Federal Energy Regulatory Commission
Office of Energy Projects, Division of Gas-Environment & Engineering

ENVIRONMENTAL ASSESSMENT REPORT

Name of Applicant: Transcontinental Gas Pipe Line Company, LLC (Transco)

Date Filed: 03/23/2015	**Docket No:** CP15-118-000
Type: Section 7(c) construction of facilities	**Cost:** $190.8M

Facilities: Transco requests approval to construct, maintain, and operate the Virginia Southside Expansion Project II in Brunswick, Greensville, Prince William, and Pittsylvania Counties, Virginia; Polk County, North Carolina; and Spartanburg and Cherokee Counties, South Carolina. The proposed project includes the construction and operation of 4.19 miles of 24-inch-diameter lateral pipeline connecting the existing Brunswick Lateral to the planned Virginia Electric and Power Company (VEPCO) Greensville Power Station; one new meter and regulator station; additional compression at two existing compressor stations; and modifications at 19 existing facilities, including odorization facilities.

The purpose of this project is to provide up to 250,000 dekatherms per day (250 million cubic feet per day) to VEPCO's Greensville Power Station. Transco anticipates beginning construction in October 2016 (pending approvals) and placing the facilities into service by December 2017.

Environmental Impact -- Conclusions:

___ **Categorical Exclusion**

___ **Environment Not Involved**

_X_ **Environment Complete**

___ **Deficiency Letter Required**

___ **EA/EIS Required**

___ **No NOI Required**

___ **NOI Required**

Environmental Considerations or Comments:

The environmental assessment is attached.

Prepared by:	**Date:**	**Approved by Branch Chief:**	**Date:**
Arianne Balsom	5/13/2016	Shannon Jones	5/13/2016

Office of

Energy Projects

May 2016

Transcontinental Gas Pipe Line Company, LLC

Docket No. CP15-118-000

Virginia Southside Expansion Project II

Environmental Assessment

Washington, DC 20426

TABLE OF CONTENTS

_Toc450913379

A. PROPOSED ACTION 1
A.1 Introduction 1
A.2 Project Purpose and Need 1
A.3 Public Review and Comment 2
A.4 Proposed Facilities 4
A.5 Construction, Operation, and Maintenance Procedures 5
A.6 Land Requirements 17
A.7 Permits 21
A.8 Non-Jurisdictional Facilities 23
B. ENVIRONMENTAL ANALYSIS 24
B.1 Geology and Soils 24
B.2 Water Resources 28
B.3 Vegetation and Wildlife 34
B.4 Special Status Species 38
B.5 Land Use and Recreation 41
B.6 Cultural Resources 45
B.7 Air Quality and Noise 47
B.8 Reliability and Safety 61
B.9 Cumulative Impacts 62
C. ALTERNATIVES 79
C.1 No-Action Alternative 79
C.2 System Alternatives 80
C.3 Major Route Alternatives 81
C.4 Aboveground Facility Alternatives 83
D. CONCLUSIONS AND RECOMMENDATIONS 86
E. REFERENCES 92
F. LIST OF PREPARERS 94

FIGURES

Figure 1. General Overview Map of the Proposed Greensville Lateral for the Project 6
Figure 2. General Overview Map of the Proposed Aboveground Facility Modification Locations for the Project 7
Figure 3. Route Alternatives Considered for the Project 82

TABLES

Table 1. Summary of Proposed Actions Associated with the Project 10
Table 2. Public Roadway and Utility Crossings for the Project 14
Table 3. Land Requirements for the Project 18
Table 4. Collocation with Other Existing Rights-of-Way 19
Table 5. Proposed Access Roads for the Project 21
Table 6. Federal and State Approvals for the Project 22
Table 7. Proposed Dry-Ditch Waterbody Crossings for the Project 30
Table 8. Total Wetland Acreages Affected by the Project 32
Table 9. Land Uses Affected by the Project 42
Table 10. Monitored Air Quality Concentrations for Criteria Pollutants at Compressor Station 166 49
Table 11. Air Quality Control Regions in the Project Region 50
Table 12. Attainment Status of the Counties Crossed by the Project 51
Table 13. Summary of Potential Construction Emissions (in tons) from the Project 56
Table 14. Potential Emission Rates (tons per year) Associated with the Compression Addition at Compressor Station 166 59
Table 15. Noise Quality Analysis for the Project 60
Table 16. Other Projects Contributing to the Virginia Southside Expansion II Cumulative Impacts 64
Table 17. Watersheds within the Project Region of Influence 69
Table 18. Fisheries within the Project Region of Influence 74
Table 19. Minor Route Variations Incorporated into the Project 80
Table 20. Other Land Requirements associated with the Project Alternatives 84

APPENDICES

Appendix A Aerial Photo-Based Project Location Maps
Appendix B Site-Specific Plan for Constructing near Residence
Appendix C Federally and State-Listed Species Potentially Occurring within the Virginia Southside Expansion Project II construction area
Appendix D Required Permits for the Non-jurisdictional Power Station
Appendix E Other Projects Evaluated for Cumulative Impacts with the Virginia Southside Expansion Project II

TECHNICAL ACRONYMS AND ABBREVIATIONS

ACP	Atlantic Coast Pipeline Project
ATWS	additional temporary workspace
AQCR	air quality control program
ASR	Atlantic Sunrise Pipeline Project
BMP	best management practice
CFR	Code of Federal Regulations
Commission	Federal Energy Regulatory Commission
dB	decibel
dBA	decibels on the A-weighted frequency scale
DOT	U.S. Department of Transportation
EA	environmental assessment
EI	environmental inspector
EIS	environmental impact statement
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
FERC	Federal Energy Regulatory Commission
FERC *Plan*	FERC *Upland Erosion Control, Revegetation, and Maintenance Plan*
FERC *Procedures*	FERC *Wetland and Waterbody Construction and Mitigation Procedures*
Power Station	Virginia Electric and Power Company's Greenville County Power Station
HAP	hazardous air pollutant
M&R Station	meter and regulator station
MP	milepost
MVP	Mountain Valley Pipeline Project
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act of 1969
NGA	*Natural Gas Act of 1938*
NOI	*Notice of Intent to Prepare an Environmental Assessment for the Proposed Virginia Southside Expansion Project II and Request for Comments on Environmental Issues*
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NSA	noise sensitive area
OEP	Office of Energy Projects
PEM	palustrine emergent wetland

TECHNICAL ACRONYMS AND ABBREVIATIONS, CONTINUED.

PFO	palustrine forested wetland
PM_{10}	particulate matter less than 10 microns in diameter
$PM_{2.5}$	particulate matter less than 2.5 microns in diameter
ppmvd	parts per million by volume, dry basis
PSD	prevention of significant deterioration
PSS	palustrine scrub-shrub wetland
SHPO	state historic preservation office
Spill Plan	*Spill Plan for Oil and Hazardous Materials*
SESC *Plan*	*Soil Erosion and Sediment Control Plan*
TDEP	Transco Dalton Expansion Project
Transco	Transcontinental Gas Pipe Line, LLC
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
VAC	Virginia Administrative Code
VDEQ	Virginia Department of Environmental Quality
VEPCO	Virginia Electric and Power Company
VSEP I	Virginia Southside Expansion Project I
VSEP II	Virginia Southside Expansion Project II

A. PROPOSED ACTION

A.1 INTRODUCTION

The staff of the Federal Energy Regulatory Commission (Commission or FERC) has prepared this environmental assessment (EA) to assess the environmental impacts of the natural gas pipeline facilities proposed by Transcontinental Gas Pipe Line Company, LLC (Transco). We[1] prepared this EA in compliance with the requirements of the *National Environmental Policy Act of 1969* (NEPA)[2] and the Commission's implementing regulations.[3]

On March 23, 2015, Transco filed an application with the Commission in docket number CP15-118-000 under Section 7(c) of the *Natural Gas Act of 1938* (NGA)[4] and the Commission's regulations.[5] Transco seeks authorization to construct and operate certain natural gas pipeline facilities in Virginia, North Carolina, and South Carolina to deliver gas to the planned Virginia Electric and Power Company (VEPCO) power plant in Greensville County, Virginia (Power Station or VEPCO project). Transco's proposed facilities are referred to as the Virginia Southside Expansion Project II (VSEP II).

The FERC is the federal agency responsible for authorizing interstate natural gas transmission facilities under the NGA, and the lead federal agency for the preparation of this EA in compliance with the requirements of NEPA. The assessment of the environmental impacts is an important and integral part of the Commission's decision whether to issue Transco a Certificate of Public Convenience and Necessity (Certificate) to construct the proposed facilities. Approval would be granted if, after consideration of both environmental and non-environmental issues, the Commission finds the project is in the public interest.

A.2 PROJECT PURPOSE AND NEED

Transco's application states that the purpose of the VSEP II is to provide natural gas transportation service from Transco pooling points[6] in Mercer County, New Jersey and Pittsylvania County, Virginia to the planned Power Station. Transco anticipates commencing construction of the VSEP II in October 2016, pending permit approvals, with an expected in-service date of December 2017.

---

1 "We," "us," and "our" refer to the environmental staff of the Commission's Office of Energy Projects.
2 See Title 40 of the Code of Federal Regulations, parts 1500-1508 [40 CFR 1500-1508]).
3 See 18 CFR 380.
4 See 15 U.S. Code Chapter 15B.
5 See 18 CFR 157.
6 A pooling point is where gas from several natural gas supply points are aggregated to a single point where gas can be sent to market.

Transco executed an agreement in May 30, 2014 with Virginia Power Services Corporation, Inc. (an affiliate of VEPCO) to provide natural gas transportation to the Power Station, which is a planned 1,580-megawatt, combined-cycle, natural gas-fired electric power station. Through the development of this project, Transco would provide 250,000 dekatherms per day to the planned Power Station that has been designed to supply the electrical demand of up to 400,000 homes in the area.

Of the 250,000 dekatherms per day total, 165,000 dekatherms of natural gas per day would be delivered from the existing Transco Compressor Station 210 in Mercer County, New Jersey and the remaining 85,000 dekatherms per day would be delivered from the existing Transco Compressor Station 195 in Pittsylvania County, Virginia.

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.

A.3 PUBLIC REVIEW AND COMMENT

On May 6, 2015, the Commission issued a *Notice of Intent to Prepare an Environmental Assessment for the Proposed Virginia Southside Expansion Project II and Request for Comments on Environmental Issues* (NOI). The NOI was published in the Federal Register[7] and mailed to property owners potentially affected by the proposed facilities; federal, state, and local officials; agency representatives; environmental organizations; federally recognized Indian tribes; and local libraries and newspapers.

We received comments from the Virginia Department of Conservation and Recreation, the Virginia Department of Environmental Quality (VDEQ), the Virginia Department of Transportation, the Virginia Department of Historic Resources, the Prince William County Service Authority, and two individuals. The scoping comments concerned potential impacts on state-managed natural heritage resources, including state-listed Manassas stonefly habitat and a freshwater mussel concentration area, waterbodies, wildlife, public safety, and historic properties. All substantive comments are addressed in the appropriate sections of this EA.

Following the scoping period, the Virginia Chapter of the Sierra Club and the Appalachian Mountain Advocates filed joint comments, requesting that the analysis include [the first Virginia Southside Expansion Project] VSEP I and the Atlantic Sunrise Project as "connected, cumulative, and/or similar projects and [to] review them in the

7 See https://federalregister.gov/a/2015-11404

same [environmental impact statement] EIS." In addition, the comments state that indirect and cumulative impacts of the Greensville Power Station should be considered, as well as the VEPCO project's effects on wetlands and the surrounding rural landscape. The comments maintain that Transco could not construct VSEP II without first building the Atlantic Sunrise Project to add bi-directional flow of natural gas at Compressor Stations 170, 185, and 190, which are north of the VSEP II facilities interconnection to the Transco mainline system. The comments state that without the compressor station modifications that Transco has proposed in the Atlantic Sunrise Project, gas could not flow southwards along Transco's mainline to supply the Power Station.

Actions are "connected" if they: "[a]utomatically trigger other actions which may require environmental impact statements;" "[c]annot or will not proceed unless other actions are taken previously or simultaneously;" or "[a]re interdependent parts of a larger action and depend on the larger action for their justification."[8] Actions are not connected if they display independent utility. The proposed VSEP II would function independently from the Atlantic Sunrise Project. The projects have different purposes, different supply sources and delivery destinations, and different customers that have fully subscribed for the proposed capacities. VSEP II would supply natural gas for electric power generation in Virginia, whereas the Atlantic Sunrise Project would provide incremental firm transportation capacity from northern Pennsylvania to Transco's Station 85 in Alabama.[9] Similarly, VSEP II has independent utility from VSEP I based on different timing, purpose, and customers.[10] While the design of VSEP II recognizes the bi-directional capability that would be created by the Atlantic Sunrise Project, as well as the existence of laterals constructed under VSEP I, VSEP II is not reliant on VSEP I or the Atlantic Sunrise Project for its justification. Therefore, we conclude that VSEP II, VSEP I, and the Atlantic Sunrise Project are functionally independent and do not need to be addressed jointly in a single NEPA document. However, in section B.9 of this EA, we consider the

---

8 40 CFR § 1508.25(a)(1)(i)-(iii) (2014).

9 The Atlantic Sunrise Project is under review by FERC in a separate proceeding under Docket No. CP15-138-000. The Atlantic Sunrise Project includes 195.2 miles of new 30-inch-diameter pipeline and compression facilities in Pennsylvania, 2.5 miles of 30-inch-diameter pipeline replacement in Virginia, minor aboveground facility modifications to allow for bi-directional flow, and associated equipment and facilities. Transco has executed long-term, binding precedent agreements with nine shippers for the entire proposed capacity of the project, 1.7 million dekatherms per day. Shippers include Anadarko Energy Services Company, Cabot Oil & Gas Corporation, Chief Oil & Gas LLC, Inflection Energy LLC, MMGS, Inc., Seneca Resources Corporation, Southern Company Services, Southwestern Energy Services Company, and WGL Midstream, Inc.

10 VSEP I was certificated by FERC on November 21, 2013 under Docket No. CP13-30-000, and was placed into service on September 1, 2015. VSEP I included about 98 miles of 24-inch-diameter pipeline to provide 270,000 dekatherms per day of incremental transportation capacity to Virginia Power Services Corporation, Inc.'s gas-fired, electric power-generation plant in Brunswick County (Brunswick County Power Station), and Piedmont Natural Gas Co.'s local distribution business in North Carolina.

cumulative impact of the proposed project in addition to other projects in the region, including the Dalton Expansion Project, the Atlantic Sunrise Project, VSEP I, and the Power Station. Non-jurisdictional projects, including the Power Station, are further discussed in section A.8 of this EA.

As mentioned above, the commentors stated that FERC should analyze this project within an EIS instead of an EA. Our environmental analysis did not indicate any significant environmental impacts, which would merit an EIS. Therefore, an EA is appropriate for this scope of proposed work.

A.4 PROPOSED FACILITIES

Transco proposes to construct and operate the following facilities:

- a new 4.19-mile-long 24-inch-diameter lateral pipeline[11] in Brunswick and Greensville Counties, Virginia, referred to as the Greensville Lateral;
- a new building containing a pig launcher[12] and a new block valve assembly at the Greensville Lateral's connection to the existing Brunswick Lateral, where the Greensville Lateral would begin;
- a new building containing the proposed Greensville Meter and Regulator (M&R) Station, a pig receiver, heaters, and a block valve assembly at the end of the Greensville Lateral on VEPCO property;
- one new 25,000 horsepower electric-driven compressor unit at Compressor Station 185 (this includes ancillary equipment) in Prince William County, Virginia;
- 21,830 horsepower of additional gas-driven compression at Compressor Station 166 (this includes piping, valve modification, gas cooling, and the re-wheeling of two existing compressor units) and a 1,208 brake-horsepower emergency generator in Pittsylvania County, Virginia; and
- modifications to 19 existing facilities on Transco's existing pipeline (mainlines and the Tryon Lateral) in North Carolina and South Carolina to account for the odorized gas flowing south to parts of the mainline system that are not equipped to process odorized gas, as required by the U.S. Department of Transportation's (DOT) pipeline safety regulations.[13]

Figures 1 and 2 show the general location of the project facilities. Appendix A includes aerial photo based project maps of the proposed pipeline route and aboveground facility modifications.

---

11 A "lateral" is a shorter segment of pipeline that branches from a larger mainline system.

12 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.

13 See 49 CFR 192. 625.

A.5 CONSTRUCTION, OPERATION, AND MAINTENANCE PROCEDURES

Transco would construct, operate, and maintain its project in compliance with all applicable federal and state permit requirements, regulations, and environmental guidelines. The key relevant DOT federal safety regulations are the Transportation of Natural and Other Gas by Pipeline: Minimum Federal Safety Standards (49 Code of Federal Regulations [CFR] 192). These regulations ensure adequate protection for the public and prevent natural gas facility accidents and failures. Part 192 specifies material selection and qualifications, minimum design requirements, and protection from internal, external, and atmospheric corrosion.

Transco would follow all applicable requirements of the FERC *Upland Erosion Control, Revegetation, and Maintenance Plan* (*Plan*), and FERC *Wetland and Waterbody Construction and Mitigation Procedures* (*Procedures*) during all phases of project construction. Transco also proposes to use best management practices (BMPs) for stormwater management in accordance with National Pollution Discharge Elimination System permits required for the projects. The *Plan*, *Procedures*, and BMPs would be incorporated into a project-specific Soil Erosion and Sediment Control Plan (SESC *Plan*) that Transco would file with its implementation plan, if the Commission approves the project.

In addition, Transco would follow the following construction related plans that it prepared for the project: *Winter Construction Plan*, *Unanticipated Discovery of Cultural Resources Plan*, *Unanticipated Discovery of Contamination Plan*, *Spill Plan for Oil and Hazardous Materials* (*Spill Plan*), *Fugitive Dust Emissions Control Plan*, and *Exotic and Invasive Species Control Plan*. We have reviewed these plans and find them acceptable.

In order to monitor for environmental compliance during construction, Transco would employ a lead environmental inspector (EI) as specified in FERC's *Plan* and additional EIs if needed. The EI would have authority to stop activities that violate the environmental conditions of the Certificate or other applicable permits. The EI would be responsible for ensuring that construction activities comply with the environmental conditions imposed on the project. This includes the requirements of FERC's *Plan* and *Procedures*; environmental conditions of the Certificate; mitigation measures proposed by Transco; and the requirements of any other environmental permits and approvals. The EI would also be responsible for identifying, documenting, and overseeing any corrective actions to bring an activity back into compliance. The Commission staff would also conduct independent inspections to verify compliance with the Commission's orders.

Figure 1. General Overview Map of the Proposed Greensville Lateral for the Project

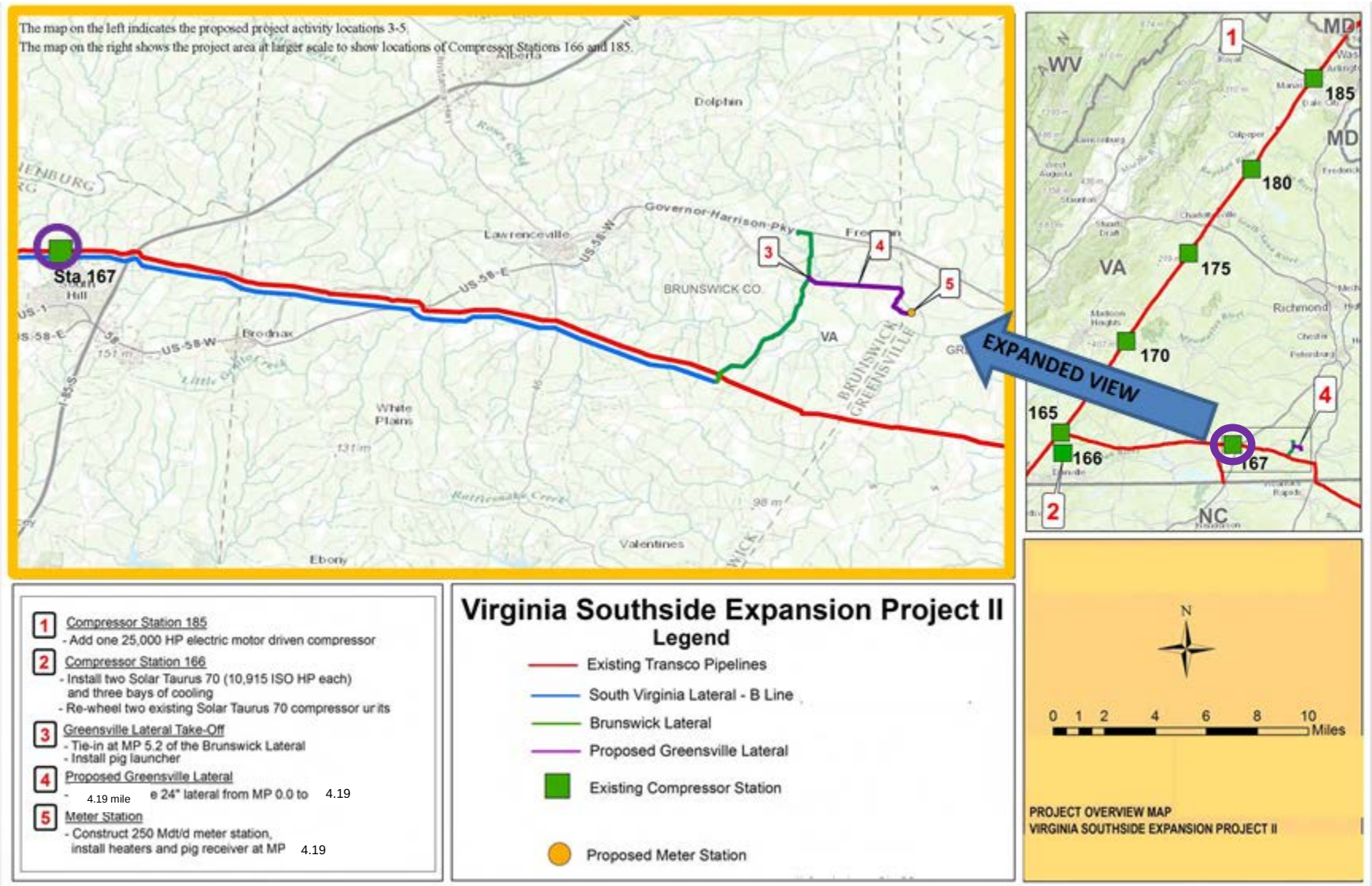
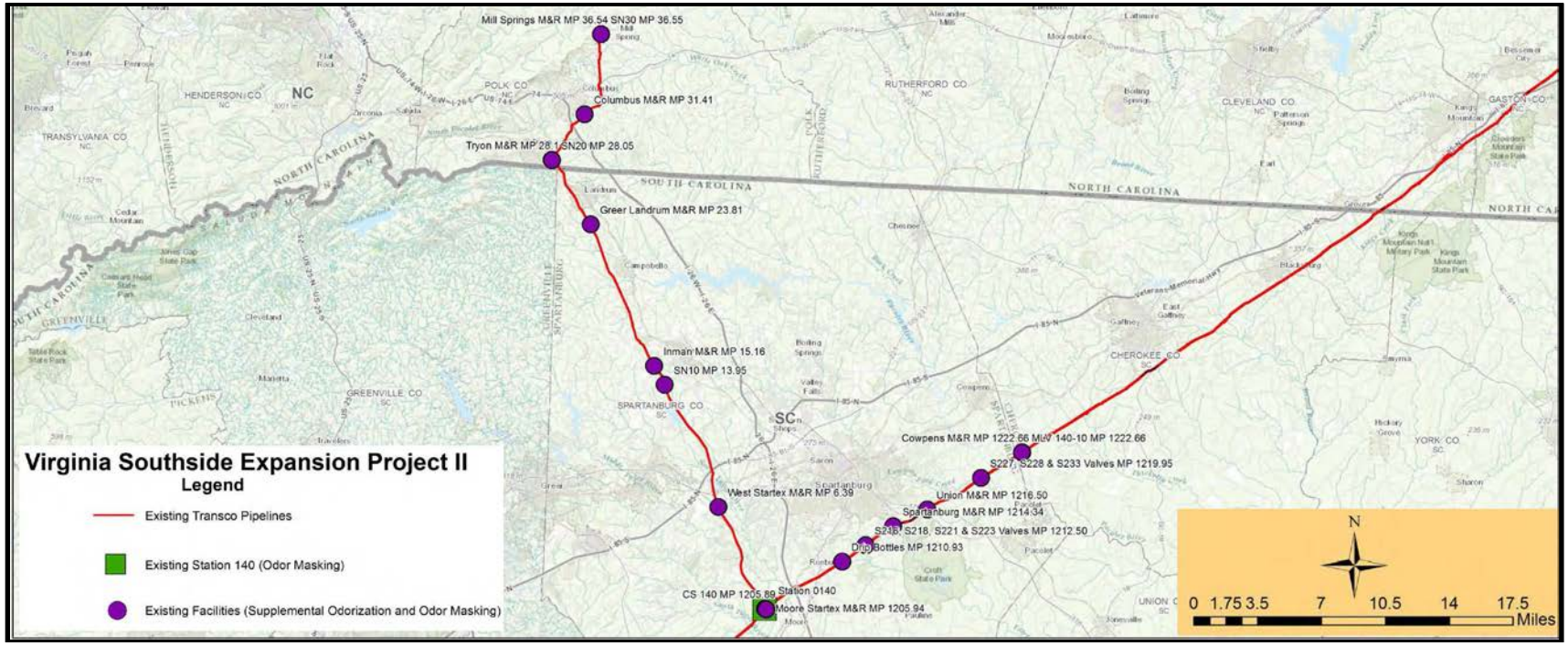


Figure 2. General Overview Map of the Proposed Aboveground Facility Modification Locations for the Project



Pipeline Construction

Construction of the proposed pipeline facilities would incorporate conventional overland construction techniques and would include a standard sequence of activities. Construction of the project would consist of: surveying and staking the workspace limits; clearing of vegetation and debris; grading of the right-of-way; trenching; pipe stringing, bending, welding, and lowering-in; backfilling soil into the trench and re-grading contours; hydrostatically testing the buried pipe; and restoring and clean-up of the right-of-way. Consistent with DOT regulations, a minimum of 3 feet of soil would cover the buried pipeline; additional cover may be required at waterbodies, ditches, road crossings, or other areas as necessary to maintain the integrity of the pipeline. Within 20 days of completion of backfilling the trench, or as soon as possible, all remaining trash, debris, surplus materials, and temporary structures would be removed from the construction right-of-way and disposed of in accordance with applicable federal, state, and local regulations. All disturbed areas would be final-graded and restored as closely as possible to preconstruction contours within the 20-day period. These restoration activities would be completed in residential areas within 10 days of backfilling. Permanent erosion control measures would also be installed during final cleanup.

