Federal Energy Regulatory Commission

Office of
Energy Projects

May 2019

Dominion Energy Transmission, Inc. **Docket No. CP19-26-000**

West Loop Project

Environmental Assessment

Washington, DC 20426

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TECHNICAL ABBREVIATIONS AND ACRONYMS

APE	area of potential effects
AQCR	Air Quality Control Regions
ATWS	additional temporary workspace
CAA	Clean Air Act
CEQ	Council on Environmental Quality
Certificate	Certificate of Public Convenience and Necessity
CFR	Code of Federal Regulations
CH_4	methane
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalents
Commission	Federal Energy Regulatory Commission
dB	decibels
dBA	A-weighted decibels
DETI	Dominion Energy Transmission, Inc.
EA	environmental assessment
EI	environmental inspector
ENC	Environmental Noise Control
EPA	U.S. Environmental Protection Agency
FERC	Federal Energy Regulatory Commission
FWS	U.S. Fish and Wildlife Service
GHG	greenhouse gas
GWP	global warming potential
HQ-CWF	High Quality Cold Water Fishery
L_{dn}	day-night sound level
L_{eq}	equivalent sound level
M&R	metering and regulation
MBTA	Migratory Bird Treaty Act
MP	milepost
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NGA	Natural Gas Act
NHA	Natural Heritage Area
NNSR	Nonattainment New Source Review
NO_2	nitrogen dioxide
NO_x	nitrogen oxides
NOI	*Notice of Intent to Prepare an Environmental Assessment for the Proposed West Loop Project and Request for Comments on Environmental Issues*
NRHP	National Register of Historic Places
NSA	noise sensitive area
NSR	New Source Review
ODNR	Ohio Department of Natural Resources
OEP	Office of Energy Projects
OEPA	Ohio Environmental Protection Agency
Order	Commission's Order
PADCNR	Pennsylvania Department of Conservation and Natural Resources
PADEP	Pennsylvania Department of Environmental Protection
PAFBC	Pennsylvania Fish and Boat Commission
PAGC	Pennsylvania Game Commission

Pb	lead
Plan	Commission's *Upland Erosion Control, Revegetation, and Maintenance Plan*
PM_{10}	particulate matter with an aerodynamic diameter less than or equal to 10 microns
$PM_{2.5}$	particulate matter with an aerodynamic diameter less than or equal to 2.5 microns
Project	West Loop Project
PSD	Prevention of Significant Deterioration
PPC Plan	Preparedness, Prevention, and Contingency Plan
Procedures	Commission's *Wetland and Waterbody Construction and Mitigation Procedures*
SHPO	State Historic Preservation Office
SO_2	sulfur dioxide
tpy	tons per year
USACE	U.S. Army Corps of Engineers
USDOT	U.S. Department of Transportation
USGCRP	U.S. Global Change Research Program
VOC	volatile organic compounds

A. PROPOSED ACTION

1. Introduction

The staff of the Federal Energy Regulatory Commission (Commission or FERC) has prepared this environmental assessment (EA) to assess the environmental effects of the natural gas pipeline facilities proposed by Dominion Energy Transmission, Inc. (DETI). We[1] prepared this EA in compliance with the requirements of the National Environmental Policy Act of 1969 (NEPA), Title 40 of the Code of Federal Regulations (CFR), Parts 1500-1508 [40 CFR 1500-1508], and with the Commission's implementing regulations under 18 CFR 380.

On December 18, 2018, DETI filed an application with the Commission in Docket No. CP19-26-000 under section 7(c) of the Natural Gas Act (NGA) and Part 157 of the Commission's regulations. DETI seeks authorization to construct, own, and operate a new natural gas pipeline loop[2] and modify facilities at existing compressor stations and meter stations to increase natural gas delivery capacity along DETI's pipeline system. The project is referred to as the West Loop Project (Project).

Our EA is an integral part of the Commission's decision on whether to issue DETI a Certificate of Public Convenience and Necessity (Certificate) to construct and operate the proposed facilities. Our principal purposes in preparing this EA are to:

- identify and assess potential impacts on the natural and human environment that could result from implementation of the proposed actions; and
- identify and recommend reasonable alternatives and specific mitigation measures, as necessary, to avoid or minimize project-related environmental impacts.

2. Purpose and Need

DETI states that the purpose of the Project is to provide 150,000 dekatherms per day of natural gas to the new Advance Power-owned South Field Energy power plant that is currently under construction in Columbiana County, Ohio to replace retiring coal-fired power and help meet the increasing demand for electricity in the Midwest.

Under Section 7(c) of the NGA, the Commission determines whether interstate natural gas transportation facilities are in the public convenience and necessity and, if so, grants a Certificate to construct and operate them. The Commission bases its decisions on technical competence, financing, rates, market demand, gas supply, environmental impact, long-term feasibility, and other issues concerning a proposed project.

[1] "We," "us," and "our" refer to environmental staff of the Office of Energy Projects.

[2] A loop is a pipeline that is constructed adjacent to another pipeline for the purpose of increasing capacity in this portion of the system.

3. Proposed Facilities

The proposed Project consists of:

- 5.1 miles of 36-inch-diameter natural gas pipeline loop in Beaver County, Pennsylvania;
- modifications to increase flow capacity at the existing Beaver Compressor Station in Beaver County, Pennsylvania;
- re-wheel two existing centrifugal compressor units at the existing Carroll Compressor Station in Carroll County, Ohio;
- install a new pig[3] launcher at the existing Koppel Junction Site and install a new pig receiver for the new Stitt Gate Site in Beaver County, Pennsylvania;
- install new control valves at the existing Old Petersburg Regulation Facility in Lawrence County, Pennsylvania; and
- install cathodic protection for the new pipeline at the existing Darlington metering and regulation (M&R) Station in Beaver County, Pennsylvania.

Maps showing the location of the proposed facilities are included in appendix A.

DETI anticipates conducting tree clearing beginning December 2019 and commencing construction activities in April 2020. Construction activities are expected to be complete by October 2020 for an in-service date of July 1, 2021.

4. Public Participation and Comment

On January 9, 2019, the Commission issued a *Notice of Intent to Prepare an Environmental Assessment for the Proposed West Loop Project and Request for Comments on Environmental Issues* (NOI). The NOI was mailed to interested parties including federal, state, and local officials; agency representatives; Native American tribes; local libraries and newspapers; and property owners affected by the proposed facilities. This notice opened the scoping period for 30 days. No comments were received in response to the NOI.

5. Land Requirements

The new pipeline loop would be installed within DETI's existing permanent right-of-way and parallel to its existing TL-400 pipeline, offset approximately 25 feet. DETI would construct the new TL-657 using a 100-foot-wide construction right-of-way in uplands and 75-foot-wide in wetlands in waterbodies to minimize the impacts on these resources. The typical 100-foot-wide right-of-way would consist of a 50-foot-wide temporary workspace and a 25-foot-wide portion of the existing permanent easement associated with the TL-400 pipeline and a new 25-foot-wide area adjacent to the existing pipeline permanent easement that would be maintained as permanent easement for the new pipeline loop. The footprint of all Project-related disturbances during construction is estimated at 103.6 acres. Table 1

[3] A "pig" is a tool that the pipeline company inserts into and pushes through the pipeline for cleaning the pipeline, conducting internal inspections, or other purposes.

provides a summary of the acreages of land required for construction and new land requirements for operation of the Project.

Operation of the Project would require a 50-foot-wide permanent right-of-way centered on the pipeline. DETI proposes to use 25 feet of existing right-of-way associated with the existing permanent easement of the TL-400 pipeline and to add 25 feet of new permanent easement. The Project would require approximately 33.6 acres of permanent right-of-way for operation, of which about 1.8 acres would be new permanent right-of-way, as detailed in table 1.

Access Roads, Staging Area/Pipe Yards, and Additional Temporary Workspace

DETI proposes to use existing access roads and extend some existing access roads, as well as construct one new permanent access road at the Stitt Gate Site. The acreage of impact from the expansion of these access roads is included in table 1.

Extra workspaces, including additional temporary workspaces (ATWS) and staging areas, are typically required at road, railroad, existing utility, pipeline interconnections, wetland, and waterbody crossings, as well as aboveground facility locations. DETI identified 42 ATWS and two pipe storage/staging areas required for the construction of the Project. ATWS vary in size and depend on site-specific conditions and the construction method or need. The area impacted by ATWS for the Project is included in table 1.

Although DETI has identified areas where additional temporary workspace would be required, additional or alternative areas could be identified in the future due to changes in site-specific construction requirements. DETI would be required to file information on each of those areas for review and approval prior to use.

Table 1: Land Requirements for the Project			
Project Component		**Construction Impact (acres)**	**Permanent Right-of-Way (acres)**
Pipeline Facilities			
TL-657 Pipeline	Beaver County, PA	56.81	15.01
Additional Temporary Workspace	Beaver County, PA	6.63	0
	TL-657 Pipeline Facilities Subtotal	**63.44**	**15.79**
Aboveground Facilities			
Beaver Compressor Station	Beaver County, PA	8.91	0
Carroll Compressor Station	Carroll County, OH	3.16	0
	Aboveground Facilities Subtotal	**12.07**	**0**
Associated Facilities			
Pig Launcher and Appurtenances-Koppel Junction Gate Site	Beaver County, PA	1.31	0.25
Pig Receiver and Appurtenances-Stitt Gate Site	Beaver County, PA	0.22	0.22
Aboveground Control Valves and Automation-Old Petersburg Regulation Facility	Lawrence County, PA	1.25	0
Cathodic Protection-Darlington M&R Station	Beaver County, PA	0.51	0
	Associated Facilities Subtotal	**3.29**	**0.47**
Pipe Storage/Contractor Yards			
Pipe Yard # 1-Darlington Pipe Yard		3.16	0
Pipe Yard #2-Route 18 Pipe Yard		6.54	0
Pipe Storage/Contractor Yards Subtotal		9.70	0
Access Roads			
Permanent	Beaver County, PA	0.65	0.65
Temporary	Beaver County, PA	14.40	0
	Access Roads Subtotal	**15.05**	**0.65**
	PROJECT TOTAL	**103.55**	**16.91**

6. Construction, Operation, and Maintenance Procedures

The proposed facilities would be designed, constructed, tested, operated, and maintained in accordance with the U.S. Department of Transportation (USDOT) Minimum Federal Safety Standards in 49 CFR 192. The USDOT's regulations are intended to ensure adequate protection for the public and to prevent natural gas facility accidents and failures. Part 192 specifies material selection and qualification, minimum design requirements, and protection from internal, external, and atmospheric corrosion.

DETI proposes to follow the construction procedures and mitigation measures contained in the Commission's *Upland Erosion Control, Revegetation, and Maintenance Plan* (Plan) and *Wetland and Waterbody Construction and Mitigation Procedures* (Procedures).[4] In addition, DETI has prepared an acceptable Preparedness, Prevention, and Contingency Plan (PPC Plan) which contains measures to prevent and respond to any inadvertent releases of hazardous materials as well as notification procedures in the event of a release.

In accordance with the FERC Plan, DETI would use at least one full-time environmental inspector (EI) during construction of the Project. The EI would be on site during Project construction activities to ensure compliance with the construction procedures contained in the Plan and Procedures. A full list of the EI's duties is presented in section II.B of the Plan. The EI's responsibilities include:

- ensuring compliance with applicable federal, state, and local environmental permits;
- ordering corrective actions for acts that violate the environmental conditions of the Commission's Certificate, or any other authorizing document;
- ensuring compliance with site-specific construction and restoration plans or other mitigation measures and landowner agreements; and
- maintaining construction status reports.

DETI would conduct environmental training sessions in advance of construction to ensure that all individuals working on the Project are familiar with the environmental mitigation measures appropriate to their jobs and the EI's authority. FERC staff would also conduct compliance inspections during construction and restoration to verify compliance with the Commission's requirements.

6.1 Pipeline Construction

DETI would use conventional techniques for buried pipeline construction and aboveground facility construction and follow the requirements set forth in the Plan and Procedures to ensure safe, stable, and reliable transmission facilities consistent with Commission and USDOT specifications. To comply with USDOT specifications, DETI would hydrostatically test all pipeline facilities prior to placing them in service.

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[4] Copies of the Plan and Procedures may be accessed on our website (http://www.ferc.gov/industries/gas/enviro/guidelines.asp) or obtained through our Office of External Affairs at 1-866-208-3372.

DETI would conduct construction activities during daylight hours for 10 hours per day, 6 days per week, typically between 6:00 am and 6:00 pm. Some construction activities may require 24-hour construction on a limited basis such as waterbody crossings, hydrostatic testing, and tie-ins.

Clearing and Grading

Clearing operations involve removing vegetation, including trees, within the construction right-of-way or construction work areas. DETI's proposed pipeline loop consists mainly of forested and open land. DETI would clear trees along the pipeline right-of-way between September 1st and March 31st to avoid impacts on nesting migratory birds and federally protected bat species. In the event that tree clearing is required outside of this window, DETI would have to consult with the U.S. Fish and Wildlife Service (FWS) and implement additional mitigation measures. Felled trees may be left on the right-of-way until grading activities commence in the spring to further minimize ground disturbance.

After clearing is complete, DETI would install temporary erosion control devices along the limits of wetland boundaries within the construction right-of-way. Grading of the construction right-of-way would be necessary for the movement of heavy equipment and safe passage for work crews. In agricultural and residential lands, topsoil would be segregated from subsoil during trenching and would remain segregated during construction to avoid loss due to mixing with subsoil material. Upon completion of backfilling operations, the topsoil would be replaced over the graded area.

Trenching

Typically, the trench for a pipeline must be excavated to a depth which allows for a minimum of 36 inches of cover in accordance with USDOT regulations. However, at crossings of foreign pipelines, utilities, or other structures the trench may be buried deeper to allow for a minimum of 12 inches of clearance. In accordance with the Plan, measures such as installing trench plugs would be taken to prevent the flow of water through the trench.

Pipe Stringing, Preparation, and Lowering In

Pipe stringing involves moving the pipe into position along the construction right-of-way in a continuous line parallel to the excavated trench in preparation for subsequent lineup and welding operations. The pipe is then bent, where necessary, to conform to changes in the direction of the alignment and natural ground contours. After the pipe has been bent, it would be lined-up and welded, and then the welds and pipe coating are inspected. Side-boom tractors are used to lower the pipe into the trench. Trench dewatering would be performed in accordance with the Plan and Procedures.

Backfilling and Hydrostatic Testing

After the pipe is lowered into the trench, the trench would be backfilled using the material originally excavated from the trench. Topsoil would not be used for padding the pipeline. In some cases, additional backfill material from other sources may be used. In areas where topsoil has been segregated, the subsoil would be placed in the bottom of the trench, followed by replacing the topsoil over the subsoil layer. The surface of the construction work space would be graded to conform to pre-existing contours of the adjoining area, except for a slight crown of soil over the trench (in upland areas only) to compensate for natural subsidence of the backfill material.

Hydrostatic testing is a process in which a pipeline is tested for leaks using a pressurized medium, such as water, which ensures the integrity of facilities and the pipeline. The process is generally carried out after backfilling and after completion of other construction activities. DETI would be required to hydrostatically test all pipe in accordance with USDOT pipeline safety regulations. A hydrostatic test involves filling the lowered-in pipeline with water and pressurizing the pipeline above its maximum allowable operating pressure. The pressure in the pipeline is then monitored for several hours. If a drop in pressure is recorded, the pipeline is examined to determine if any leaks have occurred. After hydrostatic testing is complete, DETI would either discharge the water in accordance with the Procedures and appropriate permit conditions or collect the water and transport to an approved disposal facility.

Cleanup and Restoration

Weather and soil conditions permitting, final cleanup would occur within 20 days after the trench is backfilled (within 10 days in residential areas). After backfilling is complete, all disturbed areas would be graded to the original contours, any remaining debris properly disposed of, permanent erosion controls constructed or installed, and the right-of-way seeded with an appropriate seed mix. Examples of typical erosion control devices include slope breakers, sediment barriers (such as silt fence or straw bales), and mulch. All restoration activities would be completed according to the Plan and Procedures. Seeding would be completed according to the recommendations of the National Resource Conservation Service, the applicable County Conservation Districts, and landowner agreements.

Special Pipeline Construction Procedures

Special construction techniques are typically required when constructing across waterbodies, wetlands, roads and railroads, and residential areas. The special construction methods that DETI proposes to use are described below.

Waterbody Crossings

DETI proposes to cross all of the waterbodies using dry crossing techniques, typically a flume or a dam-and-pump crossing. One waterbody, an unnamed tributary to Clarks Run at milepost (MP) 2.66, would be crossed using a horizontal bore method.

The dam-and-pump crossing method involves using pumps and hoses instead of flumes to move water around the construction work area. Water flow would be maintained while the pipeline is installed and the trench backfilled. After backfilling, the dams, pumps, and hoses would be removed and the banks restored and stabilized. A flume crossing involves diverting the flow of water across the construction work area through one or more flume pipes placed in the waterbody. Sandbags or other diversion structures would be placed directly in the waterbody upstream and downstream of the pipeline centerline to divert the water flow through the flume pipes. The trench line would be isolated and pumped dry, allowing construction crews to excavate the trench and install the pipe. Downstream water flow would be maintained until the trench is backfilled, at which time the dams and flume pipe would be removed. The horizontal bore crossing method involves excavating a pit on each side of the feature, placing boring equipment within the pits, boring a hole under the feature, and pulling a section of pipe through the hole.

DETI would cross ephemeral waterbodies and ditches where there is no perceptible flow at the time of crossing, using standard upland crossing techniques. However, DETI would be required to

maintain adequate equipment on site to conduct a dry-ditch crossing should perceptible flow occur during construction.

To the extent possible, streambeds would be returned to their preconstruction contours, and stream and river banks restored to their preconstruction condition and allowed to re-vegetate in accordance with the FERC Procedures and any applicable permit conditions. Waterbodies crossed by the Project are further discussed in section B.2.2.

Wetland Crossings

Wetland boundaries would be delineated and marked in the field prior to construction activities. The pipeline construction right-of-way in wetlands would be limited to 75 feet. Woody vegetation within the construction right-of-way would be cut off at ground level and removed from the wetlands, leaving the root systems intact. The pulling of tree stumps and grading activities would be limited to the area directly over the trench line unless it is determined that safety-related construction constraints require grading or the removal of stumps from the working side of the right-of-way. Construction equipment operating in wetland areas would be limited to that needed to clear the right-of-way, dig the trench, install the pipeline, backfill the trench, and restore the right-of-way. Topsoil segregation would be utilized in unsaturated wetlands to preserve the existing seed bank and aid in the successful restoration of the disturbed wetland. Trench plugs would be installed as necessary to maintain wetland hydrology.

The specific crossing procedures used to install the pipeline across wetlands would depend on the level of soil stability and saturation encountered during construction. Construction across unsaturated soils that can support the weight of equipment would be conducted in a manner similar to the upland construction procedures. In areas that are proposed for conventional open trench construction, but where soil conditions may not support the weight of equipment, timber mats would be used to minimize disturbance to wetland hydrology and maintain soil structure.

The push-pull method of construction could be used in inundated or saturated conditions where wetland soils and hydrology cannot support conventional pipe laying equipment, or in areas that have significant quantities of water that would allow for the pipe to be floated over the open trench. With this method, construction and excavation equipment would work from temporary work surfaces, and a prefabricated pipeline segment would be pulled or floated into position then sunk with buoyancy control devices and placed in the trench. Wetlands are further discussed in section B.2.4.

Road and Railroad Crossings

Construction of the Project would cross multiple local and state roads and the Pennsylvania Turnpike (Interstate 76) and the Beaver Valley Expressway. All state roads are proposed to be crossed using the trenchless jack and bore method. This method consists of excavating a pit on either side of the roadway and horizontally drilling or pushing the pipeline through from one side to the other without disturbing the ground surface above the pipeline. Local and township roads would be crossed using an open cut method.

6.2 Aboveground/Associated Facility Construction

At the existing Beaver Compressor Station all work would be entirely located within the current property boundaries. At the existing Carroll Compressor Station, all work would be within the existing building and on existing paved or graveled areas.

A pig launcher and receiver would be located at opposite ends of the new TL-657 pipeline loop. The Koppel Junction site, where the proposed TL-657 pipeline would terminate, would be expanded by the purchase of a residential property adjacent to the site. The newly acquired land would accommodate a new pig launcher, valves, and other piping additions. A portion of the adjacent parcel would be gravel covered with the expansion of this facility. The existing permanent access road to this site would be widened and slightly realigned to accommodate construction vehicles and the new facilities. At the existing Stitt Gate site, an aboveground pig receiver, valves, and other appurtenances would be installed. This work would all occur within the fence line of the existing facility, with the exception of a new permanent access road that would be constructed to allow access to the site during operation.

The proposed construction at the existing Old Petersburg Regulation Facility, includes installation of aboveground control valves on DETI's LN-25 and LN-35 pipelines. All of the work at this facility is within the existing facility boundary.

The Project construction at the existing Darlington M&R includes the installation of cathodic protection in an upland area within DETI's existing fence line at this facility.

During construction, workspaces at the aboveground facilities would be cleared of vegetation, as necessary, and graded. Erosion control devices would be installed as needed to prevent erosion and offsite impacts in accordance with the FERC Plan and any applicable state permit requirements. After construction, all temporary workspaces would be revegetated in accordance with the FERC Plan.

7. Non-jurisdictional Facilities

Under section 7 of the NGA, FERC is required to consider all factors bearing on the public convenience and necessity. Occasionally, proposed projects have associated facilities that do not come under the jurisdiction of FERC. These non-jurisdictional facilities may be integral to the project objective (e.g., a new or expanded power plant that is not under the jurisdiction of FERC at the end of a pipeline) or they may be merely associated as minor, non-integral components of the jurisdictional facilities that would be constructed and operated with the proposed facilities (e.g., a meter station constructed by a customer of the pipeline to measure gas off-take).

The proposed Project purpose is to serve a non-jurisdictional gas-fired power plant that is currently under construction in Columbiana County, Ohio. This facility was approved by the Ohio Public Utilities Commission on September 22, 2016. South Field Energy is a 1,182 megawatt electric generation facility that will be primarily fueled by natural gas and expected to be completed by June 2021. The facility is located on a 150-acre parcel and will occupy fewer than 20 acres after completion. The staff of the Ohio Public Utilities Commission conducted an environmental review of the power plant that was issued on May 20, 2016. This environmental review evaluated the impacts on socioeconomics, water resources, cultural resources, threatened and endangered species, vegetation, noise, and air quality. The Ohio Public Utilities Commission staff concluded that the power plant project represents the "minimum

adverse environmental impact".[5] Additional information on this facility is available on the Ohio Public Utilities Commission website.[6] This non-jurisdictional facility is further discussed in our cumulative impacts analysis in section B.8.

8. Permits, Approvals, and Regulatory Requirements

DETI would obtain all necessary federal, state, and local permits related to construction of the proposed facilities. All relevant permits and approvals would be provided to the respective contractors who would be required to be familiar with and adhere to applicable requirements. See table 2 for a list of the permits and approvals required for the Project.

Any non-federal permits or requirements would need to be consistent with the conditions of any Commission Certificate for the Project. The Commission encourages cooperation between interstate pipelines and local authorities. However, if such authorities prohibit or unnecessarily delay DETI from meeting its obligations under the Commission's Order, their requirements could be preempted by the Certificate.

[5] https://dis.puc.state.oh.us/TiffToPDf/A1001001A16E20B32939H01635.pdf

[6] https://dis.puc.state.oh.us/CaseRecord.aspx?CaseNo=15-1716

Table 2: Major Permits and Approvals for the Project

Issuing Agency	Permit/Approval	Filing Date (*Anticipated*)	Receipt Date (*Anticipated*)
Federal			
Federal Energy Regulatory Commission	Section 7(c) of the Natural Gas Act, Certificate of Public Convenience and Necessity	12/18/18	*Pending*
U.S. Army Corps of Engineers- Pittsburg District	Clean Water Act- Section 404 (PA)	12/19/18	*Pending*
U.S. Fish and Wildlife Service- PA Field Office	Endangered Species Act- Section 7 Consultation	10/18/18	*Pending*
U.S. Fish and Wildlife Service- OH Field Office	Endangered Species Act- Section 7 Consultation	10/18/18	11/8/18
State-Pennsylvania			
Pennsylvania Game Commission	State-listed species consultation (birds, mammals)	10/22/18	10/22/18
Pennsylvania Department of Conservation and Natural Resources	State-listed species consultation (plants)	10/18/18	Initial response received 10/26/18, consultation ongoing
Pennsylvania Fish and Boat Commission	State-listed species consultation (fish, mussels, amphibians, and reptiles)	10/18/18	Initial response received 10/25/18, consultation ongoing
Pennsylvania Department of Environmental Protection	Clean Water Act- Section 401 Water Quality Certification	12/19/18	*(12/18/19)*
	Water Obstruction and Encroachment Permit	12/19/18	*Pending*
	PA Erosion and Sedimentation Control General Permit	12/10/18	*Pending*
	Hydrostatic Test Water Discharge Permit	*(12/15/19)*	*Pending*
Pennsylvania Historical and Museum Commission	Section 106 of the National Historic Preservation Act Consultation	11/28/18 (Historic), 11/30/18 (Archaeology)	*Pending*
Pennsylvania Turnpike Commission	Highway Crossing Permit	10/29/18	*Pending*
State-Ohio			
Ohio Department of Natural Resources	State-listed Threatened and Endangered Species Consultation	10/18/18	12/6/18
Ohio History Connection	Section 106 of the Natural Historic Preservation Act Consultation	10/24/18	*Pending*

B. ENVIRONMENTAL ANALYSIS

Construction and operation of the Project would have temporary, short-term, long-term, and permanent impacts. As discussed throughout this EA, temporary impacts are defined as occurring only during the construction phase up to a few months after construction. Short-term impacts are defined as lasting up to three years. Long-term impacts would eventually recover, but require more than three years. Permanent impacts are defined as lasting throughout the life of the Project.

1. Geology and Soils

1.1 Geology

The proposed Project spans three physiographic regions of the Appalachian Plateaus Province. In Pennsylvania, all of the facilities in Beaver County are located in the Pittsburg Low Plateau section which is characterized by smooth to irregular topography with an undulating surface and narrow, relatively shallow valleys of low to moderate relief. Elevation in this section ranges from 660-2,340 feet. The Old Petersburg Regulation Facility in Lawrence County is located within the Northwestern Glaciated Plateau section which is characterized by broad, rounded upland and deep, steep-sided, linear valleys partly filled with glacial deposits, with very low to moderate relief. Elevation in this area ranges from 900-2,200 feet. In Ohio, the Project is located south of the glacial margin of the Muskingum-Pittsburg Plateau physiographic region of the Allegheny Plateaus. This area is characterized by a moderately high relief dissected with broad valleys that contain outwash terraces and tributaries with lacustrine terraces. Elevation in this area ranges from 650-1,400 feet.

Blasting

Shallow bedrock may be encountered in certain areas during the installation of the pipeline and aboveground facilities. However, DETI does not anticipate that blasting would be required. Due to the existing buried pipelines and aboveground facilities, DETI would first attempt to break up bedrock using hydraulic hammers or other similar equipment. In the event blasting is required, DETI would adhere to its Blasting Specifications. We have reviewed DETI's Blasting Specifications, which includes the procedures and safety measures related to blasting, and find it acceptable.

