luzerne	Wetland	Matted	N/A	Wetland within existing dirt and gravel road will be matted
AR-031DN MLV						
No Resources Delineated	19.6	Luzerne				
AR-033						
042017_MK_1001_I_MI	21.8	Luzerne	Watercourse floodway	None	N/A	Existing gravel road that will have no additional improvements that affect the floodway
041917_MK_1002_I_MI	21.8	Luzerne	Watercourse floodway	None	N/A	Existing gravel road that will have no additional improvements that affect the floodway
041917_MK_1003_I_MI	21.8	Luzerne	Watercourse floodway	None	N/A	Existing gravel road that will have no additional improvements that affect the floodway
041917_MK_1001_P_IM	21.8	Luzerne	Watercourse channel and watercourse floodway	None	No	Existing bridge that will not require improvements
041817_MK_1001_I_MI	21.8	Luzerne	Watercourse floodway	None	N/A	Existing gravel road that will have no additional improvements that affect the floodway
AR-033A						
042517_GM_1002_PEM	22.5	Luzerne	Wetland	Matted	N/A	Wetland within existing dirt road will be matted.
042517_GM_1001_P_IN	22.5	Luzerne	Watercourse channel and watercourse floodway	Mat or bridge or equivalent	Yes	Currently forded crossing along a dirt road. Temporary equipment bridge will be installed.
042017_MK_1002_P_MI	22.5	Luzerne	Watercourse channel and watercourse floodway	Mat or bridge or equivalent	No	Currently forded crossing along a dirt road. Temporary equipment bridge will be installed.
042517_GM_1002_I_MI	22.7	Luzerne	Watercourse channel and watercourse floodway	Mat or bridge or equivalent	No	Currently forded crossing along a dirt road. Temporary equipment bridge will be installed.
042517_GM_1001_PEM	22.7	Luzerne	Wetland	Matted	N/A	Wetland within existing dirt road will be matted.
AR-033B						
042517_GM_1005_P_MI	22.8	Luzerne	Watercourse floodway	None	N/A	Gravel portion of an existing road that will have no additional improvements that affect the floodway
042517_GM_1004_I_MI	22.8	Luzerne	Watercourse channel and watercourse floodway	None	No	Existing culvert under the gravel portion of the access road, which will not require improvement or replacement
042517_GM_1003_P_MI	22.8	Luzerne	Watercourse channel and watercourse floodway	Mat or bridge or equivalent	No	Currently forded crossing along a dirt portion of the access road. Temporary equipment bridge will be installed.
AR-034						



Resource ID	MP	County	Resource Type	Temporary Equipment Crossing	Instream support needed?	Comments
012617_GM_1002_P_MI	25.1	Carbon	Watercourse channel and watercourse floodway	In kind culvert replacement	No	Existing culvert will be replaced.
071817_MB_1003_I_MI	25.1	Carbon	Watercourse channel and watercourse floodway	None	No	Existing culvert under the paved portion of the access road, which will not require improvement or replacement
012617_GM_1003_I_MI	25.1	Carbon	Watercourse channel and watercourse floodway	None	No	Existing culvert under the paved portion of the access road, which will not require improvement or replacement
AR-034A						
012116_DB_1002_I_MI	24.9	Carbon	Watercourse floodway	None	N/A	Gravel portion of an existing road that will have no additional improvements that affect the floodway
012116_DB_1001_P_IN (1)	24.9	Carbon	Watercourse channel and watercourse floodway	None	No	Existing culvert under the gravel portion of the access road, which will not require improvement or replacement
012116_DB_1003_I_MI	24.9	Carbon	Watercourse channel and watercourse floodway	None	No	Existing culvert under the gravel portion of the access road, which will not require improvement or replacement
AR-034B						
012116_DB_1001_P_IN (2)	24.9	Carbon	Watercourse channel and watercourse floodway	None	No	Existing culvert under the gravel portion of the access road, which will not require improvement or replacement
AR-034EN						
No Resource Delineated	24.9	Carbon				
AR-034C						
063017_GM_1001_I_MI	24.4	Carbon	Watercourse channel and watercourse floodway	Mat or bridge or equivalent	No	Currently forded crossing along a dirt portion of the access road. Temporary equipment bridge will be installed.
Kidder Compressor Access Road						
082515_BT_1001_P_IM	26.6	Carbon	Watercourse channel and watercourse floodway	Permanent Culvert Installed	No	New permanent culvert will be installed.
AR-036A						
011817_GM_1001_I_MI	29.2R2	Carbon	Watercourse channel and watercourse floodway	None	No	Existing culvert under paved and gravel the access road, which will not require improvement or replacement
AR-037						
No Resource Delineated	32R2	Carbon				
AR-037A						
No Resource Delineated	32R2	Carbon				
AR-037BN MLV						
No Resource Delineated	32.3R2	Carbon				
AR-040						
No Resource Delineated	35.8	Carbon				
AR-045						
050918_WA_1000_E_MI	44.8R2	Carbon	Watercourse floodway	None	N/A	Existing gravel road that will have no additional improvements that affect the floodway



Resource ID	MP	County	Resource Type	Temporary Equipment Crossing	Instream support needed?	Comments
041018_WA_1001_P_MI	44.8R2	Carbon	Watercourse floodway	None	N/A	Existing gravel road that will have no additional improvements that affect the floodway
041018_WA_1000_P_MI	44.8R2	Carbon	Watercourse channel and watercourse floodway	None	No	Existing culvert under gravel access road, which will not require improvement or replacement
AR-046						
081715_MK_026_P_MI	45R2	Carbon	Watercourse channel and watercourse floodway	None	No	Existing culvert under dirt access road, which will not require improvement or replacement
051115_JC_1002_P_MI	45R2	Carbon	Watercourse floodway	None	N/A	Existing dirt road that will have no additional improvements that affect the floodway
AR-046AN MLV						
No Resource Delineated	46	Carbon				
AR-047						
No Resource Delineated	46.6	Carbon				
AR-048						
090914_WA_1000_P_IM	48.1	Carbon	Watercourse floodway	None	N/A	Existing dirt road that will have no additional improvements that affect the floodway
AR-048AN						
033018_WA_1000_E_MI	49R3	Carbon	Watercourse floodway	None	N/A	Existing dirt and gravel road that will have no additional improvements that affect the floodway
052218_WA_1000_E_MI	49R3	Carbon	Watercourse floodway	None	N/A	Existing dirt and gravel road that will have no additional improvements that affect the floodway
AR-050						
041117_GM_1003_P_MI	0.51R3	Carbon	Watercourse floodway	None	N/A	Existing paved and gravel road that will have no additional improvements that affect the floodway
AR-048CN						
N/A	51.4R3	Monroe				
AR-048DN						
052918_WA_1000_I_MI	56.2R3	Northampton	Watercourse floodway	None	N/A	Existing dirt and gravel road that will have no additional improvements that affect the floodway
080917_WA_1002_P_MI	52.6R3	Northampton	Watercourse floodway	None	N/A	Existing dirt and gravel road that will have no additional improvements that affect the floodway
AR-048EN						
No Resource Delineated	51.9R3	Northampton				
AR-050AN						
041017_GM_1001_P_IN	49.8R3	Northampton	Watercourse floodway	None	N/A	Existing dirt and gravel road that will have no additional improvements that affect the floodway
041117_GM_1002_E_MI	49.8R3	Northampton	Watercourse floodway	None	N/A	Existing dirt and gravel road that will have no additional improvements that affect the floodway
AR-054						
081815_MK_042_PEM - 2	55.9	Northampton	Wetland	Matted	N/A	Wetland within new temporary access road will be matted.
AR-054AN MLV						
No Resource Delineated	57	Northampton				
AR-055						
No Resource Delineated	60.2	Northampton				



Resource ID	MP	County	Resource Type	Temporary Equipment Crossing	Instream support needed?	Comments
AR-056A						
No Resource Delineated	60.5	Northampton				
AR-056BN MLV						
No Resource Delineated	62.4R3	Northampton				
AR-057						
No Resource Delineated	62.8R3	Northampton				
AR-057AN						
No Resource Delineated	62.7	Northampton				
AR-057BN						
No Resource Delineated	62.7	Northampton				
AR-058						
No Resource Delineated	63.4	Northampton				
AR-059						
No Resource Delineated	63.9	Northampton				
AR-061						
No Resource Delineated	64.4R3	Northampton				
AR-066N						
No Resource Delineated	68.2R3	Northampton				
AR-067						
No Resource Delineated	68.4R3	Northampton				
AR-068						
No Resource Delineated	68.8	Northampton				
AR-069						
No Resource Delineated	69.7R3	Northampton				
AR-070						
No Resource Delineated	70R3	Northampton				
AR-071						
010616_JC_1001_E_MI	70.7R3	Northampton	Watercourse floodway	None	N/A	Existing dirt road that will have no additional improvements that affect the floodway
AR-071A						
No Resource Delineated	70R3	Northampton				
AR-072DN						
No Resource Delineated	70R3	Northampton				
AR-072EN						
No Resource Delineated	70R3	Northampton				
AR-074						
092314_GO_1002_POND_MA	72.2	Northampton	Watercourse floodway	None	N/A	Existing dirt road that will have no additional improvements that affect the floodway
AR-075						
No Resource Delineated	70R3					