The construction of aboveground facilities along the pipeline, such as the tie-ins, meter station, and pigging facilities, would generally occur at the same time as construction of the pipeline facilities. Upon completion of construction, the aboveground facilities would be fenced, graveled, and maintained to allow permanent access for operation and maintenance.

Pipeline construction typically involves numerous work crews working their way along the right-of-way in an assembly-line fashion. For example, the survey crew begins by marking the pipeline centerline and construction work area and moves down the right-of-way, followed by the clearing crew, the grading crew, the trenching crew, and so on, until the finish cleanup crew completes the process. Typically, each crew follows relatively closely behind the proceeding crew to minimize the size of the active construction spread and begin the restoration as soon as possible.

Transco anticipates that one construction spread would be required for its pipeline construction project, which would take about 6 months to complete. Transco estimates that 225 temporary workers would be needed during the peak of construction activities; no new permanent employees would be required for project operation.

Aboveground Facility Modifications

Two new aboveground facilities, a launcher facility at the start of the Greensville Lateral (milepost [MP] 0) and the Greensville M&R Station at the end of the Greensville Lateral, would be constructed as a part of the project. Odorization facility work would

occur at 19 existing aboveground facilities including one compressor station, 11 M&R stations, six valve settings, and one drip bottle site. Additional horsepower would be added to two existing compressor stations (Compressor Stations 185 and 166). The compressor station modifications would take about 6 months each to complete with between 30 – 60 site workers.

Prior to commencement of any construction-related activities, survey crews would stake the limits of the construction work areas. Sensitive areas to be avoided would be flagged or fenced, as appropriate. The project workspaces would be cleared of existing vegetation. Construction work areas would then be graded as necessary to create level surfaces for the movement of construction vehicles. In accordance with the *Plan*, temporary erosion and sediment control measures would be installed following initial ground disturbance.

After site preparation, reinforced concrete foundations would be constructed where necessary for structures. Concrete foundation installation would include placement of forms and rebar, followed by concrete. Once foundations are complete, Transco would erect buildings and install piping and electrical conduit systems onsite. Disturbed areas would then be stabilized, seeded, and restored.

These aboveground facility modifications are described further in the following sections and summarized in table 1.

Launcher Facility

Construction of the project would require the installation of a new launcher facility at the start of the Greensville Lateral (MP 0). Within this facility, Transco would install a tie-in at the existing Brunswick Lateral, as well as a pig launcher and block valve assembly on the proposed Greensville Lateral.

Greensville M&R Station

Construction of the project would require the installation of the new Greensville M&R Station at the end of the Greensville Lateral (MP 4.19). This facility, located in Greensville County, Virginia, would be located entirely within the planned Power Station property.

Table 1. Summary of Proposed Actions Associated with the Project

VSEP II Activity	Facility	Equipment to be installed	Milepost	County, State
New Construction	Greensville Lateral	24-inch-diameter pipeline	GL 0 – 4.03	Brunswick, VA
			GL 4.03 – 4.19	Greensville, VA
New Construction	Pig Launcher Facility	•New building •Pipeline tie-in to existing Brunswick Lateral •Block valve assembly	GL 0	Brunswick, VA
New Construction	Greensville M&R Station	•Metering and regulating •Pig receiver facility •Block valve assembly	GL 4.19	Greensville, VA
Modification Site 1	Compressor Station 140	•Odor masking	M 1205.89	Spartanburg, SC
Modification Site 2	Startex M&R Station	•New building to house •Replacement of an existing belowground condensate tank •Odorization	M 1205.94	
	Moore M&R Station	•New building to house •Replacement of an existing belowground condensate tank •Odorization		
Modification Site 3	Drip Bottles	•Odor Masking	M 1210.93	
Modification Site 4	Valves	•Odor masking	M 1212.5	
Modification Site 5	South Union M&R Station	•New building •Replacement of an existing belowground condensate tank •Odorization	M 1214.34	
Modification Site 6	Spartanburg M&R Station	•New building •Replacement of an existing belowground condensate tank •Odorization	M 1216.5	
Modification Site 7	Valves	•Odor masking	M 1219.95	
Modification Site 8	Cowpens M&R Station	•New building •Odorization	M 1222.66	Cherokee, SC
	Mainline valve setting	•Odor masking		
Modification Site 9	Compressor Station 166	•21,830 additional horsepower (2 gas-driven units) •Piping and valve modifications •Gas cooling •Rewheeling 2 existing compressor units	M 1412.95	Pittsylvania, VA
Modification Site 10	Compressor Station 185	•One new 25,000 horsepower electric-driven compressor unit •Ancillary facilities	M 1583.34	Prince William, VA

Table 1 (continued).

VSEP II Activity	Facility	Equipment to be installed	Milepost	County, State
Modification Site 11	West Startex M&R Station	•New building •Replacement of an existing belowground condensate tank •Odorization	TL 6.39	Spartanburg, SC
Modification Site 12	Valves	•Odor masking	TL 13.95	Polk, NC
Modification Site 13	Inman M&R Station	•New building •Odorization	TL 15.16	
Modification Site 14	Landrum M&R Station	•New building •Odorization	TL 23.81	
Modification Site 15	Valves	•Odor masking	TL 28.05	
Modification Site 16	Tryon M&R Station	•New building •Odorization	TL 28.10	
Modification Site 17	Columbus M&R Station	•New building •Odorization	TL 31.41	
Modification Site 18	Mill Springs M&R Station	•New building •Replacement of an existing belowground condensate tank •Odorization	TL 36.54	
Modification Site 19	Valves	•Odor masking	TL 36.55	

GL = mileposts associated with the proposed Greensville Lateral
M = mileposts associated with the existing Transco Mainline
TL = mileposts associated with the existing Tryon Lateral

Transco would own and operate all facilities from the tie-in on the Greensville Lateral to the interconnect with the Greensville Power Station, except for the heaters, which would be operated and maintained by VEPCO. The interconnect would consist of one 24-inch by 12-inch reducing tee and 12-inch valve assembly; an M&R station consisting of two 10-inch ultrasonic meter tubes and one 3-inch rotary meter tube; a filter separator; 12-inch yard piping; a condensate tank; a remote terminal unit/chromatograph building with chromatograph and electronic flow measurement; radio communications equipment; pressure regulation; block valve assembly; and a pig receiver.

Gas heaters would be required for heating the fuel gas for VEPCO's equipment near the Greensville Power Station. These heaters would be installed upstream of Transco's pressure control equipment. Heaters prevent freezing or hydrate formation in the downstream pressure regulating valves. The heater facilities would include three 8 million British thermal units per hour water bath heaters connected by 16-inch headers and 12-inch piping risers.

Modified Compressor Stations

Transco proposes to modify the existing Compressor Station 185 in Prince William County, Virginia, and the existing Compressor Station 166 in Pittsylvania County, Virginia.

Compressor Station 185

Modifications would include the installation of one new electric-driven compressor unit for an additional 25,000 horsepower, and installation of associated buildings and ancillary facilities.

Compressor Station 166

Modifications would include the installation of two new Solar Taurus 70 gas turbines for an additional 21,830 horsepower. In order to do this, Transco would add on to the existing Compressor Station 166 compressor building to contain new gas cooling, scrubbers, blowdown silencers, as well as associated piping and valves. Transco would install an additional emergency generator to provide service to the new units in the event of a power outage. Transco would also re-wheel two existing Solar Taurus 70 gas turbines.

Odorization Facilities

Transco proposes to modify 1 existing compressor station, 11 existing M&R stations, 6 existing valve settings, and 1 drip bottle site, all located on its existing

mainlines and on the existing Tryon Lateral in North Carolina and South Carolina. Modifications to the existing M&R stations would include the addition of a new building at each site to house supplemental odorization equipment. Additionally, work at six of the existing M&R stations (Mill Springs, West Startex, Moore, Startex, Spartanburg, and South Union M&R stations) would include the replacement of a total of five belowground condensate tanks (the Startex and Moore M&R Stations share a condensate tank) with a new aboveground condensate tank. Modifications at the existing Compressor Station 140, the existing valve settings, and the existing drip bottles would include the installation of equipment necessary for odor masking of all normal operation atmospheric vents.

In addition to the standard construction methods described above, Transco would use special construction techniques where warranted by site-specific conditions (for example, crossings of roads, utilities, residential properties, wetlands, and waterbodies) as described below.

Road and Utility Crossings

Table 2 provides a list of roadways and utilities crossed by VSEP II and the crossing technique to be used. Paved roadways would be crossed using a bore, which involves drilling a horizontal shaft below the roadway through which the pipe will pass. First, a vertical bore pit is excavated on one side of the roadway and a receiving pit excavated on the other. The bore pit is excavated to a depth equal to the depth of the bore hole and is graded such that the bore will follow the grade of the pipe. A boring machine is lowered to the bottom of the bore pit and placed on supports. The machine drills a horizontal shaft under the roadway using a cutting head mounted on an auger. After the pipe is installed the boring machine is removed and the pipe is tied-in to the pipeline.

One unpaved road would be crossed using an open cut. During open-cut roadway crossings, at least one lane of traffic would typically be kept open when constructing on or across residential streets. During the brief period when a road is completely cut, steel plates would be available on-site to cover the open area to permit travel by emergency vehicles. Traffic lanes and residential access would be maintained except for the temporary periods essential for installing the pipeline. Following pipeline installation at open-cut roadways, the trench would be backfilled and the roadbed would be restored.

Before construction, Transco would contact the “Call Before You Dig” or “One Call” system to verify and mark all utilities along the project workspace areas. Where there is a question as to the location of utilities, such as water, cable, gas, and sewer lines, each utility would locate its facilities by field instrumentation and test pits.

Table 2. Public Roadway and Utility Crossings for the Project

Milepost	Road/Utility	Type	Jurisdiction/Owner	Proposed Crossing Method /a
0.05	Electric Line	Electrical Transmission Lines	Dominion Transmission, Inc.	Open-Cut **/a**
0.99	State Route 687/ Old Church Road	Dirt	State of Virginia	Open-Cut
2.27	State Route 605	Paved Road	State of Virginia	Bore
2.88	Electric Line	Electrical Transmission Lines	Dominion Transmission, Inc.	Open-Cut **/a**
3.64	State Route 605	Paved Road	State of Virginia	Bore
3.69	Electric Line	Electrical Transmission Lines	Dominion Transmission, Inc.	Open-Cut **/a**
3.70	Water Line	Underground	Virginia Beach Water	Bore
4.14	State Route 605	Paved Road	State of Virginia	Bore

a/ Utility consists of overhead power lines which are not anticipated to be disrupted during construction.

Residential and Commercial Properties

Transco would use specialized methods, such as stovepipe and/or drag section construction, in order to minimize the impacts of construction in residential and commercial areas. A site-specific plan is provided in appendix B for the one residence located within 50 feet of project construction workspace. The duration of an open trench would be minimized to the contractor's working hours and construction safety fencing would be installed to a distance of 100 feet on either side of the residence, or as otherwise negotiated with the landowner. Topsoil would be segregated by stripping up to 12 inches of topsoil over the entire workspace unless otherwise requested by the landowner.

Transco would notify landowners at least three business days prior to the start of construction, unless earlier notice is requested in the easement negotiations. Should any project-related work activity in the residential or commercial area disrupt ingress and egress to the affected areas, Transco would offer to either temporarily relocate the landowner to a motel and provide a meal allowance or provide alternative access to their property. Transco would attempt to leave any mature trees and landscaping intact within the construction work areas unless the trees and landscaping interfere with installation techniques or present unsafe working or operational conditions. Seed mixes for reclamation and revegetation would be used as specified by the landowner. Fences, mailboxes, and other structures that are removed, would be restored. Sidewalks, driveways, and roads would be restored as soon as practicable. Following final clean-up, a Transco representative would contact landowners to ensure that conditions of all landowner agreements have been met. Further information on site-specific residential construction is detailed in section B.5 of this EA.

Waterbodies

Pipeline construction would require 15 waterbody crossings, including Reedy Creek, tributaries of Reedy Creek, and tributaries of Greensville Creek (discussed in section B.2). Transco would adhere to the FERC's *Procedures* to limit water quality and aquatic resource impacts during and following construction.

Transco has proposed to cross waterbodies using a dry ditch method. Dry-ditch crossings involve isolating the construction work area from the stream flow by directing water through a flume pipe placed above the pipeline trench (flume crossing), or by damming and pumping the water around the construction area (dam-and-pump crossing). The primary objective of these methods is to minimize siltation of the waterbody.

The flume crossing method involves temporarily directing the flow of water through one or more flume pipes placed over the area to be excavated. This method allows excavation of the pipe trench across the waterbody completely beneath the flume pipes without disrupting water flow in the stream. Stream flow is diverted through the flumes by two bulkheads, constructed using sand bags, or plastic dams, to direct the stream flow through the flume pipes. Following completion of pipeline installation, backfilling of the trench, and restoration of stream banks, the bulkheads, and flume pipes would be removed. This crossing method generally minimizes the duration of downstream turbidity by allowing excavation of the pipeline trench under relatively dry conditions.

The dam-and-pump method involves the installation of temporary dams upstream and downstream of the waterbody crossing location. Temporary dams are typically constructed using sandbags, and appropriately sized pumps are used to dewater and transport the stream flow around the construction work area and trench. In accordance with our *Procedures*, Transco would install intake screens on the pump inlets to minimize entrapment of aquatic life, and energy-dissipating devices would be installed at the pump discharge point to minimize erosion and stream bed scour. Trench excavation and pipeline installation would then commence through the dewatered portion of the waterbody channel. Following completion of pipeline installation, backfilling of the trench, and restoration of stream banks, the temporary dams would be removed and water flow through the construction work area would be restored. This method is generally appropriate only for those waterbody crossings where pumps can adequately transfer the stream flow volume around the work area and there are no concerns about the passage of sensitive aquatic species.

To facilitate pipeline construction across waterbodies, additional temporary workspaces (ATWS) would be needed adjacent to the waterbody to assemble and fabricate the length of pipe necessary to complete the crossing, and store spoil removed during trenching. Spoil removed during trenching would be stored away from the water's

edge and ATWS would be located at least 50 feet away from the stream banks in cleared areas (except in actively cultivated or rotated agricultural lands and other disturbed areas). The size of the ATWS would vary based on site-specific conditions. However, the overall work area would be limited in size to the minimum area necessary to safely construct the waterbody crossing and accommodate any stockpile of excavated material from the trench and the prefabricated pipeline crossing section.

Wetlands

Crossing of wetlands would be completed in accordance with applicable state and federal permits and FERC's *Procedures*. Operation of construction equipment in wetlands would be limited to that needed to clear the right-of-way, excavate the trench, fabricate the pipe, install the pipe, backfill the trench, and restore the right-of-way. Transco would segregate the topsoil along the trench line up to 12 inches in depth in unsaturated wetlands where hydrologic conditions permit. When wetland soils are inundated or saturated to the surface, the pipeline trench would be excavated across the wetland by equipment supported on wooden swamp mats to minimize the disturbance on wetland soils. Trees would be cut to grade, but stumps would be removed directly over the trenchline or where safety concerns dictate otherwise. This would allow existing vegetation to recover more rapidly in the remainder of the right-of-way once the equipment mats and spoil piles have been removed.

To facilitate pipeline construction across wetlands, ATWS would be needed adjacent to the wetland to assemble and fabricate the length of pipe necessary to complete the crossing, and store spoil removed during trenching. In accordance with FERC's *Procedures*, fuel would not be stored within 100 feet of wetlands. Construction equipment, vehicles, hazardous materials, chemicals, fuels, lubricating oils, and petroleum products would not be parked, stored, or serviced within 100 feet of any wetlands, unless approved in advance by the EI. All equipment would be checked for leaks by a company inspector prior to beginning work in wetlands.

Operations and Maintenance

The pipelines would be patrolled on a routine basis, which would provide information on possible leaks, construction activities, erosion, exposed pipe, population density, possible encroachment, and other potential problems that may affect the safety and operation of the pipelines. Maintenance activities would include regularly scheduled gas leak surveys and measures necessary to repair any potential leaks. All fence posts, signs, marker posts, and decals would be painted or replaced to ensure that pipeline locations are visible. Other maintenance functions would include, as applicable (1) periodic seasonal mowing of the permanent right-of-way in accordance with the FERC's *Plan* and *Procedures*; (2) terrace repair and backfill replacement; and (3) periodic inspection of water crossings. During maintenance of the right-of-way,

Transco would not use herbicides or pesticides within 100 feet of a wetland or waterbody unless approved by appropriate federal, state, and local agencies.

Cathodic protection facilities installed along the pipeline would be regularly monitored to maintain required pipe-to-soil potential. This would be achieved in accordance with the specifications set forth by Transco that meet or exceed DOT regulations.

Transco would operate and maintain the compressor stations associated with the project in compliance with DOT regulations. Transco's standard procedures also include activities such as the calibration, maintenance, and inspection of equipment, as well as the monitoring of pressure, temperature, and vibration data, and traditional landscape maintenance such as mowing and the application of fertilizer.

A.6 LAND REQUIREMENTS

Transco's project would disturb 180.1 acres of land during construction and 29.3 acres during operation; 150.8 acres would revert to pre-construction conditions and uses (see table 3).

Pipeline Facilities

Transco would use an 85-foot-wide construction right-of-way, except in wetlands, where it would reduce the construction right-of-way to 75 feet. After construction, a 50-foot-wide permanent easement centered on the pipeline would be used for project operation and maintenance. Pipeline construction (excluding access roads, storage yards, and ATWS) would affect 42.7 acres; 25.2 acres would be used as permanent right-of-way and 17.5 acres would revert to pre-construction use.

Transco would require ATWS for feature crossings including wetlands, waterbodies, and roads. In total, use of ATWS would affect 16.2 acres, all of which would be restored to pre-construction conditions and revert to previous uses after construction. Should Transco identify additional areas where extra workspaces would be required in the future, it would be required to file information on each of those areas for our review and approval before use.

About 71.5 percent (3.0 miles) of the pipeline right-of-way would be co-located with existing utility rights-of-way (see table 4). Where the proposed permanent right-of-way is collocated with an existing easement, Transco would overlap ATWS areas up to 10 feet.

Table 3. Land Requirements for the Project

Facility	Land Affected During Construction (acres)	Land Affected During Operation (acres) /a
Proposed New Pipeline Facilities		
Greensville Lateral		
Right-of-Way	42.7	25.2
Additional Temporary Workspace	16.2	0
Access Roads	2.3	2.1
Contractor and Pipe Storage Yards	7.1	0
Pipeline Facilities Subtotal	**68.3**	**27.3**
Proposed New Aboveground Facilities		
Greensville Lateral		
Launcher Facility	0.2 **/b**	0.2
Greensville M&R Station	1.4 **/b**	1.4
Proposed Modifications to Existing Mainlines		
Compressor Station 185	40.4	0
Compressor Station 166	29.2	0
Cowpens M&R Station	0.8	<0.1
140-10 MLV Setting	0 **/c**	0
S216, S218, S221, and S233 Valves	0.3	0
South Union M&R Station	0.2	<0.1
Spartanburg M&R Station	0.4	<0.1
S227, S228, S231, and S233 Valves	0.5	0
Drip Bottles on Mainlines A, B, C, and D	0.1	0
Compressor Station 140	35.7	0
Startex M&R Station	0 **/d**	0
Moore M&R Station	0 **/d**	0
Proposed Modifications to Existing Tryon Lateral		
Mill Springs M&R Station	0.5	0.1
SN 30 Valve	0 **/e**	0
Columbus M&R Station	0.3	<0.1
Tryon M&R Station	0.5	<0.1
SN 20 Valve	0 /f	0
Landrum M&R Station	0.4	0
Inman M&R Station	0.2	<0.1
SN 10 Valve	<0.1	0
West Startex M&R Station	0.2	0
Aboveground Facilities Subtotal	**111.8**	**2.0**
Project Total	**180.1**	**29.3**

Table 3 (continued).

Facility	Land Affected During Construction (acres)	Land Affected During Operation (acres) /a

MLV = mainline valve

a/ Land affected during operation consists only of new permanent impacts. Workspaces within existing Transco easements or facilities are considered temporary and are included in the estimates of construction land requirements.

b/ Land affected during construction of the launcher facility and Greensville M&R Station is captured within the Greensville Lateral ATWS.

c/ Land affected during construction at the existing 140-10 MLV setting is captured within the existing Cowpens M&R Station.

d/ Land affected during construction at the Startex and Moore M&R stations is captured within the existing Compressor Station 140 construction workspace.

e/ Land affected during construction at the existing SN 30 valve is captured within the existing Mill Springs M&R Station construction workspace.

f/ Land affected during construction at the existing SN 20 valve is captured within the existing Tryon M&R Station construction workspace.

Transco has co-located VSEP II with a new alignment of a 2.55-mile-long segment of State Route 605, which is under review by the Virginia Department of Transportation for relocation to accommodate the planned VEPCO project.