Mineral Resources

The Project is located in a region that contains mineral resources including gas, coal, and sand and gravel deposits. Traditional oil and gas operations and non-traditional shale gas extraction operations are common in this region. DETI identified the presence of mineral resources within 0.5 mile of the Project facilities. According to the Pennsylvania Department of Environmental Protection's (PADEP) Oil Gas Locations-Conventional Unconventional and Coal Pillar Location Oil and Gas, the Pennsylvania Spatial Data Access, and the Ohio Department of Natural Resources' Oil and Gas Wells Map of Ohio, there are no natural gas, oil, or coalbed methane wells within the Project boundaries. These resources identified two oil/gas wells within 0.5 mile of the TL-657 Pipeline, one of which is 400 feet from an access road and the other is over 1,000 feet from the pipeline right-of-way. Five oil/gas wells were identified within 0.5 mile of the Carroll Compressor Station, and all of which are greater than 0.25 mile from the station. There are no oil or gas wells within 0.5 mile of the Project facilities in Lawrence County, PA. DETI has committed to continued coordination with landowners and easement holders to identify new oil and gas wells and associated pipelines to prevent damage to these facilities. Therefore,

we conclude that the Project would not impact existing natural gas wells as a result of Project construction or operation.

Although there are no coal or mining operations within the workspaces associated with the Project, there are mines located adjacent to the Project facilities. Three inactive coal mines, the Dodds 2 Mine, Shaddick Mine, and the Gibbons Mine are located in the vicinity of the pipeline and access roads. The inactive C-545 surface coal mine is located near the Project facilities in Lawrence County, PA. In Ohio, there is one inactive coal mine, called D-0579, within 0.5 mile of the Carroll Compressor Station. Five industrial mines consisting of sand, gravel, and limestone operations are located in the vicinity of the Project. Two of these facilities are active, the Raushel Mine and Petersburg Surface Mine/Quarry, near the Old Petersburg Regulation Facility in Lawrence County. In addition there are two inactive facilities near the Old Petersburg Regulation Facility (Petersburg Deep Mine and Raushel Mine) and one near the TL-657 Pipeline (Darlington Ready Mix-1 Mine).

The rock units in the Project area have the potential to produce acidic sulfide mineral due to a chemical reaction when water runs through sulfur-bearing minerals and exposed to air, such as in abandoned or unreclaimed mining areas. This causes a toxic pollution into waterways that can affect water quality and wildlife. Although the Allegheny and Conemaugh Formations of Beaver County are at low risk, the Mercer coals of the Pottsville Formation in Lawrence County are at higher risk. DETI has committed to limiting disturbance of any exposed problematic geologic units and contain water flows during construction.

Although there are active and inactive mineral extraction activities in the vicinity of the Project, the nature of the construction activities is unlikely to cause an adverse impact on mineral resources. We conclude that Project construction and operation would not be affected by these ongoing activities.

Geologic Hazards

Geologic hazards are natural, physical conditions that can result in damage to land and structures or injury to people. Such hazards typically include seismicity (e.g., earthquakes, surface faults, and soil liquefaction), landslides, flooding, and land subsidence. Conditions necessary for the development of other geologic hazards, including regional subsidence, avalanches, and volcanism, are not present in the Project area.

There is the potential for seismic activity in the vicinity of some of the Project facilities. DETI reviewed historic earthquake records in the vicinity of the Project facilities. A cluster of six small earthquakes in Ohio about 5 miles from the Old Petersburg Regulation Facility occurred in 2014. In addition, a 5.2 magnitude earthquake occurred in 1998 in Mercer County, PA. No other seismic activity has been reported within 25 miles of the Project.

Landslides involve the downslope movement of earth materials under a force of gravity on steep slopes due to natural or man-made causes. The areas most susceptible to landslides are on steep slopes along the TL-657 pipeline right-of-way where the slope is greater than 30 percent from MP 0.60 to 0.62 and MP 2.70-2.77. DETI would install appropriate erosion controls to minimize the potential risk from landslides. DETI is conducting a slope hazard assessment to identify the potential for land movement along the pipeline due to seismic or other factors. The results of this assessment would be filed with the Commission by DETI when complete.

The majority of the Project area is not near major stream valleys and has low to no potential for flash flooding. The greatest potential for flash flooding to occur in the Project area would be along waterbodies during or after a large storm event with significant precipitation over a short period of time. All Project facilities are in areas of minimal flood hazard and outside of 500-year flood zones. The TL-657 pipeline crosses two areas that are within the 100-year flood zone, at the crossing of West Clarks Run (MP 4.80) and S9/W26 (MP 2.95). The Project facilities would be designed and constructed in accordance to USDOT standards and all applicable stormwater regulations and permits. Impacts on flood zones would be temporary and minor. DETI would restore all Project areas to preconstruction contours, including the areas within the 100-year floodplain. No post-construction impacts related to flooding are anticipated.

Land subsidence is the sinking or downward settling of the earth's surface and may be caused by dissolution of bedrock, subsurface mining, or pumping of oil. Karst terrain features such as sinkholes, caves, and caverns can form as a result of the long-term action of groundwater on soluble carbonate rocks (e.g., limestone and dolostone). While some of the bedrock formations along the proposed pipeline route contain carbonate rocks, they are not likely to be highly susceptible to natural subsidence because they are primarily at or near the land surface. The Project facilities do not directly overlie any documented abandoned or active underground mining operations. One historic instance of mine subsidence on 2004 occurred approximately 0.75 mile south of the TL-400 right-of-way. DETI monitors the pipeline right-of-way on a monthly basis and stated that it would pay particular attention to this area for any subsidence and immediately address any issues.

Paleontology

The Project area in western Pennsylvania and eastern Ohio is underlain by Paleozoic sedimentary rocks which have the potential to contain marine fossils. Although fossil specimens may be encountered during construction activities, no impacts on sensitive paleontological resources are anticipated during construction. If unique or significant fossil specimens are discovered during excavation activities, DETI would notify the Pennsylvania Department of Conservation and Natural Resources' (PADCNR) Bureau of Topographic and Geologic Survey upon discovery.

The overall effect of the Project on topography and geology would be minor, and significant adverse effects on geological resources are not anticipated. Based on the low probability of localized earth movements or geological hazards in the vicinity of the Project, we also do not anticipate impacts attributable to such geological movements or hazards. Based on the above assessment, the proposed Project would not significantly impact mineral resources and would not be significantly impacted by geologic hazards.

1.2 Soils

Prime Farmland

The U.S. Department of Agriculture defines prime farmland as land that has the best combination of physical and chemical characteristics for growing food, feed, forage, fiber, and oilseed crops. In addition, soils may be considered of statewide or local importance if those soils are capable of producing a high yield of crops when managed according to accepted farming methods.

Forty percent of the land crossed by the pipeline is classified as Farmland of Statewide Importance and approximately 8 percent is considered Prime Farmland. All temporary workspaces would be returned to pre-existing conditions following construction and farming operations would be able to continue after construction is complete. New permanent impacts would be limited to about 0.5 acre from the construction of a permanent access road. Therefore, we conclude Project impacts on prime farmland and farmland of statewide importance would not be significant.

Hydric and Compaction-Prone Soils

Hydric soils are soils formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part. Hydric soils include wetlands which are further discussed in section B.2.3. Impacts on hydric soils would be minimized by following the wetland crossing methods in the Procedures and the U.S. Army Corps of Engineers (USACE) and state permits for waterbody crossings.

Soil compaction is the loss of soil structure or compression of the soil. Construction equipment traveling over wet soils could disrupt the soil structure, reduce pore space, increase runoff potential, and cause rutting. This can lead to poor soil aeration, increased runoff, and poor plant rooting which can affect crop production in agricultural lands. The soils in the Project area range from low to high compaction potential. DETI would implement measures such as topsoil segregation in agricultural and residential land and other measures in the Plan and Procedures to minimize the effects of soil compaction. The construction right-of-way would also be scarified prior to final stabilization to loosen the soil and promote seed germination.

Erosion and Revegetation

Clearing removes protective vegetative cover and exposes soils to the effects of wind and water which increases the potential for soil erosion and the transport of sediment to sensitive resource areas. Soils most susceptible to erosion by water typically have bare or sparse vegetative cover, non-cohesive soil particles with low infiltration rates, and moderate to steep slopes. Most of the soils crossed by the Project have a low erosion potential. However, some soils in the Project area have a slight to moderate susceptibility to wind erosion in cultivated areas. DETI's adherence to the measures in the Plan and Procedures would prevent excessive erosion during construction. DETI has developed a Slope Stability Policy and Procedure for Pipeline Design, Construction, and Right-of-Way Maintenance and would also implement this plan for the Project. Additionally, DETI is conducting a Project-specific slope stability hazard assessment to identify the potential for unintended land movement during construction and operation. This assessment would be filed with FERC when it is complete.

In accordance with the Plan, temporary erosion control devices would be maintained until the Project area is successfully stabilized/revegetated. DETI would also implement any state- or county-specific requirements for revegetation that may be more stringent than the FERC Plan and Procedures. DETI consulted with the Beaver County Conservation District, which recommended PADEP seed mixtures, unless landowners prefer otherwise.

Soil Contamination

Contamination from spills or leaks of fuels, lubricants, and coolant from construction equipment could adversely affect soils. Measures outlined in DETI's PPC Plan would be implemented to reduce potential impacts on soils from spills of the hazardous materials used during construction. These measures include regularly inspecting equipment to ensure it is in good working order, properly training employees regarding the handling of fuels and other hazardous materials, and promptly reporting any spills to the appropriate agencies. We have reviewed DETI's PPC Plan and find it acceptable.

Construction activities that create soil disturbance, such as clearing, grading, trench excavation, backfilling, and the movement of construction equipment along the right-of-way, would result in temporary, minor impacts on soil resources. Soil characteristics could affect construction performance or increase the potential for adverse construction-related soil impacts. The most significant activities that have the potential to reduce soil quality are inadvertently mixing topsoil with subsoil, bringing excess rocks to the surface, compacting soil by heavy equipment, and disrupting surface and subsurface drainage patterns. The soils crossed by the Project generally do not pose any severe limitations for construction and DETI has committed to several mitigation measures for areas such as shallow bedrock and susceptibility to erosion or soil compaction.

During construction, topsoil and subsoil would be disturbed during grading and trenching activities and the movement of heavy equipment. Implementation of proper topsoil segregation would help to ensure post-construction revegetation success, thereby minimizing loss of soil fertility and the potential for long-term erosion problems.

There is a potential for construction activities to introduce rock into topsoil during excavation in areas of shallow depth to bedrock. DETI would attempt to use mechanical methods to excavate through the bedrock, where possible. Rock excavated from the trench may be used to backfill the trench only to the top of the existing bedrock profile. Rock not returned to the trench would be considered construction debris and disposed of appropriately.

Implementation of the measures outlined in the Plan and Procedures would minimize soil impacts and facilitate revegetation of disturbed areas. Temporary erosion controls, including slope breakers and sediment barriers (e.g., hay bales and silt fences), would be installed following initial ground disturbance to control runoff and prevent sediment transport off the construction right-of-way. Permanent erosion controls would be installed, as appropriate, to ensure the successful restoration of the Project area. Further, DETI would implement its PPC Plan to reduce the potential impacts on soils from spills of hazardous materials used during construction and manage contaminated soils should they be encountered. Given the impact minimization and mitigation measures described above, we conclude that soils would not be significantly affected by construction and operation of the Project.

2. Water Resources and Wetlands

2.1 Groundwater Resources

Pennsylvania does not designate its aquifers and most of the aquifers in Pennsylvania are local, providing water from specific rock layers. Unconsolidated sediments, such as sand and gravel, produce the largest amounts of water in Pennsylvania. These aquifers are mostly found in major stream valleys that drain areas previously covered by glaciers. The Ohio Environmental Protection Agency (OEPA)

divides the state's aquifers into three main types: sand and gravel, sandstone, and carbonate. The Carroll Compressor Station is located above the Pennsylvanian undivided aquifer. No U.S. Environmental Protection Agency (EPA) sole source aquifers (aquifers that supply at least 50 percent of the drinking water consumed in an area) were identified within the Project area.

Based on a search of the PADCNR Groundwater Information System, there is one water well located within 150 feet of the TL-657 Pipeline and three groundwater wells within 150 feet of proposed access roads. The PADCNR database did not identify any springs within 150 feet of the Project area. DETI consultation with landowners is ongoing to confirm the exact location of wells or identify wells not listed in the PADCNR database. Water wells identified within 150 feet of the Project are shown in table 3.

Table 3: Water Wells in the Vicinity of the Project

Location (MP)	Well Use	Township	Distance from Centerline (feet)	Distance from Construction Workspace (feet)	Source
TL-657					
1.23	Domestic Well	Big Beaver, PA	134	76	Landowner
2.31	Domestic Well	Big Beaver, PA	140	89	Landowner
2.35	Domestic Well	Big Beaver, PA	31	18	Pennsylvania Groundwater Information System
3.81	Domestic Well	Big Beaver, PA	193	118	Landowner
Aboveground Facilities					
Carroll Compressor Station	Unknown	Lee, OH	Unknown	Unknown	ODNR Water Well Log
Carroll Compressor Station	Unknown	Lee, OH	Unknown	Unknown	ODNR Water Well Log
Access Roads					
TAR-2	Domestic Well	Chippewa, PA	907	71	Pennsylvania Groundwater Information System
TAR-6	Domestic Well	Big Beaver, PA	388	117	Landowner
PAR-1	Domestic Well	Big Beaver, PA	274	102	Pennsylvania Groundwater Information System

In Ohio, consultation with the Ohio Department of Natural Resources identified two groundwater wells within the Carroll Compressor Station parcel. No springs were identified within 150 feet of the Carroll Compressor Station boundaries. No wellhead protection areas were identified to be affected by the Project facilities. Pre-construction testing of wells would be offered to the owners of all wells within 150 feet of the proposed construction workspace to document water quality and flow and to establish a baseline for comparison in the event of construction impacts. If impacts on nearby wells occurs as a

result of construction, then DETI would provide an alternate source of water and/or other appropriate compensation to the landowner (e.g., repair, replace to former capacity).

Construction activities would involve shallow, temporary, and localized excavation. Trench excavation could intersect the water table in low-lying areas where groundwater is near the surface (e.g., wetlands) but, in general, the depth to groundwater would be below the excavated trench. Groundwater resources could also be temporarily affected due to changes in overland water flow and recharge caused by clearing and grading of the Project right-of-way. In addition, near-surface soil compaction caused by heavy construction vehicles could reduce the soil's ability to absorb water in these isolated areas. The disturbance of soils along the trench line would offer a preferential path for groundwater movement resulting in changes to permanent flow patterns. During construction, local water table elevations could be affected by trenching and backfilling, which could temporarily affect wells near the construction area.

In instances where trench dewatering would be required, all trench water would be discharged into well-vegetated upland areas to allow the water to infiltrate back into the ground, thereby minimizing any long-term effects on the water table. In accordance with the Procedures, permanent trench plugs would be installed at regular intervals within the trench to deter groundwater movement along the trench line. Upon completion of construction, DETI would restore the ground surface as closely as practicable to original contours and revegetate the right-of-way. Groundwater movement and levels would quickly return to baseline conditions, as surficial aquifers in the Project area exhibit relatively fast recharge rates. Groundwater is not proposed to be used as a hydrostatic test water source.

Inadvertent surface spills of hazardous materials used during construction could contaminate shallow groundwater. To minimize the potential impacts associated with inadvertent spills, DETI has prepared a PPC Plan which we have reviewed and find acceptable. This plan includes measures designed to prevent hazardous materials from reaching groundwater, such as scheduling equipment and vehicle inspections to identify leaks, storing fuels within secondary containment structures, and refueling equipment at least 100 feet away from waterbodies and wells. In the event that a spill should occur, DETI's PPC Plan identifies appropriate actions that would be taken to remediate and clean up the spill.

Based on DETI's proposed construction techniques and the implementation of minimization and mitigation measures, we conclude that construction and operation of the Project would not result in significant long-term or permanent impacts on the quality of groundwater resources in the Project area.

2.2 Surface Water Resources

DETI conducted surveys of the Project area in Pennsylvania to identify waterbodies impacted by the Project. The Project would impact a total of 38 waterbodies. Twenty-one of these waterbodies would be crossed by the TL-657 pipeline. Seventeen of the waterbodies are crossed by access roads that would be used during construction. No waterbodies would be impacted by construction of the proposed facilities in Ohio. Table 1 of appendix B provides additional details on these waterbodies.

DETI proposes to cross all waterbodies using a dry open cut method such as flume or dam-and-pump. These dry waterbody crossing methods are further described in section A.6.1. In accordance with the Procedures, the streambanks would be reestablished to preconstruction contours and stabilized with an erosion control fabric or similar product. Erosion and sediment control devices such as silt fence and slope breakers would be installed across the right-of-way to reduce streambank and upland erosion and sediment transport into the waterbody, and stream banks would be revegetated in accordance with the

FERC Procedures. A vegetated buffer at least 25 feet wide adjacent to waterbodies would be revegetated to preconstruction conditions over the entire width of the right-of-way, except for a 10-foot-wide strip centered over the pipeline that may be periodically mowed and maintained in an herbaceous state so that shrubs and trees cannot reestablish themselves. Riparian cover on affected stream banks would be expected to recover over several months to several years. Erosion controls would be maintained and monitored throughout restoration, and removed once restoration is deemed successful.

Impacts on surface water resources from Project construction would depend on a number of factors, including the size of the waterbody, flow at the time of crossing, duration of construction, and streambed composition. The greatest potential impacts would likely result from an increase in sediment loading and turbidity. Given the dry crossings proposed, sediment loading and turbidity impacts would primarily result from clearing and grading of stream banks, trench dewatering, installation of flume pipes or construction of dams, the loosening of the streambed soil from trenching and subsequent backfilling, as well as silt-laden runoff from the construction right-of-way.

Construction-related impacts would be limited primarily to short periods of increased turbidity before installation of the pipeline, during the installation of the upstream and downstream dams, and following pipeline installation when the dams are removed and flow across the restored work area is reestablished. We conclude that if completed in accordance with the construction and restoration methods described in the FERC Procedures and DETI's PPC Plan, the impacts on waterbodies would be minor and temporary.

Hydrostatic Test Water/Dust Suppression

DETI estimates a total of 1,325,000 gallons of water will be needed for hydrostatic testing and dust suppression. DETI proposes to obtain municipal water for hydrostatic testing from the Beaver Falls Municipal Authority which has confirmed the availability of the water. No chemicals would be added to the test water during the hydrostatic testing. After hydrostatic testing is complete, DETI would either discharge the water in accordance with the Procedures and appropriate permit requirements or collect the water and transport to an approved disposal facility. If discharged, DETI would utilize a well vegetated upland area using energy dissipating devices to reduce impacts on soil erosion. Given that DETI would either dispose of used hydrostatic test water or adhere to our Procedures and any applicable permit conditions, we conclude that hydrostatic testing would not impact water resources.

2.3 Wetlands

Wetlands are areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support a prevalence of wetland vegetation adapted for life in saturated soil conditions. Wetlands can be a source of substantial biodiversity and serve a variety of functions that include providing wildlife habitat, recreational opportunities, flood control, and naturally improving water quality.

DETI conducted field delineation surveys to determine the presence of wetlands within Project workspaces. The surveys identified 32 wetlands that would be crossed by the Project. Three types of wetlands were identified during wetland delineation surveys of the Project area: palustrine emergent, palustrine scrub/shrub, and palustrine forested wetlands. Forested wetlands are characterized by the presence of large woody trees, typically over 20 feet in height. Scrub/shrub wetlands contain saplings and

shrubs less than 20 feet tall. Emergent wetlands consist of low growing herbaceous species. Typical vegetation species found in these wetland types are further discussed in section B.3.1 below.

DETI would reduce the width of the construction right-of-way at all wetland crossings to no greater than 75 feet wide. Construction of the Project would affect a total of about 2.5 acres of wetlands (2.1 acres of palustrine emergent wetland, 0.1 acre of palustrine scrub-shrub wetland and 0.3 acre of palustrine forested wetland). Wetlands within the temporary workspace would return to their preconstruction condition following restoration. During operation, palustrine emergent wetlands would revert to emergent wetlands following construction. Less than 0.1 acre of scrub-shrub wetland, and 0.2 acre of forested wetland would be converted to emergent wetland within the permanent right-of-way during operation of the Project.

DETI would construct the pipeline segment through wetlands in accordance with the Procedures and state and federal permitting requirements. If wetland soils are non-saturated at the time of construction and able to support construction equipment, DETI would use standard pipeline construction techniques. If soils are saturated, DETI would construct a temporary travel lane to support equipment that would be fully removed following construction. To preserve natural seed stock and increase revegetation potential, up to 12 inches of topsoil would be segregated during trenching and returned to the trench during backfilling after replacing the subsoil. Erosion controls consisting of silt fence and/or stacked hay bales would be installed at wetland boundaries to prevent sedimentation from adjacent upland areas.

The primary impacts of Project construction on wetlands would be the alteration of wetland vegetation due to clearing and the mixing of topsoil and subsoil from rutting, excavation, and compaction. Construction could also affect water quality within the wetland due to sediment loading or inadvertent spills of fuel or chemicals. In general, DETI would minimize wetland impacts by collocating the proposed loop with its existing TL-400 pipeline right-of-way and by implementing the measures outlined in the Procedures and its PPC Plan. Because the construction right-of-way would overlap a portion of the existing permanent right-of-way of DETI's TL-400, the new permanent right-of-way requirements are adequately minimized.

Impacts on wetlands would be greatest during and immediately following construction. Most of these effects would be short term in nature and would diminish as wetland functionality recovers and eventually reaches preconstruction conditions. Wetlands affected within the temporary workspace would be allowed to revert to preconstruction conditions following completion of construction. Vegetation within emergent wetlands would regenerate quickly (typically within 1 to 3 years). Because these areas are naturally open and herbaceous, there would be little to no permanent impacts on emergent wetlands. Impacts on scrub-shrub and forested wetlands would last longer than those on emergent wetlands. Woody vegetation may take several years to regenerate to its original density. Furthermore, annual mowing and maintenance of a 10-foot-wide herbaceous strip centered over the pipeline, and removal of trees taller than 15 feet within 15 feet of the pipeline centerline, would result in a long-term, permanent impact by converting previously scrub-shrub vegetated wetland areas to emergent wetland areas.

DETI is currently working with PADEP and the U.S. Army Corps of Engineers to determine any additional mitigation that may be necessary for wetland impacts as part of the Clean Water Act section 404 permitting process.

Although construction would result in permanent conversion of wetland habitats, DETI would minimize these impacts by locating the construction right-of-way to overlap a portion of its existing TL-

400 permanent right-of-way. Furthermore, this would limit the conversion of wetlands from forested and scrub-shrub to emergent wetlands to a total area of about 0.2 acre (0.2 acre of forested wetland and less than 0.1 acre of scrub-shrub wetland). Based on the mitigation and restoration measures proposed by DETI, we conclude that wetland impacts associated with the construction and operation of the Project would be sufficiently minimized and do not represent a significant impact to these resources.

3. Vegetation, Wildlife and Fisheries

3.1 Vegetation

The Project area consists of upland forest, shrub-scrub, open fields, agricultural, wetlands, and developed lands. Upland forests consist of species such as sugar maple, red oak, and hickory. Shrub-scrub lands contain species such as flowering dogwood, multiflora rose, agricultural, open lands, and developed lands. Open fields consist of non-forested and shrub-scrub vegetated areas that are not in agricultural production or landscaped. Examples of this vegetation type are grasslands, successional old fields, and maintained utility rights-of-way. Typical species that can be found in open fields include reed canary grass, switchgrass, clover, rough-stemmed goldenrod, and ragweed. Land classified as agricultural consists of active crop production and hayfields. Much of the Project parallels existing right-of-way, consisting of successional field, meadow, or maintained cover types. Developed lands are described as residential areas and existing fenced industrial areas such as compressor stations and meter stations. Three types of wetlands are present in the Project area. Forested wetland species include red maple, green ash, and American sycamore. Examples of scrub/shrub species include honeysuckle, dogwoods, and blueberry. Emergent wetland species include common cattail, elderberry, and various rush and sedge species.

Communities of special concern include sensitive or protected vegetation types, natural areas, or plant communities. Two vegetative communities of special concern have been identified within the area affected by the Project, the Darlington Swamp and North Fork Little Beaver Natural Heritage Area (NHA) and the Stockman Run NHA.

Darlington Swamp and North Fork Little Beaver Natural Heritage Area

The Darlington Pipe Yard/Pipe Yard #1 is located within the Darlington Swamp and North Fork Little Beaver NHA. This NHA supports an oak-mixed hardwood palustrine forest, which is listed as state imperiled. Three species of concern are found in this NHA: blue-tipped dancer, yellow water-crowfoot, and one unidentified species. The unidentified species is not disclosed at the request of the agency overseeing its protection (PNHP 2014). Although this pipe yard is within the designated NHA, it is a developed property that has previously been used as a constructions staging area. DETI would implement erosion and sediment controls to ensure that no offsite impacts occur.

Stockman Run NHA

Stockman Run is a tributary to the Beaver River and a popular warmwater fishery. The TL-657 Pipeline crosses the Stockman Run floodplain where it is listed as an NHA at approximate MP 4.8 for 400 feet. The NHA supports a wide variety of plants and animals, including the yellow crow-foot which was identified by the PADCNR. Species of concern are further discussed in section 3.4 below.

Invasive Species

Invasive species are a concern when soil is disturbed during construction and the potential for further spreading of the species to occur. Invasive species can outcompete native vegetation and change the composition of native vegetation communities. DETI identified invasive species during habitat assessment surveys of the Project area. Numerous invasive plant species were identified within the Project area including multiflora rose, common barberry, Japanese stiltgrass, and common buckthorn. During construction activities, DETI would implement best management practices such as cleaning equipment prior to use onsite and using certified weed free non-invasive cover crops or native seed for revegetation. These measures would minimize the establishment of additional invasive species and prevent the spread of existing invasive species along the right-of-way.

After construction is complete, the Project right-of-way and all temporary work areas would be revegetated according to measures contained in the FERC Plan and Procedures and all other areas would be maintained in permanent operational use. Land disturbance associated with the construction of the pipeline would primarily occur within forested areas and open fields. Land disturbance associated with the pipe yards and aboveground facilities associated with the Project would occur primarily within developed lands containing either no vegetation or maintained grassy areas. Land outside the permanent easement would be permitted to revegetate naturally, which would be a short-term impact (3 to 12 months to reach preconstruction densities) for open land, and would be a long-term impact (30 to 50 years to reach preconstruction densities) for forested areas. A detailed breakdown of the area of land disturbance for each Project activity is provided in section B.4.

As outlined in section B.4, the total acreage affected by the proposed pipeline, aboveground/associated facilities, ATWS, pipe yards, and access roads is about 103.6 acres, with 71.8 acres of temporary disturbance and 31.7 acres of permanent impact. The Project would result in 38.9 acres of impact on forested land, 16.9 acres of open land, 10.2 acres of agricultural land, 2.4 acres of wetlands, and 0.9 acre of scrub/shrub land. The remaining 34.2 acres of disturbance for the Project consists of developed land which generally lacks vegetation. Of the 38.9 acres of impact to forested lands, 23.1 acres would be temporary impacts during construction, and the remaining 15.8 acres would be associated with the new permanent right-of-way. Forest impacts would be considered long term, as the clearing of mature, woody vegetation would result in the greatest degree of change in terms of vegetation strata, appearance, and habitat. The reestablishment of native woody vegetation within forested areas would be encouraged in the temporary impact areas to limit the amount of permanent impacts; however, natural restoration of preconstruction forest densities is expected to take 30 to 50 years. To minimize impacts on forests, the Project is collocated with the existing TL-400 maintained right-of-way, shifting the edge effect to the edge of the new maintained right-of-way associated with the Project, avoiding additional habitat fragmentation.