Resource ID	MP	County	Resource Type	Temporary Equipment Crossing	Instream support needed?	Comments
AR-078						
062415_BT_1001_P_MI	74.8	Northampton	Watercourse channel and watercourse floodway	None	No	Existing culvert under dirt access road, which will not require improvement or replacement
AR-079						
No Resource Delineated	70R3	Bucks				
AR-080						
No Resource Delineated	77.4	Bucks				

1.2.2 Aboveground Facilities

Aboveground facilities associated with the Project will include one new compressor station, meter stations, MLVs, and appurtenant facilities (e.g., pig launchers/receivers, milepost markers, cathodic protection test points, etc.). The proposed compressor station location is a 74-acre, undeveloped forested tract in Kidder Township, Carbon County. PennEast will develop 19.3 acres of the parcel; the remainder of the parcel will remain forested. Table 1.2-3 summarizes the land requirements for construction and operation of the aboveground facilities associated with the Project. The locations of the aboveground facilities are provided on the aerial alignment sheets in JPA Section H.

**Table 1.2-4
Land Requirements for Aboveground Facilities in Pennsylvania**

Facility/Location ¹	County	Temp. Disturbed Acreage (acres) ²	Perm. Disturbed Acreage on ROW ³	Perm Disturbed Acreage off ROW	Total Perm. Disturbed Area (acres)	Total Disturbed Area (acres) ²
Wyoming Interconnect	Luzerne	1.0	0.1	2.3	2.4	3.4
Springville Interconnect	Luzerne	0.0	0.6	3.2	3.8	3.8
Auburn and Leidy Interconnects	Luzerne	0.8	0.4	4.3	4.8	5.6
MLV-1	Luzerne	0.0	0.1	0.0	0.1	0.1
MLV-2	Luzerne	0.0	0.1	0.0	0.1	0.1
Kidder Compressor Station	Carbon	0.0	0.0	25.8	25.8	25.8
MLV-3	Carbon	0.0	0.1	0.0	0.1	0.1
MLV-4	Carbon	0.0	0.1	0.0	0.1	0.1
MLV-6	Northampton	0.0	0.1	0.0	0.1	0.1
MLV-7	Northampton	0.0	0.1	0.0	0.1	0.1
Church Road Interconnects	Northampton	2.7	0.3	2.4	2.7	5.4
Hellertown Launcher & Mainline Launcher/Receiver/MLV-8	Northampton	0.5	0.6	2.0	2.6	3.2
Blue Mountain Side Valve	Carbon	0.0	0.2	0.1	0.3	0.3
Blue Mountain Interconnect	Carbon	0.5	0.0	1.0	1.0	1.5
TCO & UGI-LEH Interconnects	Northampton	0.0	0.3	3.3	3.6	3.6
Total Project in PA		5.5	3.1	44.4	47.6	53.2

Notes:

¹ MLV-5 has been removed from the Project scope; however, the subsequent MLV numbers were not revised to reflect the removal.

² Discrepancies in total acreages are due to rounding.

³ MLV acreage based on 50-ft x50-ft operational workspace.

1.3 **CONSTRUCTION PROCEDURES**

1.3.1 **Standard Construction Methods**

The proposed Project will be constructed in compliance with applicable specifications, Federal regulations and guidelines, and the Project-specific permit conditions included in Section 1.5 below. Construction of the Project will commence after applicable ROW and regulatory permits and clearances have been acquired for the Project and upon receipt of a Notice to Proceed from the FERC. Construction of the entire Project is anticipated to require six to nine months to complete.

Construction and restoration techniques to be used will be those typical for cross-country and residential construction. The E&SCP (JPA Section M) provides detail of such techniques and mitigation measures that will be used for the Project. Additional construction techniques and measures that will be employed are described in the Project’s Preparedness, Prevention, and Contingency (PPC) Plan.

The Project E&SCP will be consistent with the FERC’s Upland Erosion Control, Revegetation, and Maintenance Plan (May 2013 version) and Wetland and Waterbody Construction and Mitigation Procedures (May 2013 version), collectively described as the FERC *Plan and Procedures*.

The Project will be constructed in two stages. The first stage will be located entirely within Pennsylvania and will include all project components north of MP 68.2R3 and north of State Route (SR) 33. The second stage will be located in both Pennsylvania and New Jersey and will include the proposed bore under SR 33, the activities at the Delaware River, and all other project components south of MP 68.2R3.

Construction of the Project will follow standard construction practices and will typically involve numerous divisions of the pipeline (spreads) with crews progressing work along the ROW within each spread in an ordered, choreographed fashion. The Project anticipates division of the pipeline portion of the Project into five construction spreads. Table 1.3-1 identifies the anticipated construction spreads in Pennsylvania and New Jersey.

**Table 1.3-1
Anticipated Construction Spreads**

Spread	From MP	To MP	State	From	To
1	0.0	17.8	PA	Origination	Meadow Run Road Crossing
2	17.8	49.0R3	PA	Meadow Run Road Crossing	Lower Smith Gap Road
3.1	49.0R3	68.2R3	PA	Lower Smith Gap Road	Church Road Interconnects
3.2	68.2R3	77.4	PA	Church Road Interconnects	Delaware River (west side)
4	77.4	115.0	PA/NJ	Delaware River (west side)	End

Typically, survey crews will begin the operations by demarcating the pipeline centerline and construction workspace (CWS) along the ROW. Winter tree clearing may be employed in areas with sensitive habitat. Clearing, grading, trenching, and other crews would follow until a final cleanup crew initiates the restoration process. Crews most frequently progress in close sequence to facilitate orderly progress, minimize the active construction spread size, and expedite restoration efforts.

Pipeline construction generally involves the following sequential operations, which are discussed in more detail in the E&SCP (JPA Section M). These steps are summarized in the bullets below, and additional details are provided in the following sections.

Pipeline Construction – Typical Sequential Operation Steps:

- Survey/staking the route, approved workspace, and foreign line crossings.
- Clearing – remove vegetation from CWS.
- Installation of erosion and sediment controls.
- Grading to establish safe workspace; installation of erosion and sediment controls.
- Trenching – pipeline trench excavation.
- Stringing – placement of pipe joints along the trench line.
- Bending – bending pipe joints, as needed, for route and terrain.
- Welding.
- Pipe integrity – visual inspection, non-destructive examination of welds.
- Weld coating – corrosion protection and waterproofing.
- Lowering in – pipe placed in trench, tie-ins with previously laid sections, backfill.
- Hydrostatic testing – confirmation of pipeline integrity.
- In-line tool inspection of new pipeline segments.
- Tie-in to existing pipeline, purge, pack new section with gas.
- Regrade CWS to previous contours; clean-up, restoration, and seeding.

During construction, PennEast will apply dust mitigation measures, as necessary. Such applications will be at the direction of the Contractor Supervisor, Environmental Inspector, and/or the onsite Chief Construction Inspector. Typical measures that may be employed to minimize dust will be the use of water trucks to dampen workspace, if necessary, and use of paved roadways.

1.3.1.1 Surveying and Staking

Access to the CWS will normally be obtained via public roads that intersect the ROW. Permission will be obtained from landowners for the use/upgrade of private access roads to the CWS. Prior to construction, survey crews will stake the centerline of the proposed pipeline, foreign line crossings, the limits of the CWS, and the location of approved work access roads. Wetland boundaries and other environmentally sensitive areas will also be staked at this time in such a manner as to not attract the attention of non-Project personnel.

1.3.1.2 Clearing

The CWS will be cleared to remove brush, trees, roots, and other obstructions such as stumps. Non-woody vegetation may be mowed to ground level. No cleared material will be placed within wetland areas.

Clearing includes the removal of trees and brush from the CWS. With the exception of stream buffers and wetlands, tree stumps are removed from the permanent ROW. Stump grinding may be used as an alternative to removal to leave below grade root systems intact to aid in soil stabilization. PennEast anticipates disposal of trees cleared from the CWS using several different methods. Trees, if suitable, will be taken off-site by the clearing contractor and used for timber unless the landowner has made alternative arrangements for the salvageable timber. The stumps and brush may be disposed of by chipping and spreading, hauling to an approved disposal areas, storing along the ROW with landowner approval, or other approved

methods. Trees and stumps may be chipped on-site and removed. Chipped material not removed from the site may be spread across the upland areas of the CWS in a manner that will not inhibit revegetation or broadcast into off-ROW and stable areas. Wood chips will not be left within agricultural lands, wetlands, or within 50 feet of wetlands. Wood chips will not be stockpiled in a manner that they may be transported into a wetland.