Table 4. Collocation with Other Existing Rights-of-Way

Company	Right-of-Way Type	Beginning Milepost /b	Ending Milepost /b	Length (miles)
Dominion Transmission, Inc. **/a**	Electric	0.3	2.9	2.5
	Electric	3.5	3.7	0.2
State Route 605	Road **/b**	3.7	4.0	0.3
Total				**3.0**

VEPCO is proposing to relocate State Route 605 to accommodate the Power Station. The Greensville Lateral has been designed to be collocated with the new road, as currently proposed.

Mileposts are associated with the proposed Greensville Lateral.

a/ Dominion Transmission, Inc. is an affiliate of VEPCO and Virginia Power.

New Aboveground Facilities

Transco would construct the launcher facility at the beginning of the Greensville Lateral (MP 0) within the permanent right-of-way; this area is currently also used as permanent right-of-way for the Brunswick Lateral. A total of 0.2 acre would be required for construction of the launcher facility; there would be no additional permanent impacts for operation.

The Greensville M&R station at MP 4.19 on the Greensville Lateral would be next to the planned Power Station on VEPCO property. Construction of the Greensville M&R station would affect 1.4 acres during construction and would be fenced and maintained for operation of the facilities, including the line heaters that would be maintained by VEPCO as part of the Power Station facilities.

Modified Aboveground Facilities

The modification of Compressor Station 166 at MP 1412.95 of the Transco Mainline in Pittsylvania County, Virginia would affect 29.2 acres of land that has already been cleared, graded, and fenced for a previously approved project, which included the construction of the Brunswick Lateral (VSEP I]). [14] Construction of Compressor Station 166 was completed in December 2015, and revegetation is underway. Project modifications at Compressor Station 166 would not require any additional acreage, and the fence line would not need to be expanded to accommodate the new construction.

The modification of Transco Compressor Station 185 at MP 1583.34 on the Transco Mainline would affect 40.4 acres for temporary construction; this land has been previously disturbed within the facility boundaries and no additional acreage would be required for VSEP II operation.

Proposed facility modifications for odorization equipment at the existing aboveground facilities would affect 111.8 acres for construction within previously disturbed industrial land. Of this total, 2.0 acres would be permanently fenced and maintained during the expansion of seven of the existing M&R stations. No permanent expansion activities would occur at the three compressor stations, at the drip bottle site, or at the six valve locations. The remaining 109.8 acres would be restored to pre-construction conditions. See section B.5 for additional information on modified aboveground facility impacts.

Pipe Storage and Contractor Yards

Transco identified one existing pipe storage and contractor yard, the Clover Road Pipe Yard in Mecklenburg County, Virginia, which would be used near the proposed Greensville Lateral pipeline route; this storage yard was used for the construction of VSEP I facilities and would not require any additional modifications for VSEP II construction activities.

Transco would use the yard as a base of operation during construction for equipment and material storage, fueling stations, and pre-assemblage of piping and aboveground facility components. The Greensville Lateral would use about 7 acres of

14 See http://elibrary.ferc.gov/IDMWS/common/opennat.asp?fileID=13398631.

the yard. Transco leases the yard from the landowners and the land would be returned to its pre-construction condition and former use after project construction.

Access Roads

Transco would construct two new access roads to provide access for construction; these roads would be used permanently for project operation (see table 5). Transco would negotiate with landowners for the use of these roads. In addition, four existing public roads would require improvements including grading, placement of gravel for stability, and clearing of overhead vegetation to safely accommodate project equipment and vehicles. Construction of access roads and public road improvements would affect about 2.3 acres (see table 3). Operations would retain about 2.1 acres for permanent use of private access roads. If any of the existing access roads are damaged by the project, Transco would restore the roads to pre-existing conditions or better.

Table 5. Proposed Access Roads for the Project

Access Road ID	Milepost	Proposed Use	Existing Use	Upgrade Requirements	Length (feet)	Width (feet) /a
GVLA-AR-BR- 001	0	Temporary	Public Road	•Grade •add gravel where needed •side trimming of trees	530	20
GVLA-AR-BR- 001A	0	Permanent	Forest	•Grade •add gravel where needed •side trimming of trees	340	20
GVLA-AR-BR- 002	0.35	Permanent	Public Road	•Grade •add gravel where needed •side trimming of trees	2,000	20
GVLA-AR-BR- 003	1.23	Permanent	Public Road	•Grade •add gravel where needed •side trimming of trees	1,660	20
GVLA-AR-BR- 004	3.85	Permanent	Open Land	•Grade •add gravel where needed •side trimming of trees	180	20
GVLA-AR-BR- 005	3.98	Permanent	Public Road	•Grade •add gravel where needed •side trimming of trees	145	20

a/ Access road width presented for all temporary roads is a conservative estimate for purposes of calculating impacts. No road widening has been proposed as a part of this project.

A.7 PERMITS

Table 6 provides a list of permits required for the project, the applicable local, state, and federal agencies, as well as any responses that have been received to date. Transco would be responsible for obtaining all permits and approvals required for construction and operation of the project regardless of if they appear in table 6.

Table 6. Federal and State Approvals for the Project

Permit/Clearance/Approval	Agency	Status
Federal		
Certificate of Public Convenience and Necessity	FERC	Pending
Section 404 of the Clean Water Act	U.S. Army Corps of Engineers, Norfolk District	Pending
Endangered Species Act, Section 7 consultation	U.S. Fish and Wildlife Service, Virginia Field Office	Concurrence received
	U.S. Fish and Wildlife Service, Asheville Field Office	Concurrence received
	U.S. Fish and Wildlife Service, South Carolina Field Office	Concurrence received
Migratory Bird Treaty Act consultation	U.S. Fish and Wildlife Service	Concurrence received
Virginia		
Section 401 Water Quality Certification	Virginia Department of Environmental Quality, Water Division	Automatic with Section 404 Permit
Approval of Soil Erosion and Sediment Control Plans and Variance for Open Trench Length		Pending
Clean Air Act Permit: Minor New Source Review Permit (Station 166)	Virginia Department of Environmental Quality, Air Division	Permit issued
Virginia Threatened and Endangered Species consultation	Virginia Department of Conservation and Recreation	Concurrence received
	Virginia Department of Game and Inland Fisheries	Concurrence received
Permit for Right to Cross Subaqueous Beds or Subaqueous Lands	Virginia Marine Resources Commission	Permit issued
Section 106 of the National Historic Preservation Act consultation	Virginia Department of Historic Resources	Concurrence received
Virginia Stormwater Management Permit	Virginia Department of Conservation and Recreation, Virginia Stormwater Management Program and Virginia Department of Environmental Quality, Water Division	Pending
North Carolina		
Section 106 of the National Historic Preservation Act consultation	North Carolina Department of Cultural Resources	Concurrence received
South Carolina		
Soil Erosion and Sediment Control Plan	South Carolina Department of Health and Environmental Control	Pending
Section 106 of the National Historic Preservation Act consultation	South Carolina Department of Archives and History	Concurrence received

A.8 NON-JURISDICTIONAL FACILITIES

Occasionally, proposed projects have associated facilities that do not come under the Commission's jurisdiction. These non-jurisdictional facilities may be integral to the project (for example, a new or expanded power station at the end of a jurisdictional pipeline) or minor, non-integral components of the jurisdictional facilities that would be constructed and operated because of the project.

The Greensville Lateral and associated facilities are jurisdictional under FERC regulations, and would transport gas to the non-jurisdictional Power Station. VEPCO anticipates placing the station in-service in 2019 or 2020 (Virginia Dominion Power, 2015). The Power Station is part of a private construction project under the jurisdiction of state and local agencies; the federal government has no financial involvement, and no federal land would be affected.

The Virginia State Corporation Commission is the lead state permitting agency for the planned Power Station. VEPCO is required to do all necessary surveys and permit applications to complete its filing with the Virginia State Corporation Commission for the Power Station, as well as comply with applicable federal, state, and local regulations (see appendix D). The VEPCO project was approved by the Virginia State Corporation Commission on March 29, 2016. The land parcel for the Greensville Power Station has already been cleared of vegetation except for about 8 acres of woods that have been kept as a visual buffer for construction.

Transco's proposed M&R station would require connections to electric transmission lines, which are non-jurisdictional and would be on the VEPCO property. Additionally, the piping to connect the plant to Transco's proposed pipeline is non-jurisdictional. The electric transmission lines, Power Station, and associated piping on VEPCO property would be under the jurisdiction of state and local agencies. In addition, the relocation of State Route 605 to accommodate siting of the Power Station is non-jurisdictional. We have included these non-jurisdictional facilities in our cumulative impacts analysis (see section B.9).

B. ENVIRONMENTAL ANALYSIS

The following sections discuss the project's potential direct and indirect impacts on environmental resources. When considering the environmental consequences of constructing and operating the proposed project, the duration and significance of any potential impacts should be described according to the following four levels: temporary, short-term, long-term, and permanent. Temporary impacts generally occur during construction, with the resources returning to pre-construction conditions almost immediately. Short-term impacts could continue for about three years following construction. Long-term impacts would require more than three years to recover, but eventually would recover to pre-construction conditions. Permanent impacts could occur because of activities that modify resources to the extent that they may not return to pre-construction conditions during the life of the project, such as with the construction of an aboveground facility.

B.1 GEOLOGY AND SOILS

The VSEP II is within the Piedmont and Blue Ridge physiographic provinces. Igneous (such as quartz, feldspar, and pumice) and metamorphic (such as slate, schist, and gneiss) bedrock characterizes the geology of the project area (VDEQ, 2015). The landscape includes low to moderate slopes about 600 to 1,000 feet above mean sea level in the Piedmont province (College of William and Mary, 1999).

The depth of the bedrock in the project area is generally more than 60 inches underground (Natural Resource Conservation Service [NRCS], 2015) (NRCS, 2014); however, about 20 percent of the project area has shallow bedrock. If bedrock were encountered during construction, it would be removed using one of the following techniques:

- conventional excavation with a backhoe;
- ripping with a dozer followed by backhoe excavation;
- hydraulic hammering with a backhoe attachment followed by backhoe excavation; and
- blasting followed by backhoe excavation.

Transco has developed a *Blasting Plan* that establishes procedures and safety measures that it would adhere to during construction in order to ensure compliance with applicable regulations. We have reviewed and found this plan acceptable.

Given Transco's commitment above, we conclude that impacts from blasting would be appropriately minimized and not significant.

100-year Floodplain

Portions of the proposed pipeline would be within the 100-year floodplain of Reedy Creek; however, none of the proposed aboveground facilities would be within a 100-year floodplain. Transco would implement BMPs and the FERC *Plan* and *Procedures* to avoid, minimize, and/or mitigate floodplain impacts on the project area during rain events. The BMPs applicable to floodplains include, but are not limited to:

- limiting vegetation clearing during construction to the minimum amount necessary for safe construction;
- installing erosion and sediment control devices within and at the limits of project workspaces;
- designing stream and river crossings to protect against damage due to high velocity flows and erosion resulting from seasonal or flash flooding;
- restoring associated floodplain contours to their pre-construction condition within temporarily disturbed areas; and
- maintaining erosion control devices post-construction to ensure successful revegetation of the construction area.

Transco would submit any required floodplain permits to the appropriate agencies for review and approval. Because no permanent impacts on floodplains would occur because of this project, we conclude that the project would not have a significant impact on 100-year floodplains.

Geologic Hazards

Potential geologic hazards near the project area include minor seismic hazard, subsidence, and landslides. The project is in a relatively low seismic hazard area; therefore, the risk of damage to pipeline and aboveground facilities by earthquake is low. No karst areas were identified in the project construction area. In addition, the nearest mine (a surface clay mine) is 1.9 miles north of the proposed Greensville Lateral, and no oil and gas wells are within the Virginia counties (Virginia Department of Mines, Minerals, and Energy, 2012)

Given the low probability of geologic hazards within the project area and mitigation measures proposed by Transco, we conclude that construction and operation of the project would not result in a significant impact on geologic resources, nor would geologic hazards likely occur at project facilities.

Soils

Construction activities associated with the project such as clearing, grading, trenching, and backfilling, as well as the movement of construction equipment, may

result in temporary impacts on soil resources. Impacts may include loss of soil through water and wind erosion, soil compaction from construction equipment, and mixing of topsoil and subsoil.

To minimize impacts on soils during construction and operation of the project, Transco would use soil mitigation procedures as outlined in the FERC *Plan*, as well as guidance from the VDEQ who oversees implementation of Virginia's Erosion and Sediment Control Law. These mitigation measures would be incorporated into the project specific SESC *Plan* that would be provided as part of Transco's *Implementation Plan* to construction personnel. To prevent mixing of the soil horizons or incorporation of additional rock into the topsoil, Transco would segregate topsoil in residential areas, non-saturated wetlands, improved pastures, and other areas at the request of the landowner.

The project area includes hydric soils with compaction potential. To limit the potential for compaction, Transco would segregate topsoil and follow the mitigation measures for soil compaction in the FERC *Plan*. Following construction, Transco would test topsoil and subsoil for compaction at regular intervals in agricultural and residential areas. Transco would perform appropriate soil compaction mitigation in severely compacted residential areas.

The majority of the soils in the project area have low to moderate erosion potential, with only one soil type having a high erosion potential. However, several areas are characterized by steep slopes (more than 8 percent), which are most likely to have high erosion potential. Transco would utilize erosion and sediment control devices, in accordance with the FERC *Plan*. Temporary erosion controls, such as interceptor diversions and sediment filter devices, would be installed immediately following initial soil disturbance. Trench breakers would be installed immediately following ditch excavation and during pipe installation. Temporary erosion controls would be maintained until the project area has been successfully revegetated. Transco would install permanent erosion control devices, such as permanent slope breakers, riprap, or rock outlet protection, if necessary.

The majority of soils impacted by the project have moderate to high revegetation potential. About 1 percent of the project area includes soils with low revegetation potential. Transco would revegetate the project area following construction with seed mixes and soil amendments in accordance with VDEQ guidance. Transco's seed mixes and soil amendments would be included in its SESC *Plan*. Transco would monitor the effectiveness of revegetation and permanent erosion control devices during operation and maintenance of the project facilities and file quarterly reports with the Commission until revegetation is complete.

About 20 percent of soils in the project area are characterized by shallow bedrock or contain stones larger than 3 inches in diameter within 60 inches of the soil surface.

Because of the presence of this material in the project area, the potential to introduce subsurface stone and rock into surface soils during construction could be significant. However, many of these soils already contain stone and gravel in the surface layers. Transco would remove any excess stone and rock from surface soils within residential and agricultural areas, and at the landowner's request, so that rock content within the soils would be no higher than similar soils in adjacent locations. In order to prevent damage to the pipeline protective coating, Transco would examine all excavated material and remove rocks greater than 4 inches in diameter prior to backfilling of the trench. In areas where stony/rocky soils or shallow bedrock interferes with conventional excavation or rock trenching methods, blasting may be required to excavate the trench. Transco would only perform blasting if other reasonable means of excavation (for example, rock trenchers, rock saws, and jackhammers) have proven unsuccessful.

The proposed pipeline would cross 1.3 miles (31 percent) of prime farmland, and 3.6 miles (83 percent) of farmland of statewide importance. Transco would minimize adverse impacts on soils, including prime farmland and residential areas, by implementing the best management practices outlined in the FERC *Plan*. Transco would coordinate with the applicable agencies and landowners in these areas to ensure the proper restoration of any impacted agricultural or residential area, including replacement of segregated topsoil, stone removal, and compliance with reseeding recommendations. Following construction of the pipeline, these areas would revert to their pre-construction agricultural land use.

A total of 1.7 acres associated with the new aboveground facilities, are considered prime farmland or farmland of statewide importance, and would be converted to industrial uses following the completion of construction. However, 1.4 acres of the new aboveground facilities, associated with the Greensville M&R Station, would be entirely within the planned Greensville Power Station property. Although the majority of soils within the new and existing aboveground facilities are considered prime farmland or farmland of statewide importance, none of the land is currently used for agriculture. Therefore, there would not be an overall loss in production because of construction and operation of the project.

No soil contamination has been identified within 0.25 mile of the project. However, in the event that contaminated sediments or soils are encountered during construction, Transco would follow the steps outlined in its *Unanticipated Discovery of Contamination Plan*. In addition, Transco has developed a *Spill Plan* that specifies cleanup procedures in the event of soil contamination from spills or leaks of fuel, lubricants, coolants, or solvents. Transco and its contractors would implement the *Spill Plan* to prevent accidental spills of any material that may contaminate soils, and if necessary, to ensure that inadvertent spills of fuels, lubricants, or coolants are contained, cleaned up, and disposed of in an appropriate manner.

Based on the above minimization measures, including Transco's implementation of the FERC *Plan*, as well as following VDEQ guidance, we conclude that the project would not have a significant impact on soils.

B.2 WATER RESOURCES

Groundwater

Based on the available information, correspondence from state and federal agencies, and our analysis, we have determined that the project would not effect:

- U.S. Environmental Protection Agency (EPA)-designated sole-source aquifers (EPA 2015);
- wellhead protection areas; (Virginia correspondence 01/20/2015, 01/26/2015); South Carolina Correspondence 02/26/2015 South Carolina correspondence 03/14/2015)
- public groundwater wells; (Virginia correspondence 01/20/2015; 01/22/2015, 01/23/2015 and 01/26/2015, South Carolina correspondence 03/14/2015)
- state -designated Groundwater Management Areas;
- public surface water intakes (none are within 3 miles downstream of the project) (Virginia correspondence 01/22/2015, 01/26/2015); and
- natural springs or seeps (none are within 150 feet of the construction right-of-way).

Transco reviewed available Virginia, North Carolina, and South Carolina water well databases, consulted with state agencies, and conducted field surveys to identify public and private wells near the project facilities. Transco identified three domestic wells within 150 feet of the construction workspace in Brunswick County, Virginia. Two residential water supplies are within the construction right-of-way at MP 1.95 and MP 2.04, and one is 118.5 feet from the construction right-of-way at MP 2.32. Transco stated it would offer pre- and post-construction monitoring of well yield and water quality to well owners for wells within 150 feet of the project area. Furthermore, if project construction damaged a well, Transco would compensate the landowner for the repair of that well, installation of a new well, or otherwise arrange for a suitable water supply.

Transco reviewed available Virginia, North Carolina, and South Carolina contaminant databases and consulted with state agencies; no known groundwater contamination sites or leaking underground storage tanks were identified. Transco would implement its *Unanticipated Discovery of Contamination Plan* if any affected groundwater or surface water were encountered during construction.

Clearing and grading of the construction workspace could result in changes to overland water flow and subsequent recharge of shallow aquifers. In addition,

inadvertent spills of hazardous materials used during construction could contaminate shallow groundwater. Transco stated it would follow its *Spill Plan* to minimize the potential for contamination of water resources associated with an inadvertent spill of fuels, lubricants, or solvents. The *Spill Plan* requires that the storage of petroleum products, refueling, and lubricating operations take place in upland areas that are more than 100 feet from wetlands, waterbodies, or designated watershed areas. Transco has also committed to refueling and servicing equipment at least 200 feet from any private water supply well. In correspondence dated 02/26/2015, the South Carolina Department of Health and Environmental Control stated that part of the project (the SN-10 valve site) was within the Surface Water Source Protection Area for Startex Jackson Welford Duncan Water District's intake on North Tyger River. It was further clarified by DHEC staff that the source water protection area designation is more of a public awareness and outreach program, and that no permits are required for construction within an area with this designation

Transco would implement the measures in the FERC *Plan* to ensure that restoration and revegetation is completed as soon as possible following construction. Transco would also implement its *Spill Plan* for any activities involving the storage of fuels and other materials. With the use of these plans, Transco's commitment to mitigate compacted soils, correct any well damage, we conclude that any potential impacts on groundwater would be minimized and not significant.

Surface Water and Wetlands

Based on the information available, correspondence with state and federal agencies, and our review, we have determined that the proposed project would not affect:

- EPA-designated impaired waterbodies;
- public drinking water intakes within 3 miles downstream of the project area
- U.S. Army Corps of Engineers (USACE) Section 10 Navigable Waters;
- National Oceanographic and Atmospheric Administration-designated essential fish habitat;
- state-designated special use waters (outstanding state resource waters, exceptional and reference reach waters);
- state-designated exceptional waters;
- federal or state-designated wild and scenic rivers; and
- coastal zone management areas.

The proposed project is within the five watersheds. Transco determined the locations of surface water and wetlands using desktop analysis, National Wetlands Inventory maps, and field surveys.

Surface Waters

The proposed project would require 15 waterbody crossings in Virginia (9 perennial streams, 2 intermittent streams, and 4 ephemeral streams). All but one stream, Reedy Creek, are classified as minor crossings because they are ten feet or less in width. Reedy Creek is an intermediate crossing, which is 75-feet-wide (see table 7 for a list of the waterbodies that would be affected by the proposed project). One access road would use an existing culvert to cross over a waterbody, so no in-water construction would be required; only the pipeline would cross waterbodies.

Table 7. Proposed Dry-Ditch Waterbody Crossings for the Project

MP	Feature ID	Waterbody Name	Flow Regime	FERC Classification	Approximate Waterbody Width (feet)
0.17	Stream 2	UNT to Reedy Creek	Perennial	Minor	10
0.29	Stream 4	UNT to Reedy Creek	Ephemeral	Minor	1
0.58	Stream 5	UNT to Reedy Creek	Ephemeral	Minor	2
0.75	Stream 7	Reedy Creek	Perennial	Intermediate	75
0.95	Stream 8	UNT to Reedy Creek	Ephemeral	Minor	2
0.95	Stream 9	UNT to Reedy Creek	Intermittent	Minor	2
1.07	Stream 10	UNT to Reedy Creek	Perennial	Minor	4
1.39	Stream 11	UNT to Reedy Creek	Perennial	Minor	4
1.55	Stream 12	UNT to Reedy Creek	Perennial	Minor	9
1.63	Stream 13	UNT to Reedy Creek	Ephemeral / Intermittent	Minor	1
1.77	Stream 14	UNT to Reedy Creek	Perennial	Minor	3
2.67	Stream 16	UNT to Greensville Creek	Perennial	Minor	3
2.80	Stream 18	UNT to Greensville Creek	Perennial	Minor	3
3.30	Stream 18	UNT to Greensville Creek	Perennial	Minor	1
3.47	Stream 20	UNT to Greensville Creek	Ephemeral	Minor	1

Construction within streams or adjacent to streams could result in minor, short-term impacts on waterbodies. Clearing and grading of stream banks, trenching, and backfill could result in temporary modifications of aquatic habitat, increased sedimentation, turbidity, and decreased dissolved oxygen concentrations. Less sediment would be generated where dry crossing methods (for instance, flume or dam and pump) are employed. At waterbody crossings where the flume or dam and pump methods would be used, temporary 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 installation of the pipeline when the dams are pulled and flow across the restored work area is re-established.

Following construction, Transco would restore stream banks to preconstruction contours and stabilize the waterbody bed and banks using seeding, installation of erosion control blankets, or installation of riprap materials, as appropriate. Transco would minimize surface water impacts during project operations by limiting vegetation maintenance adjacent to waterbodies to allow a 25-foot riparian strip to revegetate.

Transco would hydrostatically test the piping associated with all project facilities for structural integrity prior to in-service. Transco would use about 538,000 gallons of water from Reedy Creek along the proposed route (MP 0.75) to test the pipeline hydrostatically. Transco would screen surface water intakes for hydrostatic testing to minimize entrainment of fish. Additionally, Transco would maintain adequate flow rates to protect aquatic life, provide for all waterbody uses, and provide for downstream withdrawals of water by existing users. Transco would discharge the test water in accordance with the *Procedures* and its *Virginia Pollution Discharge Elimination System General Permit for Discharges from Petroleum Contaminated Sites, Groundwater Remediation, and Hydrostatic Tests*. Transco would discharge test water to a hay bale/silt fence structure to filter larger solids and dissipate flow at an upland area near MP 0.73, or back into Reedy Creek (pending state permit approval) using a splash plate to prevent streambed scour. Only new pipeline would be tested and no chemicals would be added to the test water.