The staging areas and temporary workspaces would eventually revegetate to their preconstruction condition. Given that the proposed Project route is collocated within DETI's existing right-of-way, impacts on forested vegetation would be minimized to the extent possible. In addition, all of the proposed aboveground facilities are located adjacent to existing aboveground facilities and within existing facility property boundaries that are previously developed and disturbed industrial areas and would not significantly alter the vegetative communities at these sites. Therefore, we conclude that the Project would not have a significant impact on vegetation in the Project area.

3.2 Wildlife

The Project area contains several types of wildlife habitat including upland forests, open land, agricultural land, and wetlands. Common wildlife species found in the various habitat types affected by the Project are listed in table 4 below.

Table 4: Common Wildlife in Habitats Affected by the Project			
Upland Forest			
White-tailed deer	Red fox	Virginia opossum	Wild turkey
Coyote	Eastern chipmunk	American crow	Wood frog
Scrub-shrub			
Eastern cottontail	Savannah sparrow	White-tailed deer	Woodchuck
Ruffed grouse	Song sparrow	Garter snake	American toad
Wetlands			
Beaver	Red-winged blackbird	Mallard	Great blue heron
Canada geese	Bull Frog		
Open Fields/Agricultural			
Eastern meadowlark	White-tailed deer	Red-tailed hawk	
Developed Land			
Killdeer	Striped skunk	Raccoon	House finch
American robin	American toad		

Potential impacts on wildlife include habitat removal and construction-related ground disturbance and noise. Some individuals could be inadvertently injured or killed by construction equipment. However, more mobile species such as birds and mammals would likely relocate to other nearby suitable habitat to avoid the Project area once construction activities commence. The temporary disturbance of local habitat is not expected to have population-level effects on wildlife because the amount of habitat crossed represents only a small portion of the habitat available to wildlife throughout the proposed Project area, and much of the Project area would return to preconstruction use. The widening of cleared areas within forested habitat could affect species that are intolerant of edge habitat, such as interior-dwelling bird species. However, long-term impacts from habitat alteration would be further minimized by the implementation of mitigation measures contained in the FERC Plan, which would ensure revegetation of most areas disturbed by construction. Therefore, we conclude that the Project would not have a significant impact on wildlife or their habitat in the Project area.

Migratory Birds

Migratory birds are species that nest in the United States and Canada during the summer and then migrate to and from the tropical regions of Mexico, Central and South America, and the Caribbean for the non-breeding season. Migratory birds are protected under the Migratory Bird Treaty Act ([MBTA]-16 U.S. Code 703-711), and Bald and Golden Eagles are additionally protected under the Bald and Golden Eagle Act (16 U.S. Code 668-668d). The MBTA, as amended, prohibits the taking, killing, possession, transportation, and importation of migratory birds, their eggs, parts, and nests. Executive Order 13186 (66 Federal Register 3853) was enacted in 2001 to, among other things, ensure that environmental analyses of federal actions evaluate the impacts of federal actions on migratory birds. Executive Order 13186 directs federal agencies to identify where unintentional take is likely to have a measurable negative effect on migratory bird populations; avoid or minimize adverse impacts on migratory birds through enhanced collaboration with the FWS; emphasize species of concern, priority habitats, and key risk factors, and give particular focus to population-level impacts.

Direct and indirect impacts can occur on birds, especially if construction occurs during the migratory bird nesting season. Examples of potential impacts include habitat loss, disruption of foraging adults, and abandonment or destruction of active nests. Pipeline rights-of-way could fragment large areas of intact forest habitat that many birds require. During active construction, noise and human presence would cause birds to avoid the construction area and relocate to other nearby suitable habitat.

DETI proposes to collocate the Project facilities with other existing facilities. This would minimize the fragmentation of forested habitat along the pipeline route. This EA also discusses several plans (e.g., FERC Plan and Procedures; DETI's PPC Plan) that contain mitigation measures that would reduce the extent and duration of impacts on migratory bird habitat, actively and naturally allow a great majority of the construction right-of-way to return to preconstruction condition, and limit the potential effects from spills or environmental contamination. We conclude that adult birds relocating to avoid construction is an impact of limited duration that would not result in a substantial or long-term change in migration patterns through the area nor constitute a population-level impact. With these mitigation measures, we conclude that the Project would not have a significant impact on migratory birds.

To further minimize the impacts on migratory birds, DETI proposes to conduct all construction activities between September 1 and March 31, which is outside of the migratory bird nesting season from April 1-August 31.

Bald Eagle

The bald eagle is no longer a federally listed endangered or threatened species under the Endangered Species Act, but is still protected under the Bald and Golden Eagle Protection Act and the MBTA. The majority of the Project area provides suitable foraging and/or wintering habitat. Bald eagles nest in tall trees near large bodies of water. Based on the FWS Pennsylvania Field Office's online nest mapping tool, there are no known bald eagle nests in the vicinity of any of the Project facilities in Pennsylvania (FWS 2017). In Ohio, the Carroll Compressor Station is not located near large waterbodies that would provide suitable nesting habitat.

During operation of the Project, vegetative maintenance clearing would occur outside of the nesting season in accordance with the FERC Plan.

For the reasons listed above, we conclude that the construction and operation of the Project would not significantly affect migratory bird species within the Project area, including the bald eagle.

3.3 Fisheries

The proposed Project crosses 38 waterbodies, all of which are in Pennsylvania. Twenty-one of the waterbodies are crossed by the TL-657 pipeline and 17 are crossed by existing access roads. Table 1 of appendix B lists the waterbodies affected by the Project and the state fisheries classification for each. No fisheries would be affected by any of the aboveground facilities because there are no waterbodies present.

In Pennsylvania, surface waters are categorized into five protected use categories: aquatic life, water supply, recreation and fish consumption, special protection, and other. Surface waters classified under aquatic life are further divided into four subcategories: cold water fishery, warm water fishery, migratory fishes, and trout stocked fishery.

The Project would not cross any waterbodies designated as wild and scenic rivers at the federal level. There are no fisheries of special concern or waterbodies that support state or federally listed species. Additionally, there is no Essential Fish Habitat present in the Project area.

DETI would avoid construction in Stockman Run and its tributaries between May 1 and July 31 to avoid impacts on the state-listed southern redbelly dace. For all remaining waterbodies, DETI would follow the timing restrictions during March 15-May 31, in compliance with its Chapter 105 Water Obstruction and Encroachment Permit from the PADEP, unless approved by a state issued waiver. Therefore, we conclude that the Project would have minor, temporary impacts on fisheries.

3.4 Special Status Species

Special status species are those species for which state or federal agencies provide an additional level of protection by law, regulation, or policy. Included in this category are federally listed species that are protected under the Endangered Species Act or are considered as candidates for such listing by the FWS, those species that are state-listed as threatened or endangered, and state species of special concern. As outlined below, special status species may be present in the Project area.

Federally Listed Species

DETI, acting as the Project non-federal representative to FERC, initiated informal consultation with the Pennsylvania and Ohio Field Offices of the FWS in October 2018 and conducted a search of the FWS' Information for Planning and Consultation database. This search identified three federally listed species as potentially occurring in the Project area: Indiana bat, northern long-eared bat, and rabbitsfoot. In a letter to DETI dated March 25, 2019, the FWS stated that while the Project is within the historic range for the rabbitsfoot, it is not known to occur in the Project area. Therefore, we conclude that that the Project would have *no effect* on the rabbitsfoot. We request that the FWS consider this EA as our Biological Assessment for the Project and we request concurrence with our determinations of effect for the Indiana bat and the northern long-eared bat. These federally listed species are listed in table 5 and further discussed below.

Indiana bat and Northern Long-Eared Bat

Both Indiana bats and northern long-eared bats hibernate in caves or mines beginning in the late summer/early fall. In the spring, the bats emerge and travel to summer roosting habitat. Summer roosting habitat, including maternity roosts, includes tree cavities, exfoliating bark, snags of dead or dying trees, and man-made structures (e.g., barns). Indiana Bats roost in trees in riparian, bottomland, and upland forests in a wide range of habitats, from highly altered landscapes to intact forests. Northern long-eared bats occur in widespread, but uncommon, patterns in forest habitats. Individuals may travel up to 35 miles from their summer habitat to their winter hibernacula.

Table 5: Federally Listed Species Potentially Present in the Project Area

Common Name (*Scientific Name*)	**Status**		**Habitat**	**Determination**
	Federal	**State**		
Indiana bat (*Myotis sodalis*)	Endangered	Endangered	Wooded or semi wooded deciduous forests during the summer months. Hibernate in caves during the winter months.	May affect, not likely to adversely affect
Northern long-eared bat (*Myotis septentrionalis*)	Threatened	Threatened	Utilizes a variety of forest habitats and man-made structures during the summer months. Hibernates in caves during the winter months.	May affect, not likely to adversely affect
Rabbitsfoot (*Quadrula cylindrica cylindrical*)	Threatened	Endangered	Shallow areas of freshwater streams and rivers with sand and gravel along the bank and next to shoals.	No effect

The Project is not in or near a cave or mine and there are no documented hibernation or maternity occurrences for Indiana bat or northern long-eared bat in the municipalities affected by the Project. Tree clearing would be required for construction of the Project. At the time of DETI's original consultation with the FWS, it had not committed to any tree clearing restrictions. However, DETI has since committed to conducting tree clearing between September 1 and March 31 to avoid impacts on bats. Therefore, we conclude that the Project *may affect, but is not likely to adversely affect* the Indiana bat and northern long-eared bat.

In compliance with Section 7 of the ESA, we are requesting concurrence from the FWS for the Project-related impacts on federally listed bat species. Because this consultation has not yet been completed, **we recommend that:**

- **DETI should <u>not begin</u> construction activities <u>until</u>:**

    a. **the staff receives comments from the FWS regarding the proposed action;**

    b. **the staff completes formal ESA consultation with the FWS, if required; and**

    c. **DETI has received written notification from the Director of the Office of Energy Projects (OEP) that construction or use of mitigation may begin.**

State-Listed Species

In Pennsylvania, state-listed threatened and endangered species are protected under Title 58, Part II of the Pennsylvania Code. Three Pennsylvania agencies are responsible for administering this law: the Pennsylvania Game Commission (PAGC), the Pennsylvania Fish and Boat Commission (PAFBC), and the PADCNR. Mammals and birds are under the jurisdiction of the PAGC. Fish, reptiles, amphibians, and aquatic organisms are under the jurisdiction of the PAFBC. Plants, natural communities, and terrestrial invertebrates are under the jurisdiction of the PADCNR.

On September 24, 2018, DETI conducted a search of the Pennsylvania Natural Diversity Inventory database to determine if any state-listed species would be potentially impacted by the Project. This search indicated that further review was required by the PADCNR and the PAFBC, and that the PAGC deferred to the FWS.

The PADCNR identified one proposed state threatened plant species, the yellow water-crowfoot, as potentially occurring in the Project area. The species is a state imperiled aquatic perennial that grows submerged or emergent in muddy areas, usually on streambanks. It blooms in May and floating stems reach about 12-17 inches long. DETI conducted a habitat assessment of wetlands in the Project area that potentially provide habitat for the yellow water-crowfoot. Based on this assessment, there are five wetlands that could potentially support this plant species. DETI has committed to conducting surveys of these wetlands in May 2019 when the plant would be blooming and would provide the survey results to FERC and the PADCNR when complete. A survey plan was submitted to the PADCNR and approved in email correspondence with DETI dated March 28, 2019.

The PAFBC identified one state-threatened species, the southern redbelly dace, as potentially occurring in the Project area. This species is a small, freshwater minnow with a historic range that includes the Project area. Based on correspondence from the PAFBC dated October 25, 2019, the PAFBC recommended that no in-stream work occur in Stockman Run and its tributaries from May 1-July 31 to avoid impacts on this species. DETI would comply with this timing restriction.

For the reasons listed above, and through continued coordination with the state regulatory agencies, we conclude that the Project would not significantly affect state-listed species within the Project area.

4. LAND USE, RECREATION, AND VISUAL RESOURCES

4.1 Land Use

Construction of the Project would disturb approximately 103.6 acres of land, of which 33.6 acres would be maintained permanent right-of-way, of which approximately 1.8 acres would be new permanent right-of-way. The remaining 70 acres would consist of temporary workspace, ATWS, or part of the existing TL-400 right-of-way, all of which would revert back to previous land use following construction. Table 6 summarizes the land use types that would be crossed by the Project.

Operation of the Project would require a 50-foot-wide permanent right-of-way centered on the pipeline in most areas. DETI proposes to use 25 feet of existing right-of-way associated with the existing permanent easement of the TL-400 pipeline and to add 25 feet of new permanent easement.

Table 6: Land Use Impacts of the Project			
Facility	**Land Use Type**	**Construction Impact (acres)**	**Permanent Impact (acres)**
Pipeline Facilities			
TL-657 Pipeline	Forested	36.63	15.01
	Scrub-shrub	0.47	0.37
	Open Fields	14.00	0
	Agricultural	8.03	0
	Emergent Wetland	1.70	0
	Scrub/Shrub Wetland	0.10	0.10
	Forested Wetland	0.32	0.21
	Other/Developed	2.18	0
	Pipeline Total	**63.44**	**15.79**
Aboveground/Associated Facilities			
Beaver Compressor Station	Other/Developed	8.91	0
Carroll Compressor Station	Other/Developed	3.16	0
Koppel Gate Junction	Other/Developed	1.31	0.25
Old Petersburg Regulation	Open Fields	1.08	0
	Other/Developed	0.16	0
Darlington M&R	Open Fields	0.02	0
	Forested	0.07	0
	Other/Developed	0.42	0
Stitt Gate	Forested	0.11	0.11
	Open Fields	0.11	0.11
	Aboveground/Associated Facilities Total	**15.35**	**0.47**
Pipe Yards			
Pipe Yard #1/Darlington Pipe Yard	Scrub/shrub	0.30	0
	Open Fields	0.12	0
	Other/Developed	2.74	0
Pipe Yard #2/Rt. 18 Pipe Yard	Other/Developed	6.54	0
Access Roads			
Access Roads	Forested	2.09	0.63
	Scrub/Shrub	0.13	0
	Open Fields	1.58	0.03
	Agricultural	2.17	0
	Palustrine Emergent Wetland	0.38	0
	Scrub-Shrub Wetland	0.02	0
	Palustrine Forested Wetland	0.001	0
	Other/Developed	8.81	0.13
	Access Roads Total	**15.05**	**0.79**

Table 6: Land Use Impacts of the Project			
Facility	**Land Use Type**	**Construction Impact (acres)**	**Permanent Impact (acres)**
	PROJECT TOTAL	**103.55**	**17.05[a]**
a = Differences in total acreages between tables occur due to rounding.			

The land use types that would be traversed by the pipeline facilities include forested land, open land, agricultural land, developed land, and open water. These land uses are described below.

Forested Lands

All of the trees within the right-of-way would be removed during clearing and preparation of the right-of-way. A 50-foot-wide permanent easement would be maintained in an herbaceous state over the centerline, which would prohibit the growth of woody species. Land outside the easement would be permitted to revegetate naturally, which is expected to take 30 to 50 years to reach preconstruction forest densities. The clearing of forested lands, for the usable life of the pipeline, would be a long-term impact. Because the pipeline is proposed to be located adjacent to and within existing pipeline rights-of-way, tree clearing would be minimized to the greatest extent practicable.

Open Land

Open land consists of maintained herbaceous vegetation that comprises the majority of the existing TL-400 right-of-way. Impacts on open land would be short term and occur primarily during construction. It would take an estimated 3 to 12 months for open land vegetation to return to its pre-existing condition. Vegetation in the operational right-of-way would be permanently maintained in an herbaceous state. Given its current use on the existing pipeline rights-of-way, open land would not be significantly affected by the pipeline facilities.

Developed Land

Developed land includes residential, roadways and railroad crossings, and industrial areas. In general, this land use category lacks vegetation or only contains maintained grassy or landscaped areas. These areas would be restored to preconstruction conditions, except that trees and certain other residential activities, such as digging for foundations, would not be permitted within the permanent right-of-way.

Agricultural Land

The Project would impact approximately 10.2 acres of agricultural land. To minimize impacts on the soil profile in agricultural lands, DETI would segregate up to 12 inches of topsoil and maintain separation to avoid mixing of topsoil and subsoil. After construction is complete, farming practices would be allowed to continue.

Open Water

The pipeline would cross one open water area that is longer than 100 feet wide in an open water wetland (wetland W4 and Stockman Run) for a total of 264 feet. Construction across this area would impact 0.3 acre of open water.

Residential and Commercial Areas

In Pennsylvania, no residences are located within 50 feet of the TL-657 pipeline, but there are two residences located within 50 feet of the pipeline construction workspace near MP 1.2 (McKinley Road). In addition, there are three non-residential buildings (one garage and two sheds) located within 50 feet of the construction workspace for the pipeline. There are also two residential parcels located adjacent to the Koppel Junction site, one of which (the more western parcel) is within the proposed construction workspace for that facility. DETI would demolish the garage on this property and has an option to purchase the entire property. DETI has proposed various mitigation measures (see table 7) for construction in these residential areas and submitted site-specific drawings.

DETI contacted county planning agencies and municipalities in Pennsylvania and Ohio to identify planned residential or commercial areas within 0.25 mile of the Project. No planned projects have been identified to date, but DETI continues to consult with these agencies. Given that the Project is collocated with the existing TL-400 pipeline right-of-way, we do not expect any impacts from future planned residential or commercial development.

Table 7: Residential Buildings within 50 Feet of the Construction Workspace

Facility	Milepost	Number of Buildings	Building Type	Distance and Direction from Construction Workspace (feet)	Distance from Pipeline Centerline (feet)	Proposed Mitigation
TL-657 Pipeline (Beaver County, PA)	0.70	2	Sheds	21.5/SE	98.8	#2 and #4
	1.23	1	House	47.9/S	106.55	#1 and #6
	1.25	1	House	48.32/N	96.26	#1 and #6
	5.08	1	Garage (part of parcel below)	4.15/NW of TL-657, 27.07/W of AR-1	29.58	DETI has option to purchase the residential parcel-house, garage, and sheds would be demolished.
Koppel Junction (Beaver County, PA)	N/A	3	House, garage, sheds	20.51/E (house) and within workspace (shed)	N/A (west of existing facility)	DETI has option to purchase the residential parcel-house, garage, and sheds would be demolished.
	N/A	0	House, garage, sheds		N/A (east of existing facility)	#1 and #6. Shed encroaches on DETI land and landowner plans to move the shed.

Mitigation Measures:

1. Mature trees and landscaping would not be removed from within the edge of the construction work area unless necessary for the safe operation of construction equipment or as specified by a landowner.
2. Immediately after cleanup operations, all lawn areas and landscaping within the construction work area will be restored consistent with the requirements of DETI's recommended Plan.
3. The edge of the construction work area adjacent to the residence should be fenced for a distance of 100 feet on either side of the residence to ensure that the construction equipment and materials, including the spoil pile, remain within the construction work area.
4. Fencing will be maintained, at a minimum, throughout the open trench phases of pipe installation.
5. A minimum of 25 feet will be maintained between the residence and the construction work area for a distance of 100 feet on either side of the residence (i.e., the construction work area should be reduced as necessary to maintain the minimum distance).
6. See site-specific plan in appendix A.

Roadways/Railroads

The pipeline would cross 9 public (local municipal) roadways once, including the Pennsylvania Turnpike, and a railroad twice. Four roads would be open cut and the remainder of the roads and railroad would be crossed using a conventional bore method. Where DETI proposes the bore method, traffic would not be affected. On all other roadway crossings where DETI would use an open-cut, there would be impacts on traffic. DETI would maintain an open traffic lane during construction except for a period of time during the lowering-in of the pipeline segment.

Aboveground/Associated Facilities

All work at the Beaver Compressor Station would be within the existing station property. The land within the compressor station property would be used for laydown and storage. Ground disturbance would be necessary to install a new 24-inch ultrasonic meter and increase the flow capacity of the existing regulation runs. At the Carroll Compressor Station, all of the work would be within the existing building and gravel/paved areas with no new ground disturbance necessary. These facilities are industrial in character. No change in land use would occur at these facilities. No new visual screening is proposed for these existing compressor stations.

The existing Koppel Junction site, where the proposed TL-657 pipeline would terminate, would be expanded by the purchase of a residential property adjacent to the site. The newly acquired land would accommodate a new pig launcher, valves, and other piping additions. A portion of the adjacent parcel would be gravel covered with the expansion of this facility. The existing permanent access road to this site would be widened and slightly realigned to accommodate construction vehicles and the new facilities. For this facility, approximately 0.5 acre of residential land would be permanently converted to industrial use.

At the existing Stitt Gate site, with the exception of a new permanent access road that would be constructed to allow access to the site during operation, would be located within the existing facility fence line. At the Old Petersburg Regulation Facility and the Darlington M&R, construction would be located entirely within the fence line of these facilities.

With the exception of the Koppel Junction site, construction would primarily occur on developed lands owned by DETI. Therefore, we conclude that the aboveground facilities would not result in a significant impact on land use.

Additional Temporary Work Space/Pipe Yards

DETI identified certain areas where it determined site-specific conditions require the use of ATWS outside of the proposed 100-foot-wide pipeline construction right-of-way. ATWS would be required in areas where the proposed pipeline route crosses wetlands and waterbodies, existing utilities, roads, and at pipeline interconnections. The ATWS consist of mainly open land/existing right-of-way, but also impact some forested and agricultural land.

In addition to ATWS at various locations along the proposed pipeline route, DETI proposes to use two pipe yards within Beaver County, Pennsylvania to support construction activities. The proposed staging areas consist of 9.7 acres of developed land.

Access Roads

Existing public and private roads and the construction right-of-way would be used to access the Project facilities during construction. Maintenance and upgrades to access roads would require about 15 acres of disturbance to primarily developed land, and to a lesser extent forested, agricultural, and open land.

4.2 Public Land, Recreation, and Special Use Areas

DETI reviewed data from various sources, including the PADEP, PADCNR, ODNR, and the OEPA to identify any public land, and recreation or special use areas within 0.25 mile of the Project.

Big Beaver Borough Community Park

The TL-657 pipeline crosses Beaver County-owned and administered Big Beaver Borough Community Park for approximately 0.5 mile between MP 1.3 and 1.9. The construction workspace would affect about 6.2 acres of land within this park of which 5.8 acres is forested land. The park includes trails, playgrounds, and picnic shelters. A frisbee golf course is currently being constructed that would cross the pipeline right-of-way. DETI is negotiating with Beaver County regarding construction of the pipeline and would notify the park administration of construction activities in the area.

Clean and Green Program

DETI evaluated tax assessment data and identified 11 parcels within the Project area that are enrolled in Pennsylvania's Clean and Green Program and are dedicated primarily as forest reserve or for agricultural use. Clean and Green is a farmland preservation program in Pennsylvania that gives landowners a tax savings for dedicating their land to agricultural or forest use. In 2010, the Pennsylvania Legislature amended the program to include a provision that land devoted to subsurface transmission or gathering lines is excluded from any roll back taxes under the Clean and Green Program. Therefore, the Project is not expected to impact a property's eligibility for the program. In the unlikely event that the Project results in the disqualification of a property or results in roll back taxes, DETI has committed to compensate the affected landowner for the financial impacts.

Pennsylvania Turnpike

The Project crosses the Pennsylvania Turnpike which was built in the 1930s to support automobile travel in the mountainous regions of the state making it the first superhighway in the United States. It was deemed eligible for listing on the National Register of Historic Places. The TL-657 pipeline crosses the Pennsylvania Turnpike at MP 3.8; however, because it would be crossed using a conventional bore method, the Project would have no adverse effect on this historic roadway.

Chippewa Veterans Park

The Bowser and WesBanco Fields at Chippewa Township Veterans Park is located approximately 0.2 mile south of MP 0.35 of TL-657 and the Darlington M&R Station. Veterans Park is a large recreational center that also includes football fields. There are baseball fields less than 0.1 mile from the beginning of AR-8 on 37th Street Extension and just northwest of the driveway entrance to this recreational area. Given that the entrance to the park would not be impacted, the distance of the proposed

facilities from the park, and the short duration of construction, we conclude that impacts on park visitors would be minimal.

The nearest state-owned game land is approximately 1.9 miles north of MP 4.0 of the Project. No other recreational areas, scenic vistas, national trails, or other federally administered lands were identified within one mile of the Project.

4.3 Visual Resources

The primary impacts of the pipeline facilities on visual resources would occur during active construction, particularly in areas where tree clearing would occur. The impacts would include the presence of construction equipment, materials and personnel, and disturbance of vegetation and soils. These construction impacts would be temporary, as construction would take several months.

Following construction, DETI would fully restore all disturbed areas. Clearing of forested lands adjacent to the existing TL-400 pipeline would widen the corridor by 25 feet. After construction, a wider permanently maintained right-of-way may be noticeable from residences and public roadways. The visual appearance of these areas would return to their preconstruction conditions within 2 to 3 years in open lands, and emergent wetlands. Scrub-shrub wetlands may take longer than 3 years to return to preconstruction conditions. Construction would have a permanent impact on some forested lands. Forested lands cleared for ATWS and the temporary construction corridor could take up to 30 to 50 years to return to their preconstruction conditions. Furthermore, clearing of forested lands for the permanent easement would result in a permanent visual change, as these areas would be maintained in an herbaceous state.

Similarly for the aboveground facilities, a temporary increase in activity, presence of construction equipment, and ground disturbance would occur. All of the aboveground facilities associated with the Project would be located within or immediately adjacent to existing industrial facilities owned by DETI. The existing viewshed has been compromised and by locating the proposed facilities next to existing structures, the visual impact would generally be minimized. Furthermore, no new areas would be subject to visual impacts.

DETI has not proposed any new visual screening for its aboveground facilities. However, it would leave existing trees and vegetation in place along roadways to screen the view of the new buildings and ancillary equipment from motorists. To a casual observer or passerby, it is not expected that any significant visual changes would be perceptible once these facilities are complete.

No visually sensitive areas were identified during review of the Project facilities. Because the TL-657 pipeline would be collocated with DETI's existing pipeline right-of-way, the visual impacts would be negligible because these areas are already subject to the visual impact of a utility corridor. The aboveground facilities associated with the Project would represent minimal change in visual conditions. Therefore, we conclude that the Project would not result in significant adverse effects on visual resources.

5. Cultural Resources

In addition to accounting for impacts to cultural resources under NEPA, section 106 of the National Historic Preservation Act, as amended, requires FERC to take into account the effects of its undertakings on historic properties listed, or eligible for listing, on the National Register of Historic

Places (NRHP) and to afford the Advisory Council on Historic Preservation an opportunity to comment. An historic property is any pre-contact or historic district, site, building, structure, object, or property of traditional religious and cultural importance to an Indian tribe or Native Hawaiian organization, included in, or eligible for inclusion in, the NRHP. DETI, as a non-federal party, is assisting FERC in meeting our obligations under section 106 and it's implementing regulations at 36 CFR Part 800.

Area of Potential Effects

The area of potential effects (APE) is the "geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist" (36 CFR 800.16(d)). The APE for direct effects includes the areas that would be impacted by the construction, operation, and maintenance of proposed facilities (i.e., permanent and temporary workspaces). The APE for indirect effects takes into account the visual, auditory, and atmospheric effects caused by a project that may alter the character-defining features of a historic property, particularly those of historic structures and/or districts.

The Project's direct APE totals approximately 223.6 acres in Pennsylvania which includes a 300-foot-wide corridor for the 5.1 mile TL-657 Pipeline; a 30-foot-wide corridor for access roads; and all areas of potential ground disturbance within existing and proposed aboveground facilities, including all construction work areas and pipe/contractor yards. The indirect APE is comprised of the areas adjacent to the pipeline right-of-way, workspaces, and access roads to account for any historic properties within the viewshed of the Project. The extent of the indirect APE was determined based on topography, vegetation, surrounding land use, and other environmental factors.