1.3.1.3 Installation of Erosion and Sediment Controls

Temporary erosion and sediment control measures will be installed in accordance with the approved E&SCP (JPA Section M). These controls include, but are not limited to, compost filter sock, silt fence, mulch, hay bales, or combinations of these measures. Soil disturbance will be minimized until the appropriate temporary erosion and sediment control have been installed. If Project construction activity extends beyond one construction season it will be necessary to stabilize the site for the over-winter period. Maintenance measures should continue as needed throughout the over-winter period. After each significant rainfall (greater than ½ inch), snowstorm (greater than 6 inches), or extended period of thawing and runoff (temperatures over 32 degrees for over seven consecutive days), the construction contractor will conduct an inspection of all installed erosion control measures and perform repairs as needed to insure their continuing function. Areas stabilized by temporary or permanent seeding prior to the onset of the winter season will be inspected in the spring to ascertain the condition of vegetation cover, to repair any damaged areas or bare spots and reseed as necessary to establish vegetative cover.

To minimize impact to the soil profile on agricultural lands, topsoil will be segregated from subsoil and will remain segregated during construction to avoid loss due to mixing with subsoil material. PennEast will utilize either full CWS topsoil segregation or ditch plus spoil side topsoil segregation, as requested by the landowner as appropriate based upon site-specific conditions. Upon completion of backfilling operations, the topsoil will be pulled back over the graded area. Grading activities will be scheduled to minimize the time between initial clearing operations and the actual installation of pipe and in accordance with the FERC *Plan and Procedures*.

1.3.1.4 Grading

Grading of the CWS will allow for the movement of heavy equipment and the safe passage of work crews. Grading will include removing rock outcrops, tree stumps, ridges, and topographic irregularities. Generally, machinery will operate on one side of the trench (working side) with excavated materials stockpiled on the other (non-working side). Special construction procedures to minimize the amount of vegetation removed from stream banks and slopes, prevent undue disturbance of the soil profile, restore the original contours of the natural ground, and prevent topsoil erosion will be implemented as necessary.

1.3.1.5 Trenching

In most areas characterized by normal soils, the trench for the pipeline is excavated by crawler-mounted, rotary wheel-type trenching machines, or track-mounted excavators. The trench generally will be approximately 24 inches wider than the diameter of the pipe and of sufficient depth to allow for the minimum cover requirements to the top of the pipe in accordance with USDOT regulations pursuant to the Natural Gas Pipeline Safety Act of 1968, as amended. Landowner requests or permitting requirements may dictate greater depth.

Except as depicted on site-specific plans, the depth of cover for the proposed pipeline facilities, as well as the depth of cover for other, non-typical conditions, such as using a horizontal directional drill (HDD), will be in accordance with PennEast's minimum specifications. Scour analysis and the potential for external damage may increase these depths. For each watercourse crossing, a site-specific crossing plan and profile has been prepared (JPA Section H). The buried depth of the pipe will be increased, as necessary, to protect the pipeline and to reduce erosion and scour within the watercourse. In actively cultivated agricultural lands, PennEast plans to install the pipeline with a minimum of 48 inches of cover, except where rock prevents this depth. In all other areas, the pipeline will be installed with a minimum of 36-inches depth of cover.

Crossing of foreign pipelines will generally require the pipeline to be buried at greater depths depending upon the depth of the foreign pipeline. A minimum of 24 inches of clearance will be maintained when crossing foreign pipelines, utilities, or other structures as required by USDOT. Pipeline burial depths in areas requiring special construction techniques through rock will be in accordance with USDOT Title 49 CFR Part 192. Before beginning construction activities, the appropriate "Call Before You Dig" number/"811" call systems will be contacted to have underground utilities and foreign pipelines identified and marked. Trenching in the vicinity of any foreign utilities will begin only after completing the appropriate notification procedures.

Measures will be employed to minimize erosion during trenching operations and construction activities. Measures also will be taken to minimize the free flow of water into the trench and through the trench into watercourses. Compacted earth for temporary trench breakers and sandbags for permanent trench breakers may be installed within the trench to reduce erosion.

1.3.1.6 Stringing

The stringing operation involves moving the pipe into position along the prepared ROW. Pipe will be delivered to the Project area's pipeline storage areas typically by truck and will then be moved by truck from the pipeline storage areas to the construction zone, where it will be placed along the ROW in a continuous line in preparation for subsequent lineup and welding operations. Individual joints of pipe will be strung along the ROW parallel to the centerline and arranged so they are easily accessible to construction personnel. The amount of pipe necessary for stream or road crossings will be stockpiled in pipeline storage areas in the vicinity of each crossing. Stringing activities will be coordinated with the advance of the trenching and pipe laying crews to minimize the potential impact to wetlands, watercourses, and other sensitive resources. Steel pipe sections or joints in standard 40, 60, or 80-foot lengths will be used on the Project.

1.3.1.7 Bending

The pipe will be delivered to the Project site in straight sections. However, field bending of the pipe will be required to allow the pipeline to follow natural grade changes and direction changes of the ROW. For this purpose, prior to line-up and welding, selected joints will be field-bent by track-mounted hydraulic bending machines. For larger horizontal changes of direction, manufactured induction bends may be used.

Pipe bending in the field will be utilized for turns involving slight deflections and/or large radii. For turns involving larger deflections and/or small radii, often related to spatial limitations due to easement and topographic constraints, prefabricated elbow fittings will be utilized.

1.3.1.8 Welding

Following stringing and bending, the joints of pipe will be placed on temporary supports adjacent to the trench. The ends will be carefully aligned and welded together using multiple passes for a full penetration weld. Only welders qualified according to applicable American National Standards Institute (ANSI), American Society of Mechanical Engineers (ASME), and American Petroleum Institute (API) standards will be permitted to perform the welding.

1.3.1.9 Pipe Integrity

To ensure that the assembled pipe meets or exceeds the design strength requirements and to ensure weld quality and integrity, the welds will be inspected visually and tested non-destructively using radiographic (x-ray) or another approved test method, in accordance with API standards. Welds displaying inclusions (void spaces) or other defects will be repaired if out of code, or they will be cut out (removed) and new welds installed and retested.

1.3.1.10 Coating

Following welding, the previously uncoated ends of the pipe at the joints will be field-coated per applicable coating specifications. Prior to lowering the pipe into the trench, the coating on the entire pipe section will be visually inspected and evaluated using a holiday detector (inspection of pipe coating using electronic equipment). Damaged areas will be repaired per applicable coating repair specifications.

1.3.1.11 Lowering-In and Backfill

The pipe lengths are lowered into the trench by specialty “side boom” tractors. Extreme care is taken to protect the coating during the lowering-in process. Lowered pipe is positioned within the trench on sandbag benches (or approved equivalent structures) or padding the trench with screened subsoil; topsoil will not be used for padding. Connecting ends of the pipe are welded together in the ditch followed by the above inspection and coating process. Following lowering-in, permanent trench plugs are installed, and the trench and pipeline are backfilled. A bedding layer of rock-free pad dirt is placed first to protect the pipe and coatings. Final backfill makes use of material excavated from the trench; topsoil will not be used for backfilling.

1.3.1.12 Hydrostatic Testing

Completed sections of pipeline are further tested using water pressure. Pipes are filled with water and then pressurized to levels higher than the maximum operating pressure designated for the pipeline. The pressure test is held for a minimum of eight hours to be in compliance with USDOT Title 49 CFR 192 regulations.

1.3.1.13 Grade, Cleanup, Restoration, and Seeding

Cleanup and restoration commence as soon as practicable following completion of backfilling and testing. These activities include replacing grade cuts to original contours, seeding fertilizer, and mulching to restore ground cover and minimize erosion. Temporary workspaces will be allowed to revert to their preconstruction land uses.

1.3.2 Watercourse Construction Methods

PennEast has evaluated numerous specialized methods for pipeline construction for crossing watercourses. This evaluation includes consultations with the U.S. Fish and Wildlife Service, PADEP, and the USACE, among others. PennEast proposes to cross watercourses using a combination of trenchless crossing methods (i.e., HDD and bores), and dry-crossing methods, as described below. The specific impact type for each watercourse crossing is provided in the Aquatic Resources Impact Table in JPA Section A-1.

Generally during crossings, the full width of the construction ROW will be used on either side of the watercourse for construction staging and pipeline fabrication. ATWS may be required in some situations and will be located in upland areas a minimum of 50 feet from the watercourse, whenever possible; however, certain crossings may require ATWS in closer proximity to the watercourse.