Because Transco would construct its stream crossings and hydrostatic testing/discharge in accordance with the FERC *Procedures*, its water crossing and quality permits, and would avoid adding chemicals to the test water, we conclude that the project would not significantly affect water resources.

Wetlands

The USACE defines wetlands as areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support a prevalence of wetland vegetation typically adapted for life in saturated soil conditions. Wetlands provide

recreational opportunities and wildlife habitat to a variety of species, in addition to controlling floodwaters and improving water quality by filtering out pollutants.

Transco used the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont Region (Version 2.0)* (USACE, 2012) and the USACE *Wetland Delineation Manual* guidance to conduct field wetland delineations in the project area (USACE, 1987). Field scientists classified the types of wetlands observed during the field delineations by using the National Wetland Inventory (Cowardin, 1979). Only the proposed pipeline facilities would cross wetlands.

See table 8 for details of proposed wetland crossings and impacts associated with construction and operation for the wetlands in the project area. The project would affect 0.8 acre of wetlands for construction; the project's operation would permanently affect 0.4 acre (table 8).

Table 8. Total Wetland Acreages Affected by the Project

Wetland Type	Temporary Construction Impacts (acres)	Permanent Operation Impacts (acres)
Palustrine Forested Wetlands	**0.6**	**0.4**
Palustrine Scrub-Shrub Wetlands	**<0.1**	**<0.1**
Palustrine Emergent Wetlands	**0.2**	**0**
Total	**0.9**	**0.5**
Permanent operational impact calculations are based on 30-foot maintained right-of-ways and areas within compressor station and M&R station fence lines.		

The primary effect of project construction on wetlands would be the potential alteration of wetland vegetation due to clearing, excavation, rutting, compaction, or mixing of topsoil and subsoil. Construction could also affect water quality within the affected wetlands due to sediment or inadvertent spills of fuel or chemicals. Temporary construction impacts on wetlands could include the loss of herbaceous and scrub-shrub vegetation; wildlife habitat disruption; soil disturbance associated with grading, trenching, and stump removal; sedimentation and turbidity increases; and hydrological profile changes. The majority of these effects would be short-term in nature and would cease when or shortly after the wetlands are restored and revegetated. Construction of the pipelines would also temporarily affect 0.6 acres of forested wetland. There would be long-term impacts on wetlands because of permanent conversion of forested wetlands to emergent or scrub/shrub wetlands. Areas of forested wetland affected would be allowed to revegetate; however, woody vegetation may take up to 30 years to regenerate. In the

long term, the affected forested wetlands would be expected to continue to provide important ecological functions such as sediment retention, nutrient removal, flood attenuation, groundwater recharge/discharge, and wildlife habitat. Following revegetation, the wetland would transition back into a community with functionality similar to that of the pre-construction state.

Impacts would be minimized by Transco's implementation of its *Spill Plan* and the *Procedures*. General construction and mitigation measures include:

- limiting construction right-of-way width in wetlands to 75 feet;
- limiting construction equipment in wetlands to that needed to clear the right-of-way, excavate the trench, fabricate the pipe, install the pipe, backfill the trench, and restore the right-of-way;
- installing sediment barriers immediately after initial ground disturbance within the right-of-way between wetlands and uplands, across the entire right-of-way immediately upslope of the wetland boundary, and along the edge of the right-of-way as necessary to contain spoil within the right-of-way and to protect adjacent off-right-of-way wetland areas;
- minimizing the length of time that topsoil is segregated and the trench is open; prohibiting the use of rock, soil imported from outside the wetland, tree stumps, or brush riprap to stabilize the right-of-way;
- using low ground weight equipment or operating equipment on timber riprap, prefabricated equipment mats, or terra mats on saturated soils or where standing water is present;
- installing trench plugs as necessary to maintain the original wetland hydrology; and
- prohibiting the use of lime, fertilizer, or mulch within 100 feet of wetlands during restoration of wetlands, unless approved by the land managing state or federal agency.

Following construction, Transco would restore and monitor wetlands for a period of three years or until revegetation is successful in accordance with the FERC *Procedures*. Transco would also file a wetland revegetation monitoring report with FERC three years after the completion of construction. Transco would continue to file wetland revegetation monitoring reports on an annual basis thereafter until revegetation efforts were considered successful by Commission staff. Vegetation maintenance on the operational right-of-way in wetlands would be limited to a 10-foot-wide herbaceous corridor centered over the pipeline and the selective removal of trees within 15 feet of the pipeline centerline that could damage the pipeline's protective coating.

Transco submitted a *Section 404 Nationwide 12 Permit Pre-Construction Notification* to the USACE in March 2015. This permit, as well as a section 401 certification from VDEQ must be obtained before construction within wetlands. As part

of the project's *Section 404 Nationwide Permit 12* review process, Transco would consult with the USACE Norfolk District staff to determine appropriate mitigation measures for conversion of about 0.6 acre of forested to emergent wetland. In addition, in accordance with section 401 of the Clean Water Act, Transco would consult with VDEQ about any mitigation measures or plans.

Based on Transco's construction and mitigation measures, and compliance with the above permit requirements, we conclude that impacts on wetlands would be adequately minimized and not significant.

B.3 VEGETATION AND WILDLIFE

Vegetation

Construction of the proposed project would primarily affect developed land, forest land, and open land consisting primarily of herbaceous vegetation (impacts on vegetation in wetlands are addressed above in section B.2). In total, 100.9 acres of developed land, 47.7 acres of herbaceous vegetation, and 30.0 acres of deciduous forest would be affected by the project during construction. After construction is complete, 1.0 acres of developed land, 14.9 acres of herbaceous vegetation, and 12.4 acres of deciduous forest would be within the permanent right-of-way. Areas disturbed by construction would be revegetated in accordance with the FERC *Plan* and *Procedures*.

Transco would also follow its *Exotic and Invasive Species Control Plan* to prevent the spread of noxious weeds during construction, including cleaning all construction equipment prior to mobilization to the sites. During restoration and post-construction monitoring, Transco would monitor the disturbed areas for noxious weeds, and control them with spraying or hand removal.

The herbaceous vegetation impacts in the temporary and permanent right-of-way workspaces would be short-term (typically one to three growing seasons). These areas would be allowed to revert to pre-construction use for the full width of the right-of-way. Impacts on forest vegetation would be long-term (up to 30 years) in the temporary workspaces, and permanent within the operational right-of-way due to periodic vegetation maintenance that would prohibit the regrowth of trees. During operation, routine vegetation maintenance in uplands would not be conducted more frequently than every three years, with the exception of a 10-foot-wide corridor centered on the pipeline that would be maintained in an herbaceous state to allow for periodic corrosion and leak surveys.

Transco would restore construction areas according to the FERC *Plan* and *Procedures* and all other applicable state and federal regulations. Revegetation would be

considered successful in uplands when vegetation cover and diversity within the disturbed areas are similar to adjacent, undisturbed lands. Seed mixes for reclamation and revegetation would be used as specified by the landowner and the local NRCS guidelines. Transco would monitor upland areas after the first and second growing seasons following restoration or until revegetation was successful. Transco would also submit quarterly monitoring reports to FERC to document the status of revegetation in disturbed areas. Fragmentation of forested areas can result in changes in vegetation (such as invasion of shrubs along the edge); however, forests within the pipeline project areas have been previously fragmented from other pipeline projects and are part of existing permanent rights-of-way. To the greatest extent practicable, Transco has collocated the proposed pipelines to minimize additional forest fragmentation.

Based on Transco's proposed construction and mitigation measures, we conclude that Transco has minimized impacts on vegetation to the greatest possible extent. We conclude that impacts on vegetation from the proposed project would not be significant.

Wildlife

The most common wildlife habitats that would be affected by the project are deciduous forest and herbaceous land. The deciduous forest habitat type may provide foraging and cover habitat for many species of birds, raptors, bats, deer, coyote, and small mammals.

Construction and operation of the project could result in short- and long-term impacts on wildlife including the displacement, stress, injury, and mortality of some mammals, reptiles, birds, and amphibians that are unable to leave the work areas. Transco would minimize or avoid direct impacts on wildlife during construction by minimizing the time that trenches are open, as well as requiring that all personnel on-site participate in environmental training that outlines the appropriate steps for workers to take if animals are found during construction or identified on the right-of-way or in trenches each day before construction.

The clearing of forest vegetation within the temporary right-of-way and ATWS could result in long-term impacts on wildlife habitat. Areas within the permanent right-of-way and aboveground facility sites would be permanently converted from forested to open habitats for the operational life of the project. Transco would conduct clearing activities within or near existing cleared pipeline rights-of-way and along the forest edges where possible to minimize additional fragmentation of existing wildlife habitats. By siting the pipeline along existing corridors (known as co-locating), the vegetation removed would contribute to habitat loss, but would not create any additional significant edge habitat because it would be abutting the existing vegetation boundaries. Following construction, Transco would restore the right-of-way to original contours, seed disturbed areas with native seed mixes, and would monitor revegetation until it was successful.

Although individuals of some wildlife species would be affected by the project, most of the impacts on wildlife would be short-term and limited to the construction period. The project would not permanently alter the character of the majority of available habitats. The aboveground facilities would be co-located with existing facilities; this would reduce the impacts from noise and light pollution because these areas already experience these impacts. Areas adjacent to the project site provide similar and abundant habitats for displaced wildlife during construction and operation of the project facilities. Based on the proposed avoidance, minimization, and restoration measures, we conclude that construction and operation of the project would not have a significant impact on local wildlife populations or habitat.

Migratory Birds

Migratory birds are species that nest in the United States and Canada during the summer, and make short or long-distance migrations for the non-breeding season. These migratory species fly to and from the tropical regions of Mexico, Central and South America, and the Caribbean.

Migratory birds are protected under the *Migratory Bird Treaty Act of 1918* [15] and bald and golden eagles are protected under the *Bald and Golden Eagle Act of 1940*.[16] The *Migratory Bird Treaty Act of 1918*, as amended, prohibits the taking, killing, possession, transportation, and importation of migratory birds, their eggs, parts, or nests unless authorized by the U.S. Fish and Wildlife Service (USFWS). Executive Order 13186[17] directs federal agencies to identify where unintentional take is likely to have a measurable negative effect on migratory bird populations and avoid or minimize adverse impacts on migratory birds through enhanced collaboration with the USFWS. Executive Order 13186 emphasizes species of concern, priority habitats, and key risk factors, and that particular focus should be given to population-level impacts. Part of FERC's commitment includes evaluating project-related impacts on species deemed most important or sensitive in a particular project area.

The USFWS has established a list of Birds of Conservation Concern[18], which is a subset of migratory bird species that have particular management challenges, including human-interest conflicts and low population numbers. The USFWS has identified potential habitat for 14 birds of management concern within the proposed project area (see appendix Efor federally and state-listed species potentially occurring within the proposed project area, which also includes the USFWS Birds of Conservation Concern).

---

15 See 16 USC 703-711.
16 See 16 USC 668-668d.
17 See the Federal Register, Volume 66, Number 11, January 17, 2001.
18 See 50 CFR 10.13.

Transco proposes to start construction activities as soon as possible after the Commission issues an order for the project, and plans an in-service date of December 2017 for the VSEP II facilities. The USFWS indicated that the nesting season for migratory birds is generally April 1- July 31 in this region. Based on USFWS recommendations, Transco would clear vegetation in fall and winter months to avoid impacts on nesting birds. However, if construction activities were delayed past this seasonal window, Transco would consult with USFWS before any vegetation clearing could occur.

As mentioned previously, Transco has minimized potential effects on migratory birds by routing through previously disturbed, cleared, fragmented, and agricultural areas where possible. During project operation, the FERC *Plan* and *Procedures* prohibits routine vegetation maintenance clearing from occurring between April 15 and August 1 of any year, unless otherwise approved by the USFWS, to minimize potential impacts on migratory birds. Given the seasonal clearing restriction, Transco's commitment to consult with USFWS if vegetation clearing activities are delayed past this seasonal window, the limited area of disturbance, and the high proportion of adjacent similar habitat associated with construction of the project facilities, we conclude that construction would not significantly affect migratory bird individuals or populations.

Fisheries

Waterbodies that could provide habitat for protected species are classified as sensitive waters for fisheries of special concern. The Virginia Department of Conservation and Recreation's Division of Natural Heritage indicated in a December 17, 2014 letter that this project occurs upstream of the Reedy Creek – Webbs Mill Stream Conservation Unit for freshwater mussels. They recommended avoiding all instream work if possible, using an emergency spill plan, and strictly following sediment control and stormwater management regulations. Transco conducted underwater surveys in May 2015 for aquatic species. In a June 18, 2015 email, the Virginia Department of Game and Inland Fisheries indicated that protective measures would not be necessary for mussels as long as work was performed using dry crossing techniques, and that appropriate erosion and sediment controls were used. Transco proposes dry crossing techniques and would implement the erosion and sediment control measures required by the FERC *Procedures.* If waterbodies were not in low-flow conditions at the time of crossing, Transco would have to use protective measures as required by the Virginia Department of Game and Inland Fisheries.

Removal of vegetation and installation/removal of dams could cause a temporary increase in turbidity levels downstream of the work area. Temporary habitat alteration, streambed structural changes, and substrate disturbance would also occur. As noted in

section B.2. of this EA, turbidity impacts would be minor and limited to short duration through use of a dry crossing technique.

The removal of stream bank and aquatic vegetation could affect aquatic species by reducing shade, as well as reducing egg deposit and refuge areas. Increased suspended solids could also reduce dissolved oxygen levels, change algal growth rates or dominant algal species, and alter what nutrients are available to aquatic species as a food source.

Hazardous fluids from construction equipment could also pollute the water or kill fish larvae. In-stream construction would occur within a limited timeframe to reduce the probability of pollution. The majority of fish populations could move to similar adjacent habitats up or downstream during construction; however, the stress, injury, or death of individual fish may still occur. Heavy equipment could kill aquatic invertebrates by physically crushing them or by covering them with disturbed sediment; turbidity could also affect downstream invertebrates. Additionally, water withdrawals for hydrostatic testing could entrain or impinge fish.

Transco would use the construction mitigation measures outlined in the FERC *Procedures* to minimize impacts on waterbodies and fisheries. These mitigation measures include reducing the size of workspaces near waterbodies where possible, installing buffers of vegetation around waterbodies to prevent run-off from entering waterbodies, installing erosion control devices, and constructing between June 1 to November 30 to avoid the peak spawning season. Once construction is complete, Transco would restore streambeds to pre-construction conditions, which would reduce erosion and long-term impacts on fisheries.

Transco would implement the hydrostatic testing measures outlined in the *FERC Procedures* and would comply with all applicable federal and state permits to reduce potential impacts of hydrostatic testing on fishery resources. Transco would use screens on all water intakes to minimize the uptake of aquatic organisms. In addition, Transco would be required to maintain all downstream uses, which includes aquatic species use.

Upstream and downstream areas near the waterbody crossings would provide similar habitat for mobile aquatic species. Because of the limited extent and duration of construction workspace use, the use of Transco's the FERC *Procedures*, the proposed construction methods, implementation of the proposed avoidance and minimization measures, we conclude that the project would not cause any long-term or significant impacts on fisheries.

B.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 and federally proposed species and their designated critical habitat

that are protected under the *Endangered Species Act of 1973* (ESA)[19], or are considered as candidates for such listing by the USFWS, and those species that are state-listed as threatened or endangered.

Federally Listed Species

Section 7 of the ESA ensures that any actions authorized, funded, or carried out by the agency would not jeopardize the continued existence of a federally listed threatened or endangered species or any of its designated critical habitat. The FERC, as the lead federal agency that would authorize the project, is required to consult with the USFWS to determine if designated critical habitat or federally listed species could be affected by the project. Typically, the FERC must prepare a biological assessment for any federally listed species or designated critical habitat areas that could be affected. However, this project would not affect Section 7 of the ESA listed species, as described more fully below.

Transco, acting as FERC's non-federal representative for complying with Section 7 consultation, initiated informal consultation with the Virginia USFWS Gloucester field office to determine the federally listed species potentially found in the project area.

Transco contacted the USFWS Gloucester, Virginia; Charleston, South Carolina; and Asheville, North Carolina field offices to obtain species information and conservation reports. Four federally endangered species (Atlantic sturgeon, American chaffseed, harparella, and Michaux's sumac) and five federally threatened species (Henslow's sparrow, loggerhead shrike, northern long-eared bat, peregrine falcon, and upland sandpiper) were identified as potentially occurring near the project (see appendix C). The USFWS has not designated any critical habitats within the project area.

Atlantic sturgeon and harparella lack suitable habitat within the project construction area. The State of Virginia conducted field surveys for plant species and identified no existing populations of American chaffseed and Michaux's sumac. Suitable habitat for Henslow's sparrow, upland sandpiper, loggerhead shrike, northern long-eared bat, and peregrine falcon is present within the proposed project area, however, any vegetation clearing would occur outside of breeding and nesting season for these species.

Construction activities within North Carolina and South Carolina would not require any tree clearing; the construction activities within Virginia would require vegetation clearing. Transco has routing through previously disturbed cleared and fragmented areas where possible, and would clear outside of the bird and bat breeding and nesting season. In addition, during project operation, the FERC *Plan* prohibits routine vegetation maintenance clearing from occurring between April 15 and August 1

19 http://www.fws.gov/laws/lawsdigest/esact.html.

of any year, unless otherwise approved by the USFWS, to minimize potential impacts on migratory birds. This would also avoid impacts on bats within the project area because the bats use similar habitat. In letters dated December 15, 2014, December 22, 2015, and June 26, 2015, the USFWS indicated that the proposed project would have **no effect** on any federally listed species in North Carolina, South Carolina, and Virginia. Given the USFWS determination, ESA consultation is complete for the project.

State Listed Species

Two state-listed endangered species (Atlantic sturgeon, brook floater mussel), five state-listed threatened species (wood turtle, green floater and Atlantic pigtoe mussels, Appalachian grizzled skipper butterfly, and Michaux's sumac), and 13 species identified in the *Virginia Wildlife Action Plan* as species with critical or very high conservation needs were identified as potentially occurring within the project area. Michaux's sumac and the Atlantic sturgeon are also federally listed as endangered and discussed above (see appendix C).

Transco consulted with state agencies about the potential project impacts on state-listed species. The Virginia Department of Game and Inland Fisheries stated in an email on June 18, 2015 that based on Transco's mussel survey report, no further protective measures were needed for mussel species (which includes the green floater and Atlantic pigtoe). The Virginia Department of Conservation and Recreation's Division of Natural Heritage conducted surveys for chaffseed and Michaux's sumac in the project area. Neither species was found in the survey area. The Virginia Department of Conservation and Recreation further commented to the FERC that no documented state-listed plant or insect species would be affected by the project. No further conservation measures were recommended for the wood turtle, Atlantic sturgeon, or Appalachian grizzled skipper butterfly.

The Virginia Department of Conservation and Recreation commented that the Manassas stonefly was historically documented downstream of Compressor Station 185 in Bull Run. Construction at Compressor Station 185 would be confined to the fenceline of the facility and sediment controls would be installed per the FERC *Plan* to contain all spoils within the workspace. We conclude the project would have no impact on the Manassas stonefly or its habitat; the Virginia Department of Conservation and Recreation did not recommend any further conservation measures for this species.

The FERC *Plan* and *Procedures* contain measures to minimize impacts on wetlands, waterbodies, and wooded areas, thus minimizing potential impacts on species that use these habitats (such as wood turtles and the Appalachian grizzled skipper butterfly). We conclude that populations of the rest of the state-listed species would not be significantly impacted with Transco's implementation of our *Plan* and *Procedures*, as

well as the appropriate consultations with both the Virginia Department of Game and Inland Fisheries and the USFWS.

B.5 LAND USE AND RECREATION

The proposed project would disturb 180.1 acres for construction, of which 29.3acres would be permanently retained for operation of the project. All temporary workspace would be restored and allowed to revert to pre-construction conditions. The land use types affected by construction and operation of the project are shown in table 9 below.

Land Uses Affected by the Project

We have determined that the project would not affect agricultural or commercial areas. Transco contacted the county planning districts regarding future planned developments on file within Greensville and Brunswick Counties and identified no future planned developments in the project vicinity. Forest land, open land, and wetlands are addressed in sections B.2 and B.3 of this EA. Project impacts on industrial and residential lands are further addressed in this section.

Residential Land

Transco has indicated that there are three residential structures that would be within 100 feet of the project area in Brunswick and Greensville Counties at MP 1.93, MP 2.02, and MP 2.35 (38 feet, 7 feet, and 56 feet away from the proposed construction workspaces, respectively). Transco has provided a landowner agreement and documentation from the owner of the second structure that the residence has been unoccupied for 15 years and there is no intent to occupy the house; therefore, a site-specific residential construction plan is not required. Transco has committed to measures outlined in the FERC *Plan* for construction in residential areas, and has provided a site-specific residential construction plan for the other residence within 50 feet of the project workspace (see appendix B). We have reviewed this plan and find it acceptable.

Construction of the project facilities could result in short-term impacts on adjacent residential areas, including increased construction-related traffic on local roads and dust and noise generated during construction. Transco would minimize impacts on residences through implementation of mitigation measures, including:

- using appropriate methods to minimize fugitive dust associated with construction activities near residences or businesses;
- conducting construction activities project-wide generally during daytime hours;

Table 9. Land Uses Affected by the Project

Facility	Residential		Industrial		Forest		Open Land		Wetland		Project Total	
	Const.	Op. a/	Const.	Op. a/	Const.	Op. a/	Const.	Op. a/	Const.	Op. a/	Const.	Op. a/
Pipeline Facilities (Proposed)												
Greensville Lateral	<0.9	0	1.1	0.4	20.6	12.2	18.4	11.7	1.6	1.0	**41.7**	**25.2**
ATWS	0	0	0.1	0	8.4	0	7.7	0	0	0	**16.2**	**0**
Access Roads	0	0	0.6	0.6	0.1	0.1	1.6	1.4	0	0	**2.3**	**2.1**
Contractor and Pipe Storage Yard	0	0	7.1	0	0	0	0	0	0	0	**7.1**	**0**
Subtotal	**<0.9**	**0**	**8.9**	**1.0**	**29.1**	**12.3**	**28.8**	**13.1**	**1.6**	**1.0**	**69.3**	**27.3**
Aboveground Facilities												
Greensville Lateral (Proposed)												
Launcher Facility **b/**	0	0	0	0	0.1	0.1	0.2	0.2	0	0	**0.2**	**0.2**
Greensville Meter and Regulator Station **b/**	0	0	0	0	0	0	1.4	1.4	0	0	**1.4**	**1.4**
Mainlines (Existing)												
Compressor Station 185	0	0	40.4	0	0	0	0	0	0	0	**40.4**	**0**
Compressor Station 166	0	0	11.8	0	0.6	0	16.7	0	0	0	**29.2**	**0**
Cowpens M&R Station	0	0	0.8	0	0	0	0	0	0	0	**0.8**	**0**
140-10 MLV setting **c/**	0	0	0	0	0	0	0	0	0	0	**0**	**0**
S216, S218, S221, and S233 valves	0	0	0.8	0	0	0	0	0	0	0	**0.8**	**0**
South Union M&R Station	0	0	0.2	0	0	0	0	0	0	0	**0.2**	**0**
Spartanburg M&R Station	0	0	0.1	0	0	0	0.2	0.1	0	0	**0.4**	**0.1**
S227, S228, S231, and S233 valves	0	0	0.5	0	0	0	0	0	0	0	**0.5**	**0**
Drip Bottles on Mainlines A, B, C, and D	0	0	0.1	0	0	0	0	0	0	0	**0.1**	**0**
Compressor Station 140	0	0	35.7	0	0	0	0	0	0	0	**35.7**	**0**

Table 9 (continued).