The Carroll Compressor Station (Carroll County, Ohio) modifications would occur inside the existing buildings and on paved and graveled areas. No ground disturbing activities are planned. Therefore, no direct or indirect effects to cultural resources would occur at the compressor station and was not assessed further.

Cultural Resources Surveys

In an effort to identify historic properties within the Project APE and to account for any direct or indirect effects to those properties by the proposed Project, DETI conducted both a Phase I archaeological survey and a historic architectural survey. Prior to the surveys, DETI performed cultural resources background research to gather information about previous cultural resources investigations and known archaeological sites and historic architectural resources within the APE. Information gathered during the background research was also used to assess the probability for archaeological resources in the Project APE. No previously recorded archaeological resources were identified during the background research. Sixteen historic architectural properties 50 years of age or older were identified within the Project APE; 14 newly identified properties and two previously recorded resources: the Pennsylvania Turnpike Western Extension and the Beaver Creek Compressor Station site. The Beaver Creek Compressor Station site was a single-family residence (circa 1860-1876), however, it was demolished sometime between 1986 and 1993 and therefore, is not considered further in this EA.

The archaeological survey consisted of pedestrian transects and a total of 598 shovel test units. Two archaeological sites were identified during the survey, which included an early twentieth century artifact scatter (Zagorski Site [36BV0410]) and a 1950s-1960s refuse burn pile that was not afforded a

state site designation number. DETI recommended that neither resource is eligible for inclusion in the NRHP.

The historic architectural survey included the visual assessment of 15 historic architectural resources identified within the Project APE. Of the 14 newly identified historic architectural resources, no direct or indirect impacts would occur at seven resources, as determined through field investigations. Five of the newly-identified resources were recommended as not eligible for inclusion in the NRHP due to lack of integrity. An additional two new resources were identified in the APE that were not evaluated for NRHP eligibility as described below.

DETI recorded the W. Johnston Farm as part of the field survey. Historic maps of the Project area indicate that the house was constructed prior to 1860. The Johnston surname is listed among the earliest Euro-American settlers in the area. Though the resource was not evaluated for its NRHP eligibility as part of the survey, it is being treated as if eligible for listing in the NRHP. DETI documented that indirect effects would likely occur to the W. Johnston Farm if screening trees are removed along AR-6 and in the pipeline corridor at the edges of the farm fields. As such, DETI recommended that effects to the property would be minimized by maintaining the row of existing evergreen trees as a visual screen. Lastly, a portion of the Pennsylvania & Ohio Railroad would be crossed by the Project. The Pennsylvania & Ohio Railroad was constructed in 1852 and is still in use today as the Norfolk Southern Railway. Like the W. Johnston Farm, the railroad can be found on several historic maps dating to the mid- to late-nineteenth century. The railroad was not evaluated for its eligibility for listing in the NRHP as part of this investigation as no impacts to the resource are anticipated (see discussion below).

The Pennsylvania Turnpike Western Extension, a previously recorded NRHP-eligible property follows along the proposed pipeline route and crosses near MP 3.9. Construction began on the western extension on October 24, 1949, and it was opened from Irwin to the Ohio border on December 26, 1951. The Pennsylvania Turnpike Western Extension had been previously evaluated as eligible for inclusion in the NRHP.

DETI proposes to cross the Pennsylvania Turnpike Western Extension and the Pennsylvania & Ohio Railroad using conventional bore construction. This construction technique would allow for pipeline installation with minimal disturbance to surficial features, therefore there would be no impacts to the resources. The terrain adjacent to both resources would be restored to pre-construction conditions once construction is completed.

With the proposed avoidance strategies, DETI recommended that the Project would have no adverse effect on historic properties.

Consultation

State Historic Preservation Officer

DETI submitted the historic architectural and archaeological survey reports to the Pennsylvania State Historic Preservation Officer (SHPO) on November 28 and 30, 2018, respectively. Though DETI had originally recommended a no adverse effect to historic properties, in a letter dated January 8, 2019, the Pennsylvania SHPO stated that the Project would have no effect on historic properties. We agree with the SHPO's assessment.

For Project facilities in Ohio, DETI submitted a Project Notification letter to the Ohio SHPO on October 24, 2018. As there is no potential to affect historic properties in the Ohio portion of the Project, no further consultation with the Ohio SHPO was necessary.

Federally Recognized Tribes

On October 13, 2017 and October 20, 2017, DETI sent Project notification letters and solicitation of comments to federally recognized tribes (tribes) for the Project (under a previous project name, *Southfield Energy Project*) and these tribes included the following: Absentee-Shawnee Tribe of Oklahoma, Delaware Nation of Oklahoma, Delaware Tribe of Indians, Eastern Shawnee Tribe of Oklahoma, St. Regis Mohawk Tribe, Seneca-Cayuga Tribe of Oklahoma, Shawnee Tribe, Seneca Nation of Indians, Tonawanda Seneca Nation, and Miami Tribe of Oklahoma. DETI also requested in the letter that tribes identify any concerns they might have regarding potential traditional cultural properties or properties of religious, cultural, or historical significance that might be affected by the proposed Project. DETI sent revised Project notification letters with solicitation of comments to the tribes previously contacted on October 24, 2018.

The Delaware Nation and the Delaware Tribe responded to DETI's October 2017 letter. In an October 24, 2017 correspondence to FERC, the Delaware Nation stated that the Project is in an area of high probability for impact to known sites and inadvertent discovery and requested additional information regarding the Project's scope of work and mitigation plan. The Delaware Tribe expressed a concern with areas of new ground disturbance and requested further consultation in correspondence dated October 26, 2018. DETI has not received any additional responses from the tribes since the October 2018 correspondence.

FERC sent the NOI to the tribes and a follow-up letter on January 8, 2019 regarding the Project. In a letter dated March 21, 2019, the Delaware Nation indicated that the location of the proposed Project does not endanger cultural or religious sites of interest to the tribe. The tribe also requested that they be contacted within 24 hours if archaeological sites or artifacts are discovered during Project construction.

The Eastern Shawnee Tribe of Oklahoma also contacted FERC by letter dated March 27, 2019 indicating that there would be no endangerment to known sites of interest to the Eastern Shawnee Tribe. However, the tribe requested that if an archeological site or objects are identified that they be contacted within 24 hours of the discovery.

Other

DETI also contacted Ohio groups identified as the Munsee Delaware Indian Nation-USA and Shawnee Nation United Remnant Band, providing them information regarding the Project on November 1, 2018. DETI has not filed any further correspondence.

Unanticipated Discoveries Plan

DETI developed a Project-specific Unanticipated Discoveries Plan which outlines the procedure to follow, in accordance with state and federal laws, in the event that unanticipated cultural resources or human remains are discovered during construction of the Project. The plan was submitted to FERC and the Pennsylvania SHPO. FERC requested minor revisions to the plan. DETI provided a revised plan which we find acceptable.

Compliance with the National Historic Preservation Act

DETI consulted with the Pennsylvania SHPO regarding the potential effects to historic properties. The Pennsylvania SHPO did not object to the APE and stated that the Project would have no effect on historic properties. Additionally, no traditional cultural properties or properties of religious or cultural importance to tribes have been identified by DETI, its consultants, the Pennsylvania SHPO, or tribes. The facility modifications in Ohio would have no potential to affect historic properties. As such, the proposed Project would have no effect on historic properties. FERC has completed its compliance requirements with section 106 of the National Historic Preservation Act.

6. Air Quality and Noise

6.1 Air Quality

Air quality would be affected by construction and operation of the Project. During construction, short-term emissions would be generated from the usage of equipment, land disturbance, and increased traffic from worker and delivery vehicles for all locations. Construction of the Project would result in minimal air emissions due to the nature of activities. Operational emissions associated with the proposed Project would be minimal and due to fugitive component leaks and pigging activities.

Ambient air quality is protected by federal and state regulations. Under the Clean Air Act (CAA) and its amendments, the EPA has established National Ambient Air Quality Standards (NAAQS) for carbon monoxide, lead (Pb), nitrogen dioxide (NO_2) ozone, particulate matter less than 10 microns (PM_{10}), particulate matter less than 2.5 microns ($PM_{2.5}$), and sulfur dioxide (SO_2). The PADEP and the OEPA have the authority to implement permit programs under the CAA for the proposed Project facilities.

These standards incorporate short-term (hourly or daily) levels and long-term (annual) levels to address acute and chronic exposures to the pollutants, as appropriate. The NAAQS include primary standards, which are designed to protect human health, including the health of sensitive subpopulations such as children and those with chronic respiratory problems. The NAAQS also include secondary standards designed to protect public welfare, including economic interests, visibility, vegetation, animal species, and other concerns not related to human health.[7] Pennsylvania has adopted all of the NAAQS along with additional state regulated standards for pollutants not applicable to the Project. Ohio has adopted all of the NAAQS.

Air quality control regions (AQCRs) are areas established by the EPA and local agencies for air quality planning purposes, in which State Implementation Plans describe how the NAAQS would be achieved and maintained. The AQCRs are intra- and interstate regions such as large metropolitan areas where improvement of the air quality in one portion of the AQCR requires emission reductions throughout the AQCR. Each AQCR, or smaller portion within an AQCR (such as a county), is designated, based on compliance with the NAAQS, as attainment, unclassifiable, maintenance, or nonattainment, on a pollutant by-pollutant basis. Areas in compliance or below the NAAQS are designated as attainment, while areas not in compliance or above the NAAQS are designated as nonattainment. Areas previously designated as nonattainment that have since demonstrated compliance

[7] The current NAAQS are listed on EPA's website at https://www.epa.gov/criteria-air-pollutants/naaqs-table.

with the NAAQS are designated as maintenance for that pollutant. Maintenance areas may be subject to more stringent regulatory requirements to ensure continued attainment of the NAAQS. Areas that lack sufficient data to determine attainment status are designated unclassifiable and treated as attainment areas.

Table 8: National Ambient Air Quality Standards

Pollutant	Averaging Period	Standards	
		Primary	Secondary
Sulfur dioxide (SO_2)	1-hour [l,m]	75 ppb 196 µg/m^3	0.5 ppm 1300 µg/m^3
	3-hour [b]	--	
	Annual [a,m]	0.03 ppm 80 µg/m^3	--
	24-hour [b,m]	0.14 ppm 365 µg/m^3	--
PM_{10}	24-hour [d]	150 µg/m^3	150 µg/m^3
$PM_{2.5}$ (2012 Standard)	Annual [e]	2.0 g/m^3	15.0 µg/m^3
$PM_{2.5}$ (2006 Standard)	24-hour [f]	35 µg/m^3	35 µg/m^3
Nitrogen Dioxide (NO_2)	Annual [a]	0.053 ppm (53 ppb) 100 µg/m^3	0.053 ppm (53 ppb) 100 µg/m3
	1-hour [c]	100 ppb 188 µg/m^3	--
Carbon Monoxide (CO)	8-hour [b]	9 ppm 10,000µg/m^3	--
	1-hour [b]	35 ppm 40,000 µg/m^3	--
Ozone (2008 Standard)	8-hour [g,h]	0.075 ppm	0.075 ppm
Ozone (2015 Standard)	8-Hour [i]	0.070 ppm	0.070 ppm
Ozone	1-hour [j,k]	0.12 ppm	0.12 ppm
Lead (Pb)	Rolling 3-month [a]	0.15 µg/m^3	0.15 µg/m^3

Notes:
a. Not to be exceeded.
b. Not to be exceeded more than once per year.
c. Compliance based on 3-year average of the 98th percentile of the daily maximum 1-hour average at each monitor within an area.
d. Not to be exceeded more than once per year on average over 3 years.
e. Compliance based on 3-year average of weighted annual mean $PM_{2.5}$ concentrations at community-oriented monitors.
f. Compliance based on 3-year average of 98th percentile of 24-hour concentrations at each population-oriented monitor within an area.
g. Compliance based on 3-year average of fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area.
h. The 2008 8-hour ozone standard would remain in effect until one year after an area is designated for the 2015 8-hour ozone standard, which corresponds with January 16, 2019 based upon attainment designations for the 2015 ozone standard issued on January 16, 2018.
i. Permit applications that have not met EPA's grandfathering criteria would have to demonstrate that the proposed Project does not cause or contribute to a violation of any revised ozone standards that are in effect when the permit is issued, including the 2015 revised standards.
j. Maximum 1-hour daily average not to be exceeded more than one day per calendar year on average.
k. The 1-hour ozone standard has been revoked in all areas in which Project activities would occur.
l. Compliance based on 3-year average of 99th percentile of the daily maximum 1-hour average at each monitor within an area.
m. The 24-hour and annual average primary standards for SO_2 have been revoked.
ppm = parts per million by volume.
ppb = parts per billion by volume.
µg/m^3 = micrograms per cubic meter.

Lawrence County, Pennsylvania is in the Northwest Pennsylvania-Youngstown Interstate AQCR and is designated as in nonattainment for ozone and maintenance for $PM_{2.5}$. Beaver County, Pennsylvania is located in the Southwest Pennsylvania Intrastate AQCR and is designated as in nonattainment for ozone and maintenance for $PM_{2.5.}$ Carroll County, Ohio is located in the Zanesville-Cambridge Intrastate AQCR, which is designated as in attainment for all criteria pollutants. Additionally, all of Pennsylvania is located in the Ozone Transport Region, which is designated as a moderate non-attainment area for ozone in the CAA. Therefore the Old Petersburg Regulation Station, located in Lawrence County, PA, would be regulated as being in an area that is moderate nonattainment for ozone. As a result, nonattainment new source review requirements associated with moderate nonattainment areas would apply for ozone at all facilities except the Carroll Compressor Station. NAAQS are presented in table 8. Attainment status of Project facilities are presented in table 9.

Table 9: Attainment Status of Project Facilities

Facility	County, State	Unclassifiable/ Attainment	Non-attainment	Maintenance
TL-657	Beaver, PA	SO_2, CO, PM_{10}, NO_2, Pb	ozone (marginal)	$PM_{2.5}$
Koppel Junction	Beaver, PA	SO_2, CO, PM_{10}, NO_2, Pb	ozone (marginal)	$PM_{2.5}$
Stitt Gate Site	Beaver, PA	SO_2, CO, PM_{10}, NO_2, Pb	ozone (marginal)	$PM_{2.5}$
Beaver Compressor Station	Beaver, PA	SO_2, CO, PM_{10}, NO_2, Pb	ozone (marginal)	$PM_{2.5}$
Old Petersburg Regulation Station	Lawrence, PA	SO_2, CO, PM_{10}, NO_2, Pb	Ozone	$PM_{2.5}$
Carroll Compressor Station	Carroll, OH	CO, ozone, $PM_{2.5}$, SO_2, CO, PM_{10}, NO_2, Pb	N/A	N/A

Greenhouse Gases

Greenhouse gases (GHGs) occur in the atmosphere both naturally and as a result of human activities, such as the burning of fossil fuels. GHGs are gases that absorb infrared radiation in the atmosphere, and an increase in emissions of these gasses has been determined by the EPA to endanger public health and welfare by contributing to global climate change. The most common GHGs emitted during fossil fuel combustion and natural gas transportation are carbon dioxide (CO_2), methane (CH_4), and nitrous oxide. Emissions of GHGs are typically expressed in terms of CO_2 equivalents (CO_2e), where the potential of each gas to increase heating in the atmosphere is expressed as a multiple of the heating

potential of CO_2 over a specific timeframe, or its global warming potential (GWP).[8] The 100-year GWP of CO_2 is 1, CH_4 is 25, and nitrous oxide is 298. During construction and operation of the Project, these GHGs would be emitted from non-electrical construction and operational equipment, as well as from fugitive CH_4 leaks from the pipeline and aboveground facilities.

On November 8, 2010, the EPA signed a rule that finalizes reporting requirements for the petroleum and natural gas industry under 40 CFR 98. Subpart W of 40 CFR 98 requires petroleum and natural gas facilities that emit 25,000 metric tons or more of CO_2e per year to report annual emissions of specified GHGs from various processes within the facility. Construction emissions are not covered under the GHG Reporting Rule, but those related to the proposed Project are expected to be well below the 25,000 metric tons reporting threshold. Operational emissions from the proposed facilities are likewise not expected to exceed this threshold and be reported to the EPA. The EPA has expanded its regulations to include the emission of GHGs from major stationary sources under the Prevention of Significant Deterioration (PSD) program. The EPA's current rules require that a stationary source that is major for a non-GHG-regulated New Source Review pollutant must also obtain a PSD permit prior to beginning construction of a new or modified major source with mass-based GHG emissions equal to or greater than 100,000 tons per year (tpy) and significant net emission increases in units of CO_2e equal to or greater than 75,000 tpy. There are no NAAQS or other significance thresholds for GHGs.

7.1.1 Permitting/Regulatory Requirements

Prevention of Significant Deterioration/ Non-Attainment New Source Review

Preconstruction air permitting programs that regulate the construction of new stationary sources of air pollution and the modification of existing stationary sources are commonly referred to as New Source Review (NSR). NSR can be divided into two categories: major NSR and minor NSR. Major NSR has two components: projects located in attainment and unclassifiable areas are performed under the PSD permitting program; and projects located in nonattainment areas are performed under the nonattainment area NSR (NNSR) permitting program. The PSD program is intended to ensure that new and modified major sources do not cause existing air quality in attainment areas to deteriorate beyond acceptable levels. The NNSR program is intended to ensure that new and modified major sources in nonattainment areas do not adversely impact reasonable further progress towards attainment. A new or modified facility can undergo both PSD and NNSR review, depending on the total emissions of each pollutant and the regional air quality attainment status. Minor source NSR permitting is administered by the states and covers certain projects that are not major sources of air pollutant emissions.

Project activities would occur at the Beaver Compressor Station in Pennsylvania. This facility is an existing major source under PADEP's NNSR program with potential nitrogen oxide (NO_x) and volatile organic compounds (VOC) emissions above their respective major source threshold. All other Project activities would occur at facilities that are minor PSD and/or NNSR sources. The Project would include new stationary emission sources, including a pig launcher at Koppel Junction and a pig receiver at the Stitt Gate Site. Additionally, fugitive emissions from pipeline connections and fugitive components at Koppel Junction, Stitt Gate Site, and Old Petersburg Regulation Station are subject to PADEP's NNSR program.

[8] These GWPs are based on a 100-year time period. We have selected their use over other published GWPs for other timeframes because these are the GWPs the EPA has established for reporting of GHG emissions and air permitting requirements. This allows for a consistent comparison with these regulatory requirements.

State and Title V Operating Permit

The Title V permit program requires major stationary sources of air pollutants to obtain federal operating permits. The major source thresholds under the Title V program are 100 tpy of any air pollutant, 100 tpy for NO_x and 50 tpy for VOC in an Ozone Transport Region, 10 tpy of any single hazardous air pollutant, or 25 tpy of total hazardous air pollutants.

The Carroll Compressor Station and Beaver Compressor Station are existing Title V major source and operates under a Title V Operating Permit. The activities associated with the Project would be *de minimis* and exempt from permitting requirements. The Title V Operating Permits would not need to be modified as part of the Project. Other Project sites would be minor sources of emissions below permitting thresholds and are exempt from state operating permit requirements.

The re-wheeling of the compressor units at Carroll Compressor Station in Ohio is a minor PSD source, but is considered a major source under the Title V permit program. The re-wheeling would not increase short-term or long-term potential emission rates or add any new applicable requirements, and therefore a modification of the existing Title V Operating Permit will not be required.

General Conformity

The EPA promulgated the General Conformity Rule to implement the conformity provision of Title I, Section 176(c)(1) of CAA. Section 176(c)(1) requires that the federal government not engage, support, or provide financial assistance for licensing or permitting, or approve any activity not conforming to, an approved CAA implementation plan.

The General Conformity Rule is codified in Title 40 CFR Part 51, Subpart W and Part 93, Subpart B, Determining Conformity of General Federal Actions to State or Federal Implementation Plans. A conformity determination must be conducted by the lead federal agency if a federal action's construction and operational activities is likely to result in generating direct and indirect emissions that would exceed the conformity threshold (*de minimis*) levels of the pollutant(s) for which an air basin is in nonattainment or maintenance. According to the conformity regulations, emissions from sources that are subject to any NNSR or PSD permitting/licensing (major or minor) are exempt and are deemed to have conformed.

The General Conformity Rule was developed to ensure that federal actions in nonattainment and maintenance areas do not impede states' attainment of the NAAQS. The lead federal agency must conduct a conformity determination if a federal action's construction and operational activities is likely to result in generating direct and indirect emissions that would exceed the General Conformity Applicability threshold levels of the pollutant(s) for which an air basin is designated nonattainment or maintenance. Section 176(c)(1) states that a federal agency cannot approve or support any activity that does not conform to an approved State Implementation Plan. Conforming activities or actions should not, through additional air pollutant emissions:

- cause or contribute to new violations of the NAAQS in any area;
- increase the frequency or severity of any existing violation of any NAAQS; or
- delay timely attainment of any NAAQS or interim emission reductions.

The General Conformity Rule entails both an applicability analysis and a subsequent conformity determination, if deemed necessary. A General Conformity Determination must be completed when the total direct and indirect emissions of a project would equal or exceed the specified pollutant thresholds on a calendar year basis for each nonattainment or maintenance area.

As noted earlier, the Project facilities would be in nonattainment and maintenance areas for ozone and $PM_{2.5}$, respectively, within AQCR's, and would have to meet the nonattainment new source review requirements for ozone. The construction and operational emissions would be below the general conformity applicability thresholds in nonattainment or maintenance area for the Project. Therefore, a General Conformity Determination is not required.

Construction of the Project would result in short-term increases in emissions of some pollutants from the use of fossil fuel-fired equipment and the generation of fugitive dust due to earthmoving activities. Some temporary indirect emissions, attributable to construction workers commuting to and from work sites during construction and from on-road and off-road construction vehicle traffic, could also occur. Large earth-moving equipment and other mobile equipment are sources of combustion-related emissions, including criteria pollutants (i.e., NO_x, CO, VOC, SO_2, and PM_{10}).

DETI would mitigate exhaust emissions from construction equipment by requiring contractors to meet all air quality regulations and emission standards associated with each piece of equipment, use low-sulfur diesel fuel in non-road construction equipment, and limit idling of diesel and gasoline powered on-road vehicles and non-road construction equipment operating at, or visiting, the construction site.

Construction related emission estimates were based on a typical construction equipment list, hours of operation, and vehicle miles traveled by the construction equipment and supporting vehicles for each area of the Project. These emission-generating activities would include earthmoving, construction equipment exhaust, on-road vehicle traffic, and off-road vehicle traffic. DETI conservatively utilized emission factors from EPA's AP-42, along with EPA's NONROAD2008a and MOVES2014 emission modeling software. Venting would also be part of the construction activities.

Construction is estimated to occur between December 2019 and October 2020, with an in-service date of July 1, 2021. The air quality impacts of Project construction are considered short-term and would be further minimized by DETI's implementation of fugitive dust control measures outlined in the Fugitive Dust Control Plan such as watering exposed soil surfaces and expediting restoration and stabilization activities. Following construction, air quality would revert back to previous conditions. These emissions present the combined emissions for each facility of construction equipment combustion, on-road vehicle travel, off-road vehicle travel, and earthmoving fugitives. Construction emissions for the Project are presented in table 10.

Given the temporary nature of construction, and the intermittent nature of construction emissions, we find that emissions from construction-related activities for the Project are not expected to cause or significantly contribute to a violation of any applicable ambient air quality standard, or significantly affect local or regional air quality.

No new sources of emissions are to be constructed as part of the Project. Operational emissions are presented in table 11.

Table 10: Estimated Construction Emissions (tons per year)[a]									
Facility	**County, State**	**CO**	**O_x**	**O_2**	**PM_{10}**	**$PM_{2.5}$**	**VOC**	**Total HAPs**	**GHG[a] (CO_{2e})**
TL-657 Pipeline	Beaver, PA	2.12	4.59	0.01	24.49	2.69	0.80	0.00	2,570.97
Koppel Junction	Beaver, PA	0.03	0.05	0.00	0.11	0.01	0.03	0.00	121.00
Stitt Gate Site	Beaver, PA	0.03	0.04	0.00	0.07	0.01	0.14	0.00	507.71
Beaver Compressor Station	Beaver, PA	0.03	0.04	0.00	0.49	0.05	0.18	0.00	649.82
Old Petersburg Regulation Station	Lawrence, PA	0.02	0.03	0.00	0.05	0.01	0.24	0.00	875.83
Carroll Compressor Station	Carroll, OH	0.03	0.02	0.00	0.09	0.01	0.01	0.00	25.28
	Project Total	**2.26**	**4.77**	**0.01**	**25.26**	**2.78**	**1.39**	**0.00**	**4750.61**
General Conformity Thresholds		**100**	**100**	**100**	**100**	**100**	**50**	**-**	**-**
a. All construction is estimated to be completed between December 2019 and October 2020. HAP = hazardous air pollutant									

Table 11: Estimated Operational Emissions (tons per year)					
Facility	**County, State**	**VOC**	**CO_2**	**CH_4**	**GHG[a] (CO_{2e})**
TL-657 Pipeline	Beaver, PA	0.00	-	-	0
Koppel Junction	Beaver, PA	0.02	0.02	6.03	151
Stitt Gate Site	Beaver, PA	0.05	0.02	6.71	168
Beaver Compressor Station	Beaver, PA	0.04	0.01	4.49	112
Old Petersburg Regulation Station	Lawrence, PA	0.03	0.01	3.77	94
Carroll Compressor Station	Carroll ,OH	0.00	-	-	0
General Conformity Thresholds		**50**	-	-	-
	Project Total	**0.15**	**0.06**	**21.00**	**525**

Considering that no new sources of operational emissions are being constructed and the minimal operational emissions associated with the Project, we conclude that operational emissions would not have a significant impact on air quality.

6.2 Noise

Construction and operation of the Project would affect the local noise environment in the Project area. The ambient sound level of a region, which is defined by the total noise generated within the specific environment, is usually comprised of sounds emanating from both natural and artificial sources. At any location, both the magnitude and frequency of environmental noise may vary considerably over the course of the day and throughout the week, in part due to changing weather conditions and the impacts of seasonal vegetative cover.

Two measurements used by some federal agencies to relate the time-varying quality of environmental noise to its known effects on people are the equivalent sound level (L_{eq}) and the day-night sound level (L_{dn}). The L_{eq} is an A-weighted sound level containing the same sound energy as the

instantaneous sound levels measured over a specific time period. Noise levels are perceived differently, depending on length of exposure and time of day. The L_{dn} takes into account the duration and time the noise is encountered. Specifically, in the calculation of the L_{dn}, late night to early morning (10:00 p.m. to 7:00 a.m.) noise exposures are penalized +10 decibels (dB), to account for people's greater sensitivity to sound during the nighttime hours. The A-weighted scale (dBA) is used because human hearing is less sensitive to low and high frequencies than mid-range frequencies. For an essentially steady sound source that operates continuously over a 24-hour period and controls the environmental sound level, the L_{dn} is approximately 6.4 dB above the measured L_{eq}.

In 1974, the EPA published its Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety. Noise levels are expressed as decibels on the A-weighted scale (dBA) to put more emphasis on frequencies in the range that humans hear best. Because noise levels are perceived differently, depending on length of exposure and time of day, the day-night sound level (L_{dn}) takes into account the duration and time the noise is encountered. Specifically, the L_{dn} adds 10 dBA to nighttime sound levels between the hours of 10 p.m. and 7 a.m. to account for a people's greater sensitivity to sound during the night. The EPA has indicated that an L_{dn} of 55 dBA protects the public from indoor and outdoor activity interference. We have adopted this criterion and use it to evaluate the potential noise impacts from the proposed Project at noise sensitive areas (NSAs), such as residences, schools, or hospitals. Also, in general, a person's threshold of perception for a perceivable change in loudness on the A-weighted sound level is about 3 dBA, whereas a 6 dBA change is clearly noticeable, and a 10 dBA change is perceived as either twice or half as loud.