For all watercourse crossings with exception of the Lehigh River crossing (Francis E. Walter Reservoir), PennEast will follow the instream timing restrictions identified by the Pennsylvania Fish and Boat Commission (PFBC) for dry crossings. There is a March 1 to June 15 instream timing restriction for PFBC-approved trout waters and trout stocked streams, and an October 1 to December 31 instream timing restriction for PFBC-designated wild trout waters, and an October 1 to April 1 instream timing restriction for PFBC-designated Class A trout waters. The Chapter 93 Trout Stocked Fishery designation does not carry any instream timing restrictions. The approved trout water instream timing restrictions only apply to the stocked portions of the watercourse and any unnamed tributaries within 0.5 mile of the stocked portions. These instream timing restrictions do not apply to unnamed tributaries outside of the 0.5 mile of the stocked streams. The instream timing restriction for PFBC wild trout waters applies to the entire reach of any stream within the designated watershed and the tributaries thereto. For Class A trout waters, the instream timing restriction applies to the stream reach defined by the PFBC.

The PFBC considers “instream construction” to consist of any impacts to the streambed/bank or flowing water below the top of bank, which would include the installation of a utility line dry crossing. The PFBC has confirmed that the installation of a temporary equipment bridge that spans from bank to bank, or any pre-blasting required outside of the top of banks, would not be subject to the instream timing restrictions.

At the proposed Lehigh River (Francis E. Walter Reservoir) crossing, PennEast will request a waiver to construct the crossing during the October 1 to December 31 instream construction restriction for wild trout waters. As described in the Luzerne and Carbon JPAs, PennEast proposes to construct this crossing between mid-October and February, when the USACE releases water from the Francis E. Walter Reservoir dam, and water levels at the proposed crossing will be the lowest. PennEast will employ best management practices to minimize impacts to wild trout.

1.3.2.1 Temporary Equipment Crossings

During clearing and grading activities, temporary bridges will be constructed across all watercourses to permit construction equipment to cross. Construction equipment will be required to use the bridges, except the clearing crew who will be allowed one pass through the watercourses before the bridges are installed. Bridges and supports will be removed after restoration is complete. If bridges are not installed at state-designated fishery streams, equipment will be required to move around the watercourses to gain access to the other side.

In general, equipment refueling and lubricating will take place in upland areas that are more than 100 feet from the edges of streams and rivers and their associated wetlands. There may be certain instances where

equipment refueling and lubrication may be necessary in or near streams and rivers. For example, stationary equipment, such as water pumps for hydrostatic test water, may need to be operated continuously on the banks of watercourses and may require refueling in place. PennEast has prepared a PCC Plan to address the handling of fuel and other materials in or within 100 feet of watercourses.

1.3.2.2 Open Cut Crossing

The open cut construction method involves the excavation of the pipeline trench across the watercourse, installation of a prefabricated pipeline segment, and backfilling of the trench with excavated material. Depending upon the width of the crossing and the reach of the excavating equipment, excavation and backfilling of the trench will generally be accomplished using backhoes or other excavation equipment operating from one or both banks of the watercourse. Excavated material from the trench will be placed on the bank above the ordinary high-water mark for use as backfill. The pipe segment can be weighted, as necessary to provide negative buoyancy and placed below scour depth. Typical backfill cover requirements will be met, contours will be restored within the watercourse, and the banks will be stabilized via seeding and/or the installation of erosion control matting or approved alternative, per applicable agency approvals.

1.3.2.3 Pre-Blasting In Streams

For streams that will be open cut, PennEast is proposing that during ditching activities, all streambeds that contain solid rock be drilled and blasted. An application for a Permit for Use of Explosives in Commonwealth Waters will be filed with the PFBC. Any blasting activities will be completed in accordance with the E&SCP. The ditch crew will test bore the stream banks with a rock drill to determine if rock will be encountered. Should the test holes determine the area will need to be shot or blasted, the crew will continue to prepare the ditch line area for blasting. Upon completion of blasting, the crew will ensure that the stream bottom is restored to prevent interference with the flow. Once the mainline tie-in crews move to the area, the stream will be excavated and pipeline installed in accordance with the E&SCP. The stream pre-blasting activities will reduce the duration of stream disturbance and enable the contractor to meet the timing restrictions for in-stream disturbance.

1.3.2.4 Dam and Pump Crossing Method

The primary crossing method that PennEast will use to cross watercourses is the dam and pump crossing method. The dam and pump crossing method involves constructing temporary sand or pea gravel bag dams upstream and downstream of the proposed crossing site while using a high capacity pump to divert water from the upstream side around the construction area to the downstream side (see E&SCP in JPA Section M). Energy dissipation devices, such as steel plates will be placed on the downstream side at the discharge point to prevent streambed scour.

After installing the dams and commencing pumping, a portable pump (separate from that pumping the stream flow around the construction area) may be used to pump standing water from between the dams into a dewatering structure consisting of straw bales/silt fence or into a filter bag located away from the stream banks, thereby creating a dry construction area.

Once the area between the dams is stable, backhoes located on both banks will excavate a trench across the stream. Spoil excavated from the trench may be stored in the dry streambed adjacent to the trench if the stream crossing is major or in a straw bale/silt fence containment area located a minimum of 10 feet from the edge of the stream banks. Leakage from the dam, or subsurface flow from below the streambed, may

cause water to accumulate in the trench. As water accumulates in the trench, it may be periodically pumped out and discharged into a dewatering structure located away from the stream banks.

After trenching across the streambed is completed, a prefabricated segment of pipe will be installed in the trench. The streambed portion of the trench is immediately backfilled with streambed spoil. Once restoration of the streambed is complete, the dams are removed, and normal flow is re-established in the stream.

1.3.2.5 Flume Crossing Method

PennEast may also choose to cross specific watercourses by using the flume crossing method. The flume crossing method involves diverting the flow of the stream across the construction site through one or more flume pipes placed in the stream (see E&SCP in JPA Section M). The first step in the flume crossing method involves placing a sufficient number of adequately sized flume pipes in the stream to accommodate the highest anticipated flow during construction. After placing the pipes in the stream, sand or pea gravel bags will be placed in the stream upstream and downstream of the proposed trench. The bags serve to dam the stream and divert the stream flow through the flume pipes, thereby isolating the stream flow from the construction area.

Backhoes located on both banks of the stream will excavate a trench under the flume pipe in the isolated streambed. Spoil excavated from the stream trench will be placed or stored a minimum of 10 feet from the edge of the watercourse or in ATWS as necessary. Once the trench is excavated, a pre-fabricated segment of pipe will be installed beneath the flume pipes. The trench will then be backfilled with native spoil from the streambed. Clean gravel or native cobbles will be used to backfill the top 12 inches of the trench in coldwater fisheries.

If trench dewatering is necessary near watercourses, the trench water will be discharged into an energy dissipation/sediment filtration device, such as geotextile filter bag or straw bale structure, away from the water's edge, preferably in a well-vegetated upland area to prevent heavily silt-laden water from flowing into the watercourse.

1.3.2.6 Restoration of Open Cut Watercourses

Completed stream crossings using the flume or dam and pump methods will be stabilized before returning flow to the channel. Original streambed and bank contours will be re-established, and mulch, jute thatching, or bonded fiber blankets will be installed on the stream banks. Where the flume technique is used, stream banks will be stabilized before removing the flume pipes and returning flow to the watercourse channel.

To minimize the potential for the establishment of invasive species and to promote the restoration of a healthy, native, riparian corridor, seeding of disturbed watercourse approaches will be completed in accordance with the E&SCP (JPA Section M) and the Wetland and Riparian Reforestation Plan (JPA Section L-4A) after final grading, weather and soil conditions permitting. Where necessary, slope breakers will be installed adjacent to stream banks to minimize the potential for erosion. Sediment barriers, such as silt fence and/or straw bales will be maintained across the ROW until permanent vegetation is established. Temporary equipment bridges will be removed following construction.

1.3.2.7 Conventional Bore

Auger boring, often referred to as “jack and bore” or “conventional boring,” involves jacking a casing pipe housing auger flights from a launch pit to a retrieval pit. A hydraulic unit located within the jacking pit thrusts the casing pipe forward as the auger flight is rotated to convey the encountered geotechnical material at the leading edge of the casing pipe back to launch pit. The leading auger flight is typically one to two pipe diameters inside the casing pipe. Operating the auger flights in this manner reduces risks associated with excessive excavation / flow of soil into the auger flight during advancement. Once brought back to the launch pit, a muck bucket/excavator is used to remove the spoil. When groundwater is present and high permeable soils are anticipated, dewatering is often used to lower the water table to allow excavation under dry conditions and to reduce installations risks associated with unabated free flowing water through the auger flights. In low permeable soils, the installation is typically completed with little to no dewatering. In bedrock installations, a special rock cutting head needs to be attached to the casing pipe. Referred to as small boring units, these units are only capable of mining through very soft/weak bedrock materials.