Facility	Residential		Industrial		Forest		Open Land		Wetland		Project Total	
	Const.	Op. a/	Const.	Op. a/	Const.	Op. a/	Const.	Op. a/	Const.	Op. a/	Const.	Op. a/
Startex M&R Station **d/**	0	0	0	0	0	0	0	0	0	0	**0**	**0**
Moore M&R Station **d/**	0	0	0	0	0	0	0	0	0	0	**0**	**0**
Tryon Lateral (Existing)												
Mill Springs M&R Station	0	0	0.4	0	0	0	0.1	0.1	0	0	**0.5**	**0.1**
SN 30 valve **e/**	0	0	0	0	0	0	0	0	0	0	**0**	**0**
Columbus M&R Station	0	0	0.2	0	0.1	0.1	0.1	0	0	0	**0.3**	**0.1**
Tryon M&R Station	0	0	0.2	0	0.1	0	0.2	0	0	0	**0.5**	**0.1**
SN 20 valve **f/**	0	0	0	0	0	0	0	0	0	0	**0**	**0**
Landrum M&R Station	0	0	0.4	0	0	0	0	0	0	0	**0.4**	**0**
Inman M&R Station	0	0	0.1	0	0	0	0.1	0	0	0	**0.2**	**0**
SN 10 valve	0	0	0	0	0	0	0	0	0	0	**0**	**0**
West Startex M&R Station	0	0	0.2	0	0	0	0	0	0	0	**0.2**	**0**
Subtotal	**0**	**0**	**92.0**	**0**	**0.9**	**0.1**	**18.9**	**1.8**	**0**	**0**	**111.8**	**2.0**
Total	**0**	**0**	**100.9**	**1.0**	**30.0**	**12.4**	**47.7**	**14.9**	**1.6**	**1.0**	**180.1**	**29.3**

No residential structures would be affected by construction of the Greensville Lateral, however a driveway and landscaping would be affected within the proposed construction right-of-way.

a/ Land affected during operation consists only of new permanent impacts. Workspaces within existing Transco easements or facilities are considered temporary and are included in the estimates of construction land requirements.

b/ Land affected during construction of the launcher facility and Greensville M&R Station is captured within the Greensville Lateral ATWS.

c/ Land affected during construction at the 140-10 MLV setting is captured within the Cowpens M&R Station construction workspace.

d/ Land affected during construction at the Startex and Moore M&R stations is captured within the Station 140 construction workspace.

e/ Land affected during construction at the SN 30 valve is captured within the Mill Springs M&R Station construction workspace.

f/ Land affected during construction at the SN 20 valve is captured within the Tryon M&R Station construction workspace.

- installing safety fencing around the edge of construction areas in within 100 feet of a residence;

- restoring lawns, landscaping, and walls or other structures that were damaged or removed during construction within 10 days of backfill as negotiated by the landowner and Transco to pre-construction conditions;
- taking all measures necessary to ensure that utilities are not disrupted during construction. If the need to disrupt utilities arises, Transco would provide as much notice as possible to the landowner prior to the disruption;
- conducting clean-up and backfill immediately following installation of the pipeline;
- revegetating disturbed areas within 10 days of backfill;
- notifying nearby residences (within a 1-mile radius of construction) no later than 2 weeks prior to the start of construction;
- maintaining traffic flow and emergency vehicle access on residential roadways, and using traffic detail personnel and/or detour signs where appropriate;
- fencing off or covering with a steel plate any section of the trench left open at the end of the workday in the general vicinity of residences; and
- periodically inspecting and, if necessary, keeping the road surfaces clean.

Project construction activities would result in some temporary construction impacts on nearby residences. These impacts would be minimized to the extent possible. We conclude that project construction would not result in significant impacts on residential land.

Industrial Land

Industrial land primarily consists of developed land that is not otherwise classified as residential. Industrial areas crossed by the project mainly consist of existing aboveground facilities and transportation corridors (for example, areas under construction, roads, railroads, and associated easements). Most of these areas are either sparsely vegetated or lack vegetation (for example, cement foundations, pavement, gravel pads, or bare, compacted land with a hard clay surface). Industrial land accounts for 56 percent of the project area. A total of 100.9 acres of industrial land would be disturbed by construction of the project. The project would require about 1.0 acre of industrial land for operation of the pipeline, aboveground facilities, and permanent access roads.

Public Land, Recreation, and Other Designated Areas

We have determined that the proposed project would not affect:

- U.S. Department of Agriculture's Wetlands Reserve Program or Grassland Reserve Program easements;

- national park system units, which include national parks, monuments, preserves, historic sites, historical parks, memorials, recreation areas, seashores, lakeshores, rivers, parkways, trails, and other designations;
- Indian reservations;
- national wildlife refuges or national wilderness areas;
- registered national landmarks;
- U.S. Department of Agriculture Farm Service Agency Conservation Reserve Program lands; and
- state parks, forests, wildlife management areas, and registered state landmarks.

Based on the analysis above, we conclude that the project would not result in significant impacts on public land, recreational land, or other designated areas.

Visual Resources

While many of the impacts would be temporary, construction of the project would result in some permanent land use changes from forested areas to maintained right-of-way or aboveground facilities. Visual impacts along the right-of-way would be minor, with the largest impacts related to a conversion of forested land to open land. Visual impacts from the project's aboveground facilities would be minimal, because 19 of these facilities already exist, and the Greensville M&R station would be adjacent to the planned Power Station, which has been rezoned for industrial use (previously agricultural use). This project would not result in any visual impacts not already planned on the VEPCO property. Therefore, we conclude there would not be any significant impacts on visual resources from construction or operation of the project.

B.6 CULTURAL RESOURCES

Section 106 of the *National Historic Preservation Act 0f 1966*, as amended, requires the FERC to take into account the effects of its undertakings (including the issuance of Certificates) on properties listed in, or eligible for, listing in the National Register of Historic Places (NRHP). This provides the Advisory Council on Historic Preservation an opportunity to comment on the undertaking. Transco, as a nonfederal party, is assisting the FERC in meeting our obligations under Section 106 consultation by preparing the necessary information, analyses, and recommendations.[20]

Transco consulted with the North Carolina and South Carolina State Historical Preservation Officers (SHPO) regarding the minor modifications in North and South Carolina that were not covered under Transco's categorical exemption agreements. The SHPOs agreed that no cultural resources surveys were warranted due to the presence of existing facilities and prior disturbance. We concur.

20 See 36 CFR 800,2(a)(3).

Work at Compressor Station 166 in Pittsylvania County, Virginia would take place inside the existing facility footprint and does not require an additional survey.

Transco conducted a cultural resources survey of the proposed 4.19-mile Greenville Lateral within a 300-foot-wide study corridor and a 50-foot-wide corridor for access roads. The survey included the proposed associated aboveground facility locations. FERC staff previously reviewed and approved cultural resources within the Clover Road contractor yard for VSEP I use.

Background research indicated that the project would cross two previously identified architectural resources and eight previously identified archaeological sites.

The surveys encountered three newly identified archaeological sites in the western two-thirds of VSEP II (outside the overlapping VEPCO project area). Three isolated finds, two newly identified archaeological sites, and four previously recorded archaeological sites were found within the eastern third of VSEP II (within the overlapping VEPCO project area). Two previously recorded archaeological sites that were not re-identified in the VSEP II field survey were also reviewed. Additionally, another recorded site located within a portion of the project area that had been previously surveyed was not recommended for further study by the current project and was not re-identified within the VSEP II survey.

Transco documented two newly identified abandoned residences, documented a newly identified cemetery, and re-evaluated two previously recorded aboveground resources within the project area. The three newly identified aboveground resources are recommended "not eligible" for listing in the NRHP. One of the previously recorded aboveground resources is also an abandoned residence and was determined as "not eligible" for the NRHP. The fifth aboveground resource, Webb's Mill, was determined to be "eligible" for the NRHP during a prior survey; however, VSEP II would avoid impacts on this resource. Nine of the 11 archaeological sites and the 3 isolated finds are recommended as "not eligible" for the NRHP. No further study is recommended for these non-eligible resources. One pre-contact-period site (44BR0153) and one historic-period site (44GV0381) are recommended "potentially eligible" for the NRHP.

In a May 1, 2015 letter, the Virginia SHPO concurred that Webb's Mill was unlikely to be adversely affected by the project and that sites 44GV0381 and 44BR0153 are potentially eligible for the NRHP. The SHPO also concurred that no further work was recommended for the seven sites determined as not eligible for the NRHP and the three previously recorded sites not to be relocated during this survey.

Transco has proposed reroutes to avoid both potentially NRHP-eligible sites. In a June 2, 2015 letter, the SHPO concurred that the reroute around site 44BR0149 avoided the site, but cautioned against inadvertent impacts during construction. The reroute crosses 2 previously identified sites that remain in their originally recorded locations and the SHPO recommended that no further work be warranted. The reroute for Greensville

M&R station avoided 44GV0381 and did not identify any cultural resources at the newly proposed location. The SHPO recommended no further work was necessary. We concur.

Transco also has prepared a plan to avoid the newly identified cemetery. On August 13, 2015, the SHPO concurred that the plan was sufficient to avoid inadvertent impacts on the cemetery.

Subsequent to the original surveys, Transco evaluated proposed changes to Compressor Station 185 in Prince William County, Virginia. The proposed work would take place within the fence line of the existing station. Compressor Station 185 is within the mapped boundaries of the First Battle of Manassas/First Battle of Bull Run and the Second Battle of Manassas/Second Battle of Bull Run, both of which have been determined potentially eligible for the NRHP. However, the setting for these resources has been altered and fragmented by modern development. The SHPO concurred on September 18, 2015 that no additional investigation is necessary for the Compressor Station 185 improvements.

On February 17, 2015, Transco wrote to the United Keetoowah Band of Cherokee Indians, the Tuscarora Nation of New York, the Shawnee Tribe, the Eastern Shawnee Tribe of Oklahoma, the Cherokee Nation, and the Absentee Shawnee Tribe of Oklahoma to request their comments on the project. In addition, we sent the NOI to the same tribes on May 6, 2015. On June 9, 2015, we wrote to the tribes requesting their comments on the project. No responses have been received to date.

Transco has prepared a plan in the event any unanticipated historic properties or human remains are encountered during construction. We find the plan to be acceptable.

Based on consultations with the SHPO and tribes, we have determined that the project, as proposed, would have no adverse effect on any properties listed in or eligible for listing in the NRHP.

B.7 AIR QUALITY AND NOISE

Air Quality

Construction and operation of VSEP II could potentially have an effect on local and regional air quality. Federal and state air quality standards have been designed to protect human health and the environment from airborne pollutants. The EPA has developed National Ambient Air Quality Standards (NAAQS) for criteria air pollutants as further described below in this analysis. The NAAQS were set at levels the EPA believes are necessary to protect human health and welfare.

Greenhouse gases (including carbon dioxide, methane, nitrous oxide, ozone, hydrofluorocarbons, and perfluorocarbons) are naturally occurring pollutants in the atmosphere as well as products of human activities, including burning fossil fuels. Fossil

fuel combustion emits carbon dioxide, methane, and nitrous oxide. Greenhouse gas emissions are usually calculated in terms of carbon dioxide equivalents, where the warming potential of each gas is expressed as a multiple of the warming potential of carbon dioxide equivalents.

Existing Environment

The *Clean Air Act of 1970* (CAA) [21] and the EPA designate seven pollutants for which the NAAQS are implemented. The NAAQS for sulfur dioxide, nitrogen dioxide, particulate matter with an aerodynamic diameter less than 10 microns (PM_{10}), particulate matter with an aerodynamic diameter less than 2.5 microns ($PM_{2.5}$), carbon monoxide, ozone, and lead were established to protect human health (primary standards) and human welfare (secondary standards). NAAQs are enforced at the state level through the use of State Implementation Plans, which describe how ambient air quality standards would be achieved and maintained. Individual states may have their own air quality requirements, provided they are no less stringent than national standards. Virginia's State Implementation Plan is managed by VDEQ. The monitored air quality concentrations for criteria pollutants in Virginia are summarized in table 10 (data is provided only for Compressor Station 166; Compressor Station 185 would not result in a new source of operational emissions because the additional compressors that would be installed are electric-driven and not gas-driven units).

An Air Quality Control Region is defined in section 7407(c) of the CAA as "...any interstate area or major intrastate area which [the Administrator of the EPA] deems necessary or appropriate for the attainment and maintenance of ambient air quality standards." The EPA characterizes Air Quality Control Region s using three categories: nonattainment, indicating the area has not attained compliance with national ambient air quality standards; attainment, indicating the area has attained compliance with national ambient air quality standards; and unclassified, meaning there is not enough conclusive evidence/data to support classification. Unclassified areas are treated as attainment areas for air permitting purposes.

VSEP II would take place within five Air Quality Control Regions (see table 11).

As shown in table12, the counties affected by the VSEP II area are in attainment or unclassifiable for all criteria pollutants, with the exception of Prince William County, Virginia, which is classified as nonattainment for 1-hour and 8-hour ozone. Only the proposed electric driven compression addition at Transco's existing Compressor Station 185 is in Prince William County and this compression would not result in any new emissions.

21 See 42 section 7401.

Table 10. Monitored Air Quality Concentrations for Criteria Pollutants at Compressor Station 166

Monitor/ Facility Location	Year	Carbon Monoxide 1-hr ($\mu g/m^3$)	Carbon Monoxide 8-hr ($\mu g/m^3$)	Nitrogen Oxide ($\mu g/m^3$)	Ozone 8-hr ($\mu g/m^3$)	Sulfur oxide 1-hr ($\mu g/m^3$)	$PM_{2.5}$ 24-hr ($\mu g/m^3$)	$PM_{2.5}$ Annual ($\mu g/m^3$)	PM_{10} 24-hr ($\mu g/m^3$)	Lead 24-hr ($\mu g/m^3$)
Roanoke, Roanoke City, VA	2011	1,488.37	1,488.37	--	--	--	22	10.2	39	0.143
	2012	1,717.35	1,373.88	--	--	--	19	9.1	31	0.069
	2013	1,488.37	1,144.90	--	--	--	22	8.3	45	0.109
Vinton, Roanoke County, VA	2011	--	--	71.46	131.45	23.57	--	--	--	
	2012	--	--	69.58	137.34	13.09	--	--	--	
	2013	1,144.90	915.92	65.82	111.83	15.71	19	8.5	--	

$PM_{2.5}$ = particulate matter smaller than 2.5 microns in diameter

PM_{10} = particulate matter smaller than 10 microns in diameter

$\mu g/m^3$ = micrograms per cubic meter of air

1-hr = averaged measurements in a 1-hour interval

8-hr = averaged measurements in an 8-hour interval

24-hr = averaged measurements in a 24-hour interval

Regulatory Requirements

The CAA, as amended in 1977 and 1990, and 40 CFR 50 through 99 provide the federal statutes and regulations governing air pollution in the United States. Virginia, North Carolina, and South Carolina regulate air pollution in the Virginia Administrative Code, Title 9, North Carolina Administrative Code, Title 15A and the South Carolina Code of Regulations, Chapter 30, respectively. The federal statutes and state air quality requirements that are potentially relevant to VSEP II are discussed below.

Table 11. Air Quality Control Regions in the Project Region

County	State	Air Quality Control Region
Greensville	VA	State Capital Intrastate
Brunswick	VA	Central Virginia Interstate
Pittsylvania	VA	
Prince William	VA	National Capital Interstate
Spartanburg	SC	Greenville-Spartanburg Intrastate
Cherokee	SC	
Polk	NC	Eastern Mountain Intrastate

New Source Review

Construction of VSEP II would require approval under either major or minor New Source Review regulations for stationary sources of air pollution. New Source Reviews for major sources includes two permitting programs, Prevention of Significant Deterioration (PSD) and Nonattainment New Source Review, which are established at the federal level and implemented by state or local permitting authorities. If a facility would emit less than the major source thresholds, the state may issue a minor source permit. Nonattainment New Source Review only applies to new major sources and modifications in nonattainment areas. The proposed electric compression addition at Compressor Station 185 would not result in a new source of operational emissions, and the proposed natural gas compression addition at Compressor Station 166 is within attainment areas for all criteria pollutants; therefore, Nonattainment New Source Review does not apply.

Under PSD, special consideration is taken for Class I Areas (which are locations with 10 or fewer buildings intended for human occupancy), or areas of special national or regional value from a natural, scenic, recreational, or historical perspective. Little or no industrial development is permitted in these areas to prevent air quality deterioration.

Table 12. Attainment Status of the Counties Crossed by the Project

County	State	Sulfur Dioxide	Carbon Monoxide	Nitrogen Dioxide	Ozone (1-hr standard)	Ozone (8-hr standard)	PM_{10}	$PM_{2.5}$	Lead
Brunswick	VA	A	U/A	U/A	U/A	U/A	U	U/A	U/A
Greensville	VA	A	U/A	U/A	U/A	U/A	U	U/A	U/A
Pittsylvania	VA	A	U/A	U/A	U/A	U/A	U	U/A	U/A
Prince William	VA	A	U/A	U/A	Nonattainment (marginal)	Nonattainment (marginal)	U	U/A (maintenance)	U/A
Polk	NC	A	U/A	U/A	U/A	U/A	U	U/A	U/A
Cherokee	SC	A	U/A	U	U/A (maintenance)	U/A	U	U/A	U/A
Spartanburg	SC	A	U/A	U/A	U/A	A	U	U/A	U/A

$PM_{2.5}$ = particulate matter smaller than 2.5 microns in diameter

PM_{10} = particulate matter smaller than 10 microns in diameter

A = in attainment

U = unclassifiable

If a new source or major modification of an existing source is subject to the PSD program requirements and is within 62 miles (100 kilometers) of a Class I area, the facility is required to notify the appropriate federal officials and assess the impacts of the proposed project on the Class I area. The James River Face Wilderness and the Shenandoah National Park are the nearest Class I areas to Compressor Station 166 and are about 50 miles north and 92 miles northeast, respectively, of the station. However, as noted above, emissions from VSEP II would be below PSD major source thresholds. Therefore, we conclude that operation of the compressor station would have a negligible effect on Class I area air quality.

On May 13, 2010, the EPA issued the Greenhouse Gas Tailoring Rule.[22] According to the rule, a compressor station that exceeds 100,000 tons per year of carbon dioxide equivalents is a major PSD source. Carbon dioxide equivalents are the weighted values of carbon dioxide, methane, and nitrous oxide based on each of their global warming potentials. However, on June 23, 2014, the U.S. Supreme Court determined that certain aspects of the Greenhouse Gas Tailoring Rule were invalid, and the EPA guidance confirmed on July 24, 2014 that PSD could not be triggered solely because of greenhouse gas emissions. As shown in table 12, anticipated emissions from the proposed project would not exceed the 250 tons per year major source threshold for other PSD pollutants; therefore, VSEP II would not be subject to the PSD program.

New Source Performance Standards

The New Source Performance Standards[23] were issued by the EPA to regulate specific source categories. Each source category must adhere to specific emission limits and standards, as well as monitoring, recordkeeping, and reporting requirements. Two new combustion turbines with an output of 10,915 horsepower and 1 new 1,208-brake-horsepower emergency generator would produce emissions at Compressor Station 166.

The New Source Performance Standards are divided into subparts based on source types and sizes. The potentially applicable subparts are addressed below.

Subpart KKKK applies to stationary combustion turbines that were constructed, modified, or reconstructed after February 18, 2005 and have a heat input at peak load greater than or equal to 10 million British thermal units per hour. The combustion turbines have a heat input of 89.54 million British thermal units per hour Higher Heating Value at International Organization for Standardization[24] conditions, so they would be subject to and have to comply with *Subpart KKKK*. As such, emissions of nitrogen oxides from each turbine would be limited to 25 parts per million by volume, dry basis

22 See https://www.epa.gov/nsr/clean-air-act-permitting-greenhouse-gases
23 See 40 CFR 60.
24 International Organization for Standardization conditions for combustion turbines are 288 Kelvin (59 degrees Fahrenheit), 60 percent relative humidity, and 101.3 kilopascals atmospheric pressure.

(ppmvd) at 15 percent oxygen. *Subpart KKKK* also limits the sulfur content of fuel burned in each turbine to 0.06 pound per million British thermal units.

Transco has stated that the new turbines would be equipped with SoLoNOx, which is a combustion technology designed to reduce the nitrogen oxides and peak combustion temperatures with a lean, premixed air/fuel mixture and advanced combustion controls. The SoLoNOx control system would operate at approximately 50 to 100 percent full load of each turbine. Required annual performance tests[25] would be used to demonstrate nitrogen oxide compliance. Compliance with the sulfur dioxide limit would be achieved by using pipeline quality natural gas.[26]

Subpart JJJJ applies to manufacturers and operators of stationary spark ignition internal combustion engines. For VSEP II, the proposed generator is subject to this subpart as a natural gas-fired emergency engine manufactured after January 1, 2009 with a rated capacity greater than 130 horsepower. The following limits apply to this equipment type:

- For nitrogen oxides, the limit is 2.0 grams per horsepower-hour or 160 ppmvd at 15 percent oxygen.
- For carbon dioxide, the limit is 4.0 grams per horsepower-hour or 540 ppmvd at 15 percent oxygen.
- For volatile organic compounds, the limit is 1.0 gram per horsepower-hour or 86 ppmvd at 15 percent oxygen.

Transco stated that the selected engine would comply with the above emissions limits. Additionally, *Subpart JJJJ* requires performance testing, work practice, monitoring, recordkeeping, and reporting for the engines. These requirements would be included in the VDEQ air permits issued for Compressor Station 166.

Subpart OOOO applies to crude oil and natural gas production, transmission, and distribution. Only the transmission segment of *Subpart OOOO* would apply to VSEP II.

National Emission Standards for Hazardous Air Pollutants

The EPA issued standards to specifically regulate the emission of hazardous air pollutants (HAPs). The National Emission Standards for Hazardous Air Pollutants[27] are based on specific source categories and the HAP status of major or minor sources. Major sources of HAPs have the potential to emit 10 or more tons per year of a single HAP or 25 tons per year or more for combined HAPs. Compressor Station 166 would continue to be a minor or area source of HAPs. *Subpart HHH, (Natural Gas Transmission and Storage Facilities*) and *Subpart YYYY (Stationary Combustion Turbines)* are only

25 See 40 CFR 60.4340.
26 See 40 CFR 60.4365(a).
27 See 40 CFR 63.

applicable to major sources of HAPs; therefore, they do not apply to VSEP II. National Emission Standards for Hazardous Air Pollutants *Subpart ZZZZ* would apply to the emergency generator at an area source. Transco would meet the requirements of this subpart by complying with New Source Performance Standards *Subpart JJJJ* as discussed above.

General Conformity

The General Conformity Rule[28] was included in the CAA so that federal actions in nonattainment and maintenance areas do not interfere with the State Implementation Plan in order to meet attainment. The rule requires federal agencies to work with state and local governments so that the NAAQS are not delayed. The conformity process includes two parts: applicability analysis and determination. Federal agencies are required to perform an applicability analysis to determine if any actions would exceed the preset threshold levels for nonattainment and maintenance areas.

The proposed natural gas compression addition at Compressor Station 166 would not be within a nonattainment area and thus will not be subject to the General Conformity Rule. In addition, the proposed installation of electric driven compression at Compressor Station 185 in Prince William County would not result in a new source of operational emissions. Only the emissions associated with construction activities at Compressor Station 185, Cowpens M&R Station, and the mainline valve are potentially subject to General Conformity. However, VSEP II is not anticipated to result in emissions (subject to General Conformity determination) during construction or operation that exceed General Conformity applicability thresholds[29] and would not cause a new NAAQS violation or significantly contribute to a NAAQS violation. Therefore, the proposed VSEP II would meet conformity criteria.

State Minor Facility Permit Program and Stationary Source Air Quality Requirements

The potential-to-emit for the proposed compression addition at Compressor Station 166 would not exceed significant emission thresholds for criteria pollutants as defined in Virginia administrative code (VAC)[30] and greenhouse gases.[31] Therefore, construction and operation of the proposed turbines at Compressor Station 166 would be authorized under a minor New Source Review modification permit from the VDEQ.