Construction of the facilities would involve operation of general construction equipment and noise would be generated during the installation of the Project components. Measures to mitigate construction noise would include compliance with federal regulations limiting noise from trucks, proper maintenance of equipment, restricting speed limits on access roads and ensuring that sound muffling devices provided by the manufacturer are kept in good working condition.

Construction noise would be highly variable because the types of equipment in use at a construction site changes with the construction phase and the types of activities. Noise from construction activities may be noticeable at nearby NSAs. However, construction equipment would be operated on an as-needed basis during the short-term construction period. Further, DETI would limit construction activities to occur during daytime hours, typically between 6:00 am and 6:00 pm, except when required for activities such as hydrostatic testing that requires continuous work. If night time construction is required, advanced notice would be provided to the residents informing them of the planned activities and duration.

Because construction of the Project would mostly be limited to daytime hours and intermittent, we conclude that construction noise would not have a significant impact on the environment.

The modified Project facilities would generate operational noise from the Old Petersburg Regulation Station and the Beaver Compressor Station. Environmental Noise Control (ENC) completed a pre-construction sound survey and noise analysis on October 16, 2018 for these facilities using baseline sound surveys, sound level data for the specific equipment planned for the facility, and calculations for the noise attenuation over distance and proposed noise control measures. The existing (ambient) noise sound levels, estimated sound levels from the proposed sources, total noise sound levels, and noise increases were calculated.

Old Petersburg Regulation Station

ENC identified 4 NSAs within 0.5 mile from the facility which are residences. The results of the noise analysis for the Old Petersburg Regulation Station are summarized in table 12 for the impacts at the nearest NSAs.

Table 12: Noise Analysis- Old Petersburg Regulation Station					
NSA	**Distance/ Direction**	**Existing facilities + ambient Ldn (dBA)**	**Estimated noise from new equipment Ldn (dBA)**	**Total L_{dn} (dBA)**	**Potential Noise Increase (dBA)**
1	425ft/ N	51	47	53	2
2	250ft/ SW	56	52	57	1
3	350ft/W	50	49	53	3
4	675ft/NW	51	42	52	1

The estimated noise from the modifications at the regulation station is below the FERC's noise criterion of 55 dBA. We note that total noise at NSA 2 is above 55 dBA, but that is due to ambient noise levels at NSA 2 being above 55 dBA. Overall, potential noise increase for the minor Project modifications at this facility would be well below perceptible levels.

Beaver Compressor Station

ENC identified 7 NSAs associated with the Beaver Compressor Station. The results of the noise analysis for the Beaver Compressor Station are summarized in table 13 for the impacts at the nearest NSAs. Sound levels at NSA 2, 4, and 5 measure greater than 55 dBA under existing conditions. Traffic noise from the Pennsylvania Turnpike was the dominating noise sources for these locations during analysis and the Beaver Compressor Station was not perceptible at any NSAs.

Table 13: Noise Analysis- Beaver Compressor Station					
NSA	**Distance/ Direction**	**Existing facilities + ambient Ldn(dBA)**	**Estimated noise from new equipment Ldn (dBA)**	**Total L_{dn} (dBA)**	**Potential Noise Increase (dBA)**
1	2,550ft/NW	54	31	55	1
2	4,250ft/NNW	57	26	57	0
3	1,975ft/NNE	43	33	46	3
4	2,800ft/NE	56	30	56	0
5	3,150ft/E	57	29	57	0
6	1,900ft/E	49	33	50	1
7	1,675ft/SE	43	34	47	4
Notes: Existing station sound levels at NSAs present lower than measured sound levels, as they were influenced by other environmental noise sources not associated with the station.					

There are no additional sources of noise associated with the Project. DETI would submit post-construction sound surveys for the Old Petersburg Regulation Station and Beaver Compressor Station within 60 days of placing the facilities into service.

Since the noise generated from the modifications would not cause an increase to the existing noise, we conclude that the Project would not result in significant noise impacts on residents and the surrounding communities.

7. RELIABILITY AND SAFETY

A natural gas compressor station or aboveground interconnect site involves some risk to the public in the event of an accident and subsequent release of gas. The greatest hazard is a fire or explosion following a leak, or rupture at the facility. Methane, the primary component of natural gas, is colorless, odorless, and tasteless. It is not toxic, but is classified as a simple asphyxiate, possessing a slight inhalation hazard. If breathed in high concentration, oxygen deficiency can result in serious injury or death.

The modifications to the Project facilities must be designed, constructed, operated, and maintained in accordance with the USDOT Minimum Federal Safety Standards in 49 CFR Part 192. The regulations are intended to ensure adequate protection for the public and to prevent facility accidents and failures, including emergency shutdowns and safety equipment. The USDOT's Pipeline and Hazardous Materials Safety Administration ensures that people and the environment are protected from the risk of pipeline incidents. This work is shared with state agency partners and others at the federal, state, and local level.

The USDOT provides for a state agency to assume all aspects of the safety program for intrastate facilities by adopting and enforcing the federal standards. USDOT federal inspectors perform inspections and enforce the pipeline safety regulations for interstate gas pipeline facilities.

The USDOT also defines area classifications, based on population density in the vicinity of the pipeline facility, and specifies more rigorous safety requirements for populated areas. The class location unit is an area that extends 220 yards on either side of the centerline of any continuous 1-mile length of pipeline. The four area classifications are defined below:

Class 1 Location with 10 or fewer buildings intended for human occupancy.

Class 2 Location with more than 10 but less than 46 buildings intended for human occupancy.

Class 3 Location with 46 or more buildings intended for human occupancy or where the pipeline lies within 100 yards of any building, or small well-defined outside area occupied by 20 or more people on at least 5 days a week for 10 weeks in any 12-month period.

Class 4 Location where buildings with four or more stories aboveground are prevalent.

Class locations representing more populated areas require higher safety factors in pipeline design, testing, and operation. The existing facilities are located in Class 3 locations. Modifications to existing facilities would be designed to meet existing Class requirements.

Part 192 also requires a pipeline operator to establish a written emergency plan that includes procedures to minimize the hazards in an emergency. Additionally, the operator must establish a continuing education program to enable the public, government officials, and others to recognize an emergency at the facility and report it to appropriate public officials. DETI would incorporate the proposed facilities into the emergency response plan and provide the appropriate training to local emergency service personnel before the facilities are placed in service.

Facilities associated with the Project must be designed, constructed, operated, and maintained in accordance with DETI's standards, including the provisions for written emergency plans and emergency shutdowns. DETI would provide the appropriate training to local emergency service personnel before the facilities are placed into service. The construction and operation of the modified facilities would represent a minimum increase in risk to the nearby public and we are confident that with implementation of the required design criteria for the design of these facilities, that they would be constructed and operated safely.

8. CUMULATIVE IMPACTS

In accordance with NEPA and with FERC policy, we identified other actions in the vicinity of the proposed Project facilities and evaluated the potential for a cumulative impact on the environment. As defined by the Council on Environmental Quality (CEQ), a cumulative effect is the impact on the environment that results from the incremental effects of a proposed action when added to other past, present, or reasonably foreseeable future actions, regardless of the agency or party undertaking such other actions. Cumulative impacts can result from individually minor, but collectively significant actions, taking place over time. The CEQ guidance states that an adequate cumulative effects analysis may be conducted by focusing on the current aggregate effects of past actions without delving into the historical details of individual past actions. In this analysis, we consider the impacts of past projects within the defined geographic scope as part of the affected environment (environmental baseline) which were described and evaluated in the preceding environmental analysis. However, present effects of past actions that are relevant and useful are also considered. When evaluating cumulative impacts, we establish a geographic scope for each resource affected by the proposed Project, shown in table 14.

Table 14: Geographic Scope of Potential Impact of the Project

Resource	Geographic Scope
Geological Resources and Soils	Limits of Project disturbance
Water Resources	Watershed boundary (Hydrologic Unit Code [HUC]-12)
Vegetation, Wildlife, and Special Status Species	HUC-12
Land Use, Recreation, and Visual Resources	1 mile
Cultural Resources	Area of potential effects
Air Quality	Construction: 0.25 mile Operation: 50 kilometers (31.1 miles)

Noise	Construction: 0.25 mile for general construction activities, 0.5 mile for drilling activities Operation: 1 mile

This cumulative effects analysis generally follows a method set forth in relevant CEQ and EPA guidance and focuses on potential impacts from the proposed Project on resource areas or issues where the incremental contribution could result in cumulative impacts when added to the potential impacts of other actions. To avoid unnecessary discussions of insignificant impacts and projects and to adequately address and accomplish the purposes of this analysis, an action must first meet the following three criteria to be included in the cumulative analysis:

- affect a resource potentially affected by the Project;
- cause this impact within all, or part of, the geographic scope of the Project; and
- cause this impact within all, or part of, the time span for the potential impact from the Project.

As described in section B of this is EA, constructing and operating the Project would temporarily and permanently impact the environment. The Project would impact geology, soils, water resources, wetlands, vegetation and wildlife, cultural resources, land uses, recreation, visual resources, air quality, and noise. However, throughout section B of this EA, we determined that the proposed Project would have only minimal or temporary impacts on these resources and nearly all of the Project-related impacts would be contained within or adjacent to the temporary construction right-of-way and ATWS. For example, erosion control measures included in the FERC Plan and Procedures would keep disturbed soils within work areas.

8.1 Projects Identified within the Geographic Scope

Table 2 of appendix B identifies 51 present and reasonably foreseeable projects or actions that occur within the geographic scope identified above. These projects were identified by a review of publicly available information; aerial and satellite imagery; and information provided by DETI. These projects include both FERC jurisdictional projects as well as other, non-jurisdictional projects.

As the Project would not result in any perceptible change in operational air or noise emissions; our geographic scope was further limited to consider effects on these resources during construction activity only. Therefore, the geographic scope for cumulative impacts on air quality is 0.25 mile from construction activities and 0.5 mile for noise impacts during construction. For soils, the geographic scope is the limits of Project disturbance. For water resources, vegetation, and wildlife, the geographic scope is the HUC-12 watershed in which the Project is located. Given the lack of Project impacts on geology, cultural resources, land use, recreation, and visual resources, cumulative impacts were not evaluated further for these resources. In addition, given that the impacts on all resources from construction activities in Ohio are minimal (all within the existing fence line of the Carroll Compressor Station) and temporary, our cumulative analysis focuses on the proposed facilities in Pennsylvania. Based on this refinement of the geographic scope, we identified the following 31 projects that may result in cumulative impacts when combined with the effects of the proposed Project:

- DETI's Lebanon West II Project
- DETI's TL-400 Pipeline Replacement Project
- National Fuel Gas Supply Corporation's Line N to Monaco Project
- Bluestone to Sunoco Ethane Transmission Line
- Mariner West Pipeline
- Four PennDOT projects: the Wallace Run Road Resurface, SR 551 Resurface Project, Darlington Road Maintenance Project and Constitution Boulevard Project
- Beaver County Conservation District's North Fork Little Beaver Streambank Stabilization Habitat Project
- DETI's LN-25 and LN-35 Replacement Project
- Pittsburg International Race Complex
- D1447 Pipeline Project
- Patterson Compressor Station
- Ellwood City Station
- Blackhawk Compressor Station
- Pittsburg International Race Complex Point
- IPSCO Koppel Works
- Pike Business Park
- PSC Metals LLC/Koppel
- Three Rivers Aggregates/Palmer Plant
- Blackhawk HS Stadium Field Renovations
- Brighton Steel/Beaver Falls
- Austin Association Inc./Vermiculite Plant
- Musser Site Restoration Project
- Utica Gas Svc LLC/Beaver Creek CDP
- Hilcorp Energy Co/NCD Central FAC
- Hickory Bend Gas Processing Plant
- Poland CLL Production Facility
- NALCO Co North/South Plants
- South Field Energy Plant

8.2 Potential Cumulative Impact on Specific Resources within the Project Area

Soils

Construction of the Project would result in localized impacts on soils as a result of clearing, grading, and trenching activities; however, DETI would employ best management practices to avoid off-site migration of soils during construction. The geographic scope is defined as the area of Project disturbance for soils. Approximately 0.9 acre of land at the Beaver Compressor Station property was impacted by DETI's Lebanon West II Project which was placed in-service in 2016. DETI's TL-400 Pipeline Replacement Project, completed in 2013, was located adjacent to the proposed Project between MP 0.0 and 0.4. The Bluestone to Sunoco Ethane Transmission Line crosses the proposed Project right-of-way at MP 3.5. The PennDOT Wallace Run Road Resurface Project crosses the proposed Project right-of-way at about MP 0.4 and the SR 551 Resurface Project is immediately adjacent to the Project at the Koppel Junction Station. The Lebanon West II and TL-400 Pipeline Replacement Projects were

required to adhere to the Plan and Procedures to minimize impacts on soils and ensure successful restoration/revegetation. PennDOT's Wallace Run Road and SR 551 Resurface Projects would be required to comply with applicable state permit conditions, which include measures to avoid erosion. As a result, cumulative effects on soils are expected to be temporary and minor.

Water Resources

Construction of the Project facilities could result in minor, temporary, and localized impacts on groundwater infiltration due to vegetation clearing. No large groundwater withdrawals are proposed as part of the Project. Therefore, cumulative impacts on groundwater would be limited to the construction of other projects overlapping workspace or in the immediate vicinity and overlapping Project construction in time. Both the Lebanon West II and TL-400 Replacement Projects and the Bluestone to Sunoco Transmission Line were completed at least several years prior to the proposed construction timeline for the Project. The PennDOT projects are still in the planning and development phase with unknown timeframes for construction. For the PennDOT projects to result in a cumulative impact on groundwater, construction would have to overlap or occur within days of the proposed schedule of the Project. If this occurs, the impacts would be temporary and minor. We also conclude that Transco's PPC Plan would prevent impacts from spills of fuels or other hazardous materials and the opportunity for cumulative impacts if other projects also result in spills. For these reasons, we conclude that any cumulative impact on groundwater from the Project would be negligible.

For the analysis of cumulative impacts on wetlands and waterbodies, we identified projects occurring within the HUC-12 watersheds crossed by the Project. Other projects identified within the geographic scope (HUC-12) that are known or likely to impact wetlands to some extent include DETI's TL-400 Replacement and LN-25 and LN-35 Replacement Projects; the Bluestone to Sunoco Ethane Transmission Line, Mariner West Pipeline; Columbia's D1447 Pipeline Project; the Pike Business Park; Musser Site Restoration Project; the Blackhawk High School Stadium Field Renovations; the Three Rivers Aggregates Palmer Plant; the Beaver County Conservation District's North Fork Little Beaver Streambank Stabilization Habitat Project; and the four PennDOT road projects.

The Project would impact a total of 38 waterbodies, 21 of which would be crossed by the TL-657 pipeline. Two of these waterbodies, S9 and S11, are crossed by the Bluestone to Sunoco pipeline 0.6 mile and 0.1 mile from the Project, respectively; however, this project which was completed in 2014. We expect that these waterbodies have been restored and the impacts of this project crossing these waterbodies due to increased sediment into these streams would have been of short duration and would not add cumulatively to the temporary impacts of the TL-657 pipeline construction. The TL-400 Replacement, Lebanon West II, and LN-25 and LN-35 Replacement Projects have also been completed and were constructed and restored in accordance with the FERC Procedures.

Construction impacts on wetlands range from short-term to permanent depending on the type of wetlands impacted and the type of facility being constructed. Emergent wetlands would revert back to similar preconstruction community and functionality within about 1 to 3 years. Permanent impacts on forested wetlands would occur due to conversion to a different type of wetland; however, these wetlands would retain hydrologic function as a wetland. Of the approximate 2.5 acres of wetlands that would be affected by construction of the Project, less than 0.1 acres of scrub/shrub wetlands and 0.2 acre of forested wetland would be converted to herbaceous and scrub/shrub wetland. DETI would implement the Procedures to minimize the temporary and permanent impacts on wetlands disturbed by the Project. For other projects that are FERC jurisdictional, the mitigation measures in the Procedures would also apply.

For other projects, we anticipate that similar erosion control measures and mitigation would occur in accordance with local or state permitting authorities. Based on the minimal amount of wetland impact overall in the context of existing wetlands in the area and the requirement for mitigation for impacts, we conclude that the temporary impact and limited permanent impact on wetlands from the Project would be cumulatively minor when considered in the context of other projects' wetland impacts. Therefore, we conclude that the Project would not contribute to adverse cumulative impacts on wetland resources.

Vegetation and Wildlife

We also used the HUC-12 watershed as the geographic scope for impacts on vegetation and wildlife. The construction activities associated with removal of vegetation and the potential for the establishment of invasive plant species occurring during the same timeframe and area can result in cumulative impacts. Changes in the vegetation can impact wildlife habitat and cause other secondary effects such as forest fragmentation.

The facilities associated with the TL-400 Replacement, Lebanon West II, and the LN-25 and LN-35 Replacement Projects involve construction within or adjacent to existing facilities, which minimizes the effects of vegetation clearing, particularly forest clearing which avoids forest fragmentation. Likewise, the Project would be constructed adjacent to existing aboveground facilities and the TL-657 right-of-way would overlap DETI's existing pipeline for the entire route which would result in a slightly wider permanent easement, but not create new areas of fragmented forest. Given the minimal temporary impacts on vegetation and wildlife from the Project, we conclude that the Project would not contribute significant cumulative impacts on vegetation or wildlife.

Air Quality and Noise

Construction activities for the Project would result in temporary increases in noise from construction equipment, as well as temporary increases in air emissions of some pollutants due to the use of equipment powered by diesel or gasoline engines and fugitive dust generated by excavation activities, vegetation clearing, and grading operations. Construction activities would result in short-term noise impacts and emissions that would be localized, temporary, and intermittent. Direct effects of Project construction activities would be localized and limited to the period of construction. The Project would only result in minimal operational emissions and no new sources of emissions would be constructed. Construction of other projects could occur simultaneously which result in cumulative impacts on air quality and noise during construction. However, it is not known if construction of any other projects would overlap with the Project. Based on the limited scope of the Project, we conclude the Project would not result in significant cumulative impacts on air quality and noise during construction.

Several projects are within the geographic scope for operational impacts on air quality (50 km), including the South Field Energy Power Plant to which the proposed Project would provide natural gas. However, the Project would result in minimal operational emissions on air quality and there are no new sources of operational emissions proposed as part of the Project. Therefore, we conclude that operation of the Project would not contribute to cumulative impacts.

Climate Change

Climate change is the variation in climate (including temperature, precipitation, humidity, wind, and other meteorological variables) over time, whether due to natural variability, human activities, or a

combination of both, and cannot be characterized by an individual event or anomalous weather pattern. For example, a severe drought or abnormally hot summer in a particular region is not a certain indication of climate change. However, a series of severe droughts or hot summers that statistically alter the trend in average precipitation or temperature over decades may indicate climate change. Recent research has begun to attribute certain extreme weather events to climate change (USGCRP 2018).

The leading U.S. scientific body on climate change is the U.S. Global Change Research Program (USGCRP), composed of representatives from thirteen federal departments and agencies.[9] The Global Change Research Act requires the USGCRP to submit a report to the President and Congress no less than every four years that "1) integrates, evaluates, and interprets the findings of the Program; 2) analyzes the effects of global change on the natural environment, agriculture, energy production and use, land and water resources, transportation, human health and welfare, human social systems, and biological diversity; and 3) analyzes current trends in global change, both human-induced and natural, and projects major trends for the subsequent 25 to 100 years." These reports describe the state of the science relating to climate change and the effects of climate change on different regions of the U.S. and on various societal and environmental sectors, such as water resources, agriculture, energy use, and human health.

In 2017 and 2018, the USGCRP issued its *Climate Science Special Report: Fourth National Climate Assessment*, Volumes I and II (Fourth Assessment Report) (USGCRP, 2017; and USGCRP, 2018, respectively). The Fourth Assessment Report states that climate change has resulted in a wide range of impacts across every region of the country. Those impacts extend beyond atmospheric climate change alone and include changes to water resources, transportation, agriculture, ecosystems, and human health. The U.S. and the world are warming; global sea level is rising and acidifying; and certain weather events are becoming more frequent and more severe. These changes are driven by accumulation of GHGs in the atmosphere through combustion of fossil fuels (coal, petroleum, and natural gas), combined with agriculture, clearing of forests, and other natural sources. These impacts have accelerated throughout the end of the 20th and into the 21st century (USGCRP 2018).

Climate change is a global phenomenon; however, for this analysis, we will focus on the existing and potential cumulative climate change impacts in the Project area. The USGCRP's Fourth Assessment Report notes the following observations of environmental impacts are attributed to climate change in the Midwest region (USGCRP, 2017; USGCRP, 2018):

- increased temperature stress, wetter springs, and the continued occurrence of springtime cold air outbreaks may reduce crop yields overall in the long-term (particularly corn and soybeans);
- a change in range and/or elevation is projected for many tree species with potential declines in paper birch, quaking aspen, balsam fir, and black spruce and increases in oaks and pines;
- tree species in flat terrain may have difficultly migrating the long distances needed to reach temperatures suitable for the species, resulting in some potential decline in forests;

[9] The USGCRP member agencies are: Department of Agriculture, Department of Commerce, Department of Defense, Department of Energy, Department of Health and Human Services, Department of the Interior, Department of State, Department of Transportation, Environmental Protection Agency, National Aeronautics and Space Administration, National Science Foundation, Smithsonian Institution, and U.S. Agency for International Development.

- increased insect outbreaks, forest fire, and drought may result in increased tree mortality and the reduction in beneficial carbon sinks;

The USGCRP's Fourth Assessment Report notes the following projections of climate change impacts in the Project region with a high or very high level of confidence[10] (USGCRP, 2018):

- average temperatures have risen about 1.5 °F between 1900 and 2010 and are projected to increase another 4 to 5 °F over the next several decades;

- annual precipitation has increased by about 20 percent over the past century, particularly from increased high intensity rainfall events, and this trend is projected to continue;

- surface water temperatures in the Great Lakes have increased several degrees between 1968 and 2002, and are projected to increase by about 7 to 12 degrees by the end of the century;

- increased surface water temperatures, increased precipitation, and longer growing seasons are projected to result in an increase in blue-green and toxic algae in the Great Leaks, harming fish and reducing water quality; and

- the agricultural crop growing season has lengthened since 1950 and is projected to continue lengthening due to the earlier occurrence of the last spring freeze, potentially increasing crop production in the short-term.

The GHG emissions associated with construction and operation of the Project are described in section B.7.1.1. Construction and operation of the Project would increase the atmospheric concentration of GHGs in combination with past and future emissions from all other sources globally and contribute incrementally to future climate change impacts.

In addition, as noted in section A.2 of the EA, the Project's purpose is to provide 150,000 dekatherms per day of natural gas to the new Advance Power-owned South Field Energy power plant that is currently under construction in Columbiana County, Ohio; therefore, we determined the GHG emissions from combustion of the Project volumes at the South Field Energy power plant. The electric power plant being constructed has the potential to emit 4.1 million tons per year of GHGs. The Project can deliver up to 150,000 dekatherms per day of new volumes of natural gas, which if combusted at the facility above, would produce 2.9 million metric tons of CO_2 per year.[11] This represents an upper bound of GHG emissions from the Project because it assumes the total maximum capacity is transported 365 days per year and that the electric power plant is operating at its maximum allowable level. As such, it is unlikely that this total amount of GHG emissions would occur. Additionally, were the generation capacity to be fueled by coal or oil, the GHG emissions would be greater. This 2.9 million metric tons of

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[10] The report authors assessed current scientific understanding of climate change based on available scientific literature. Each "Key Finding" listed in the report is accompanied by a confidence statement indicating the consistency of evidence or the consistency of model projections. A high level of confidence results from "moderate evidence (several sources, some consistency, methods vary and/or documentation limited, etc.), medium consensus." A *very* high level of confidence results from "strong evidence (established theory, multiple sources, consistent results, well documented and accepted methods, etc.), high consensus." https://science2017.globalchange.gov/chapter/front-matter-guide/

[11] CO_2, not CO_{2e}, as we do not account for downstream N_2O in combustion (very minor component) or methane leakage.

GHG emissions would result in a 1.4 percent increase in GHG emissions from fossil fuel combustion in Ohio,[12] and a 0.05 percent increase in national emissions.[13]

Currently, there is no universally accepted methodology to attribute discrete, quantifiable, physical effects on the environment to the Project's incremental contribution to GHGs or to the end-use combustion of the natural gas supplied by the Project. We have looked at atmospheric modeling used by the EPA, National Aeronautics and Space Administration, the Intergovernmental Panel on Climate Change, and others and we found that these models are not reasonable for project-level analysis for a number of reasons. For example, these global models are not suited to determine the incremental impact of individual projects, due to both scale and overwhelming complexity. We also reviewed simpler models and mathematical techniques to determine global physical effects caused by GHG emissions, such as increases in global atmospheric CO_2 concentrations, atmospheric forcing, or ocean CO_2 absorption. We could not identify a reliable, less complex model for this task and we are not aware of a tool to meaningfully attribute specific increases in global CO_2 concentrations, heat forcing, or similar global impacts to project-specific GHG emissions. Similarly, it is not currently possible to determine localized or regional impacts from GHG emissions from the Project.

Absent such a method for relating GHG emissions to specific resource impacts, we are not able to assess potential GHG-related impacts attributable to this Project. Additionally, we have not been able to find any GHG emission reduction goals established either at the federal level[14] or by the State of Ohio. Without either the ability to determine discrete resource impacts or an established target to compare GHG emissions against, we are unable to determine the significance of the Project's contribution to climate change.

8.3 Cumulative Impact Conclusion

In conclusion, when the impacts of the Project are added to other projects in the vicinity, we conclude that the cumulative impacts would be minimal. We conclude that impacts would be temporary in nature and no significant cumulative impacts would be incurred from the Project.

C. ALTERNATIVES

As required by NEPA and Commission policy, we identified and evaluated alternatives to the specific natural gas transmission facilities (and locations) comprising the Project as proposed by the applicant in their application and associated supplements. Specifically, we evaluated the no action and system alternatives. Aboveground facility site alternatives (including compressor station equipment alternatives) and alternative pipeline routes were not identified.

The purpose of this evaluation is to determine whether an alternative would be preferable to the proposed action. We generally consider an alternative to be preferable to a proposed action using three

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[12] Based upon Ohio GHG emissions of 206.3 million metric tons for 2016, per year according to U.S. Energy Information Administration (October, 2018) . https://www.eia.gov/environment/emissions/state/

[13] Based on 5,742.6 million metric tons of CO_2 in 2017 as presented by the EPA at https://www.epa.gov/sites/production/files/2019-04/documents/us-ghg-inventory-2019-main-text.pdf

[14] The national emissions reduction targets expressed in the EPA's Clean Power Plan and the Paris climate accord are pending repeal and withdrawal, respectively.

evaluation criteria, as discussed in greater detail below. These criteria include whether the alternative meets the stated purpose of the project, is technically and economically feasible and practical, and offers a significant environmental advantage over a proposed action.

Our evaluation of the identified alternatives is based on project-specific information provided by the applicant; publicly available information; and our expertise and experience regarding the siting, construction, and operation of natural gas transmission facilities and their potential impact on the environment. We did not receive any comments from the landowners, stakeholders, or any state or federal resource agencies.