The guided bore installation technique is a slight modification to the auger bore installation technique. It is identical to the auger bore installation methodology, with the addition of a new first step that involves pushing short five-foot sections of drill rods from the launch pit through the ground surface to the retrieval pit. The auger equipment is then attached to the installed drill rods and pushed through the ground to completion. The benefit of the guided bore method is that it eliminates the line and grade inaccuracy associated with an auger bore installation. In addition, no material is removed during this phase of the work. Instead, the soil is displaced outwards as the drill rods are advanced.

Auger and guided bore installations are typically limited installation lengths of 300 to 400 feet and installations in soil. Bedrock installations are typically shorter.

1.3.2.8 Horizontal Directional Drilling

Directional drilling is an advanced boring method that requires the drilling of a small diameter hole, or pilot hole, along a predetermined design path. The pilot hole is then gradually enlarged until it is sufficient to accommodate the pipeline being installed. The pipeline may or may not be installed concurrently with the hole enlargement depending upon the final diameter of the enlarged hole and the soil conditions encountered.

Excavation of the drill entry and exit locations will be necessary to contain drilling fluids during all phases of the installation. These fluids and cuttings must be disposed of in an approved manner periodically or at the completion of the crossing installation. The crossing length and cross-sectional geometry are dependent upon the pipeline design parameters, the obstacle to be crossed, and the subsurface conditions. Additional temporary workspace, including pipe staging areas and storage areas for drilling mud and borehole cuttings, will be located in upland areas outside of wetlands and riparian zones wherever practicable.

Although PennEast is confident in the current HDD methods and technologies available, it recognizes that such methods contain inherent risks. PennEast has developed HDD Inadvertent Returns and Contingency Plan (JPA Section L-3D) to mitigate these risks. However, if HDD bores at the specified locations are not successful after two attempts, PennEast would resort to an open cut crossing. PennEast would submit revised crossing plans and coordinate with pertinent regulatory agencies for environmental evaluations and permit modifications that may be required.

Beltzville Lake, the Lehigh River (Crossing 2), and the Delaware River are proposed to be crossed using HDD. These and other proposed HDD crossings in Pennsylvania are listed in Table 1.3-2 below.

**Table 1.3-2
Horizontal Directional Drilling in Pennsylvania**

Location/Feature	County	Begin Mile Post ¹	End Mile Post ¹	Length (ft.) ²	HDD Exhibit No. ³
PA State Route 315 / Interstate 81	Luzerne	10.2R2	10.6R2	1,755	000-03-07-001
Interstate 80	Carbon	26.8R2	27.6R2	3,824	000-03-07-013
Wild Creek & Pohopoco Creek (Beltzville Lake)	Carbon	43.2R3	44.4R3	6,100	000-03-07-002
Lehigh River	Northampton	70.9R3	71.5	4,152	000-03-07-005
Interstate 78	Northampton	71.6	72.1	2,286	000-03-07-006
Delaware River and Canal	Bucks	77.4	77.9	2,836	000-03-07-007

¹ Begin/End MPs are at the approximate locations of HDD entry/exit points.

² Lengths are approximate and subject to field verification.

³ For more information refer to the HDD Exhibit Plan and Profiles in JPA Section H.

1.3.3 Wetland Construction Methods

In Pennsylvania, wetland construction will be done in accordance with FERC’s *Procedures* as well as applicable best management practice (BMP) required by the USACE, PADEP, and County Conservation Districts. In accordance with FERC guidelines PennEast will limit the typical width of the construction ROW to 75 feet, unless a variance is requested and approved at specific crossings and would maintain a 10-foot-wide corridor centered on the pipeline for operational purposes. In addition, PennEast will follow the PPC Plan and E&SCP as well as specific Pennsylvania permit conditions.

The pipeline will be constructed through or under wetlands using conventional open cut construction, conventional bore, or HDD methods. The specific impact type for each wetland crossing is provided in the Aquatic Resources Impact Table in JPA Section A-1.

1.3.3.1 Open Cut Crossing

The standard crossing method within wetlands will be via open cut trench. PennEast will utilize one of the following methods for installing the pipeline via conventional open cut construction techniques within wetlands during construction:

- Standard Pipeline Construction for non-saturated wetlands (described in Section 1.3.1)
- Conventional Wetland Construction (saturated wetland)

- Push-Pull Technique (inundated wetland)

To minimize the potential for adverse effects to wetlands, PennEast will implement the following BMPs outlined in the E&SCP (JPA Section M) when conducting pipeline installation activities:

- PennEast will minimize vegetation clearing where feasible and stumps that do not interfere with travel or installation of the pipeline will be left in place to allow for re-sprouting following construction and restoration;
- PennEast will use construction mats in all wetlands to minimize impacts to the soil profile and reduce compaction in the travel lane;
- The excavation procedures used to cross unsaturated wetlands will be similar to those used in uplands;
- PennEast will segregate topsoil from the area disturbed by trenching, except in areas where standing water is present or soils are saturated;
- PennEast will install temporary trench plugs at the edges of wetlands, as necessary, to prevent the flow of upland sediments or other potential pollutants into wetlands during construction;
- PennEast will install permanent trench plugs at the edges of wetlands before the trench is backfilled to restore hydrology to preconstruction conditions;
- PennEast will install compost filter socks across and along the edge of the construction ROW, where indicated on the approved E&SCP (JPA Section M) and wherever necessary, to minimize the flow of sediment into wetlands; and
- PennEast will maintain a minimum 100-foot buffer from wetlands to refuel vehicles, store or transfer liquid hazardous materials, and field coat pipeline segments with concrete, unless otherwise approved by the EI and secondary containment is implemented.

1.3.3.2 Trenchless Construction

PennEast may also utilize trenchless construction methods to install the pipeline under wetlands, avoiding direct impacts to the wetlands. These methods include conventional bore and HDD methods described in Sections 1.3.2.7 and 1.3.2.8 above.

1.3.3.3 Wetland Restoration

Restoration of the natural hydrology, soil profiles, and topography is critical to promote natural regeneration and to maintain a successful wetland ecological community. Where the original contours are reestablished within a ROW and no other impediments to the natural hydrology occur, natural revegetation of a ROW that is adjacent to an unaffected wetland plant community will usually occur within one or two growing seasons in PEM and PSS wetlands. Restoration activities in wetlands will be conducted in accordance with PennEast's approved E&SCP (JPA Section M), unless federal or state agencies require an alternative method. PennEast will utilize the following criteria to restore disturbed wetland areas to as close to their pre-construction condition as practical:

- All equipment mats, temporary timber bridges, and other construction debris shall be removed during the final grading of the ROW. Once backfilling is complete, the original surface contours and flow regimes will be restored, and segregated topsoil will be returned to affected locations;
- During final grading, wetlands (including areas within 100 feet of wetlands) will be restored to their original contours and the buffer areas seeded and mulched as soon after backfilling as

practicable with the exception of the travel portion of the ROW, which will also be restored using these procedures after the travel way is no longer required;

- For each wetland crossed, trench breakers will be installed at the base of slopes near the boundary between the wetland and adjacent upland areas and the trench bottom will be sealed as necessary to maintain the original wetland hydrology in areas where the pipeline trench may affect the groundwater hydrology;
- Permanent slope breakers will be installed across the construction ROW at the base of slopes in accordance with the E&SCP (JPA Section M) to prevent sediment transport into the wetland.
- Sediment barriers will be installed as outlined in the E&SCP (JPA Section M) and as approved or specified by the EI;
- Wetlands will be revegetated, unless standing water is present, in accordance with the procedures outlined in the E&SCP (JPA Section M) and the Wetland and Riparian Reforestation Plan (JPA Section L-4A);
- No fertilizers, lime or mulch will be utilized in wetland areas unless required in writing by applicable regulatory agencies; and
- After construction, disturbed wetlands and adjacent uplands will be monitored to ensure long-term stabilization. Regular inspection and maintenance of erosion control measures will expedite successful restoration of the wetlands.

1.3.4 Other Specialized Construction Methods

1.3.4.1 Other Utilities

Publicly available utility mapping indicates that foreign pipelines and utilities are present in a number of locations. PennEast has coordinated with the utility companies where the Project is proposing to collocate with respect to access, set-back distances required from their facilities, and areas of their existing ROWs that can be used for staging, laydown, stockpiling of soils and related construction activities. PennEast will utilize previously disturbed areas in existing ROWs to the extent feasible, thereby reducing greenfield impacts. In addition to any agreements with the utilities, PennEast will continue to work with, and obtain consent from the individual landowners affected by the ROW. In addition, prior to construction, PennEast will contact the national “Call Before You Dig” number (811) so that the locations can be properly marked in the field.