Compressor Station 166 is subject to the requirements specified in the VAC for Existing Stationary Sources[32] and Permits for Stationary Sources.[33]

---

28 See https://www.fedcenter.gov/assistance/facilitytour/air/conformity/
29 See 40 CFR 93.153(b)(1).
30 See 9 VAC 5-80 Section 1110 and 9 VAC 5-80 Section1615.
31 See 9 VAC 5-85 Section 50.
32 See 9 VAC 5 40.

Construction Emissions Impacts and Mitigation

Emissions associated with construction activities would include combustion emissions and particulate matter fugitives. Combustion emissions would include nitrogen oxides, carbon monoxide, volatile organic compounds, PM_{10}, $PM_{2.5}$, sulfur dioxide, and trace amounts of air toxins from diesel or gasoline powered mobile sources such as construction equipment and vehicles. Fugitive dust emissions would result from construction activities such as excavation, grading, and clearing, and from vehicle traffic on paved and unpaved roads. Fugitive dust emissions would vary based on silt and moisture contents of the soil, frequency of precipitation, vehicle traffic, vehicle types, and roadway characteristics. In general, fugitive dust emissions would be higher during dry summer and autumn months. Additionally, cleared vegetative brush may be burned where permitted by law.

Transco estimated potential construction-related emissions using the methodology in the EPA's *Compilation of Air Pollutant Emission Factors*.[34] Estimated construction emissions are provided in table13 and are based on the anticipated equipment types to be used and their anticipated levels of use.

As shown in table 13, anticipated emissions from construction would not exceed the NAAQS. Combustion emissions from construction equipment would be minimized because the engines on construction equipment would be required to meet the standards for mobile sources established by the EPA non-road source emission regulations and imposed on equipment manufacturers.

Fugitive dust and construction emissions would occur during the construction period and would be primarily limited to the construction area. Fugitive dust and other construction emissions associated with pipeline construction would typically be intermittent and short-term at any one location because pipeline construction moves though individual areas relatively quickly. Fugitive dust and other emissions from construction activities generally do not result in a significant increase in regional pollutant levels, although local pollutant levels could increase temporarily.

Transco would require its contractors to incorporate dust mitigation measures into their operating programs. Various methods would be used to mitigate fugitive dust emissions, including minimizing the extent of the areas disturbed, minimizing the duration of the disturbance, application of dust suppressants, rinsing construction vehicles before they leave the work site, covering loads, and prohibiting excessive vehicle speeds on unpaved roads. Disturbed areas would be re-vegetated as appropriate.

---

33 See 9 VAC 5 80.
34 See AP-42.

Table 13. Summary of Potential Construction Emissions (in tons) from the Project

Source	Nitrogen oxides	Carbon monoxide	Sulfur dioxide	PM_{10}	$PM_{2.5}$	Volatile organic compounds	Greenhouse gas warming potential (CO_2e)	Formaldehyde	Total hazardous air pollutants
Greensville Lateral	39.98	63.41	7.23E-02	12.11	6.53	7.87	8,190.80	5.42E-02	0.17
Greensville M&R Station	8.96	8.86	1.57E-02	2.6	0.81	1.01	1,651.54	1.18E-02	3.78E-02
Compressor Station 166	32.42	29.49	5.16E-02	3.83	2.05	3.24	5,358.65	3.86E-02	0.12
Compressor Station 185	31.85	29	5.06E-02	3.8	2.02	3.18	5,258.52	3.79E-02	0.12
Odorization Sites	2.17	3.87	3.39E-03	2.34	0.56	0.48	463.29	2.54E-03	8.16E-03
Total	**115.38**	**134.64**	**0.19**	**24.67**	**11.97**	**15.79**	**20,922.80**	**0.15**	**0.47**

E = exponential notation indicating decimal placement (for example, 7.23E-02 = 0.0723)

$PM_{2.5}$ = particulate matter smaller than 2.5 microns in diameter

PM_{10} = particulate matter smaller than 10 microns in diameter

At any construction areas within 25 feet of a residence, Transco would require its contractors to wet all excavation areas, all unpaved work areas, and stockpiles of dusty materials. In addition, synthetic cover and wind breaks would be used as needed.

In conclusion, we find that construction-related impacts on local or regional air quality would not be significant.

Operation Emissions

Table 14 lists potential emissions from equipment proposed to be installed at Compressor Station 166. As previously noted and shown in table 14, Compressor Station 166 would not exceed PSD or Title V major source thresholds for either criteria pollutants or HAPs.

Transco conducted preliminary dispersion modeling using the American Meteorological Society/EPA Regulatory Model (AERMOD) to evaluate NAAQS compliance when combined with existing ambient background concentrations. The results of the dispersion modeling are provided in table 14. As shown in the table below, the modeled concentrations meet the NAAQS for all pollutants when combined with existing ambient background concentrations, demonstrating that impacts from operation of Compressor Station 166, when added to existing ambient concentrations, would remain below applicable NAAQS standards.

Based on the above review of the estimated emissions from construction and operation of VSEP II and an analysis of the modeled air quality impacts from operation of Compressor Station 166, we find there would be no regionally significant impacts on air quality.

Transco conducted preliminary dispersion modeling using AERMOD to evaluate NAAQS compliance when combined with existing ambient background concentrations. However, the results identified in Transco's Resource Report 9 filing identified only the air quality impacts from the new turbines that would be installed at Compressor Station 166. Therefore, **we recommend that**:

> **Prior to construction, Transco should file with the Secretary of the Commission (Secretary), for review and approval by the Director of OEP, the results of an air quality screening (AERSCREEN), or refined modeling analysis (AERMOD or EPA-approved alternative) for all of the emission generating equipment (including existing equipment) at Compressor Station 166. The results should demonstrate that the modeled existing emissions, plus the modeled incremental increase in emissions of criteria pollutants from the modifications either:**

a. result in local concentrations below the NAAQS where current modeled concentrations from the existing compressor station (existing and ambient background) are below the NAAQS; or

b. does not cause or contribute to significantly increased local area concentrations above the NAAQS where the current ambient background concentrations are currently above the NAAQS.

Based on the above review of the estimated emissions from construction and operation of VSEP II and our recommendation for modeled air quality impacts from operation of Compressor Station 166, we find there would be no regionally significant impacts on air quality.

Noise

Noise is measured in decibels (dB), which measures the energy of the noise. Because the human ear is not uniformly sensitive to all noise frequencies, decibels on the A-weighted frequency scale (dBA) were devised to correspond with humans' sensitivity. The human ear's threshold of perception for noise change is considered to be 3 dBA; 6 dBA is clearly noticeable to the human ear, and a 9 dBA increase is perceived as a doubling of noise.

Regulatory Requirements

Noise quality can be affected during construction and operation of pipeline projects and the magnitude and frequency of noise can vary considerably during the day, week, or the seasons, based on changing weather conditions, vegetative cover, and non-project sources of noise. Two measures that associate the time-varying quality of noise to its effect on people are the 24-hour equivalent sound level (L_{eq}) and day-night averaged sound level (L_{dn}). The L_{eq} is the level of steady sound with the same total (equivalent) energy as the time-varying sound of interest, averaged over a 24-hour period. The L_{dn} is the L_{eq} plus 10 dBA, added to account for people's greater sensitivity to nighttime sound (between the hours of 10:00 pm and 7:00 am). The A-weighted scale is used because human hearing is less sensitive to low and high frequencies than mid-range frequencies. In 1974, EPA published its *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety,*[35] providing information for state and local regulators to use when developing their own ambient noise standards. The EPA has determined that an L_{dn} of 55 dBA protects the public from indoor and outdoor activity noise interference. An L_{dn} of 55 dBA is equivalent to a continuous noise level of 48.6 dBA. For comparison, normal speech at a distance of three feet averages 60 to 70 dBA L_{eq}.

35 See the EPA Noise Report.

Table 14. Potential Emission Rates (tons per year) Associated with the Compression Addition at Compressor Station 166

Emission Source	Nitrogen oxides	Carbon monoxide	Volatile organic compounds	Sulfur dioxide	$PM_{2.5}$/ PM_{10}	Formaldehyde	Total hazardous air pollutants	Greenhouse gas warming potential
Turbine #3	18.24	18.51	2.12	0.96	2.24	0.241	0.34	40,189
Turbine #4	18.24	18.51	2.12	0.96	2.24	0.241	0.34	40,189
Turbine Start Ups/Shutdowns	0.29	25	0.29	-	-	0.032	0.045	24
Emergency Generator	1.33	2.66	0.67	0.0015	0.025	0.133	0.17	343
Equipment Leaks (fugitive emissions)	-	-	0.38	-	-	-	0.01	469
Natural Gas Venting/Blowdown	-	-	0.5	-	-	-	0.02	1,283
Facility-Wide Annual Totals	**38.1**	**64.7**	**6.1**	**1.9**	**4.5**	**0.647**	**0.92**	**82,497**
Permitting Requirement Thresholds								
Prevention of Significant Deterioration **/d**	40	100	40	40	10 / 15	N/A	N/A	N/A
Title V Major Source **/e**	100	100	100	100	100	10	25	N/A

$PM_{2.5}$ = particulate matter smaller than 2.5 microns in diameter
PM_{10} = particulate matter smaller than 10 microns in diameter
a/ Emission rate for normal operation at 0 degrees Fahrenheit.
b/ Maximum emission rate.
c/ Estimated annual maximum averaged over 8,760 hours per year.
d/ The Prevention of Significant Deterioration major source thresholds were obtained from 40 CFR 52.21(b)(23)(i) for areas in attainment of the NAAQS. Hazardous air pollutant emissions are not covered by the Prevention of Significant Deterioration permitting program.
e/ The Title V major source thresholds were obtained from 40 CFR 70.2 for areas in attainment of the NAAQS.
N/A not applicable to this project

FERC has adopted the EPA's determination and requires that a new compressor station not exceed an L_{dn} of 55 dBA at noise-sensitive areas (NSAs). In addition to noise requirements, FERC requires that operation of the compressor station not result in any perceptible increase in vibration.

Construction Noise Impacts and Mitigation

Construction noise is highly variable. Construction equipment operates intermittently, and the type of equipment in use at a given location at any point in time changes with the phase of construction. The sound level impacts on NSAs along the pipeline right-of-way due to construction activities would depend on the type of equipment used, the duration of use for each piece of equipment, the number of construction vehicles and machines used simultaneously, and the distance between the sound source and receptor. Nighttime noise due to construction would be limited because construction generally occurs during daylight hours, Monday through Saturday. Because of the temporary nature of construction activities, no long-term noise effects are anticipated from VSEP II construction. We conclude that construction activities associated with VSEP II would not result in any significant noise impacts.

Operational Noise Impacts and Mitigation

Noise from operation of VSEP II would result primarily from operation of the Greensville M&R, Compressor Station 166, and Compressor Station 185. Operational noise sources and impacts on nearby residences (the only NSAs identified in close proximity to the project) are shown below in table 15.

Table 15. Noise Quality Analysis for the Project

NSA	Distance from and Direction of NSA (feet)	Ambient Sound Level (dBA)	Calculated Sound Level of Existing Facility at Full Load Operation (dBA)	Estimated Total Sound Level of Proposed Additional Facilities at Full Load (dBA)	Estimated Total Sound Contribution (dBA) /a	Potential Increase in Sound Level (dB)
Greensville Meter and Regulator Station						
NSA #1	1,686 E	32.6	--	31.9	35.3	2.7
Compressor Station 166						
NSA #1	1,420 NE	67.9	67.9	48.6	68	0.1
NSA #2	1,920 NNW	51.8	51.8	45.5	52.7	0.9
Compressor Station 185						
NSA #1	730 NNW	67.7	67.7	47.8	67.7	0
NSA #2	750 N	70.1	70.1	46	70.1	0
NSA #3	1,320 S	53	53	43.8	53.5	0.5

a/ This includes the noise generated by the proposed facility plus ambient sound levels measured at the NSA.
NSA = noise sensitive area
dBA = decibels on the A-weighted frequency scale
dB = decibels

The noise impacts from the Greensville M&R Station would be below 55 dBA L_{dn}. The noise impacts from Compressor Station 166 would be below 55 dBA at NSA #2, and experience an insignificant increase of 0.1 dB at NSA #1. For Compressor Station 185, noise would increase at NSA #3 but remain below 55 dBA. Several NSAs at Compressor Stations 166 and 185 already experience noise levels above 55 dbA. To ensure that the noise from these compressor stations does not exceed the predicted noise levels, **we recommend that:**

> **Transco should file a noise survey with the Secretary for Compressor Stations 166 and 185 <u>no later than 60 days</u> after placing the stations into service. If a full power load condition noise survey is not possible, Transco should file an interim survey at the maximum possible power load <u>within 60 days</u> of placing the station into service and file the full power load survey <u>within 6 months</u>. If the noise attributable to operation of all equipment at the station under interim or full power load conditions exceeds predicted values at any nearby noise sensitive area, Transco should:**
>
> **a. file a report with the Secretary, for review and written approval by the Director of the OEP, on what changes are needed;**
>
> **b. install additional noise controls to meet that level <u>within 1 year</u> of the in-service date; and**
>
> **c. confirm compliance with this requirement by filing a second full power load noise survey with the Secretary for review and written approval by the Director of the OEP <u>no later than 60 days</u> after it installs the additional noise controls.**

Based on the noise analyses above and our recommendation, we conclude that operation of VSEP II would not have a significant impact on the noise environment in the vicinity.

B.8 RELIABILITY AND SAFETY

The transportation of natural gas by pipeline 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 major pipeline rupture. 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 pipeline and aboveground facilities associated with the project must be designed, constructed, operated, and maintained in accordance with the DOT Minimum

Federal Safety Standards in 49 CFR part 192. The regulations are intended to ensure adequate protection for the public and to prevent natural gas facility accidents and failures.

The DOT pipeline standards are published in parts 190-199 of title 49 of the CFR. For example, part 192 of 49 CFR specifically addresses natural gas pipeline safety issues, prescribes the minimum standards for operating and maintaining pipeline facilities, and incorporates compressor station design, including emergency shutdowns and safety equipment. Part 192 also requires a pipeline operator to establish a written emergency plan that includes procedures to minimize the hazards in a natural gas pipeline emergency.

The operator must also establish a continuing education program to enable customers, the public, government officials, and those engaged in excavation activities to recognize a gas pipeline emergency and report it to appropriate public officials.

Facilities associated with the proposed project must be designed, constructed, operated, and maintained in accordance with DOT standards, including the provisions for written emergency plans and emergency shutdowns. Transco would provide the appropriate training to local emergency service personnel before the facilities are placed in service.

Transco has stated that the VSEP II facilities would be designed, constructed, operated, and maintained in accordance with or to exceed the DOT Minimum Federal Safety Standards. Transco's construction and operation of the pipeline, modified compressor stations and aboveground facilities, and M&R station would represent a minimum increase in risk to the public. Transco would comply with all requirements of DOT and other applicable regulations, standards, and guidelines for safety. This would include compliance with applicable design standards and codes, construction provisions as mandated, and operation procedures and standards. We are confident that with implementation of the required design criteria for these facilities, they would be constructed and operated safely.

B.9 CUMULATIVE IMPACTS

In accordance with NEPA and with FERC policy, we evaluated the potential for cumulative effects of the project. Cumulative impacts represent 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.

This cumulative effects analysis generally follows a method set forth in relevant guidance (Council on Environmental Quality, 1997), (Council on Environmental Quality, 2005); (EPA, 1999) and focuses on potential impacts from the proposed project on

resource areas or issues where the incremental contribution would be potentially significant 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 project area; and
- cause this impact within all, or part of, the time span for the potential impact from the project.

Information about present and future planned developments was obtained through Transco's research as well as our own. Transco consulted sources including federal, state, and local agency and municipality websites, reports, and direct communications; permit applications with various agencies; and online database searches.

The region of influence varies for each resource and, therefore, different projects would influence the cumulative effects on different resources. The resource discussions below state the region of influence that was identified for cumulative impacts on that resource. Regions of influence range from distances to VSEP II (0.25 mile and 0.5 mile), to the watershed and the county in which the project is located.

Cumulative impacts on facilities in North Carolina and South Carolina were not considered because all proposed work would occur inside existing industrial areas, the work would be limited in extent and duration, and would not result in any permanent noise or air quality impacts.

Other Projects Potentially Contributing to Cumulative Impacts

Appendix E identifies 16 past, current, and planned projects that were evaluated for potential cumulative impacts on VSEP II project facilities in Virginia. Five projects would not contribute to cumulative impacts because they have already been completed and the effects are considered as part of the baseline for our environmental analysis, and two are not reasonably foreseeable with unknown construction timeframes.

The nine remaining projects could contribute to cumulative impacts with VSEP II (see table 16). These include the Atlantic Coast Pipeline (ACP), the Transco Dalton Expansion (TDEP), Atlantic Sunrise Pipeline (ASR), and Mountain Valley Pipeline (MVP) Projects, as well as four projects associated with the Power Station that would occur within the 240-acre VEPCO construction footprint, or near it (relocation of a segment of State Route 605 and three transmission lines). To provide a general

understanding of the proximity of these projects to the VSEP II facilities, table 16 identifies estimated impact acreages within 0.5 mile of the VSEP II project workspaces.

Table 16. Other Projects Contributing to the Virginia Southside Expansion II Cumulative Impacts

Project	Company	Construction	Operation	Overlap with VSEP II regions of interest (0.5 mile)
Atlantic Coast Pipeline	Dominion	9830	4667	8
Transco Dalton Expansion Project	Transco	1140	685	18
Atlantic Sunrise Pipeline	Transco	4126	1219	13.7
Greensville Power Station	VEPCO	1143	1143	240
Relocation of State Route 605	VEPCO	25	25	25
Transmission Line No. 585	PJM Interconnection, LLC	35	35	35
Transmission Line No. 503				
Transmission Line No. 596 ***a/***		--	--	--
Mountain Valley Pipeline	EQT and partners	5458	2687	12
Other Projects Total		**21757**	**10461**	**351.7**
VSEP II		**180.1**	**29.3**	**--**

a/ Acreage within VEPCO 240-acre total

Other projects within VSEP II's regions of influence are substantially larger than VSEP II and could have much larger impacts on environmental resources than VSEP II; in comparison, VSEP II's contribution to cumulative impacts for many environmental resources would be negligible. Transco would minimize VSEP II adverse environmental impacts by implementing appropriate measures as described in section B of this EA.

Atlantic Coast Pipeline Project

The ACP includes five proposed lateral pipelines totaling 564 miles; one of the proposed Atlantic Coast lateral pipelines would end on the VEPCO property near the proposed VSEP II Greensville M&R Station. Four of the lateral pipelines would cross parts of Brunswick and Greensville Counties. About 8 acres of land within 0.5 miles of VSEP II could also be affected by ACP construction.

Transco Dalton Expansion Project

The TDEP includes 115 miles of new natural gas pipelines and one new compressor station in Georgia, in addition to facility modifications. Some of these modifications would take place at Compressor Station 165 (MP 1413.0), which is

adjacent to Compressor Station 166 (MP 1412.95). About 18 acres of land within 0.5 acres of VSEP II could also be affected by TDEP construction.

Atlantic Sunrise Project

The ASR includes 195.2 miles of new natural gas pipelines, 2.5 miles of pipeline replacement, two new compressor stations, and modifications of existing facilities. Some of the modifications have been proposed at Compressor Station 185, where modifications for VSEP II would also occur. About 13.7 acres of land within 0.5 miles of the VSEP II would be affected by ASR construction.

VEPCO Power Station

The Power Station includes a 240-acre site for the new combined-cycle unit facility, including laydown sites for the required equipment staging, a new substation, a new 0.2-mile 500-kilovolt transmission line including foundations and towers, upgrades of two 0.9-mile existing parallel transmission lines, a new 500-kilovolt breaker switching station, and supporting facilities in Greensville and Brunswick Counties. The entire project, which would include the installation of new generators, gas turbines, a new switchyard, water and fuel oil storage tanks, a cooling tower, new potable water lines, auxiliary boilers, a new electrical substation, water treatment facilities, and stormwater retention ponds, are all being constructed on the VEPCO Power Station property.

One new powerline at end of the proposed Greensville Lateral would be required to provide electricity to the Greensville M&R station. The Greensville M&R station would be connected to overhead powerlines that would be constructed as part of the VEPCO project. The Greensville M&R station would also be connected to the new combined-cycle facilities by associated piping (less than 1 mile long) that would be constructed on the VEPCO property, by VEPCO.

Initial tree clearing has already occurred on the Power Station land parcel, but construction of facilities has not yet started. For this analysis, we estimate that about 35 acres of land overlaps with VSEP II near the proposed Greensville M&R Station site at MP 4.19.

Relocation of State Route 605 Segment

A portion of State Route 605 would have to be re-routed in order for the planned Power Station to be sited and aligned with the existing transmission system. This segment re-route would occur within 0.5 miles of VSEP II; the total acreage of this project is not available, for this analysis, we have estimated that it would affect about 25 acres.

Greensville-Rogers Road Transmission Line No. 596

The acreage for this transmission line, which is associated with the Power Station, is included in the Power Station's 240-acre total.

Carson-Rogers Road Transmission Line No. 585 and Rogers Road-Heritage Transmission Line No. 503

These transmission lines would connect the planned Power Station to the existing transmission line network. A portion of these two transmission lines would be within the 240-acre parcel of VEPCO land; an additional 35 acres of land is within 0.5 miles of the VSEP II and outside of the 240-acre parcel would also be affected by construction of the two transmission lines.

Mountain Valley Pipeline Project

The MVP includes about 301 miles of new natural gas pipelines and three new compressor stations. This project would end at Compressor Station 185, where modifications for VSEP II would also be installed. About 12 acres of land within 0.5 miles of VSEP II would also be affected by MVP construction.

Potential VSEP II Cumulative Impacts

Resources evaluated for cumulative impacts within the VSEP II regions of influence include geology and soils, water resources and wetlands, vegetation and wildlife (including special status species), cultural resources, land use and visual resources, and air quality and noise. Based on the impacts of the project as identified and described in this EA and consistent with CEQ guidance, we have determined that the following resource-specific regions of influence are appropriate to assess cumulative impacts:

- Geology and soils: the region of influence considered for cumulative impacts is 0.25 mile from the Virginia VSEP II facilities, because impacts are localized to the construction right-of-way and mitigation measures, including erosion and sediment controls, would contain impacts within or directly adjacent to proposed workspaces.
- Water resources, wetlands, vegetation, fisheries, and wildlife: the region of influence considered is the HUC 8 watershed boundary which contains VSEP II; impacts within waters or wetlands could migrate downstream within the

watershed. Furthermore, climate, habitat types, water availability within distinct watersheds can also affect the types of vegetation and wildlife in that area.

- Cultural resources: the region of influence considered is the VSEP II project footprint, as impacts would be contained within the project workspaces and cumulative impacts would only arise where other projects/actions overlap with known cultural features potentially affected by the project.
- Land use and visual resources: the region of influence considered is a 0.5-mile radius from the new and modified VSEP II aboveground facilities in Virginia to encompass areas with specialized or recreational uses, as well as potential visual impacts.
- Air quality and noise: the regions of influence considered for air quality is the county border (the scale that air quality information is available) and for noise is 0.5 mile from the VSEP II footprint. Given the temporary nature of project construction and the limited geographic scope of construction, construction-related air quality impacts would be intermittent, highly localized to the pipeline construction right-of-way and the aboveground facility areas.

Our review has determined that VSEP II would not affect groundwater, federally and state-listed species, or cultural resources and therefore would not contribute to cumulative impacts on these resources. Therefore, these resources are not addressed further in this cumulative impacts analysis.

Geology and Soils

Our review has determined that VSEP II would not contribute to adverse cumulative impacts on:

- mineral resources;
- surface or underground mines; or
- prime farmlands.

Cumulative impacts would be most significant if the projects were constructed at or near the same time and within proximity to one another. Four planned projects (relocation of State Route 605, Power Station, and the three transmission lines) were identified within the region of influence (see appendix E), totaling about 95 acres within the region of influence.