Evaluation Process

Through environmental comparison and application of our professional judgement, each alternative is considered to a point where it becomes clear if the alternative could or could not meet the three evaluation criteria. To ensure a consistent environmental comparison and to normalize the comparison factors, we generally use desktop sources of information (e.g., publicly available data, GIS data, aerial imagery) and assume the same right-of-way widths and general workspace requirements. Where appropriate, we also use site-specific information (e.g., field surveys or detailed designs). As described previously, our environmental analysis and this evaluation only considers quantitative data (e.g., acreage or mileage) and uses common comparative factors such as total length, amount of collocation, and land requirements. Our evaluation also considers impacts on both the natural and human environments. Impacts on the natural environment include wetlands, forested lands, geology, and other common environmental resources. Impacts on the human environment include residences, roads, utilities, and industrial and commercial development near construction workspaces. In recognition of the competing interests and the different nature of impacts resulting from an alternative that sometimes exist (i.e., impacts on the natural environment versus impacts on the human environment), we also consider other factors that are relevant to a particular alternative or discount or eliminate factors that are not relevant or may have less weight or significance.

The purpose of the Project, which is described in greater detail in section A.2, is to provide 150,000 dekatherms per day of natural gas to the new Advance Power-owned South Field Energy power plant. Therefore, a preferable alternative must create similar transportation capabilities as those of the proposed action.

Many alternatives are technically and economically feasible. Technically practical alternatives, with exceptions, would generally require the use of common construction methods. An alternative that would require the use of a new, unique, or experimental construction method may not be technically practical because the required technology is not available or unproven. Economically practical alternatives would result in an action that generally maintains the price competitive nature of the proposed action. Generally, we do not consider the cost of an alternative as a critical factor unless the added cost to design, permit, and construct the alternative would render the project economically impractical.

Determining if an alternative provides a significant environmental advantage requires a comparison of the impacts on each resource as well as an analysis of impacts on resources that are not common to the alternatives being considered. The determination must then balance the overall impacts and all other relevant considerations. In comparing the impact between resources (factors), we also considered the degree of impact anticipated on each resource. Ultimately, an alternative that results in

equal or minor advantages in terms of environmental impact would not compel us to shift the impacts from the current set of landowners to a new set of landowners.

One of the goals of an alternatives analysis is to identify alternatives that avoid significant impacts. In section B, we evaluated each environmental resource potentially affected by the Project and concluded that constructing and operating the Project would not significantly impact these resources. Consistent with our conclusions, the value gained by further reducing the (not significant) impacts of the Project when considered against the cost of relocating the route/facility to a new set of landowners was also factored into our evaluation.

No-Action Alternative

Under the No-Action Alternative, DETI would not implement the proposed action. The No-Action Alternative would avoid the potential environmental impacts associated with construction of the Project; however, the Project's objective, to provide natural gas for a planned power plant, would not be met.

Another natural gas pipeline company would likely need to construct the new facilities to meet this requirement for the company constructing the power plant. This would transfer impacts from one location to another, but would not eliminate or necessarily reduce impacts and may have larger environmental impacts than the Project. Consequently, the No-Action Alternative would also not provide a significant environmental advantage over the Project.

System Alternatives

System alternatives are alternatives to the proposed action that would meet the project objectives, but would use existing or modified pipeline systems or a different configuration of pipeline facilities that would render all or part of the proposed facilities unnecessary.

The purpose of the Project is to provide natural gas to a new power plant that is being built to replace retiring coal-fired power plant capacity and help meet increasing demand for electricity in the Midwest. Because DETI currently operates an existing transmission system in the region, DETI can supply the increased demand for natural gas in this area using efficiencies afforded by its existing system. The Project has firm purchaser commitment and can meet the demand sooner than a hypothetical project not yet planned or committed. Therefore, we did not consider any system alternatives involving the use of other (non-DETI) natural gas pipeline systems.

We evaluated an alternative involving only the addition of compression to an existing DETI compressor station to deliver the needed 150,000 dekatherms per day. We did not evaluate an alternative involving new, non-looping pipeline. Because the proposed Project is entirely collocated with an existing pipeline right-of-way, a new greenfield pipeline would result in greater environmental impacts such as forest clearing and impacting new landowners.

Compression options involve either the addition of more compressor horsepower at existing facilities or the installation of a new compressor station facility. We did not evaluate the installation of a new compressor station because of the greater permanent environmental impacts associated with constructing a new, permanent aboveground facility including air emissions, noise, and permanent clearing of a parcel which would likely be forested. If a suitable site along the existing pipeline right-of-

way cannot be found, additional pipeline to connect the new compressor station site to the existing pipeline system could be necessary. To achieve the Project objectives, including providing the same reliability and flexibility as the Project, we identified one possible system alternative which involves adding 4,700 horsepower at DETI's existing Carroll Compressor Station.

The main environmental impact of adding compression horsepower at the Carroll Compressor Station is the increased air emissions, which are substantially greater than the limited construction emissions associated with the proposed Project. While the alternative would avoid the Project's impacts on wetlands, waterbodies, and forested land, we conclude that these impacts are not significant. In balancing impacts on different resources, we conclude that this compression alternative would not provide a significant environmental advantage over the Project.

Alternative Pipeline Routes

Route alternatives are alternatives that differ from the proposed route and may be major and deviate from the proposed route for an extended distance or minor and deviate from the proposed route for a short distance. The proposed pipeline loop is entirely collocated within and adjacent to DETI's existing TL-400 pipeline right-of-way. Any newly identified alternative pipeline route would involve development of new right-of-way that may not offer the benefits of using existing right-of-way for workspace that the Project does. Since the Project is collocated within existing rights-of-way, we did not identify any routing alternatives that could offer a significant environmental advantage over the Project. In addition, we did not receive any stakeholder comments requesting that we consider any pipeline route alternatives.

Aboveground/Associated Facility Alternatives

Because all of the aboveground and other associated facilities are existing facilities and the proposed modifications at these stations would be completed within or immediately adjacent to the existing property boundaries, our review of the Project found no significant environmental impacts that would drive an evaluation of additional alternatives. We also did not receive any alternative compressor station site alternatives from stakeholders during our scoping and review process.

D. CONCLUSIONS AND RECOMMENDATIONS

Based on the analysis in this EA, we have determined that if DETI constructs and operates the proposed facilities in accordance with its application and supplements, approval of this proposal would not constitute a major federal action significantly affecting the quality of the human environment. We recommend that the Order contain a finding of no significant impact and include the mitigation measures listed below as conditions to any Certificate the Commission may issue.

1. DETI shall follow the construction procedures and mitigation measures described in its application and supplements (including responses to staff data requests) and as identified in the EA, unless modified by the Order. DETI must:

    a. request any modification to these procedures, measures, or conditions in a filing with the Secretary;
    b. justify each modification relative to site-specific conditions;
    c. explain how that modification provides an equal or greater level of environmental protection than the original measure; and

d. receive approval in writing from the Director of the OEP **before using that modification**.

2. The Director of OEP, or the Director's designee, has delegated authority to address any requests for approvals or authorizations necessary to carry out the conditions of the Order, and take whatever steps are necessary to ensure the protection of environmental resources during construction and operation of the Project. This authority shall allow:

   a. the modification of conditions of the Order;
   b. stop-work authority; and
   c. the imposition of any additional measures deemed necessary to ensure continued compliance with the intent of the conditions of the Order as well as the avoidance or mitigation of unforeseen adverse environmental impact resulting from Project construction and operation.

3. **Prior to any construction**, DETI shall file an affirmative statement with the Secretary, certified by a senior company official, that all company personnel, EIs, and contractor personnel will be informed of the EI's authority and have been or will be trained on the implementation of the environmental mitigation measures appropriate to their jobs **before** becoming involved with construction and restoration activities.

4. The authorized facility locations shall be as shown in the EA, as supplemented by filed alignment sheets. **As soon as they are available, and before the start of construction**, DETI shall file with the Secretary any revised detailed survey alignment maps/sheets at a scale not smaller than 1:6,000 with station positions for all facilities approved by the Order. All requests for modifications of environmental conditions of the Order or site-specific clearances must be written and must reference locations designated on these alignment maps/sheets.

   DETI's exercise of eminent domain authority granted under NGA section 7(h) in any condemnation proceedings related to the Order must be consistent with these authorized facilities and locations. DETI's right of eminent domain granted under NGA section 7(h) does not authorize it to increase the size of its natural gas facilities to accommodate future needs or to acquire a right-of-way for a pipeline to transport a commodity other than natural gas.

5. DETI shall file with the Secretary detailed alignment maps/sheets and aerial photographs at a scale not smaller than 1:6,000 identifying all route realignments or facility relocations, and staging areas, pipe storage yards, new access roads, and other areas that would be used or disturbed and have not been previously identified in filings with the Secretary. Approval for each of these areas must be explicitly requested in writing. For each area, the request must include a description of the existing land use/cover type, documentation of landowner approval, whether any cultural resources or federally listed threatened or endangered species would be affected, and whether any other environmentally sensitive areas are within or abutting the area. All areas shall be clearly identified on the maps/sheets/aerial photographs. Each area must be approved in writing by the Director of OEP **before construction in or near that area**.

   This requirement does not apply to extra workspace allowed by the Commission's Plan and/or minor field realignments per landowner needs and requirements that do not affect other landowners or sensitive environmental areas such as wetlands.

Examples of alterations requiring approval include all route realignments and facility location changes resulting from:

a. implementation of cultural resources mitigation measures;
b. implementation of endangered, threatened, or special concern species mitigation measures;
c. recommendations by state regulatory authorities; and
d. agreements with individual landowners that affect other landowners or could affect sensitive environmental areas.

6. **Within 60 days of the acceptance of the Certificate and before construction begins,** DETI shall file an Implementation Plan with the Secretary for review and written approval by the Director of OEP. DETI must file revisions to their plan as schedules change. The plan shall identify:

a. how DETI will implement the construction procedures and mitigation measures described in its application and supplements (including responses to staff data requests), identified in the EA, and required by the Order;
b. how DETI will incorporate these requirements into the contract bid documents, construction contracts (especially penalty clauses and specifications), and construction drawings so that the mitigation required at each site is clear to onsite construction and inspection personnel;
c. the number of EIs assigned, and how DETI will ensure that sufficient personnel are available to implement the environmental mitigation;
d. company personnel, including EIs and contractors, who will receive copies of the appropriate material;
e. the location and dates of the environmental compliance training and instructions DETI will give to all personnel involved with construction and restoration (initial and refresher training as the Project progresses and personnel change);
f. DETI personnel (if known) and specific portion of DETI's organization having responsibility for compliance;
g. the procedures (including use of contract penalties) DETI will follow if noncompliance occurs; and
h. for each discrete facility, a Gantt or PERT chart (or similar project scheduling diagram), and dates for:

    i. the completion of all required surveys and reports;
    ii. the environmental compliance training of onsite personnel;
    iii. the start of construction; and
    iv. the start and completion of restoration.

7. DETI shall employ at least one EI per construction spread. The EI shall be:

a. responsible for monitoring and ensuring compliance with all mitigation measures required by the Order and other grants, permits, certificates, or other authorizing documents;

b. responsible for evaluating the construction contractor's implementation of the environmental mitigation measures required in the contract (see condition 6 above) and any other authorizing document;
c. empowered to order correction of acts that violate the environmental conditions of the Order, and any other authorizing document;
d. a full-time position, separate from all other activity inspectors;
e. responsible for documenting compliance with the environmental conditions of the Order, as well as any environmental conditions/permit requirements imposed by other federal, state, or local agencies; and
f. responsible for maintaining status reports.

8. Beginning with the filing of its Implementation Plan, DETI shall file updated status reports with the Secretary on a **biweekly** basis until all construction and restoration activities are complete. On request, these status reports will also be provided to other federal and state agencies with permitting responsibilities. Status reports shall include:

a. an update on DETI's efforts to obtain the necessary federal authorizations;
b. the construction status of the Project, work planned for the following reporting period, and any schedule changes for stream crossings or work in other environmentally-sensitive areas;
c. a listing of all problems encountered and each instance of noncompliance observed by the EI during the reporting period (both for the conditions imposed by the Commission and any environmental conditions/permit requirements imposed by other federal, state, or local agencies);
d. a description of the corrective actions implemented in response to all instances of noncompliance;
e. the effectiveness of all corrective actions implemented;
f. a description of any landowner/resident complaints which may relate to compliance with the requirements of the Order, and the measures taken to satisfy their concerns; and
g. copies of any correspondence received by DETI from other federal, state, or local permitting agencies concerning instances of noncompliance, and DETI's response.

9. DETI must receive written authorization from the Director of OEP **before commencing construction of any Project facilities.** To obtain such authorization, DETI must file with the Secretary documentation that it has received all applicable authorizations required under federal law (or evidence of waiver thereof).

10. DETI must receive written authorization from the Director of OEP **before placing the Project into service**. Such authorization will only be granted following a determination that rehabilitation and restoration of the right-of-way and other areas affected by the Project are proceeding satisfactorily.

11. **Within 30 days of placing the authorized facilities in service**, DETI shall file an affirmative statement with the Secretary, certified by a senior company official:

d. that the facilities have been constructed in compliance with all applicable conditions, and that continuing activities will be consistent with all applicable conditions; or

e. identifying which of the conditions of the Order DETI has complied with or will comply with. This statement shall also identify any areas affected by the Project where compliance measures were not properly implemented, if not previously identified in filed status reports, and the reason for noncompliance.

12. DETI shall **not begin** construction activities **until**:

a. the staff receives comments from the FWS regarding the proposed action;
b. the staff completes formal ESA consultation with the FWS, if required; and
c. DETI has received written notification from the Director of OEP that construction or use of mitigation may begin.

E. REFERENCES

U.S. Fish and Wildlife Service, Pennsylvania Field Office (FWS). 2017. Pennsylvania Bald Eagle Nest Locations and Buffer Zones. Available online at: https://www.fws.gov/northeast/pafo/bald_eagle_map.html. Accessed April 2019.

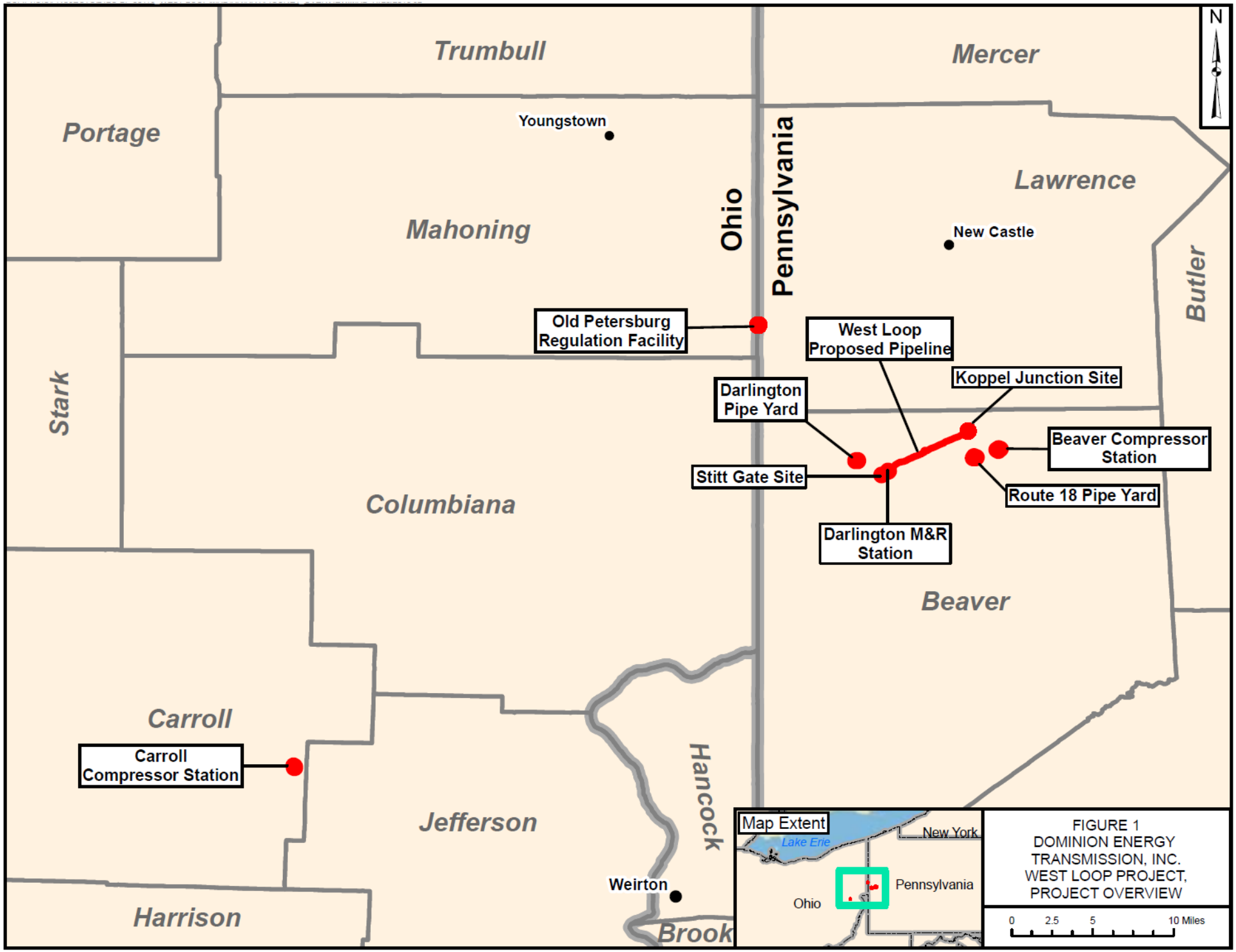
Pennsylvania Natural Heritage Program (PNHP). 2014. Beaver County Natural Heritage Inventory. Available at: http://www.naturalheritage.state.pa.us/CNAI_PDFs/Beaver_CNHI_Update_web.pdf. Accessed April 2019.

U.S. Global change Research Program (USGCRP). 2017. Climate Science Special Report: Fourth National Climate Assessment, Volume I, Chapter 3 Detection and Attribution of Climate Change (Wuebbles, D.J., D.W. Fahey, K.A. Hibbard, D.J. Dokken, B.C. Stewart, and T.K. Maycock (eds.)). U.S. Global Change Research Program, Washington, DC, USA, 470 pp., doi: 10.7930/J0J964J6.

U.S. Global Change Research Program (USGCRP). 2018. Impacts, Risks, and Adaptation in the United States: Fourth National Climate Assessment, Volume II (Reidmiller, D.R., C.W. Avery, D.R. Easterling, K.E. Kunkel, K.L.M. Lewis, T.K. Maycock, and B.C. Stewart (eds.)). U.S. Global Change Research Program, Washington, DC, USA, 1515 pp. doi: 10.7930/NCA4.2018.

APPENDIX A

PROJECT MAPS


N
Trumbull
Mercer
Portage
Youngstown
Ohio
Pennsylvania
Lawrence
Mahoning
New Castle
Butler
Old Petersburg
Regulation Facility
West Loop
Proposed Pipeline
Koppel Junction Site
Darlington
Pipe Yard
Beaver Compressor
Station
Stark
Stitt Gate Site
Route 18 Pipe Yard
Columbiana
Darlington M&R
Station
Beaver
Carroll
Carroll
Compressor Station
Hancock
Jefferson
Weirton
Harrison
Brook
Map Extent
Lake Erie
New York
Pennsylvania
Ohio
FIGURE 1
DOMINION ENERGY
TRANSMISSION, INC.
WEST LOOP PROJECT,
PROJECT OVERVIEW
0
2.5
5
10 Miles

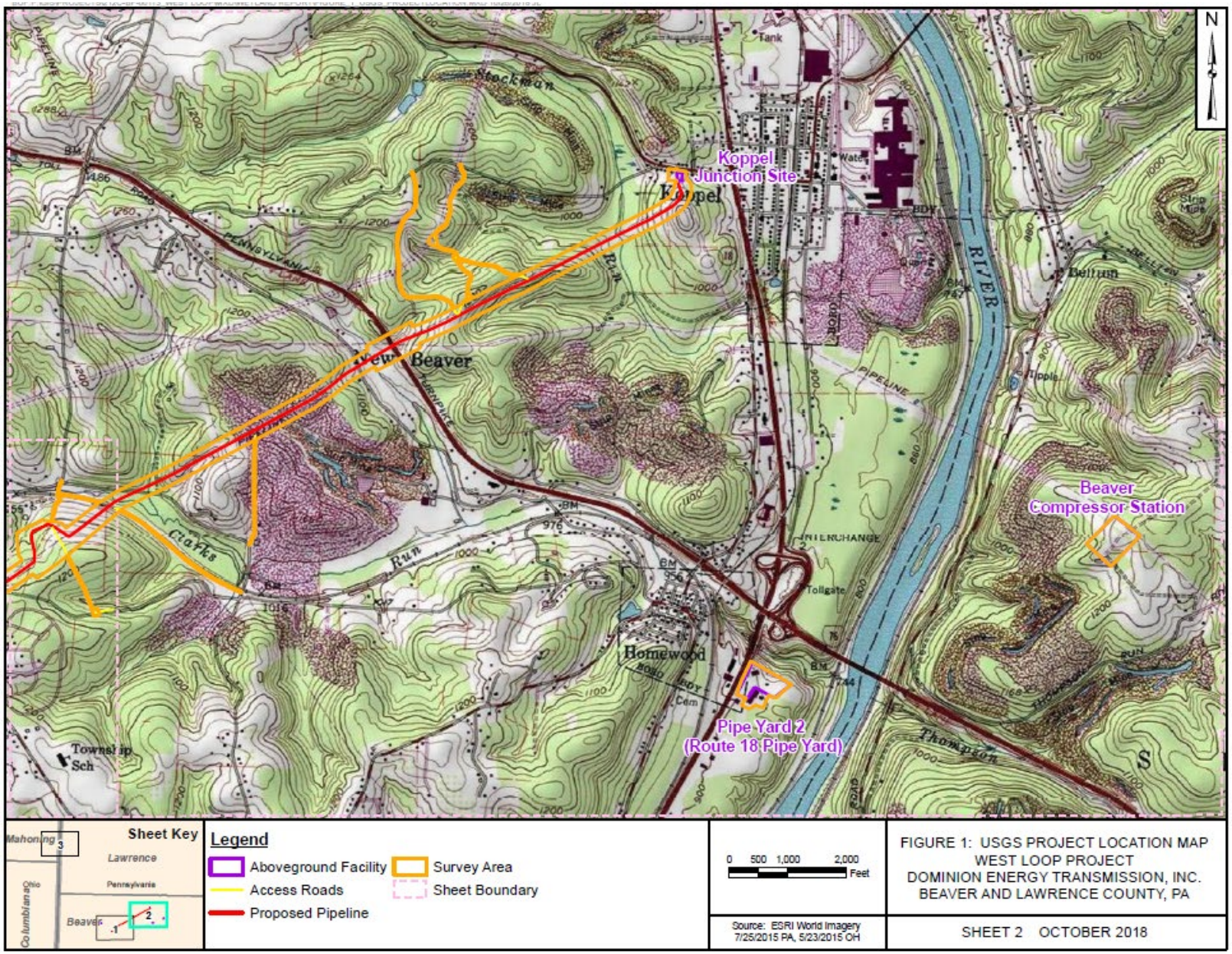


FIGURE 1: USGS PROJECT LOCATION MAP
WEST LOOP PROJECT
DOMINION ENERGY TRANSMISSION, INC.
BEAVER AND LAWRENCE COUNTY, PA

SHEET 2 OCTOBER 2018

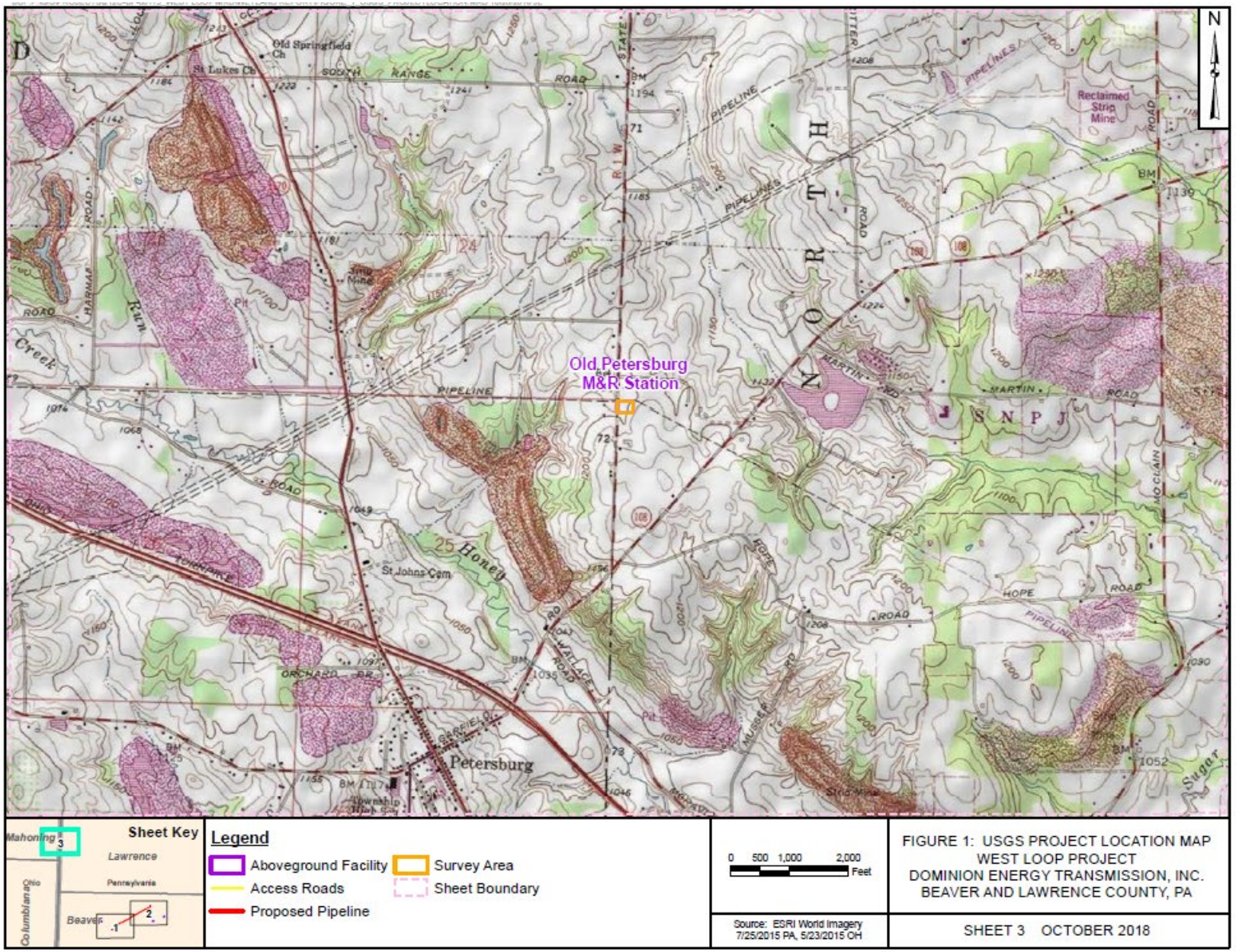
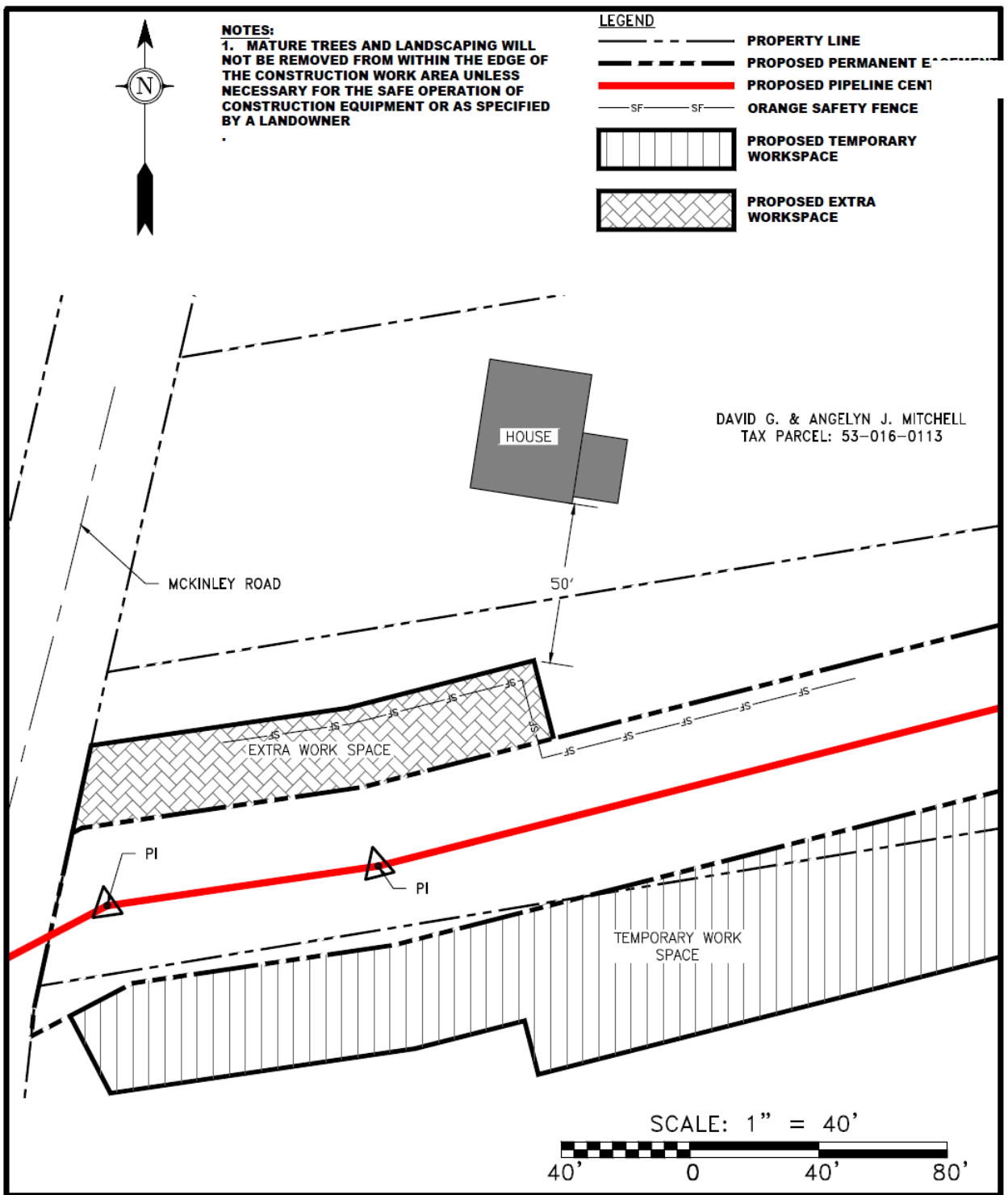