1.3.4.2 Rugged Topography

Rugged topography is considered areas with steep slopes and side slopes greater than 30% and for pipeline length of greater than 68 feet (triple length of pipe) where recorded. In Pennsylvania, including both the mainline and the Hellertown Lateral, PennEast will cross 109 areas of rugged topography totaling approximately 3.4 miles.

1.3.4.3 Residential or Commercial

At this time, approximately 280 existing structures have been identified within 50 feet of the proposed CWS in Pennsylvania, which include buildings, sheds, and garages. Once the Project footprint is finalized, field surveys will be conducted at locations where structures are in close proximity to the construction work and confirm the structure types. All residential or commercial structures located within 50 feet of the edge of the construction ROW and extra work/staging areas have been identified. In cases where the workspace cannot be reduced to maintain a 25-foot separation from the residence, site-specific construction plans have

been created. As part of the FERC process, PennEast developed site-specific residential construction plans for currently identified residences within 25 feet of the CWS. PennEast land agents and contractors will coordinate with property owners throughout the construction process to minimize disruption and to maintain access to residences, commercial establishments, industrial areas and other buildings.

1.3.4.4 Active Croplands

Active croplands observed during field surveys conducted to date include corn, soybeans, and hay fields. PennEast has worked with state agencies as well as advocacy groups to formulate a comprehensive Agricultural Impact Minimization Plan to be implemented during construction. The plan outlines agriculture-specific construction methods and BMPs as well as restoration methods and monitoring to ensure that crop yields are not significantly impacted as a result of construction of the Project.

1.3.4.5 Road Crossings

The Project will cross 96 publicly used roadways in Pennsylvania. Of the 210 roads crossed in Pennsylvania, 115 are constructed of asphalt, 45 are dirt/grass, and 50 are gravel. PennEast proposes to cross the majority of these with a bore (82 roadway crossings). The other proposed crossing methods for the roads are an open cut method (108 roadway crossings) or HDD (20 roadway crossings).

1.3.4.6 Rock Removal and Blasting

Rock encountered during trenching will be removed using one of the available rock removal techniques:

- Conventional excavation with a backhoe;
- Ripping with a bulldozer followed by backhoe excavation;
- Pneumatic hammering followed by backhoe excavation;
- Blasting followed by backhoe excavation; and
- Blasting surface rock prior to excavation.

The technique selected is dependent on relative hardness, fracture susceptibility, expected volume, and location.

All blasting activity will be performed according to federal and state safety standards and in accordance with PennEast's comprehensive Blasting Plan to be implemented by a certified blasting contractor.

Excess rock generated during the construction of the Project will be hauled to approved quarries near the pipeline route and disposed of.

1.3.5 Aboveground Facility Construction

The proposed aboveground facilities will be constructed in accordance with American Society of Mechanical Engineers B31.8 standards⁹. The duration of construction for the aboveground facilities is

⁹ American Society of Mechanical Engineers B31.8: Gas Transmission and Distribution Piping Systems. 49 CFR 192.619(a)(1)(i).

approximately six to nine months. The only permanent employees will be located at the proposed compressor station.

1.3.6 Environmental Training for Construction

Environmental training will be required for all land agents, construction personnel and environmental inspectors; and agency personnel will also be invited to the training. This training will include an overview of the FERC *Plan and Procedures*, and detailed sessions using the Environmental Permit Notebooks that describe the timing, notification and environmental permit conditions required to be implemented and adhered to at each phase of construction, restoration and mitigation. PennEast will use FERC's third-party monitoring program during construction.

1.3.7 Construction Workforce

It is anticipated that four construction spreads will be employed for the Pennsylvania portion of the Project. There will be approximately 600 personnel involved in each spread for the pipeline portion of the Project. In addition, it is planned that there will be a Chief Environmental Inspector as well as a minimum of two Environmental Inspectors for each spread. FERC third-party monitors will also review construction throughout the construction time period.

1.4 OPERATION AND MAINTENANCE PROCEDURES

PennEast will own, operate, and maintain the pipeline, the compressor station and other facilities associated with the Project in accordance with USDOT Title 49 CFR Part 192 and 199 and other applicable regulations. The proposed facilities will be operated and maintained in a manner to ensure that a safe, continuous supply of natural gas reaches each of the delivery points. Maintenance activities will include regularly scheduled ground and overflight surveys. Signs, marker posts, aerial markers, and decals will be painted or replaced to ensure that the pipeline locations will be visible from the air and ground.

The facilities will be patrolled from the air periodically. This will provide information on possible leaks, construction activities, erosion, population density, possible encroachment, and any other potential problems that may affect the safety and operation of the facility. In addition, PennEast contractors will adhere to the "Call Before You Dig" program. Under the "Call Before You Dig" program, anyone planning excavation activities may call a single number to alert all utility companies. Representatives of the utility companies that might be affected then visit the site and mark their facilities so that the excavation can proceed with relative certainty as to the location of all underground lines.

Other maintenance functions will include:

- Mowing of the ROW in accordance with the timing restrictions outlined in FERC's *Plan and Procedures*;
- Periodic inspection of MLVs, water crossings and erosion control devices;
- Maintenance of a supply of emergency pipe, leak repair clamps, sleeves, and other equipment needed for repair activities;
- Periodic internal inspection with in-line inspection tools or "pigs"; and
- Calibration of equipment and transmitters.

No herbicides or pesticides will be used for the clearing or maintenance of the temporary or permanent ROW or within 100 feet of a watercourse.

A cathodic protection system for the pipeline and station will be constructed and maintained. In areas where the proposed pipeline parallels high-voltage electric transmission lines, an alternating current mitigation system will be implemented as necessary to reduce stray current, prevent possible shock to personnel during post-construction activities, and prevent interference with the cathodic protection system.

1.4.1 Cleared Areas

A 30-foot cleared area in the 50-foot permanent ROW, in non-wetland resource areas, will be maintained over the centerline of the pipeline. A permanent 10-foot wide cleared corridor will be maintained through wetland resource areas in accordance with FERC's *Plan and Procedures*. Maintaining a cleared ROW is required:

- For pipeline patrols and corrosion surveys;
- For emergency repairs of the pipeline; and
- For visibility during aerial patrols.

1.4.2 Erosion Control

Erosion problems on the pipeline ROW will be identified and repaired as necessary.

1.4.3 Periodic Pipeline and ROW Patrols

Erosion control devices will be regularly inspected and maintained, including:

- Stormwater outfalls;
- Water bars;
- Stream and river banks; and
- Other conditions that could affect operation of the pipeline.

1.5 PNDI AVOIDANCE MEASURES

In August 2014, PennEast submitted a Large Project Pennsylvania Natural Diversity Inventory (PNDI) review for rare, candidate, threatened, and endangered species under the jurisdiction of the USFWS, PFBC, Pennsylvania Game Commission (PGC) and the Pennsylvania Department of Conservation and Natural Resources (DCNR) for the PennEast Pipeline Project. Each agency identified species under their jurisdiction which had the potential to be affected by the Project (refer to EA section S2.C.2, Potential PNDI Conflicts). Surveys were conducted for rare, threatened, and endangered species, as well as species of concern, from 2015 to 2019.

The species that may be impacted by the Project and require avoidance measures include the bog turtle (*Glyptemys mühlenbergii*, federal threatened) northern long-eared bat (*Myotis septentrionalis*, federal threatened), northern flying squirrel (*Glaucomys sabrinus macrotis*, state endangered) timber rattlesnake (*Crotalus horridus*, delisted), and various state-listed plant species.

A summary of the PNDI avoidance measures for each species is provided below. Additional information is provided in JPA Sections G, L-2, and L-3.