It is reasonable to expect that current, proposed, or reasonably foreseeable future projects would involve grading and other temporary ground disturbance activities associated with construction. The construction of these projects has the potential to affect near-surface geologic resources and soils through wind and water erosion, blasting, and poor post-construction soil stabilization and restoration. Permanent impacts would occur

if other past, present, or reasonable foreseeable future projects have or will convert land to impervious surfaces; however, this impact would not be significant based on the minor permanent impacts proposed from access roads and aboveground facilities for VSEP II.

Because the VSEP II would be constructed in 2017-2020 and the four other projects would be constructed in 2016-2019, the disturbed areas would likely occur simultaneously within the same region of influence for geology and soils. Cumulative impacts would occur where both projects disturb the same areas, which, if it occurs, would likely be along the easternmost 1.5 mile of the Greensville Lateral, where it would connect to the Power Station facilities. We expect cumulative impacts would be minor, based on the existing industrial use in the area of overlap of construction workspaces of the projects. Further, the other projects would adhere to similar erosion and sedimentation control plans and procedures to minimize erosion impacts.

As described in section A.5, effects from the construction and operation of the VSEP II facilities would be relatively minor and would be minimized by implementation of Transco's construction plans. In addition, the four construction projects discussed above are required to apply for similar federal and state permits that require implementation of erosion and sediment control measures. Therefore, we conclude that VSEP II's contribution to cumulative impacts on geological resources and soils would not be significant.

Surface Waters and Wetlands

Construction of VSEP II would result in temporary impacts on 14 waterbodies at 15 locations (see section B.2 and table 7). These waterbodies are within the Meherrin River Watershed. Compressor Station 185 is within the Middle Potomac-Anacostia-Occoquan watershed, and Compressor Station 166 is within the Bannister River watershed (see table 17).

Six projects – the relocation of State Route 605, the Power Station, the ACP, and the three transmission lines were identified within the same region of influence (Meherrin River) as VSEP II's Greensville Lateral pipeline, launcher facility, and Greensville M&R Station. One project – the ASR - would occur within the same region of influence (the Middle Potomac-Anacostia-Occoquan) as the VSEP II Compressor Station 185 modifications.

The construction projects involve grading and other ground-disturbing activities that have the potential to affect surface water and wetlands within the watersheds crossed by VSEP II. The construction of all of the projects has the potential to affect surface waters and wetlands through increased turbidity because of direct impacts associated with waterbody crossings and potentially reintroducing buried contaminated sediments into

the water column, and indirect impacts associated with improper erosion control devices and increased pollutants due to the potential for leaks and spills. General impacts on water quality resulting from the projects discussed in section B.9 are anticipated to be similar to those described for VSEP II in section B.2.

Surface Water

The seven projects potentially contributing to cumulative impacts on waterbodies would be required by various federal, state, and local agencies to use mitigation measures to minimize erosion and sedimentation into surface water resources.

Table 17. Watersheds within the Project Region of Influence

Facility		Watersheds (HUC 8)		
		Meherrin	Middle Potomac-Anacostia-Occoquan	Bannister
VSEP II	Greensville Lateral	✓		
	Launcher Facility	✓		
	Greensville M&R Station	✓		
	Compressor Station 185		✓	
	Compressor Station 166			✓
State Route 605 Relocation		✓		
Greensville Power Station		✓		
Atlantic Coast Pipeline		✓		
Transco Dalton Expansion Project CP15-117				✓
Atlantic Sunrise Project CP15-138			✓	
Greensville-Rogers Road transmission line No. 596		✓		
Carson-Rogers Road transmission line No. 585		✓		
Rogers Road-Heritage transmission line No. 503		✓		
Mountain Valley Pipeline Project				✓

The ACP would cross a total of 1,294 waterbodies; FERC classifies 14 of these waterbodies as major waterbodies, 371 as intermediate waterbodies, 882 as minor waterbodies, and 27 as open water ponds. Forty-four of these waterbodies would be crossed within the Meherrin River watershed using a dry-ditch method. One waterbody within the VSEP region of influence, the Meherrin River, would be crossed by open-cut.

The TDEP would cross 354 waterbodies by either horizontal directional drill or a dry-ditch method; although the proposed work at Compressor Station 185 for DEP occurs within the Banister River watershed, no new waterbody crossings have been proposed for this construction site.

The ASR would cross 333 waterbodies; FERC classifies six of these as major waterbodies, 101 as intermediate waterbodies, and 227 as minor waterbodies. Four of these waterbodies would be crossed within the Middle Potomac-Anacostia-Occoquan watershed.

The VDEQ reviewed the combined projects for the Power Station project, which included the road relocation and the three transmission lines. These projects would affect seven streams; all of these occur within the Meherrin River watershed.

VSEP II would not result in any permanent fill of surface water resources or alterations of flow. Therefore, construction and operation of VSEP II and current, planned, or reasonably foreseeable future projects would result in temporary and minor impacts on surface water resources. The greatest potential for cumulative impacts would be sediment loading from construction within or runoff into waterbodies. During project construction, water withdrawals from surface waters would come Reedy Creek along the construction right-of-way; this water would be discharged either within a well-vegetated upland area according to the FERC *Procedures*. The seven additional projects would use water as needed for fugitive dust control and pressure testing, as permitted by state and federal agencies. As discussed in section B.2, Transco would implement measures in its *Spill Plan* to prevent and manage inadvertent spills.

As described in section A.5, effects from the construction and operation of the proposed VSEP II facilities would be temporary, relatively minor, and would be further minimized by implementation of Transco's construction plans. In addition, the other projects would be required to apply for Clean Water Act Section 401 permits to minimize impacts on water quality. Therefore, we conclude that VSEP II's minor additive impacts on waterbodies would not contribute to significant cumulative impacts on surface water resources within the affected watersheds.

Wetlands

Based on our review, VSEP II would not contribute to any cumulative impacts on USDA NRCS Wetland Reserve Program easements.

The ACP would have 1,068 wetland crossings and 656.7 acres of temporary wetland impacts for construction. Of this total, 478 wetland crossings would occur in Virginia. 192.4 acres of PFO wetlands and 12.0 acres of palustrine scrub-shrub (PSS)

wetlands would be permanently converted to palustrine emergent (PEM) wetlands. Access roads would affect another 14.2 acres of land for the entire project, including 0.1 acre of PEM and 0.6 acre of palustrine forested (PFO) in Greensville County, and 0.1 acre of PFO in Brunswick County. The amount of wetlands affected by ACP within the Meherrin River watershed is undetermined.

The TDEP would cross 109 wetlands and have 23.6 acres of temporary wetland impacts from construction; 14.7 acres of wetlands would be permanently impacted by operation

The ASR would have 260 wetland crossings and 48.4 acres of temporary wetland impacts from construction. Of this total, 10 wetland crossings (2.2-acre total, all PEM wetlands) would occur in Virginia. The number of these wetland crossings within the Middle Potomac-Anacostia-Occaquan watershed is undetermined.

The VDEQ reviewed the combined projects for the Power Station project, which included the road relocation and the three transmission lines. The wetland delineations for the project's total impacts on wetlands for the 1,143 acre parcel has not been finalized; however, about 0.6 acre of wetlands within VSEP II's region of influence (the Meherrin River watershed).

The MVP would have 6.2 acres of temporary and 3.1 acres of permanent impacts on wetlands within the VSEP II region of influence.

All wetland impacts associated with construction of VSEP II would occur along the pipeline route. VSEP II would result in temporary impacts on 0.9 acre of wetlands, while operations would permanently affect about 0.6 acre of wetlands, mostly through the conversion of PFO and PSS wetlands to PEM wetlands (see section B.2). Cumulative impacts on wetlands would occur when construction and operation of other past, present, and reasonably foreseeable future projects result in the filling or conversion of the same wetland type within the watershed. Individual wetlands could be cumulatively affected if multiple projects affect the same wetlands in the same general timeframe, which would encompass both the construction period and the time necessary for wetlands to restore to former functionality.

Impacts on nearby jurisdictional wetlands would be reduced by implementing BMPs required by the Virginia Pollution Discharge Elimination System permit. There is the potential for cumulative impacts to occur from wetland vegetation clearing, access road construction, or sedimentation, which may occur from construction within or around a wetland. Land use data indicates that there are about 50,000 acres of wetlands within the Meherrin River watershed (North Carolina Department of Environmental Quality,

2016). Of this acreage, a minimal portion (less than 1 percent) would be affected by VSEP II projects.

Most of the estimated impacts on wetlands would be temporary because VSEP II does not include permanent fill of a wetland, and most impacts would be from conversion of PFO and PSS wetlands to PEM wetlands. The creation of new wetlands and restoration or enhancement of existing wetlands through compensatory mitigation, if required by the USACE and other state agencies, would appropriately mitigate for impacts on wetland resources and minimize any cumulative wetland impacts from past, present, and reasonably foreseeable future projects.

As described in section B.2, effects from the construction and operation of the VSEP II facilities would be relatively minor and minimized by implementation of Transco's construction plans, including the FERC *Procedures*. Therefore, we conclude that VSEP II's minor contribution of additive impacts in the watershed would not contribute to significant cumulative impacts on wetlands.

Vegetation, Fisheries, and Wildlife

The Meherrin watershed (about 1,600 square miles) is also VSEP II's region of influence for vegetation, fisheries, and wildlife because climate, habitat types, water availability within distinct watersheds can also affect the types of animals that live in that area. The Power Station and six additional projects were identified within the region of influence for vegetation, fisheries, and wildlife in the Meherrin River watershed (see table 17).

Vegetation

Cumulative impacts on vegetation would occur if current, planned, or reasonably foreseeable future projects within the geographic boundary affected a large percentage of any existing vegetation type or caused a large amount of fragmentation, thereby blocking the efficiency of seed distribution. The introduction or spread of invasive, non-native species, such as noxious weeds, also has the potential to cumulatively affect native plant populations.

The ACP would affect 4,280.8 acres of upland forest for construction and 2,458.3 acres for project operation.

The TDEP would affect 475.5 acres of various vegetation types for construction and 447.1 acres for project operation; this includes 296.6 acres of temporary upland forest impacts.

The ASR would affect 1860.2 acres of various vegetation types for construction and 518.0 acres for operation ; this includes 1,128.7 acres of temporary impacts on upland forest and 436.2 acres of permanent upland forest impacts.

The Power Station project, which is associated with the road relocation and the three transmission lines, would temporarily affect about 1143.0 acres of land for construction, and 275 acres of land for operation. This land is primarily old pine plantation land that has already been cleared; since the clearing has already happened, this 1,143 acre impact is now considered part of the area's baseline conditions and therefore would not contribute to the cumulative impacts of VSEP II.

The MVP would have a temporary impact on 4,859.5 acres of various vegetation types and operation would permanently affect 1,714.1 acres; of this total, 4, 772.3 acres of forest would be temporarily impacted and 1,678.8 acres would be permanently impacted.

Construction of VSEP II would temporarily affect about 179.3 acres of various vegetation types and permanently affect about 28.3 acres of vegetation, including 12.4 acres of forested land. The 240 acres affected by the VEPCO project within the VSEP II region of influence has been re-zoned for industrial purposes, and is mostly cleared open land with small-sized wooded areas left for visual buffers during construction.

Crops and native low-growing vegetation would be allowed to regrow within the VSEP II rights-of-way and would recover within 1 to 2 years. No active cropland would be affected by the Power Station, however the other projects may affect some agricultural lands. Forested upland areas within the construction workspace for all of the contributing projects would experience long-term impacts, because the regrowth of forested areas to pre-construction conditions could take 20 to 30 years for many species, while many hardwood species could take more than 50 years to reach maturity.

As described in section B.3, effects from the construction and operation of the proposed pipeline facilities would be relatively minor and would be minimized by implementation of Transco's construction plans (for example, the *Invasive Species Management Plan*), the FERC *Plan* and *Procedures*; therefore, we conclude that construction and operation of the VSEP II and the other projects considered would not result in significant cumulative effects on vegetation in consideration of other current, planned, or reasonably foreseeable projects would not be significant.

Fisheries

Cumulative impacts on fisheries and aquatic resources could occur if current, planned, or reasonably foreseeable future projects occur within the same segment of a

waterbody as VSEP II, and would be compounded if they have similar construction timeframes. In addition to potential impacts from habitat alteration, destruction of stream cover, interruption of fish migration and spawning, water depletions, and entrainment tor entrapment during construction, the greatest potential impacts are related to water quality degradation through sedimentation, turbidity, erosion, and accidental spills. The Meherrin River watershed contains high quality warmwater streams that provide habitat to many state-listed threatened and endangered aquatic species.

Table 18. Fisheries within the Project Region of Influence

Project	Fishery Types			
	Warmwater	Coldwater	Migratory fish species	Trout Waters
VSEP II	✓			
Atlantic Coast Pipeline	✓			✓
Dalton Expansion Project	✓	✓		✓
Atlantic Sunrise Pipeline	✓	✓	✓	✓
Greensville Power Station	✓			
Relocation of State Route 605	✓			
Transmission Line No. 585	✓			
Transmission Line No. 503	✓			
Transmission Line No. 596	✓			
Mountain Valley Pipeline	✓	✓		

The 15 waterbodies proposed to be crossed by VSEP II are warmwater fisheries. As stated above, seven of these waterbodies would also be affected by the Power Station. Construction that would occur within the waterbodies or on the banks has the potential to cause temporary sedimentation that would be compounded if multiple projects occurred simultaneously. Combined, these contributing projects could result in water quality impacts and could potentially affect aquatic species within the larger Meherrin River watershed, and could potentially contribute minor additive effects to waterways feeding the Meherrin River by increasing sedimentation or releasing petroleum products.

Based on the characteristics of the affected waterbodies, the amount and quality of habitat found in these waterbodies, Transco's proposed construction methods, and VEPCO's permit requirements, we conclude that construction and operation of the VSEP II and the other projects considered would not result in significant cumulative affects to fisheries resources.

Wildlife

Construction of VSEP II and the nine other projects would affect wildlife. The primary impact on wildlife would be short-term due to removal of vegetation habitat and the displacement of wildlife from construction areas. Temporary impacts include but are not limited to, impacts on food, cover, and water sources. Construction noise would cause most mobile species to avoid areas during construction.

Cumulatively, VSEP II and the nine other contributing projects would affect 531.8 acres of land for construction in VSEP II's region of influence; permanent operational impacts would be less than this, but is unspecified for the contributing projects. Wildlife uses this land as habitat.

Transco proposes to collocate VSEP II with existing rights-of-way (Dominion's, the State of Virginia's, and Virginia Beach Water's rights-of-way) for about 71 percent of the pipeline alignment (and thus follow existing forest edges) to minimize impacts on wildlife habitat. This would decrease the impacts associated with undisturbed habitats and vegetation, which would limit the project's contribution to cumulative impacts on wildlife habitats, including migratory birds. The Power Station and the interconnect piping would be entirely within VEPCO's property boundaries, and most of this land has been routinely disturbed for logging and therefore of lower wildlife habitat quality than undisturbed areas. The electrical facilities to the M&R station would result in minor ground disturbance, and a negligible impact on wildlife.

The effect of workspace clearing on forest wildlife species would be greater than on open habitat wildlife species concerning restoration and growth rate of forested habitat. This would potentially result in the cumulative loss of individuals of small mammal species, amphibians, reptiles, nesting birds, and non-mobile species from these areas. Project restoration activities would restore some vegetation cover in the forested areas unless the habitat was removed for structures or impervious surfaces. Typically, when restoration has been completed in an area, wildlife will return to the construction areas and adjacent areas to use the habitat. To minimize impacts, temporary disturbance areas would be revegetated following construction.

As described in section B.3, effects from the construction and operation of the VSEP II facilities would not affect wildlife populations and would be minimized by implementation of FERC *Plan* and *Procedures*. We conclude that construction and operation of the VSEP II and the other projects considered would not result in significant cumulative effects on wildlife, in consideration of other current, planned, or reasonably foreseeable projects, would not be significant.

Land Use and Visual Resources

The region of influence that was identified for cumulative impacts on land use, recreation, and visual resources is a 0.5-mile radius from the new and modified VSEP II aboveground facilities in Virginia to encompass areas with specialized or recreational uses, as well as potential visual impacts. A 0.5-mile radius around a specific point includes 500 acres of land. Seven of the contributing projects would all occur within a 0.5 mile-radius of the Greensville M&R Station.

About 351.7 acres of land within 0.5-mile radius by the Greensville M&R Station would be affected by the construction of these seven other projects (see table 16).

TDEP and the MVP would occur within the region of influence for Compressor Station 165, which is next to VSEP II's Compressor Station 166 modifications. A total of 30 acres (6 percent) of the land use and visual resources within the VSEP II region of influence would also be impacted by these two other projects.

The construction and operation of VSEP II and other current, planned, and reasonably foreseeable future projects would result in temporary and permanent cumulative impacts on land use. About 71 percent of VSEP II would be collocated with existing utility corridors, which would reduce visual and land use impacts. The proposed VSEP II would be collocated with Dominion's, the State of Virginia's, and Virginia Beach Water's existing systems.

While many of the impacts would be temporary, construction of VSEP II would result in some permanent land use changes from forested areas to maintained right-of-way or aboveground facilities. Visual impacts along the right-of-way would be minor, with the largest impacts related to a conversion of forested land to open land. Visual impacts VSEP II's aboveground facilities would include additional fencelines and the loss of trees. The Greensville M&R station would be constructed near planned industrial structures on VEPCO property; however, expansion of the existing aboveground facilities would include extending fencelines to include the new construction. Likewise, the electrical facilities would be constructed adjacent to existing electrical powerlines. These locations would not result in any visual impacts not already planned for the proposed M&R station site, and the two mainline valves have been proposed within previously disturbed, permanently maintained right-of-way.

If the project was built at the same time as other projects, cumulative impacts could result on recreation and on special-interest areas if other projects affect the same areas or features at the same time. Because the other eight construction projects would

affect industrial land (previously agricultural use for a pine tree plantation) and road rights-of-way at the same time as VSEP II, and because almost 71 percent of the proposed project would be constructed near existing rights-of-way as well as being located within previously disturbed and logging areas, we conclude that VSEP II's contribution to cumulative impacts on current land use and visual resources would not be significant.

Air Quality and Noise

The regions of influence for cumulative impacts on air quality is the county border (the scale that air quality information is available) and noise is 0.5 mile from the VSEP II footprint. Given the temporary nature of project construction and the limited geographic scope of construction, construction-related air quality impacts would be intermittent, highly localized to the pipeline construction right-of-way and the aboveground facility areas. The VSEP II would include compressor station modifications, which could cause changes in operational emissions and aboveground facilities that could contribute to cumulative impacts on air quality or noise. Of the projects potentially contributing to cumulative impacts in appendix E, five projects were identified within Greensville County and two were identified within Pittsylvania County.

The emissions from construction and operation of these contributing projects would add to levels of air pollution measured in their respective counties.

The impacts most likely to be noticed by local residents would be from fugitive dust from construction of projects within the region of influence. The combined effect of multiple construction projects occurring in the same area and timeframe as the proposed Transco project could temporarily add to the ongoing air quality effects of existing activities. These impacts may be minimized by mitigation measures, such as using properly maintained vehicles, using commercial gasoline and diesel fuel products with specifications to control pollutants, implementing fugitive dust control measures, and using erosion control devices to prevent erosion. However, the contribution of VSEP II and the other projects would be minimal, because effects would generally be localized and other projects would be required to comply with the CAA and state air quality regulations. For the Power Station, the operator must apply for a revised Title V operating permit. In addition, VEPCO would also have to abide by the New Source Performance Standards that enact emission standards on new facilities, the National Emission Standards for Hazardous Air Pollutants, which regulate hazardous air pollutant emission sources, and remain in compliance with federal and state Prevention of Significant Deterioration thresholds. Based on this information and the minor and temporary impact of VSEP II, we conclude that VSEP II's minor and temporary contribution to cumulative air quality impacts would not be significant.

Noise impacts associated with VSEP II construction would be temporary, and VSEP II operation would permanently increase the existing noise level at the modified aboveground facilities during operation.

Construction Noise

Noise impacts are highly localized and attenuate quickly as the distance from the noise source increases; therefore, cumulative impacts are unlikely, unless one or more of the other projects are constructed at the same time and location. Assuming that the eight other projects would be constructed at the same time as VSEP II, most noise impacts would occur during daytime hours and be intermittent rather than continuous.

Operation Noise

As discussed in section B.6, the increase in noise from each aboveground facility in Virginia would be perceptible by humans at the NSAs nearest to the Greensville M&R Station (0.3 mile away), Compressor Station 166 (0.3 and 0.4 mile away), and Compressor Station 185 (0.25 mile). Two of the NSAs near Compressor Station 185 (each 0.14 mile away) already experience existing noise levels louder than what the modifications would add. These noise levels take into account the ambient noise, which would include any existing natural or man-made sources of noise. Because of this, the noise analysis presented in section B.6 is a cumulative analysis. Compressor Stations 166 and 185 are existing noise sources and the modifications would represent a minor change in noise levels.

The other eight projects within the region of influence would be required to adhere to similar construction noise requirements and mitigation measures as VSEP II; therefore, cumulative noise impacts on residents and surrounding communities would not be significant.

Conclusion on Cumulative Impacts

We believe that impacts associated with VSEP II would be relatively minor, and we are recommending additional measures to reduce the environmental impacts associated with the proposed project. A majority of the cumulative impacts identified from current, proposed, or reasonably foreseeable future projects or activities in the region of influence would also be temporary and minor. Consequently, a small and insignificant cumulative effect is anticipated when the impacts of VSEP II are added to past, present, or reasonably foreseeable future projects in the regions of influence.

C. ALTERNATIVES

In accordance with NEPA and Commission policy, we evaluated alternatives to the project to determine whether they would be reasonable and environmentally preferable to the proposed action. These alternatives included the no action alternative, a system alternative, and pipeline route alternatives. The evaluation criteria used for developing and reviewing alternatives were:

- technical and economic feasibility and practicality;
- significant environmental advantage over the proposed action; and
- ability to meet the project's stated objective.

Information used to evaluate alternatives to VSEP II included published studies, comments and suggestions from regulatory agencies, analyses prepared for similar projects, comments from the public, data provided by Transco in its application and supplemental filings, and our own independent analysis. Each alternative was considered until it was clear that the alternative was not reasonable or that the alternative would not provide a clear environmental advantage to the proposed VSEP II. It is anticipated that minor alignment shifts may be required prior to and during construction to accommodate currently unforeseeable site-specific constraints related to engineering, landowner, and environmental concerns. All such alignment shifts would be subject to review and approval by the FERC.

During the application process, Transco refined the proposed route based on discussions with landowners, land managing agencies, project engineers, and FERC staff input to avoid or minimize impacts on sensitive resources, reduce or eliminate engineering and constructability concerns, and/or avoid or minimize conflicts with existing land uses. These adopted route variations are described in table 19 and are considered in our environmental analysis of VSEP II in section B.

C.1 NO-ACTION ALTERNATIVE

If the Commission were to deny Transco's application, the project would not be built and the environmental impacts identified in this EA would not occur. Under this alternative, VEPCO would likely not be able to commence operations of its natural gas Power Station as scheduled and would need to secure another source of natural gas. Additionally, other projects and activities would be needed to meet the demand of the Power Station which would likely be associated with direct or indirect environmental impacts similar to or greater than the proposed project. No other project has been identified to meet the purpose and need of the proposed project. Therefore, we have concluded that the no-action alternative is not environmentally preferable to the proposed project.