FIGURE 1: USGS PROJECT LOCATION MAP
WEST LOOP PROJECT
DOMINION ENERGY TRANSMISSION, INC.
BEAVER AND LAWRENCE COUNTY, PA

SHEET 3 OCTOBER 2018



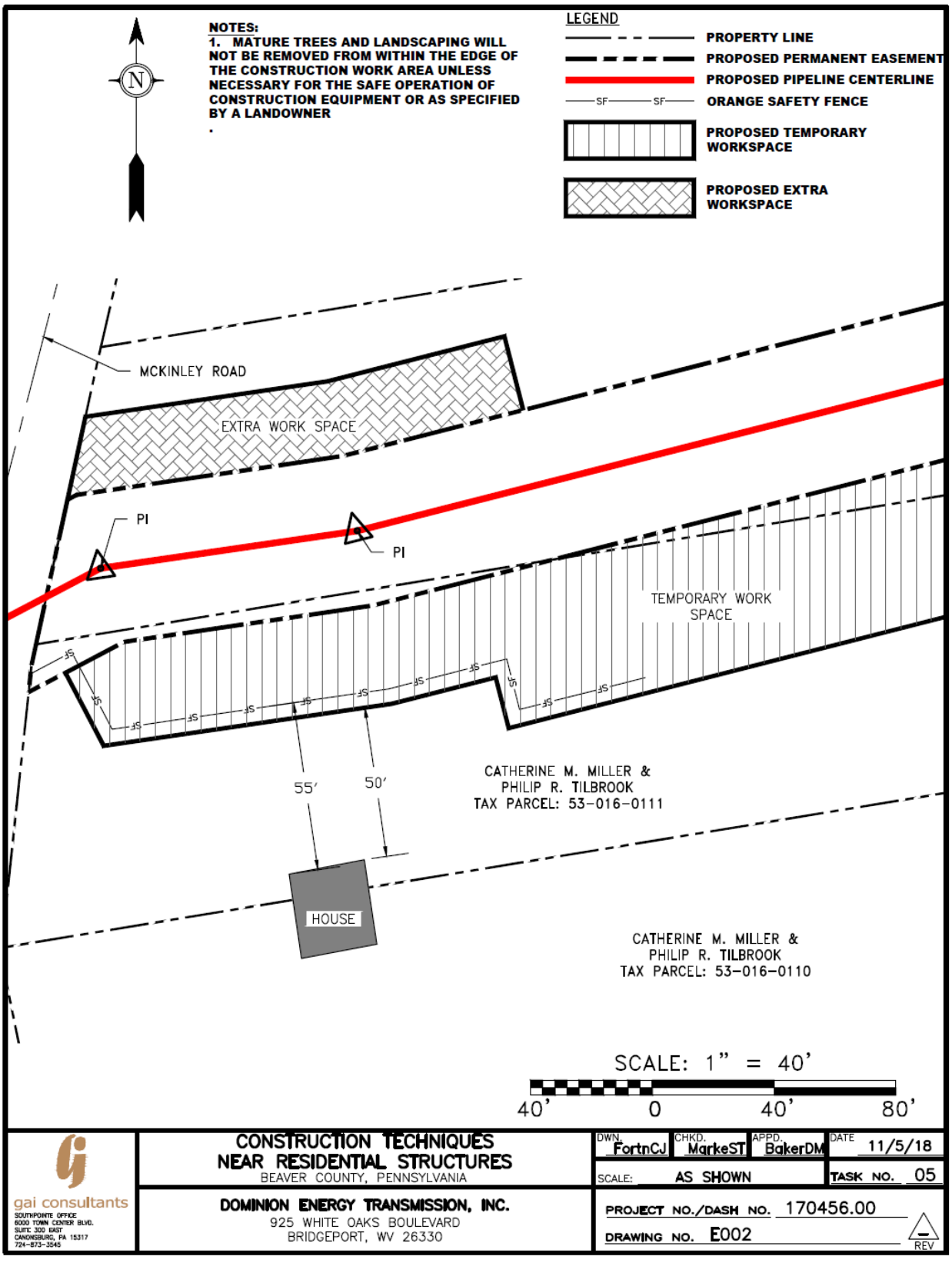
gai consultants
SOUTHPOINTE OFFICE
6000 TOWN CENTER BLVD.
SUITE 300 EAST
CANONSBURG, PA 15317
724-873-3545

CONSTRUCTION TECHNIQUES NEAR RESIDENTIAL STRUCTURES
BEAVER COUNTY, PENNSYLVANIA

DOMINION ENERGY TRANSMISSION, INC.
925 WHITE OAKS BOULEVARD
BRIDGEPORT, WV 26330

DWN.	CHKD.	APPD.	DATE
FortnCJ	MarkeST	BakerDM	11/5/18

SCALE: AS SHOWN
TASK NO. 05
PROJECT NO./DASH NO. 170456.00
DRAWING NO. E001
REV -



gai consultants
SOUTHPOINTE OFFICE
6000 TOWN CENTER BLVD.
SUITE 300 EAST
CANONSBURG, PA 15317
724-873-3545

CONSTRUCTION TECHNIQUES NEAR RESIDENTIAL STRUCTURES

BEAVER COUNTY, PENNSYLVANIA

DOMINION ENERGY TRANSMISSION, INC.
925 WHITE OAKS BOULEVARD
BRIDGEPORT, WV 26330

DWN.	CHKD.	APPD.	DATE
FortnCJ	MarkeST	BakerDM	11/5/18

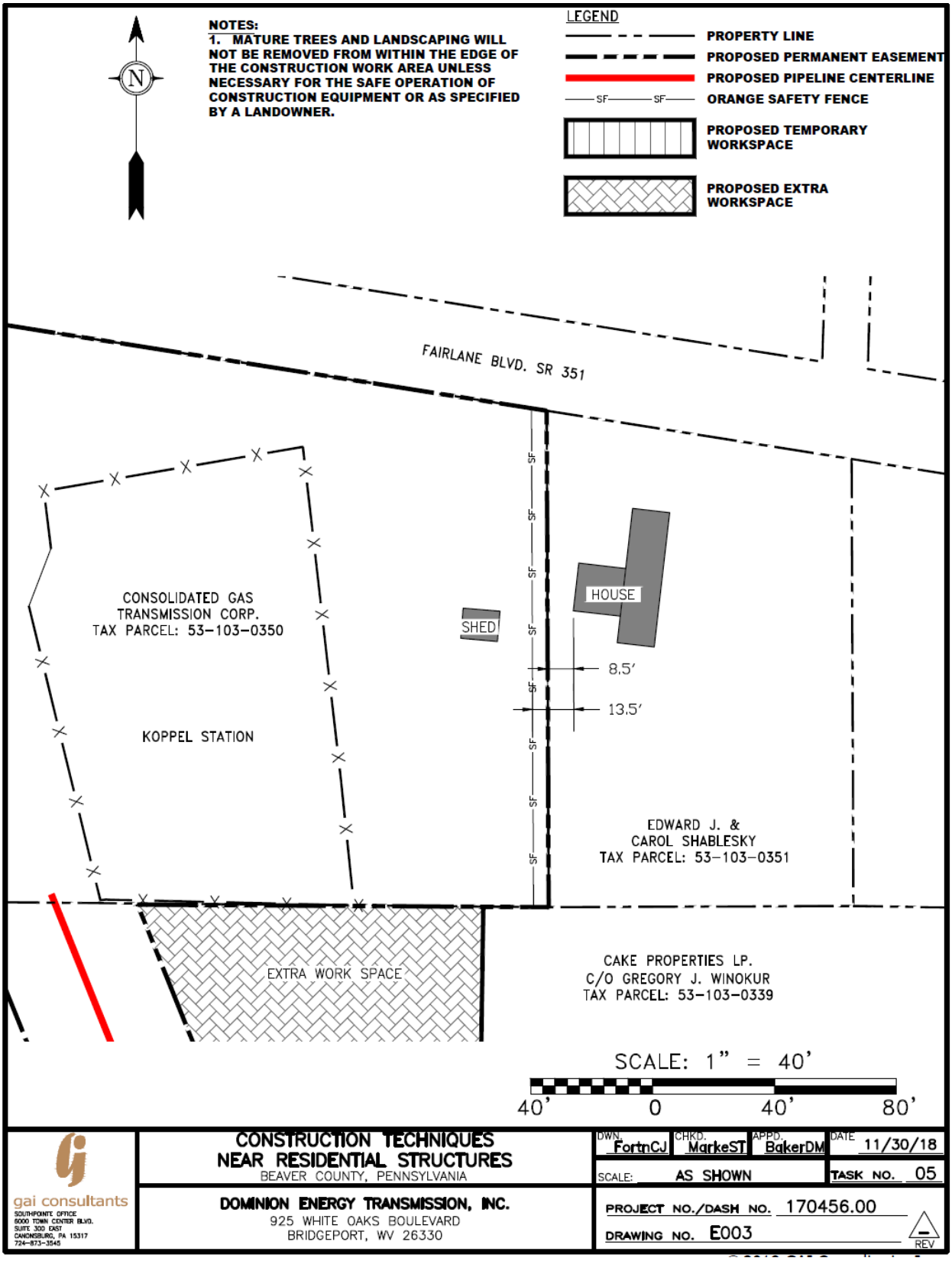
SCALE: AS SHOWN

TASK NO. 05

PROJECT NO./DASH NO. 170456.00

DRAWING NO. E002

REV –


NOTES:
1. MATURE TREES AND LANDSCAPING WILL NOT BE REMOVED FROM WITHIN THE EDGE OF THE CONSTRUCTION WORK AREA UNLESS NECESSARY FOR THE SAFE OPERATION OF CONSTRUCTION EQUIPMENT OR AS SPECIFIED BY A LANDOWNER.
LEGEND
PROPERTY LINE
PROPOSED PERMANENT EASEMENT
PROPOSED PIPELINE CENTERLINE
SF SF ORANGE SAFETY FENCE
PROPOSED TEMPORARY WORKSPACE
PROPOSED EXTRA WORKSPACE
N
FAIRLANE BLVD. SR 351
CONSOLIDATED GAS TRANSMISSION CORP.
TAX PARCEL: 53-103-0350
KOPPEL STATION
SHED
HOUSE
8.5'
13.5'
EDWARD J. & CAROL SHABLESKY
TAX PARCEL: 53-103-0351
EXTRA WORK SPACE
CAKE PROPERTIES LP.
C/O GREGORY J. WINOKUR
TAX PARCEL: 53-103-0339
SCALE: 1" = 40'
40' 0 40' 80'
gai consultants
SOUTHPOINTE OFFICE
600 TOWN CENTER BLVD.
SUITE 300 EAST
CANONSBURG, PA 15317
724-873-3545
CONSTRUCTION TECHNIQUES
NEAR RESIDENTIAL STRUCTURES
BEAVER COUNTY, PENNSYLVANIA
DOMINION ENERGY TRANSMISSION, INC.
925 WHITE OAKS BOULEVARD
BRIDGEPORT, WV 26330
DWN. FortnCJ
CHKD. MarkeST
APPD. BakerDM
DATE 11/30/18
SCALE: AS SHOWN
TASK NO. 05
PROJECT NO./DASH NO. 170456.00
DRAWING NO. E003
REV

APPENDIX B

OVERSIZED TABLES

Table 1: Waterbodies Crossed by the Project								
Milepost Location/Access Road	**Feature ID**	**Waterbody Name**	**Flow Regime**	**Crossing Width**	**State Waterbody Classification**	**PAFBC Stream Designation**	**Timing Restriction**	**Crossing Method**
TL-657 Pipeline								
0.44	S29	UNT to North Fork Little Beaver Creek	Perennial	8	HQ-CWF	Drains to ATW, STS	March 1-June 15	Dry Crossing/Temporary Bridge
0.89	S32	UNT to North Fork Little Beaver Creek	Ephemeral	1	Drains to HQ-CWF	Drains to ATW, STS	March 1-June 15	Dry Crossing/Temporary Bridge
0.9	S33	UNT to North Fork Little Beaver Creek	Intermittent	4	Drains to HQ-CWF	Drains to ATW, STS	March 1-June 15	Dry Crossing/Temporary Bridge
1.47	S22	UNT to North Fork Little Beaver Creek	Intermittent	4	Drains to HQ-CWF	Drains to ATW, STS	March 1-June 15	Dry Crossing/Temporary Bridge
1.51	S24	UNT to North Fork Little Beaver Creek	Intermittent	4	Drains to HQ-CWF	Drains to ATW, STS	March 1-June 15	Dry Crossing/Temporary Bridge
1.66	S26	UNT to North Fork Little Beaver Creek	Intermittent	4	Drains to HQ-CWF	Drains to ATW, STS	March 1-June 15	Dry Crossing/Temporary Bridge
1.84	S31	UNT to North Fork Little Beaver Creek	Perennial	11	HQ-CWF	Drains to ATW, STS	March 1-June 15	Dry Crossing/Temporary Bridge
2.17	S16	UNT to North Fork Little Beaver Creek	Ephemeral	2	Drains to HQ-CWF	Drains to ATW, STS	March 1-June 15	Dry Crossing/Temporary Bridge
2.18	S15	UNT to North Fork Little Beaver Creek	Intermittent	6	Drains to HQ-CWF	Drains to ATW, STS	March 1-June 15	Dry Crossing/Temporary Bridge

Table 1: Waterbodies Crossed by the Project								
Milepost Location/Access Road	**Feature ID**	**Waterbody Name**	**Flow Regime**	**Crossing Width**	**State Waterbody Classification**	**PAFBC Stream Designation**	**Timing Restriction**	**Crossing Method**
2.18	S17	UNT to North Fork Little Beaver Creek	Ephemeral	6	Drains to HQ-CWF	Drains to ATW, STS	March 1-June 15	Dry Crossing/Temporary Bridge
2.25	S18	UNT to North Fork Little Beaver Creek	Intermittent	4	Drains to HQ-CWF	Drains to ATW, STS	March 1-June 15	Dry Crossing/Temporary Bridge
2.26	S19	UNT to North Fork Little Beaver Creek	Ephemeral	2	Drains to HQ-CWF	Drains to ATW, STS	March 1-June 15	Dry Crossing/Temporary Bridge
2.66	S10	UNT to Clarks Run	Intermittent	4	Drains to WWF	n/a	n/a	Horizontal Bore
2.95	S9	Clarks Run	Perennial	6	WWF	n/a	n/a	Dry Crossing/Temporary Bridge
3.04	S11	UNT to Clarks Run	Perennial	4	WWF	n/a	n/a	Dry Crossing/Temporary Bridge
3.89	S8	UNT to Clarks Run	Intermittent	2	WWF	n/a	n/a	Dry Crossing/Temporary Bridge
3.94	S6	UNT to Clarks Run	Ephemeral	3	Drains to WWF	n/a	n/a	Dry Crossing/Temporary Bridge
3.99	S37	UNT to Clarks Run	Intermittent	2	Drains to WWF	n/a	n/a	Dry Crossing/Temporary Bridge
4.79	S36	UNT to Stockman Run	Perennial	5	Drains to WWF	n/a	May 1-July 31	Dry Crossing/Temporary Bridge
4.8	n/a	Stockman Run	Perennial	n/a	WWF	n/a	May 1-July 31	Dry Crossing/Temporary Bridge
4.84	S2	UNT to Stockman Run	Ephemeral	2	Drains to WWF	n/a	May 1-July 31	Dry Crossing/Temporary Bridge

Table 1: Waterbodies Crossed by the Project								
Milepost Location/Access Road	**Feature ID**	**Waterbody Name**	**Flow Regime**	**Crossing Width**	**State Waterbody Classification**	**PAFBC Stream Designation**	**Timing Restriction**	**Crossing Method**
Access Roads								
TAR-9	S1x	UNT to North Fork Little Beaver Creek	Perennial	12	HQ-CWF	Drains to ATW, STS	March 1-June 15	Temporary Bridge Only
TAR-7	S7y	UNT to North Fork Little Beaver Creek	Perennial	10	HQ-CWF	Drains to ATW, STS	March 1-June 15	Temporary Bridge Only
TAR-7	S8y	UNT to North Fork Little Beaver Creek	Perennial	15	Drains to HQ-CWF	Drains to ATW, STS	March 1-June 15	Temporary Bridge Only
TAR-7	S9y	UNT to North Fork Little Beaver Creek	Ephemeral	1	Drains to HQ-CWF	Drains to ATW, STS	March 1-June 15	Temporary Bridge Only
TAR-7	S10y	UNT to North Fork Little Beaver Creek	Ephemeral	1	Drains to HQ-CWF	Drains to ATW, STS	March 1-June 15	Temporary Bridge Only
TAR-7	S11y	UNT to North Fork Little Beaver Creek	Ephemeral	1	Drains to HQ-CWF	Drains to ATW, STS	March 1-June 15	Temporary Bridge Only
TAR-7	S12y	UNT to North Fork Little Beaver Creek	Ephemeral	1	Drains to HQ-CWF	Drains to ATW, STS	March 1-June 15	Temporary Bridge Only
TAR-7	S13y	UNT to North Fork Little Beaver Creek	Ephemeral	1	Drains to HQ-CWF	Drains to ATW, STS	March 1-June 15	Temporary Bridge Only
TAR-11	S1y	UNT to Clarks Run	Ephemeral	7	Drains to WWF	n/a	n/a	Temporary Bridge Only
TAR-11	S2y	UNT to Clarks Run	Perennial	15	Drains to WWF	n/a	n/a	Temporary Bridge Only

Table 1: Waterbodies Crossed by the Project								
Milepost Location/Access Road	**Feature ID**	**Waterbody Name**	**Flow Regime**	**Crossing Width**	**State Waterbody Classification**	**PAFBC Stream Designation**	**Timing Restriction**	**Crossing Method**
TAR-10	S3y	Clarks Run	Perennial	20	WWF	n/a	n/a	Temporary Bridge Only
TAR-5	S5ya	UNT to Clarks Run	Intermittent	20	Drains to WWF	n/a	n/a	Temporary Bridge Only
TAR-5	S5yb	UNT to Clarks Run	Ephemeral	4	Drains to WWF	n/a	n/a	Temporary Bridge Only
TAR-5	S6y	UNT to Clarks Run	Ephemeral	7	Drains to WWF	n/a	n/a	Temporary Bridge Only
TAR-2	S3x	UNT to Clarks Run	Ephemeral	2	Drains to WWF	n/a	n/a	Temporary Bridge Only
TAR-2	S4x	UNT to Clarks Run	Ephemeral	2	Drains to WWF	n/a	n/a	Temporary Bridge Only
TAR-2a	S5x	UNT to Clarks Run	Ephemeral	2	Drains to WWF	n/a	n/a	Temporary Bridge Only

UNT = unnamed tributary
TAR = temporary access road
HQ-CWF = High Quality Cold Water Fishery
WWF = Warm Water fishery
ATW = Approved Trout Water
STS = Stocked Trout Stream

Table 2: Projects Evaluated for Potential Cumulative Impacts							
Past, Present or Future Projects	**Primary Elements/ Description**	**Location**	**Distance (miles)/ Direction from Identified Other Project to Nearest Project MP or Facility**	**Current Status and Schedule**	**Footprint/Layout and Anticipated Impacts**	**Permits and Authorizations/ Description of Environmental Review, if required**	**Applicable Resource CIAA (Potentially Affected Resource Areas)**
FERC Jurisdictional Projects							
Lebanon West II Project (CP14-555) Dominion Transmission, Inc. (DTI) now known as DETI	Replacement of 11 natural gas pipeline segments of TL-400 pipeline totaling about 10.1 miles; modifications at four compressor facilities, including additional regulation at Beaver Compressor Station; and installation of additional valves and piping at Coxcomb Gate Assembly.	Tuscarawas, Muskingum, Licking, Harrison, Coshocton, Columbiana, Fayette, and Carroll Counties, OH; Allegheny, Armstrong, and Beaver Counties, PA	Within Beaver Compressor Station; 3.5 miles NE to TL-657; 3.22 miles NE to Carroll Compressor Station	Past In service – 2016	Total footprint about 196.5 acres affected during construction and about 130.4 acres for operational use in OH and PA. Total LOD at Beaver Compressor Station is 0.9 acre, 0.0 acre increase of land for operation.	FERC Certificate, FWS Section 7 Consultation, USACE Section 404 Permit, PA SHPO Section 106 Clearance, PADEP Section 401 Water Certification, E&S Plan, NPDES for hydrostatic discharge permit, ODNR T&E Clearances, Water Withdrawal Facility Registration, *Federal and State of PA & OH permits listed, other state permits omitted here.	Water Use & Quality (HUC 12), Fish, Wildlife and Vegetation, Cultural Resources, Geology, Soils, Land Use, Air Quality, Noise

Table 2: Projects Evaluated for Potential Cumulative Impacts							
Past, Present or Future Projects	**Primary Elements/ Description**	**Location**	**Distance (miles)/ Direction from Identified Other Project to Nearest Project MP or Facility**	**Current Status and Schedule**	**Footprint/Layout and Anticipated Impacts**	**Permits and Authorizations/ Description of Environmental Review, if required**	**Applicable Resource CIAA (Potentially Affected Resource Areas)**
TL-400 Pipeline Replacement Project (DTI) now known as DETI	Replacement and maintenance of 12-miles of existing 30-inch-diameter pipeline (TL-400). Two Sections of the project are located in Beaver County: Section 29- replacement of 0.81 mile of 30-inch-diameter pipeline and Section 30 replacement of 0.76 mile of 30-inch-diameter pipeline.	Beaver County, PA; Fairfield, Franklin, and Muskingum Counties, OH	Adjacent and northwest between MP 0.0 to MP 0.4 (Section 30); 1.51 miles NE to MP 0.0 (Section 29)	Past – completed in 2013.	1.57 miles in Beaver County Section 30: construction workspace of 9.86 acres; Section 29: construction workspace of 10.74 acres. Section 30 did not cross any streams or wetlands (the ROW abutted one wetland). No archeological resources or historic properties were identified.	FERC 2.55(b), FWS Section 7 Consultation, USACE Section 404 Permit, PADEP, SHPO Section 106 Clearance,	Water Use & Quality (HUC 12), Fish, Wildlife and Vegetation, Cultural Resources, Geology, Soils, Land Use, Air Quality, Noise
LN-25 and LN-35 Pipeline Replacement Project DETI	Replacement of two parallel sections of existing 20-inch-diameter natural gas pipeline each approximately 3,500 feet long.	Beaver County PA	0.71 miles SE to MP 5.08	Past construction completed in 2017	Total earth disturbance of approximately 18 acres.	FERC 2.55(b), FWS Section 7 Consultation, USACE Section 404 Permit, PADEP, SHPO Section 106 Clearance,	Cultural Resources; Land Use, Air Quality, Noise

Table 2: Projects Evaluated for Potential Cumulative Impacts							
Past, Present or Future Projects	**Primary Elements/ Description**	**Location**	**Distance (miles)/ Direction from Identified Other Project to Nearest Project MP or Facility**	**Current Status and Schedule**	**Footprint/Layout and Anticipated Impacts**	**Permits and Authorizations/ Description of Environmental Review, if required**	**Applicable Resource CIAA (Potentially Affected Resource Areas)**
Abandonment and Capacity Restoration Project (CP15-88) Tennessee Gas Pipeline. L.L.C.	Compressor Station 216.5: installation and operation of a new 21,044 HP (167.4 MMBtu/hr) natural gas-fired compressor Solar Turbine and fugitive equipment leaks.	Mahoning County, OH	3.82 miles from Old Petersburg Regulation Facility	OEPA Air Permit Issued 12/16/2017	~24.2 acres total disturbance 1 Permanent AR (2.2 acres)	FERC (Order Vacated 11/18/2018) Ohio EPA	Air Quality
Line N to Monaco Project (CP18-135) National Fuel Gas Supply Corporation	Installation of 4.5 miles of 12-inch-diameter pipeline (Line N20B2), extension of existing Line N pipeline, construction of a metering and regulating station/delivery point, and a pipeline interconnect to Line N. The project will deliver natural gas to the new Shell Petrochemicals Complex facility.	Beaver and Washington Counties, PA	9.94 miles NW to MP 0.0	Current – Construction activities were expected to commence in September 2018 (now TBD) and service is anticipated on June 1, 2019	Project requires 76.2 acres for construction and 30.6 acres for operation.	FERC; environmental review by the following agencies as project plans and conditions require: FWS, USACE (NWP-12), PADEP, PADCNR, PAGC, PAFBC, SHPO	Air Quality
Oil and Gas Projects[b]							
Bluestone to Sunoco Ethane Transmission Line MarkWest	Installation of 32 miles of 8-inch-diameter ethane pipeline connecting the Bluestone Processing Plant in Butler County, PA to the Mariner West Pipeline.	Beaver and Butler Counties, PA	Crosses at MP 3.25	Past – construction occurred in 2014 and is now in-service	Project crossed approximately 225 feet of the TL657 construction ROW with an overlap of approximately 0.36 acre	Environmental review by the following agencies as project plans and conditions require: FWS, USACE (NWP-12), PADEP, PADCNR, PAGC, PAFBC,	Water Use & Quality (HUC 12), Fish, Wildlife and Vegetation, Cultural Resources, Geology, Soils, Land Use, Air Quality, Noise