1.5.1 Bog Turtle

On November 28, 2017, the USFWS issued a Biological Opinion (BO) for impacts that the Project may have on bog turtles. The USFWS later revised their BO on July 29, 2019 to address several proposed route amendments. To minimize impacts to the species, PennEast will implement the following conservation measures:

- PennEast committed to avoid and minimize disturbance to wetlands with known or presumed bog turtle presence, wherever feasible, by deviation, workspace adjustment, or trenchless crossing method.
- A Recognized Qualified Bog Turtle Surveyor (RQBTS) will be employed prior to construction and during periods of active construction. The RQBTS will have the authority to stop work at any time. Work will cease immediately if a bog turtle is encountered at any time, and the USFWS will be immediately notified.
- If the RQBTS is on-site and determines that the proposed method of crossing a particular wetland will result in unanticipated impacts to bog turtles, given the wetlands site-specific characteristics or potential for bog turtle presence, the RQBTS will consult with PennEast and the USFWS immediately for further direction.
- Project contractors will receive site-specific environmental training related to the environmental review process, minimizing wetland impacts, species of concern, bog turtle habitat, and special protections for specific watershed areas (this is typically done by the RQBTS).
- Construction activities near areas that could support bog turtles will be confined by the installation of habitat exclusion barriers designed to keep turtles from entering the limit of disturbance outside of the wetland. This barrier will consist of backfilled 24-inch-high silt fence without voids. This barrier will be installed manually under the supervision of a RQBTS, in areas of soft soils and muck, and by equipment in uplands and areas containing 3-18 inch firm soils. Habitat exclusion barriers will be removed by hand immediately upon completion of all construction activities.
- Prior to construction, a RQBTS will oversee hand-clearing and removal of vegetation along the access path, the installation of the habitat exclusion barrier, and the placement of timber matting within the habitat exclusion barrier.
- Timber mats and equipment will be either new or pressure-washed of free-standing soil and vegetative materials prior to arrival on-site. This minimizes the potential impacts that could occur from the introduction of invasive plants, contaminants, or bog turtle pathogens or that can make their habitats unsuitable.
- Any matted wetland crossings will be completed in a manner that does not lower the water table or alter the hydrological characteristics of the wetland.
- Any horizontal directional drilling (HDD) work proposed for crossing a wetland or waterbody with known, or presumed, bog turtle presence will take place outside of the winter hibernation months (October 15 to March 31), to avoid any potential subterranean disturbance that may occur during an inadvertent return of drilling fluid.
- PennEast's Plans and Procedures will be adhered to for all activities in wetlands, including but not limited to signage, restrictions on fueling activities and repairs, and wetland restoration measures. The RQBTS will forward the results of pre-construction surveys, construction monitoring, Project timelines, and photographic documentation of site restoration to the USFWS and FERC. The USFWS will be contacted immediately if bog turtles are observed or if take occurs.

On November 22, 2019, the PFBC issued PennEast a state-level BO and Special Take Permit for construction activities in known, occupied bog turtle wetlands in Northampton County. The issuance of this BO and Special Take Permit allowed for the take of two bog turtles, with the following conditions:

Conservation Measures

- PennEast shall implement all Conservation, Avoidance and Minimization Measures, and Monitoring described in applicant's Biological Assessment (BA), including:
 - Prior to construction, a qualified Bog Turtle surveyor will survey the work area for the presence of Bog Turtles.
 - Prior to the survey, herbaceous vegetation will be cut to a height of 4 to 6 inches using a hand-held trimmer/weed-cutter, and carefully raked away from the area to be searched.
 - Immediately following the survey, silt fencing will be placed around the work area to exclude turtles from entering the work area.
 - If any bog turtle is encountered during the clearance survey, a radio-transmitter shall be attached, and the turtle(s) shall be monitored throughout construction activities.
 - An RQBTS will be onsite prior to and during all construction activities within the known occupied bog turtle wetlands.
 - Construction will take place during the bog turtle's active season (April 1 – October 31) to avoid potential impacts to hibernating turtles.

Mitigation

- Prior to construction, PennEast will develop a Bog Turtle Management Plan with the assistance of an RQBTS. The Plan will address bog turtle wetlands impacted by the Project and will be reviewed and approved by the PFBC prior to being implemented.
- PennEast will implement all mitigation measures outlined in the BA, including:
 - Leave temporary workspace as herbaceous vegetation after construction.
 - Cut all trees within the 50-foot permanent ROW easement within and adjacent to wetlands to open the canopy in occupied bog turtle wetlands.
 - Maintain the entire 50-foot easement as herbaceous or scrub-shrub habitat, with maintenance occurring during November 1 – March 31.
 - Coordinate with neighboring utility ROW regarding management activities on the ROW corridor.
 - Revegetate with appropriate beneficial plant species

Monitoring

- Following construction, a bog turtle surveyor will conduct vegetation monitoring of impacted bog turtle wetlands annually for a minimum of 5 years post-construction. If invasive plants and/or non-native species are found within the disturbed wetlands, the applicant will prepare a proposal to implement invasive species control.
- PennEast will have an RQBTS conduct one mark-recapture (Phase 3) survey to assess the colony size and overall status of the species in the bog turtle wetlands, within one-year post-installation.
- Any dead specimens will be clearly photographed, frozen, and reported to the PFBC within 24 hours.

PennEast will also allow access to the Project ROW at the known bog turtle site in Northampton County, while accompanied by PennEast or their representative.

1.5.2 Northern Long-Eared Bat

The USFWS's BO also addressed impacts that the Project may have on the northern long-eared bat. To minimize impacts to the species, PennEast will implement the following conservation measures:

- PennEast will only clear trees ≥ 5 inches diameter-at-breast-height (dbh) between November 1 and March 31.
- PennEast will not blast within 0.25-mile of known northern long-eared bat hibernacula.
- PennEast will work with the USFWS to conduct vibration, and/or temperature and humidity monitoring within subterranean features found at Tunnel 34 prior to, during, and after construction as long as landowner access continues to be granted.
- Prior to construction, PennEast will file with the FERC Secretary, for review and written approval by the Director of Office of Energy Projects, a list of locations by milepost where, in accordance with the BO, the USFWS is requiring tree clearing restrictions that are specifically applicable to federally listed bat species.

1.5.3 Northern Flying Squirrel

The PGC identified a portion of the Project in Carbon County where northern flying squirrels are known to exist. The PGC requested avoidance of clearing activities between April 15 and June 15 to avoid potential impacts to northern flying squirrel young that are expected to be confined to their nests during this period, and the implementation of a northern flying squirrel mitigation plan. PennEast's Northern Flying Squirrel Impact Minimization Plan was approved by the PGC on January 9, 2019. In this plan, PennEast committed to seasonal tree clearing, replanting of temporary workspaces, and protection of timber reserve areas which are meant to act as crossing areas for northern flying squirrels, among other measures.

1.5.4 Timber Rattlesnake

Portions of the Project in Luzerne, Carbon, Monroe, and Northampton counties are within the range of the timber rattlesnake. Avoidance and minimization measures for the timber rattlesnake will include the re-creation of impacted gestation habitat in accordance with PFBC guidelines and the avoidance of occupied dens.

1.5.5 Protected Plant Species

PennEast conducted rare plant surveys for targeted species that DCNR identified in consultation letters, and individuals and/or populations of the following species were observed within the or near the proposed workspace: variable sedge (*Carex polymorpha*), northern panic grass (*Dicanthelium boreale*), rough-leaved aster (*Eurybia radula*), thread rush (*Juncus filiformis*), Appalachian climbing fern (*Lygodium palmatum*), white fringed orchid (*Platanthera blephariglottis*), Torrey's bulrush (*Schoenoplectus torreyi*), golden club (*Orontium aquaticum*), and sundial lupine (*Lupinus perennis*).

PennEast will implement their Rare Plant Mitigation Plan that was approved by the PADCRN on August 24, 2018. In this plan, PennEast commits to additional pre-construction surveys in the areas where rare plant populations were identified in surveys conducted 2015-2019. During these surveys, individual plants and/or the extents of population boundaries will be mapped. If any rare plants are observed within the proposed Project workspace, the avoidance, minimization, and mitigation measures that are outlined in the plan would be followed. Affected populations would be monitored for three growing seasons after construction.

1.6 AGENCY AND PUBLIC CONSULTATIONS AND REQUIRED AUTHORIZATIONS

PennEast will obtain applicable permits and licenses relating to the aboveground facilities or crossings under watercourses, wetlands, and through any other sites or places that a governmental license or permit may be required. Table 1.6-1 provides a list of permits and the applicable federal, state, and local agencies. Agency consultation letters to date are included in JPA Section D (Pennsylvania Historical and Museum Commission [PHMC] consultation) and JPA Section G (Threatened and Endangered [T&E] Species Consultation). PennEast will include copies of all relevant environmental permits and approvals in the construction bid packages and contracts. The contractor will be required to be familiar with all permits and licenses obtained by PennEast; the requirements of these permits/licenses will be reviewed during the Project Environmental Training. The contractor will be also required to comply with all the requirements related to the construction of the aboveground facilities and to the restoration of any areas disturbed by the construction of the certified facilities.