Table 2: Projects Evaluated for Potential Cumulative Impacts							
Past, Present or Future Projects	**Primary Elements/ Description**	**Location**	**Distance (miles)/ Direction from Identified Other Project to Nearest Project MP or Facility**	**Current Status and Schedule**	**Footprint/Layout and Anticipated Impacts**	**Permits and Authorizations/ Description of Environmental Review, if required**	**Applicable Resource CIAA (Potentially Affected Resource Areas)**
						SHPO	
Mariner West Pipeline Sunoco Logistics Partners, LP now Energy Transfer Partners (ETC)	Installation of new 350 miles of 10-inch-diameter ethane pipeline extending from Houston, PA to Michigan and ultimately Sarnia, Ontario.	Beaver, Allegheny, and Washington Counties, PA	1.5 miles W of MP 0.0	Past – in service in October 2013	Approximately 6.6 miles of pipeline crosses the same HUC-12 as the TL-657 Pipeline	Environmental review by the following agencies as project plans and conditions require: FWS, USACE (NWP-12), PADEP, PADCNR, PAGC, PAFBC, SHPO	Water Use & Quality (HUC 12); Air Quality
Blackhawk Station Columbia Gas of Pennsylvania Columbia Gas of PA Inc. (Site ID 466115-495328)	Pigging operations stack; dehydrator stack; pneumatic devices. (Crude Petroleum and natural Gas).	Beaver County, PA	3.39 miles NE to MP 0.0/Stitt Gate Site and Koppel Junction Site	Air Permit Application 2014	Unknown	Unknown	Air Quality
Ellwood City Compressor Station Columbia Gas Transmission Corp	Renewal of operating permit and minor permit modification for existing facility originally constructed in 1968.	Beaver County, PA	4.1 miles W to MP 5.08 and Koppell Junction Site	Air Permit Application 2014	Unknown	PADEP Air Quality Permit	Air Quality

Table 2: Projects Evaluated for Potential Cumulative Impacts							
Past, Present or Future Projects	**Primary Elements/ Description**	**Location**	**Distance (miles)/ Direction from Identified Other Project to Nearest Project MP or Facility**	**Current Status and Schedule**	**Footprint/Layout and Anticipated Impacts**	**Permits and Authorizations/ Description of Environmental Review, if required**	**Applicable Resource CIAA (Potentially Affected Resource Areas)**
Carrollton Compressor Station, Utica Gas Services, LLC	Operate Oil & Gas Compressor Station 110 MMcfd capacity including ten (10) - 1,775 horsepower natural gas-fired Caterpillar G3606 engines equipped with oxidation catalysts.	Carroll County, OH	4.09 miles SE to Carroll Compressor Station	Operational in 2014; OEPA Title V Air Permit Issued 12/18/2017	Unknown	Ohio EPA Title V Air Permit	Air Quality, Noise
D1447 Pipeline Project (Site ID 459060-825477) Columbia Gas of Pa	Installation of approximately 13,000 linear feet of 8-inch-diameter plastic pipeline.	Lawrence County, PA	4.11 miles SE to MP 3.8; 7.06 miles NW to Old Petersburg Regulation Facility	Unknown	No Data	Environmental review by the following agencies as project plans and conditions require: FWS, USACE (NWP-12), PADEP, PADCNR, PAGC, PAFBC, SHPO	Water Use & Quality (HUC 12), Air Quality, Noise,
Hilcorp Energy NCD Central Facility (Site ID 813981) Hilcorp Energy Co.	Air emission plant and natural gas pipeline.	Beaver County, PA	5.34 miles	Air Permit Application 2015	Unknown	PADEP Air Emission Permitting	Air Quality

Table 2: Projects Evaluated for Potential Cumulative Impacts							
Past, Present or Future Projects	**Primary Elements/ Description**	**Location**	**Distance (miles)/ Direction from Identified Other Project to Nearest Project MP or Facility**	**Current Status and Schedule**	**Footprint/Layout and Anticipated Impacts**	**Permits and Authorizations/ Description of Environmental Review, if required**	**Applicable Resource CIAA (Potentially Affected Resource Areas)**
Patterson Compressor Station RE Gas Development LLC now owned by PENNENERGY Resources (Site ID 773394-765453)	Installation of pigging operations stack Air pollution control device: CAT. G3508BLE oxidation catalyst.	Lawrence County, PA	5.67 miles SE to MP 5.08 /Koppel Junction Site	Air Permit Application 2018	Unknown	PADEP Air Emission Permitting	Air Quality
Beaver Creek CDP Utica Gas SVC LLC (Site ID 745645-739527)	DEHY #1 (15 MMSCFD, 0.5 MMBTU/HR) Stack.	Beaver County, PA	5.34 miles NE to MP 0.0 / Stitt Gate Site	Air Permit Application	Unknown	PADEP Air Emission Permitting	Air Quality
Hilcorp Energy – Poland CLL Production Facility	Installation and operation of a 690-horsepower Caterpillar G3508 4SLB natural gas-fired compressor engine with oxidation catalyst at existing facility	Mahoning County, OH	5.91 miles from Old Petersburg Facility	OEPA Air Permit Issued 12/16/2017	Unknown	Ohio EPA Air Permit	Air Quality

Table 2: Projects Evaluated for Potential Cumulative Impacts							
Past, Present or Future Projects	**Primary Elements/ Description**	**Location**	**Distance (miles)/ Direction from Identified Other Project to Nearest Project MP or Facility**	**Current Status and Schedule**	**Footprint/Layout and Anticipated Impacts**	**Permits and Authorizations/ Description of Environmental Review, if required**	**Applicable Resource CIAA (Potentially Affected Resource Areas)**
Shell Chemical Appalachia Petrochemical Complex (Ethane Cracker Plant) Royal Dutch Shell/Shell Chemical Appalachia	The ethane cracker will consist of more than 200 major components and 95 miles of pipe, a 900- foot cooling tower, rail- and truck-loading facilities, water treatment plant, office building, laboratory and 250-megawatt natural gas fired power plant part of future construction	Beaver County, PA	9.5 miles north to MP 0.0	Current – under construction-anticipated completion 2020	The project will bring growth and jobs to the region, with up to 6,000 construction workers involved in the building of the facility and an anticipated 600 permanent employees once completed.	Environmental review by the following agencies as project plans and conditions require: FWS, USACE (NWP-12), PADEP, PADCNR, PAGC, PAFBC, SHPO	NA
Falcon Ethane Pipeline Project Shell Pipeline Company, LP	Construction of approximately 45.5 miles of 12.5-inch-diameter ethane pipeline in PA. Pipeline will carry ethane liquid from Ohio and Houston PA to a junction meter site in Raccoon Township, Beaver County and 16- inch-diameter segment to Shell Petrochemical Complex (Ethane Cracker Plant).	Beaver, Washington, and Allegheny Counties PA; Jefferson, Carroll, Harrison Counties OH; Hancock County WV	9.5 miles N to MP 0.0; 6.2 miles to Carroll Compressor Station	Future – in development anticipated construction TBD/2019	NA	Environmental review by the following agencies as project plans and conditions require: FWS, USACE (NWP-12), PADEP, PADCNR, PAGC, PAFBC, SHPO	NA

Table 2: Projects Evaluated for Potential Cumulative Impacts							
Past, Present or Future Projects	**Primary Elements/ Description**	**Location**	**Distance (miles)/ Direction from Identified Other Project to Nearest Project MP or Facility**	**Current Status and Schedule**	**Footprint/Layout and Anticipated Impacts**	**Permits and Authorizations/ Description of Environmental Review, if required**	**Applicable Resource CIAA (Potentially Affected Resource Areas)**
Revolution Pipeline Energy Transfer Partners (ETC)	Install approximately 110 miles of 20-inch, 24-inch and 30-inch-diameter gathering pipeline	Butler, Beaver, and Washington Counties PA	11 miles NW to MP 0.0	Current Construction complete; in service (TBD 2019)	NA	Environmental review by the following agencies as project plans and conditions require: FWS, USACE (NWP-12), PADEP, PADCNR, PAGC, PAFBC, SHPO	NA
Pennant Midstream, LLC – Hickory Bend Gas Processing Plant	Increase fugitive emissions from pigging activities and controlled maintenance blowdown activities	Mahoning County, OH	2.27 miles from Old Petersburg Regulation Facility	OEPA Air Permit Issued 12/16/2017	Unknown	Ohio EPA Air Permit	Air Quality, Land Use, Noise
Commercial/Industrial/Residential/Municipal Development[C]							
IPSCO Koppel Works IPSCO Koppel Tubulars LLC (Site ID 236661 238740)	Emergency Generator (435 BHP) (Steelyard); UV Coater Filter	Beaver County, PA	0.69 mile W to MP 5.08 / Koppel Junction Site	Air Permit Application	Unknown	PADEP Air Emission Permitting	Land Use, Air Quality, Noise
Pittsburgh International Race Complex	Re-paving and expansion project	Beaver County, PA	0.87 mile SE to MP 5.08 / Koppel Junction Site	Past – Under construction in 2017	Unknown	Beaver County Consistency Review	Land Use, Air Quality, Noise

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Pike Business Park Pike Business Park LLC (Site ID 823574-819426)	Commercial/manufacturing development	Beaver County, PA	1.43 miles SE to MP 0.00 / Stitt Gate Site; 0.53 of Darlington Pipe Yard	Current – under development	50-acre site	PADEP - Erosion and Sediment Control Permit.	Water Use & Quality (HUC 12), Air Quality, Noise
Phillips Svc Corp Beaver Falls Plant PSC Metals LLC/Koppel (Site ID 518123-3127	Secondary cleaning exhaust system installation	Beaver County, PA	0.93 mile E to Beaver Compressor Station; 1.14 miles NW to MP 5.08 / Koppel Junction Site	Current 2018	Permit Modification is administrative and therefore no impacts	PADEP Air Emission Permitting (Minor Modification)	Land Use, Air Quality, Noise
Musser Site Restoration Project Ast Fairfield Coal Co (Site ID 557200 - 827506)	Landscape Restoration Underground Limestone Ohio Mine	Lawrence County, PA	0.57 mile NW to Old Petersburg Regulation Facility	Unknown	Unknown	Environmental review by the following agencies as project plans and conditions require: FWS, USACE (NWP-12), PADEP, PADCNR, PAGC, PAFBC	Fish, Wildlife and Vegetation, Cultural Resources, Geology, Soils, Land Use, Air Quality, Noise

Table 2: Projects Evaluated for Potential Cumulative Impacts							
Past, Present or Future Projects	**Primary Elements/ Description**	**Location**	**Distance (miles)/ Direction from Identified Other Project to Nearest Project MP or Facility**	**Current Status and Schedule**	**Footprint/Layout and Anticipated Impacts**	**Permits and Authorizations/ Description of Environmental Review, if required**	**Applicable Resource CIAA (Potentially Affected Resource Areas)**
Blackhawk Middle/Senior High School Blackhawk HS Stadium Field Blackhawk School District (Site ID 720104-816414)	Blackhawk HS Stadium Field Renovations	Beaver County, PA	2.04 miles N to MP 0.0 / Stitt Gate Site	Past	Unknown	PADEP - Erosion and Sediment Control Permit Environmental review by the following agencies as project plans and conditions require: FWS, USACE (NWP-12), PADEP, PADCNR, PAGC, PAFBC	Water Use & Quality (HUC 12), Air, Noise
Three Rivers Aggregates / Palmer Plant Three Rivers Aggregates LLC (Site ID 609431-632557)	Sand and Gravel Plant Fugitive Emissions, 2,346 BHP Mitsubishi Engine Stack	Beaver County, PA	2.93 miles SE to MP 1.3; 2.54 miles SW to Darlington Pipe Yard; 7.27 miles NE to Old Petersburg Regulation Facility	Air Permit Application (18) between 2013 -2108	85 acres	PADEP Air Emission Permitting	Water Use & Quality (HUC 12), Air Quality, Noise
Beaver County Conservation District's North Fork Little Beaver Streambank Stabilization Habitat Project	Streambank stabilization and habitat project	Beaver County, PA	Unidentified location in HUC-12 in the vicinity of Darlington Pipe Yard	Past work conducted in 2016	Unknown	Beaver County Conservation District	Water Use & Quality (HUC 12), Fish, Wildlife and Vegetation, Cultural Resources, Geology, Soils, Land Use, Air Quality, Noise

Table 2: Projects Evaluated for Potential Cumulative Impacts							
Past, Present or Future Projects	**Primary Elements/ Description**	**Location**	**Distance (miles)/ Direction from Identified Other Project to Nearest Project MP or Facility**	**Current Status and Schedule**	**Footprint/Layout and Anticipated Impacts**	**Permits and Authorizations/ Description of Environmental Review, if required**	**Applicable Resource CIAA (Potentially Affected Resource Areas)**
Brighton Electric Steel Casting Brighton Steel/Beaver Falls (Site ID 242219-549128	Steel casting facility and production of precise metals and plastics. Permit modification for existing facility.	Beaver County, PA	3.43 miles N to MP 5.08 / Koppel Junction Site; 2.84 miles NE to Beaver Compressor Station;	Air Permit Application (2 permits for stack emissions) between 2013 - 2108	Unknown	PADEP Air Emission Permitting	Air Quality
Argos USA Bessemer Plant (terminal) 245249	The cement plant at this location was closed 2009 and idle ever since. 2017 new sign on property "Argos Bessemer Terminal"	Lawrence County, PA	3.55 miles SW to Old Petersburg Regulation Facility	Air Permit Application filed – State Operating Permit Approved 1/25/2017	Fugitive emissions from 500-gallon gasoline storage tank	PADEP Air Emission Permitting	Air Quality
Austin Assoc Vermiculite Plant Austin Assoc Inc. (Site ID 488680-517150)	Installation of Exfoliation Furnace 2, rated at 1.32 MMBTU/HR	Beaver County, PA	4.0 miles NW to MP 2.4	Air Permit Applications (5) filed between 2013 and 2018	Unknown	PADEP Air Emission Permitting	Air Quality
ONDEO NALCO Energy Services, NALCO Co. North/South Plants Site ID 239093	Existing air emission facility with multiple points of emission and control device technology.	Beaver County, PA	3.74 miles SW to MP 5.08, Koppel Junction Site	Air Permit Applications (31) filed between 2013 and 2018	Unknown	PADEP Air Emission Permitting	Air Quality
Ellwood City Forge Ellwood City	Iron and steel manufacturing facility, existing air emission facility with multiple points of emission and control device technology.	Lawrence County, PA	2.70 miles SW to MP 5.08, Koppel Junction Site	Air Permit Applications filed - State operating permit approved 5/28/2015	Unknown	PADEP Air Emission Permitting	Air Quality

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Rosebud Mining Co. – Carrollton Mine (D-2438)	Surface w/ Underground Coal Mine	Carroll County, OH	2.02 miles E/SE of Carroll Compressor Station (at closest point)	Permit application submitted 2009, Approved 2015	~9,337.7 acres	Ohio DNR	Air Quality
Rosebud Mining Co. – Carrollton Mine (D-2438-1)	Surface w/ Underground Coal Mine	Carroll County, OH	2.02 miles E/SE of Carroll Compressor Station (at closest point)	Permit application submitted 2015; Pending approval	~7,544.3 acres	Ohio DNR	Air Quality
Pennsylvania Department of Transportation (PennDOT) Projects							
SR 51/ Constitution Blvd. SR Project ID: 91698	Resurface. Bituminous overlay and bridge preservation (3 structures) on SR 51 from SR 251 to SR 4004 Cannelton in Chippewa/South Beaver/Darlington Townships, Beaver County covering approximately 4.56 miles	Beaver County, PA	0.34 miles NE to MP 0.0 0.14 NE to AR 9	Past Project Completed June 2014	~4.56 miles	Statewide Transportation Network Improvement Program. PennDOT-Road Design and Environment Division.	Water Use & Quality (HUC 12), Fish, Wildlife and Vegetation, Cultural Resources, Geology, Soils, Land Use, Air Quality, Noise

Table 2: Projects Evaluated for Potential Cumulative Impacts							
Past, Present or Future Projects	**Primary Elements/ Description**	**Location**	**Distance (miles)/ Direction from Identified Other Project to Nearest Project MP or Facility**	**Current Status and Schedule**	**Footprint/Layout and Anticipated Impacts**	**Permits and Authorizations/ Description of Environmental Review, if required**	**Applicable Resource CIAA (Potentially Affected Resource Areas)**
SR 551, Wallace Run Rd Project ID 91738	Resurface; Expanded Maintenance Located on SR 551, Wallace Road in South Beaver Township and Darlington Borough, Beaver County. 0.37 miles and also 1.94 miles from intersection of Church Rod (SR168) and Wallace Run Road (SR 551) to McKinley Road	Beaver County, PA	Crosses MP 0.41	Future -In planning/under development	~2.31 miles	Statewide Transportation Network Improvement Program. PennDOT-Road Design and Environment Division.	Water Use & Quality (HUC 12), Fish, Wildlife and Vegetation, Cultural Resources, Geology, Soils, Land Use, Air Quality, Noise
New Galilee over North Fork Creek Project ID: 78308	Bridge rehabilitation. Bridge restoration on SR 4005, New Galilee Road over North Fork of Little Beaver Creek, in Darlington Township, Beaver County.	Beaver County, PA	1.74 miles SE to MP 0.9; 1.63 miles SW to Darlington Pipe Yard	Current – construction start: July 2018; estimated complete November 2019	454 feet	Statewide Transportation Network Improvement Program. PennDOT-Road Design and Environment Division.	Air Quality
SR 551, Project ID 108251 GRP 112-21-7135-1	Resurface; Expanded Maintenance	Beaver County, PA	0.0 miles or adjacent to from Koppel Junction Station for a 0.08 mile portion.	Future – In Planning/underdevelopment; estimated complete in 2021	~1.89 miles	Statewide Transportation Network Improvement Program. PennDOT-Road Design and Environment Division.	Water Use & Quality (HUC 12), Fish, Wildlife and Vegetation, Cultural Resources, Geology, Soils, Land Use, Air Quality, Noise

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Past, Present or Future Projects	**Primary Elements/ Description**	**Location**	**Distance (miles)/ Direction from Identified Other Project to Nearest Project MP or Facility**	**Current Status and Schedule**	**Footprint/Layout and Anticipated Impacts**	**Permits and Authorizations/ Description of Environmental Review, if required**	**Applicable Resource CIAA (Potentially Affected Resource Areas)**
Old Darlington Road (A409EM) Project ID: 101216	SR 4013, Old Darlington Road in South Beaver Township, Beaver County. Guiderail reset, base repair on SR 4013, covering approximately 1.75 miles on Old Darlington Road in South Beaver Township, Beaver County	Beaver County, PA	0.68 miles NE to MP 0.0	Current estimated completion date November 2018	~1.75 miles	Statewide Transportation Network Improvement Program. PennDOT-Road Design and Environment Division.	Water Use & Quality (HUC 12), Fish, Wildlife and Vegetation, Cultural Resources, Geology, Soils, Land Use, Air Quality, Noise
Ohio Department of Transportation (OhioDOT) Projects							
Ohio DOT Project No. 95536	Minor Rehabilitation - Pavement surface	Jefferson County, OH	1.58 miles SW to Carroll Compressor Station	Past Construction 6/22/2017 to 9/27/2017	2.6 miles	Statewide Transportation Improvement Program.	Air Quality
Ohio DOT Project No. 96440	Bridge Replacement, SR 164	Jefferson County, OH	2.67 miles NW to Carroll Compressor Station	Future – construction planned for 2019-2020	Unknown	Statewide Transportation Improvement Program.	Air Quality
Ohio DOT Project No. 108813	Bridge Replacement, SR 43	Carroll County, OH	3.30 miles NE to Carroll Compressor Station	Future In development anticipated construction TBD/2024	Deck width 32 feet deck area 1668 square feet	Statewide Transportation Improvement Program.	Air Quality
Ohio DOT Project No. 102985	Bridge Replacement, Route 53	Jefferson County, OH	3.89 miles NW to Carroll Compressor Station	Future In development anticipated construction TBD/2022	Deck width 17.8 feet, deck area 2293 square feet, main structure 344 feet	Statewide Transportation Improvement Program.	Air Quality

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Energy & Utility Projects (*include other linear projects –e.g., process water pipelines, electric transmission)*[d]							
Bruce Mansfield-Glenwillow 345-kV Project: A 119-mile transmission line FirstEnergy	Installation of new a 119-mile transmission line installed on current transmission structures or other existing ROW. From Beaver County to new substation near Cleveland. Approximately 70 percent of the project and almost all of the Pennsylvania portion of the project involves adding a line to the "open-arm" position on existing structures to minimize impact	Beaver County PA, Cuyahoga, Summit, Portage, Mahoning, Columbiana, and Trumbull Counties in OH	10.5 miles NE to MP 0.0	Past – in service 2015	Unknown	NA	NA
Beaver Valley Power Station – Deactivation Project First Energy	Deactivation of 1,872 MW Nuclear Generating Plant in Shippingport, PA	Beaver County, PA	11.8 miles N to MP 0.0	Future – 3-yr deactivation plan: est. 2021	Unknown	NA	NA
Advanced Power, South Field Energy	1,180 megawatt natural gas generating facility	Columbiana County, OH	15 miles NE of the Carroll Compressor Station, 17 miles SW of MP 0.0	Currently under construction. Planned to be complete by June 2021.	20 acre permanent footprint on 150 acre parcel	Ohio Power Siting Board Approved Permit	Air Quality

Table 2: Projects Evaluated for Potential Cumulative Impacts							
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Oil & Gas Production Wells[e]							
Wells, 0.5-mile CIAA in Beaver County, PA surrounding TL-657, Stitt Gate Site and Koppel Junction Site, Beaver Compressor Station, and Darlington M&R Station	There are 4 wells located within the HUC-12 boundary and 22 wells located within 6.21 mile/10 km. A total of 61 well drilling permit applications were approved between 2013 to present and to date. A total of 3 wells have been drilled. While there is a total of 61 approvals/permits granted, there are a number of applications associated	Beaver County, PA	Varies	Past, Present, and Future	Varies	PADEP, Bureau of Oil and Gas Management	Water Use & Quality (HUC 12), Air Quality
Wells, 0.5-mile CIAA in Lawrence County, PA surrounding Old Petersburg Station	There are 0 wells located within 0.5 mile and 8 wells located within 6.21 mile/10 km.	Lawrence County, PA	Varies	Past, Present, and Future	Varies	PADEP, Bureau of Oil and Gas Management	Air Quality
Wells, 0.5-mile CIAA in Mahoning County, OH surrounding Old Petersburg Station	There are 0 wells located within 1 mile and 7 wells within 6.21 mile/10 km.	Mahoning County, OH	Varies	Past, Present, and Future	Varies	Ohio Department of Natural Resources, Division of Oil and Gas	Air Quality

Table 2: Projects Evaluated for Potential Cumulative Impacts							
Past, Present or Future Projects	**Primary Elements/ Description**	**Location**	**Distance (miles)/ Direction from Identified Other Project to Nearest Project MP or Facility**	**Current Status and Schedule**	**Footprint/Layout and Anticipated Impacts**	**Permits and Authorizations/ Description of Environmental Review, if required**	**Applicable Resource CIAA (Potentially Affected Resource Areas)**
Wells, 0.5-mile CIAA in Carroll County, OH surrounding Carroll Compressor Station	There are 4 producing wells and 1 well permitted but not drilled within 0.5 mile and 4 additional wells within 6.21 mile/10 km.	Carroll County, OH	Varies	Past, Present, and Future	Varies	Ohio Department of Natural Resources, Division of Oil and Gas	Air Quality
Wells, 0.5-mile CIAA in Jefferson County, OH surrounding Carroll Compressor Station	There 7 wells within 6.21 mile/10 km.	Jefferson County, OH	Varies	Past, Present, and Future	Varies	Ohio Department of Natural Resources, Division of Oil and Gas	Air Quality

Notes:

N/A = not applicable.

a Minor projects such as those listed here are generally authorized either under Blanket Authority (in accordance with Section 7 of the Natural Gas Act) because they would have relatively little impact on ratepayers, operations, or the environment, or are further exempt from Section 7(c) authority because the pipe, ROW, and environmental conditions have already been certificated. Section 2.55(a) authorizes auxiliary installations for obtaining more efficient or economical operation and Section 2.55(b) authorizes replacements of physically deteriorated or obsolete facilities with equivalent designed delivery capacity. These projects should be completed in the near term.

b Projects recently completed, under construction, or expected to be under construction in the same timeframe as, and located within the CIAA of, the West Loop Project.

c Land Use Information Request Letters were sent to the Beaver, Lawrence, and Carroll County Planning Commissions as well as South Beaver Township, Chippewa Township, Big Beaver Borough, Homewood Borough, North Sewickley Township, Darlington Township, North Beaver Township PA and Lee Township OH. No responses received as of December 4, 2018. Correspondence is included in Resource Report 8, Appendix 8-A (see Volume I Public).

d Bruce Mansfield-Glenwillow 345-kV, 119-mile Transmission Line Project is outside of the CIAA boundary. This project originates from the Bruce Mansfield Plant located south of Ohio River and is 10.5 miles SW of the Project.

e Well drilling activity within the same counties as the West Loop Project.

Sources:

- FERC eLibrary accessed at https://www.ferc.gov/docs-filing/elibrary.asp.
- EIA Pipeline projects data accessed at https://www.eia.gov/naturalgas/data.php#pipelines and www.eia.gov/state/maps.php/v=Petroleum).
- PADEP & PUC: Publicly available information (including pipeline and Oil and Gas Well records and permits) accessed at http://www.depreportingservices.state.pa.us/ReportServer/Pages/ReportViewer.aspx?/Oil_Gas/Permits_Issued_Detail and at http://www.depreportingservices.state.pa.us/ReportServer/Pages/ReportViewer.aspx?/PUC/PUC_Interactive_Web.
- US DOT PHMSA at https://hip.phmsa.dot.gov/analyticsSOAP/saw.dll?Portalpages and https://hip.phmsa.dot.gov/analyticsSOAP/saw.dll?Portalpages
- PA Spatial Data Access at: http://www.pasda.psu.edu/uci/SearchResults.aspx?originator=Pennsylvania+Department+of+Environmental+Protection
- PennDOT Project Tracker accessed at https://www.dot7.state.pa.us/ONEMAP/
- OhioDOT accessed at https://gis.dot.state.oh.us/tims/Data/Download
- Ohio DNR GIS Division of Oil and Gas Information Technology accessed at http://geospatial.ohiodnr.gov/data-metadata/search-by-county
- Ohio EPA accessed at https://epa.ohio.gov/dapc/newpermits/issued
- Beaver County Planning Commission Annual Reports accessed at: http://www.beavercountypa.gov/Depts/Planning/Pages/Reports.aspx
- Oil and Gas Industry websites: https://www.shell.com/about-us/major-projects/pennsylvania-petrochemicals-complex.html; http://www.sunocologistics.com/Customers/Business-Lines/Asset-Map/241/ https://www.firstenergycorp.com/content/fecorp/newsroom/news_articles/firstenergy-completes-transmission-projects-to-boost-electric-re.html https://www.ogj.com/articles/2014/08/markwest-to-expand-processing-fractionation-in-pennsylvania.html

APPENDIX C

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LIST OF PREPARERS

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