**Table 1.6-1
Required Environmental Permits and Approvals for the Project in Pennsylvania**

Agency	Permit/Approval	Status
FEDERAL		
Federal Energy Regulatory Commission	Certificate of Public Convenience and Necessity	PennEast request for pre-filing review filed October 7, 2014. Application filed September 24, 2015. Supplemental information provided in 2015 and 2016. FERC issued PennEast Certificate January 19, 2018. PennEast submitted an Amendment Application for the PA Revised Route on February 1, 2019. FERC issued an Environmental Assessment on September 20, 2019. PennEast submitted an Amendment Application for the Church Road Interconnects and staging Project construction on January 30, 2020.
U.S. Army Corps of Engineers - Philadelphia and Baltimore Districts	Clean Water Act Section 404, Rivers and Harbors Act Section 10	Initial consultation letter sent August 12, 2014. Introduction and coordination meeting held October 2014. Updated route materials sent and pre-application meetings held in 2015. Delineation Verifications commenced in Nov. 2015 and are ongoing. Applications submitted 2/5/16. Route updates provided subsequent to application submittal. District-specific Section 404/10 packages submitted to each district on 1/26/2017. Provided responses to public comments on the Philadelphia District Individual Permit in December 2017 and responses to public comments on the Baltimore Individual Permit in January 2018. Amended applications submitted December 2018. Additional Individual Permits noticed 5/23/19.
U.S. Army Corps of Engineers - Philadelphia District	Title 33 Section 408 Approvals	Initial consultation letter sent August 12, 2014. Pre-application meeting held July 16, 2015. 408 Applications for Frances E. Walter Reservoir and Beltzville Lake submitted February 5, 2016. Supplemental information provided 2016-2018. Draft applicant-prepared Environmental Assessments provided in April and May 2017. Final applicant-prepared Environmental Assessments provided July 2018. 408 Approvals and Finding of No Significant Impacts issued by the USACE on November 24, 2018.



Agency	Permit/Approval	Status
U.S. Fish and Wildlife Service - Pennsylvania	Endangered Species Act, Section 7 Consultation and Clearance	<p>Initial consultation letter sent August 12, 2014. Records of coordination from 2014 through 2020 are documented in JPA Section G.</p> <p>USFWS issued a Biological Opinion for the Project on November 28, 2017; USFWS amended the Biological Opinion on July 29, 2019.</p> <p>On March 5, 2020, the USFWS confirmed that the additional workspace associated with the Church Road Interconnects will not result in effects above what was analyzed in the July 29, 2019 Opinion.</p>
National Marine Fisheries Service (NMFS)	Endangered Species Act, Section 7 Consultation and Clearance	<p>Initial consultation letter sent August 12, 2014. Response received stating that no threatened or endangered species under the jurisdiction of the NMFS are known to occur in the Project area, and no further consultation is necessary. Records of coordination from 2014 through 2018 are documented in JPA Section G.</p>

Agency	Permit/Approval	Status
STATE - PENNSYLVANIA		
PADEP (Northeast and Southeast Regional Offices)	<ul style="list-style-type: none"> Water Obstruction and Encroachment Permits Submerged Lands License Agreements Section 401 Water Quality Certification (WQC) Erosion and Sediment Control General Permit (ESCGP) Hydrostatic Testing Discharge General Permits (PAG-10) Plan Approval and Operating Permit for a Non-Major Source 	<p>Initial consultation letter sent August 12, 2014. Coordination meeting held November 2014. Updated route materials sent in 2015 and 2016. Pre-application meetings held in 2015; additional meetings held in 2016, 2018, and 2019.</p> <ul style="list-style-type: none"> Water Obstruction and Encroachment Permit Applications and Submerged Land License Agreements documentation submitted February 5, 2016. Amended applications submitted December 2018. Application determined to be administratively complete January 25, 2019. Technical comments received July 3, 2019. Revised JPAs in response to technical comments submitted October 30, 2019. Section 401 WQC application submitted February 5, 2016. 401 WQC issued February 7, 2017. ESGPG-2 application submitted March 10, 2016. Amended application (ESCGP-3) submitted December 2018. Application determined to be administratively complete January 25, 2019. Technical comments received July 3, 2019. Revised ESCGP in response to technical comments submitted October 30, 2019. PAG-10 to be submitted 2st Quarter 2020. Plan approval application submitted March 3, 2016.
Pennsylvania Game Commission (PGC)	T&E Species Consultation and Clearance	<p>Initial consultation letter sent August 12, 2014. Records of coordination from 2014 through 2020 are documented in JPA Section G. The PGC issued concurrence on January 9, 2019. Additional coordination for Project changes occurred in October 2019 and January 2020. In a letter dated March 10, 2020, the PGC confirmed that no new surveys were required for the Project changes, and no impacts are anticipated to species under PGC jurisdiction.</p>
Pennsylvania Fish and Boat Commission (PFBC)	<ul style="list-style-type: none"> T&E Species Consultation and Clearance 	<p>Initial consultation letter sent August 12, 2014. Records of coordination from 2014 through 2020 are documented in JPA Section G. On November 22, 2019, the PFBC issued a Special Take Permit</p>



Agency	Permit/Approval	Status
	<ul style="list-style-type: none"> Aid to Navigation Plan Approval Permit for Use of Explosives in Commonwealth Waters 	for potential bog turtle impacts in Northampton County, concluding consultation. Additional coordination for Project changes occurred in October 2019 and January 2020. In a letter dated January 30, 2020, the PFBC confirmed that no new surveys were required for the Project changes, and no new impacts are anticipated to species under PFBC jurisdiction.
Pennsylvania Department of Conservation and Natural Resources (DCNR)	T&E Species Consultation and Clearance	Initial consultation letter sent August 12, 2014. Records of coordination from 2014 through 2020 are documented in JPA Section G. The PADCNR issued their concurrence on August 24, 2018. Additional coordination for Project changes occurred in October 2019 and January 2020. In a letter dated February 4, 2020, the DCNR confirmed that no new surveys were required for the Project changes, and no new impacts are anticipated to species under DCNR jurisdiction.
Pennsylvania Historical and Museum Commission (PHMC)	National Historic Preservation Act, Section 106 Consultation and Clearance	Initial consultation letter sent August 20, 2017. Records of coordination from 2014 through 2020 are documented in JPA Section D. The PHMC has reviewed archaeological survey results for the Project's APE in Pennsylvania and has concurred with PennEast's recommendations in letters concluding February 7, 2020. The PHMC has reviewed architectural history survey results for the Project's APE within Pennsylvania and has concurred with PennEast's recommendations in letters concluding February 26, 2020.
COUNTY		
Luzerne Conservation District	Erosion and Sediment Control General Permit (ESCGP) Technical Review	Initial consultation letter sent August 12, 2014. Pre-application meetings held in 2015, and route updates provided in 2015 and 2016. ESGPG-2 application submitted March 10, 2016. Amended application (ESCGP-3) submitted December 2018. Application determined to be administratively complete January 25, 2019. Technical comments received July 3, 2019. Revised JPAs in response to technical comments submitted October 30, 2019.
Carbon County Conservation District	Erosion and Sediment Control General Permit (ESCGP) Technical Review	Initial consultation letter sent August 12, 2014. Pre-application meetings held in 2015, and route updates provided in 2015 and 2016. ESGPG-2 application submitted March 10, 2016. Amended application (ESCGP-3) submitted December 2018. Application



Agency	Permit/Approval	Status
		determined to be administratively complete January 25, 2019. Technical comments received July 3, 2019. Revised JPAs in response to technical comments submitted October 30, 2019.
Northampton County Conservation District	Erosion and Sediment Control General Permit (ESCGP) Technical Review	Initial consultation letter sent August 12, 2014. Pre-application meetings held in 2015, and route updates provided in 2015 and 2016. ESGPG-2 application submitted March 10, 2016. Amended application (ESCGP-3) submitted December 2018. Application determined to be administratively complete January 25, 2019. Technical comments received July 3, 2019. Revised JPAs in response to technical comments submitted October 30, 2019.
Bucks County Conservation District	Erosion and Sediment Control General Permit (ESCGP) Technical Review	Initial consultation letter sent August 12, 2014. Pre-application meetings held in 2015, and route updates provided in 2015 and 2016. ESGPG-2 application submitted March 10, 2016. Amended application (ESCGP-3) submitted December 2018. Application determined to be administratively complete January 25, 2019. Technical comments received July 3, 2019. Revised JPAs in response to technical comments submitted October 30, 2019.

1.7 **REFERENCES**

- Concentric Energy Advisors. 2018. Estimated Energy Market Savings from Additional Pipeline Infrastructure Serving Eastern Pennsylvania: Update for Winter 2017/2018. Available at http://penneastpipeline.com/wp-content/uploads/2018/05/PennEast_Concentric_Update_FINAL_4-24-2018.pdf
- Federal Energy Regulatory Commission (FERC). 2013. *Upland Erosion Control, Revegetation, and Maintenance Plan* (May 2013 version) and *Wetland and Waterbody Construction and Mitigation Procedures* (May, 2013 version). Washington, D.C.
- PJM. Generation Fuel Mix. Available at: <http://www.pjm.com/markets-and-operations.aspx>. Accessed July 2018.
- U.S. Energy Information Administration. 2018. Annual Energy Outlook 2018. Available at <https://www.eia.gov/outlooks/aeo/pdf/AEO2018.pdf>. Accessed July 2018.