Table 19. Minor Route Variations Incorporated into the Project

Milepost Range (Original Proposed Siting)		Reason for Variation from Originally Proposed Pipeline Corridor
3.02	3.20	Minor route deviation to eliminate a Greensville Creek crossing. This would require a similar amount of tree clearing as the original proposed route.
2.87	3.87	Adjusted to avoid potentially National Register of Historic Places-eligible cultural resource and a scrub-shrub wetland. This adjustment crosses a forested wetland that was not previously affected. The route modification was developed in response to correspondence with the Virginia Department of Historic Resources received on March 26, 2015 that indicated the cultural resource designated 44BR0153 is potentially eligible for listing in the National Register of Historic Places and should be avoided by the project. As a result, Transco has rerouted the proposed Greensville Lateral west of the previously proposed route between milepost (MP) 2.87 and MP 3.51 to avoid the potentially eligible cultural resource. Existing power lines located east of the previously proposed route and landowner requests necessitated the development of a route to the west.
3.41	3.58	Minor route deviation to eliminate a Greensville Creek crossing. This would require a similar amount of tree clearing as the original proposed route.
3.58	3.81	Shifted pipeline alignment 50 feet east to follow civil survey parcel boundaries. Also avoids a forested wetland and a scrub-shrub wetland previously affected.
4.27	4.33	Adjusted location of Greensville M&R Station 90 feet west to account for VEPCO's Power Station change in siting plans. Alignment of pipeline adjusted to account for new position of Greensville M&R Station.

C.2 SYSTEM ALTERNATIVES

System alternatives would make use of existing, modified, or proposed pipeline systems to meet the stated objectives of VSEP II. Although some modifications or additions to existing or proposed pipeline systems may be required, implementation of a system alternative would deem it unnecessary to construct all or a part of the project. These modifications or additions could result in environmental impacts that are less than, similar to, or greater than those associated with construction and operation of the project. The purpose of identifying and evaluating system alternatives is to determine whether the environmental impacts associated with construction and operation of the project could be avoided or reduced by using another pipeline system, while still meeting the objectives of the project.

We identified and evaluated two existing pipelines in southern Virginia that potentially could meet the objectives of the project, which are Transco's existing South Virginia Lateral A and South Virginia Lateral B pipelines. No other existing, modified, or proposed systems have the ability to meet the objectives of the project. The Transco South Virginia Lateral A Pipeline is a 144.7-mile-long, 20-inch-diameter natural gas pipeline that originates in Chatham, Virginia and terminates in Ahoskie, North Carolina. Transco stated the South Virginia Lateral A pipeline is fully contracted (in other words,

has no available capacity as it is presently built); this alternative would require construction of looping pipeline, or replacing the line with a larger pipe. Additionally, Transco would still have to build a lateral pipeline to connect the Greensville County Power Station to the Transco system. The South Virginia Lateral B Pipeline system alternative would decrease the number of additional compression units that would be required at Compressor Station 166, but would require 65 miles of additional looping to support the proposed capacity at appropriate operating pressures an d a 5-mile pipeline connecting the existing Brunswick Lateral to the Power Station.

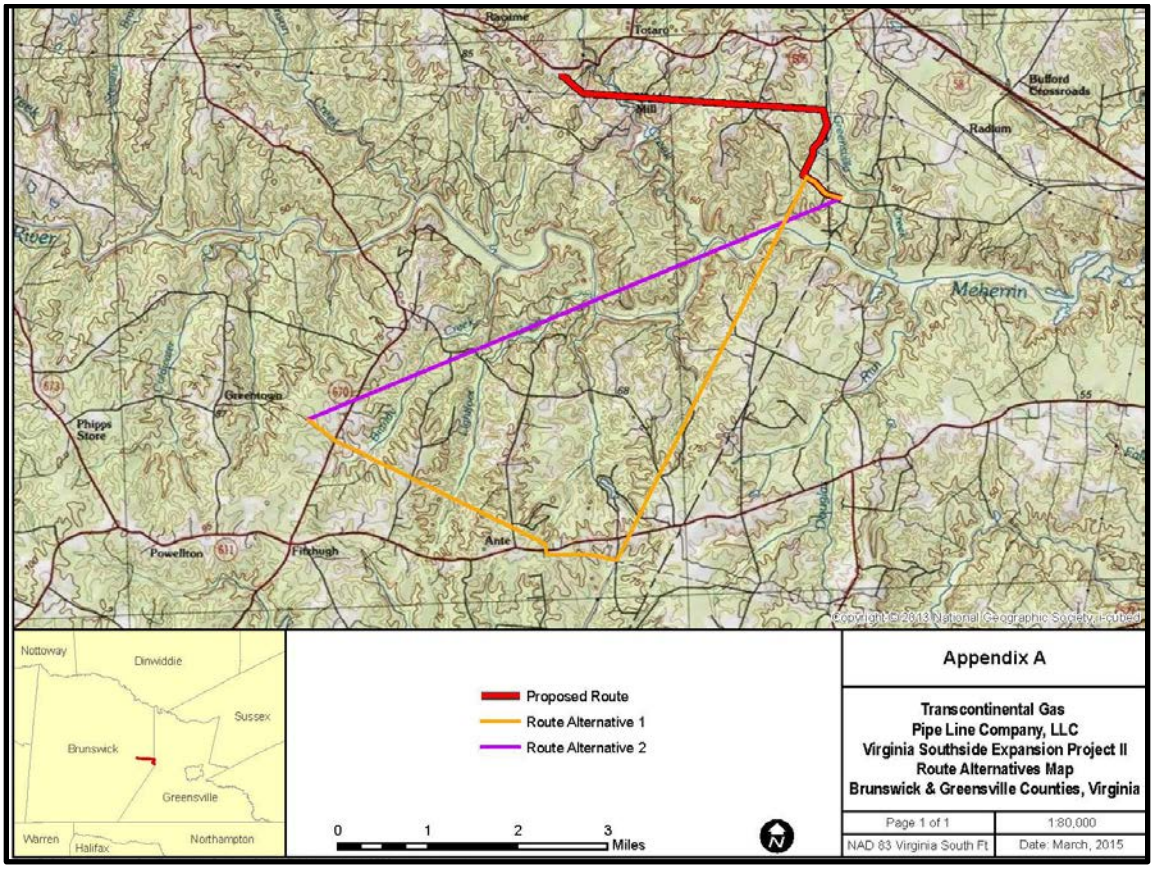
The construction of these system alternatives would have similar or greater environmental impacts as the project. The Greensville Lateral would also be required to deliver gas to the Power Station. For these reasons, we conclude the South Virginia Lateral A and SVL B Pipeline System Alternatives do not provide a significant environmental advantage over the proposed action.

C.3 MAJOR ROUTE ALTERNATIVES

Major route alternatives were identified to determine if these alternatives could avoid or reduce impacts on environmentally sensitive resources. While the origin and delivery points of a major route alternative are generally similar to the proposed route, major route alternatives could follow routes significantly different from the proposed pipeline. Major route alternatives would not modify or make use of an existing pipeline system as would a system alternative.

Transco's route for the proposed Greensville Lateral pipeline was selected to connect the Power Station to the existing Transco pipeline system in southern Virginia, using existing Transco pipelines to the extent feasible. This would be preferable to constructing a new route through undisturbed area and would minimize construction and operational impacts. For the proposed Greensville Lateral, Transco stated that it developed the pipeline alignment to result in the shortest route possible that would minimize construction and operational impacts on sensitive resources. Two major route alternatives along Transco's proposed route for the Greensville Lateral pipeline were identified and analyzed (see figure 3). Both of the major route alternatives assumed a fixed starting point at the location of the interconnect between the Brunswick Lateral and the South Virginia Lateral and an interconnect to the Power Station.

Figure 3. Route Alternatives Considered for the Project



Alternative 1

Alternative 1 was collocated with an existing power transmission line and the existing Transco South Virginia Lateral permanent right-of-way; about 85 percent of this route would be collocated with an existing right-of-way. Alternative 1 would begin at MP 91.3 of the existing South Virginia Lateral and would route southeast and then northeast for 8.65 miles, connecting to the proposed route at MP 3.87, where it would continue 0.46 mile along the proposed route to the Greensville M&R Station location.

As shown in table 20, the alternative route would be about 5 miles longer than the proposed route, and would result in significantly greater impacts on the Meherrin River, which has been state-designated as a Threatened and Endangered Water, a Virginia Scenic River, and a Virginia Department of Conservation and Recreation Blueway. This alternative would create a smaller amount of forest fragmentation; however, the additional 4.78 miles of right-of-way would result in substantial additional forest removal, as compared to the proposed route. We conclude the proposed route is preferred over Alternative 1 because it is 4.78 miles shorter, would still be predominately collocated, affects less land overall, and nearly 7.8 fewer acres of forested habitat.

Alternative 2

Alternative 2 would also begin at the existing Transco South Virginia Lateral MP 91.3 of the existing South Virginia Lateral, but would not be collocated with any existing right-of-way. Alternative 2 would route northeast for 6.42 miles, connecting at the Greensville M&R Station location.

As shown in table 20, the alternative route would be about 2 miles longer than the proposed route, and would result in significantly greater impacts on the Meherrin River, which would be crossed multiple times. This alternative would route through a continuous tract of forested land, creating forest fragmentation. We conclude the proposed route is preferred over Alternative 2 because it is 2.1 miles shorter, would still be predominately collocated, affects less land overall, and nearly 19.2 fewer acres of forested habitat.

C.4 ABOVEGROUND FACILITY ALTERNATIVES

Transco states that the launcher facility was based on its proximity to public roads, which would eliminate the need for the construction of a long access road to a more remote location, and its greater distance from streams and wetlands than other locations. The aboveground facility locations (the mainline valves and the M&R station) were not evaluated for alternative locations, because the siting of these facilities was required for the function of the project (to connect both ends of the proposed lateral to the system).

Table 20. Other Land Requirements associated with the Project Alternatives

Category	Proposed Route	Alternative 1	Alternative 2
Route Length (miles)	4.19	9.12	6.47
Total Land Disturbance (acres) **/a**	42.73	94.18	66.79
Percent Near Existing ROW	73	100	0
Roads Crossed			
Minor Roads Crossed	4	15	6
Major Roads Crossed	0	0	0
Total Road Crossings	4	15	6
Residences within 100 feet	2	1	0
Federal Lands within 0.25 mile	0	0	0
State Lands within 0.25 miles	0	0	0
Land Use (percent) /a, /b			
Agricultural	0	5	3
Forest	48	31	66
Open Water	0	<0.01	1
Wetland	4	<0.01	6
Open	45	61	24
Developed **/c**	3	2	0
Waterbodies Crossed			
Minor Waterbodies Crossed **/d**	19	18	13
Intermediate Waterbodies Crossed **/e**	1	0	2
Major Waterbodies Crossed **/f**	0	1	5
Total Waterbody Crossings	20	19	20
Wetland Impacts (percent) /b			
Non-forested (PEM/PSS) Wetland	2	<1	<1
Forested (PFO) Wetland	2	<1	6
Total Impact	4	<1	6

a/ Percent is based on an 85-foot construction right-of-way.

b/ Land use impacts for the Proposed Route are based on field survey data, NWI data, and the USGS.

c/ National Land Cover Database (2006) were used to assess Alternatives 1 and 2.
Developed land use category includes roads, urban, industrial, and residential areas.

d/ Minor waterbodies are those with a crossing width of 10 feet or less.

e/ Intermediate waterbodies are those with a crossing width of greater than 10 feet and less than 100 feet.

f/ Major waterbodies are those with a crossing width of 100 feet or greater.

In addition, no alternative sites were considered for the proposed modifications at the valve, drip bottle, and compressor station locations because this work would be associated with existing facilities.

We investigated the feasibility of using electric-motor-driven compressors at proposed Compressor Station 166. Transco stated that two 6,000 kW electric units could be used at the compressor station; however, it would require construction of a new distribution line and possibly a new substation, which would result in additional impacts. While the use of an electric-motor-driven compressor is feasible, the additional cost does not appear warranted given the minor air quality impacts associated with the proposed station; see our analysis in section B.7. Further, Transco states that the use of electric motor compression would not provide the proposed Power Station with a steady supply of power. Natural gas, unlike electricity, is not subject to service interruptions due to grid interruptions during peak use periods. Therefore, VEPCO would have to generate additional electricity from its natural gas fuel source provided by the Greensville Lateral to maintain dependable electricity for the power grid. As a result, we conclude that the alternative design does not provide an environmental or operational advantage.

In conclusion, we have determined that the proposed project is preferred to any of the alternatives considered that can meet the project objectives.

D. CONCLUSIONS AND RECOMMENDATIONS

Based on the analysis in this EA, we have determined that if Transco constructs and operates it proposed facilities in accordance with its application and supplements, and our recommended mitigation measures presented in this EA, approval of the proposed project would not constitute a major federal action significantly affecting the quality of the human environment. We recommend that the Commission's 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. Transco 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. Transco 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 OEP **before using that modification**.

2. The Director of OEP has delegated authority to take whatever steps are necessary to ensure the protection of all environmental resources during construction and operation of the project. This authority shall allow:

    a. the modification of conditions of the Order; and
    b. the design and implementation of any additional measures deemed necessary (including stop-work authority) to assure continued compliance with the intent of the environmental conditions as well as the avoidance or mitigation of adverse environmental impact resulting from project construction and operation.

3. **Prior to any construction**, Transco 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 soon as they are available, and before the start of construction**, Transco 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.

Transco'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. Transco's right of eminent domain granted under NGA section 7(h) does not authorize it to increase the size of its natural gas pipeline or facilities to accommodate future needs or to acquire a right-of-way for a pipeline to transport a commodity other than natural gas.

5. Transco 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 *Plan* or the company project specific plan described in the document and/or minor field realignments per landowner needs and requirements which 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 authorization and before construction begins**, Transco shall file an Implementation Plan with the Secretary for review and written approval by the Director of OEP. Transco must file revisions to the plan as schedules change. The plan shall identify:

   a. how Transco 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 Transco 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 per spread, and how the company 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. Transco will give to all personnel involved with construction and restoration (initial and refresher training as the project progresses and personnel change);
   f. the company personnel (if known) and specific portion of Transco's organization having responsibility for compliance;
   g. the procedures (including use of contract penalties) Transco will follow if noncompliance occurs; and
   h. for each discrete facility, a Gantt or PERT chart (or similar project scheduling diagram), and dates for:

      (1) the completion of all required surveys and reports;
      (2) the environmental compliance training of onsite personnel;
      (3) the start of construction; and
      (4) the start and completion of restoration.

7. Transco shall employ at least two EIs for the project facilities in Virginia, and one EI for the facility modifications in North Carolina and South Carolina. The EIs 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. for the Greensville Lateral, 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, Transco 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 Transco'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 EIs 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, and their cost;
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 Transco from other federal, state, or local permitting agencies concerning instances of noncompliance, and Transco's response.

9. **Prior to receiving written authorization from the Director of OEP to commence construction of any project facilities**, Transco shall file with the Secretary documentation that it has received all applicable authorizations required under federal law (or evidence of waiver thereof).

10. Transco 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**, Transco shall file an affirmative statement with the Secretary, certified by a senior company official:

    a. that the facilities have been constructed in compliance with all applicable conditions, and that continuing activities will be consistent with all applicable conditions; or
    b. identifying which of the conditions in the Order Transco 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. **Prior to construction,** Transco shall file with the Secretary, for review and approval by the Director of OEP, the results of an air quality screening (AERSCREEN), or refined modeling analysis (AERMOD or EPA-approved alternative) for all of the emission generating equipment (including existing equipment) at Compressor Station 166. The results shall demonstrate that the modeled existing emissions, plus the modeled incremental increase in emissions of criteria pollutants from the modifications either:

    a. result in local concentrations below the NAAQS where current modeled concentrations from the existing compressor station (existing and ambient background) are below the NAAQS; or

    b. does not cause or contribute to significantly increased local area concentrations above the NAAQS where the current ambient background concentrations are currently above the NAAQS.

13. Transco shall file a noise survey for Compressor Stations 166 and 185 **no later than 60 days** after placing the stations into service. If a full power load condition noise survey is not possible, Transco shall file an interim survey at the maximum possible power load **within 60 days** of placing the station into service and file the full power load survey **within 6 months**. If the noise attributable to operation of all equipment at the station under interim or full power load conditions exceeds predicted values at any nearby noise sensitive area, Transco should:

    a. file a report with the Secretary, for review and written approval by the Director of the OEP, on what changes are needed;

    b. install additional noise controls to meet that level within 1 year of the in-service date; and

c. confirm compliance with this requirement by filing a second full power load noise survey with the Secretary for review and written approval by the Director of the OEP **no later than 60 days** after it installs the additional noise controls.

E. REFERENCES

Clark, S. H. (2008). *Geology of the Southern Appalachian Mountains.* U.S. Geological Survey.

College of William and Mary. (1999). *Physiographic Map of Virginia.*

Council on Environmental Quality. (1997). *Considering Cumulative Effects.* Washington, DC.

Council on Environmental Quality. (2005). *Memorandum from James L. Connaughton to Heads of Federal Agencies regarding Guidance on the Consideration of Past Actions in Cumulative Effects Analysis.*

Cowardin, L. M. (1979). *Clasification of wetlands and deepwater habitats of the United States.* US Department of the Interior, US Fish and Wildlife Service.

EPA. (1999). *Consideration of Cumulative Impacts in EPA Review of NEPA Documents.*

Federal Geographic Data Committee. (2013). *Classification of Wetlands and Deepwater Habitats of the United States.*

Kentucky Department of Fish and Wildlife Resources. (2013). *Kentucky's Comprehensive Wildlife Conservation Strategy.* Frankfort: Kentucky Department of Fish and Wildlife Resources.

Natural Resource Conservation Service [NRCS]. (2015). *Web Soil Survey.* NRCS.

North Carolina Department of Environmental Quality. (2016). Retrieved from http://portal.ncdenr.org/web/wq/home?p_p_id=20&p_p_lifecycle=1&p_p_state=exclusive&p_p_mode=view&_20_struts_action=%2Fdocument_library%2Fget_file&_20_folderId=8399171&_20_name=DLFE-88931.pdf

NRCS. (2014). *Official Soil Series Descriptions.*

Tennessee Valley Authority. (2013). *Paradise Fossil Plant Units 1 and 2 Mercury and Air Toxics Standards Compliance Project Final Environmental Assessment.* Knoxville: TVA.

United States Geological Survey [USGS]. (2001). *Contributions to the Geology of Kentucky; Physiography.*

USACE. (1987). *Wetlands Delineation Manual.*

USACE. (2011). *Green River Watershed Section 729 Initial Watershed Assessment.* Louisville.

USACE. (2012). *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont REgion: Version 2.* COE.

USGS. (2014). *Geology maps of U.S. States.*

USGS. (2014). *The 8, 10, and 12 digit hydrologic unit boundaries for Kentucky.* USGS.

VDEQ. (2015). *Physiographic Provincies of Virginia.*

Virginia Department of Mines, Minerals, and Energy. (2012). *Mapping and Resource Center*. Retrieved March 15, 2016, from http://www.dmme.virginia.gov/DMLR/MappingLandingPage.shtml

Virginia Dominion Power. (2015, March 26). *Dominon Selects Greensville County for Site of New Power Station*. Retrieved December 16, 2015, from Dominion Virginia Power Home Page: https://www.dom.com/residential/dominion-virginia-power/news/news-releases/136997

F. LIST OF PREPARERS

Balsom, Arianne – Project Manager, *Water Resources, Vegetation, Wildlife, Threatened and Endangered Species, Land Use, Cumulative Impacts, Alternatives*

M.S. Ecology and Evolutionary Biology, University of Tennessee, 2003
B.S. Ecology and Evolutionary Biology, University of Tennessee, 2000
B.A. Marine Biology, University of Tennessee, 2000

Crosley, Shannon –*Soils and Geology*

B.S., Natural Resources Management, 1998, University of Maryland

Monib, Kareem – *Air Quality and Noise, Reliability and Safety*

M.S., Chemical Engineering, Pennsylvania State University
B.S., Chemical Engineering, University of Delaware

Armbruster, Ellen – *Cultural Resources*

M.A., Anthropology, 1986, University of Pennsylvania
B.A., Anthropology, 1979, Bryn Mawr College

Appendix A - Aerial Photo-Based Project Location Maps

Figure A- 1. Aerial overview of the proposed Greensville Lateral pipeline (Greensville and Brunswick Counties, Virginia) Part 1 of 3

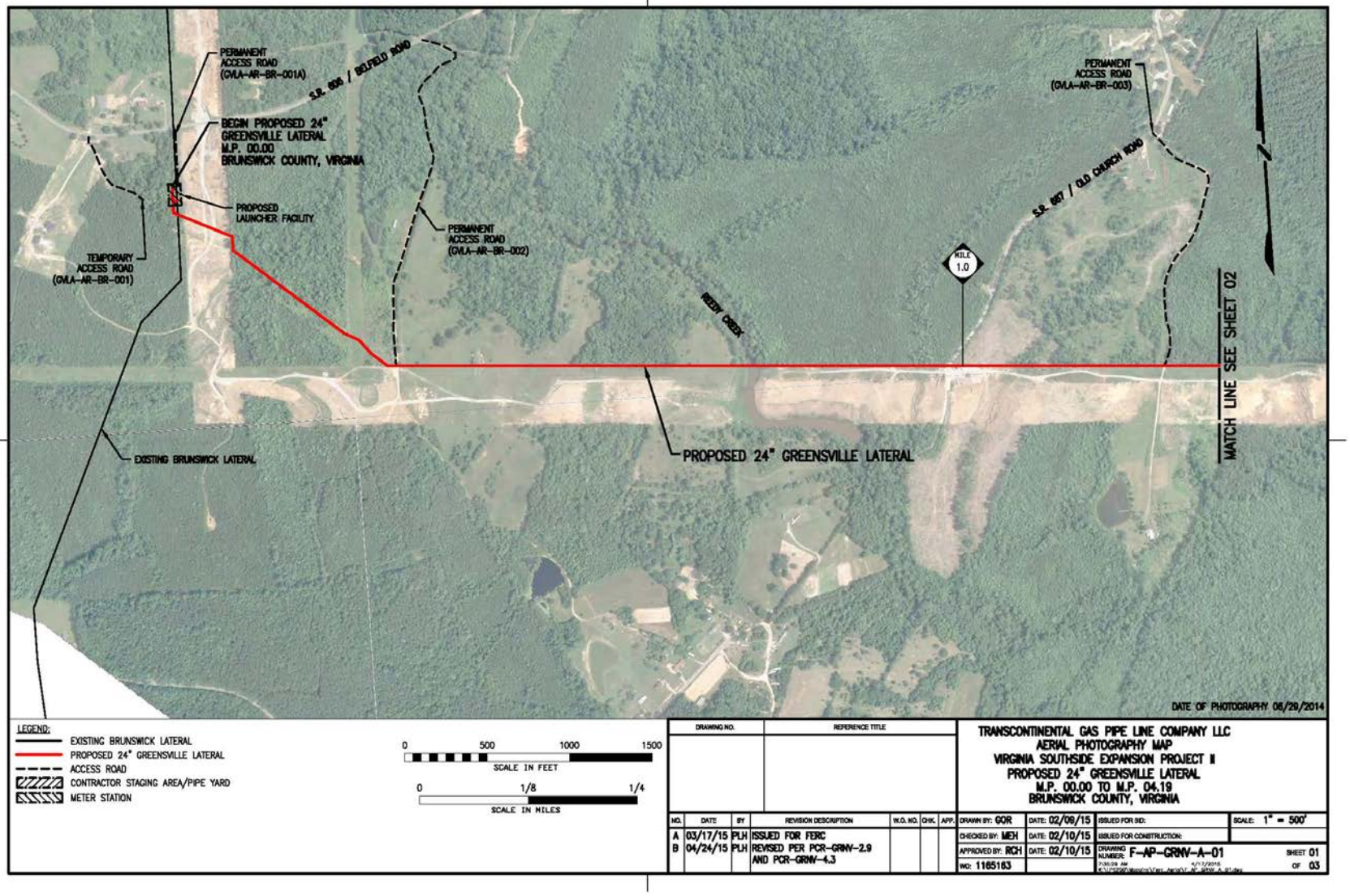


Figure A- 2. Aerial overview of proposed Greensville Lateral pipeline (Greensville and Brunswick Counties, Virginia) Part 2 of 3

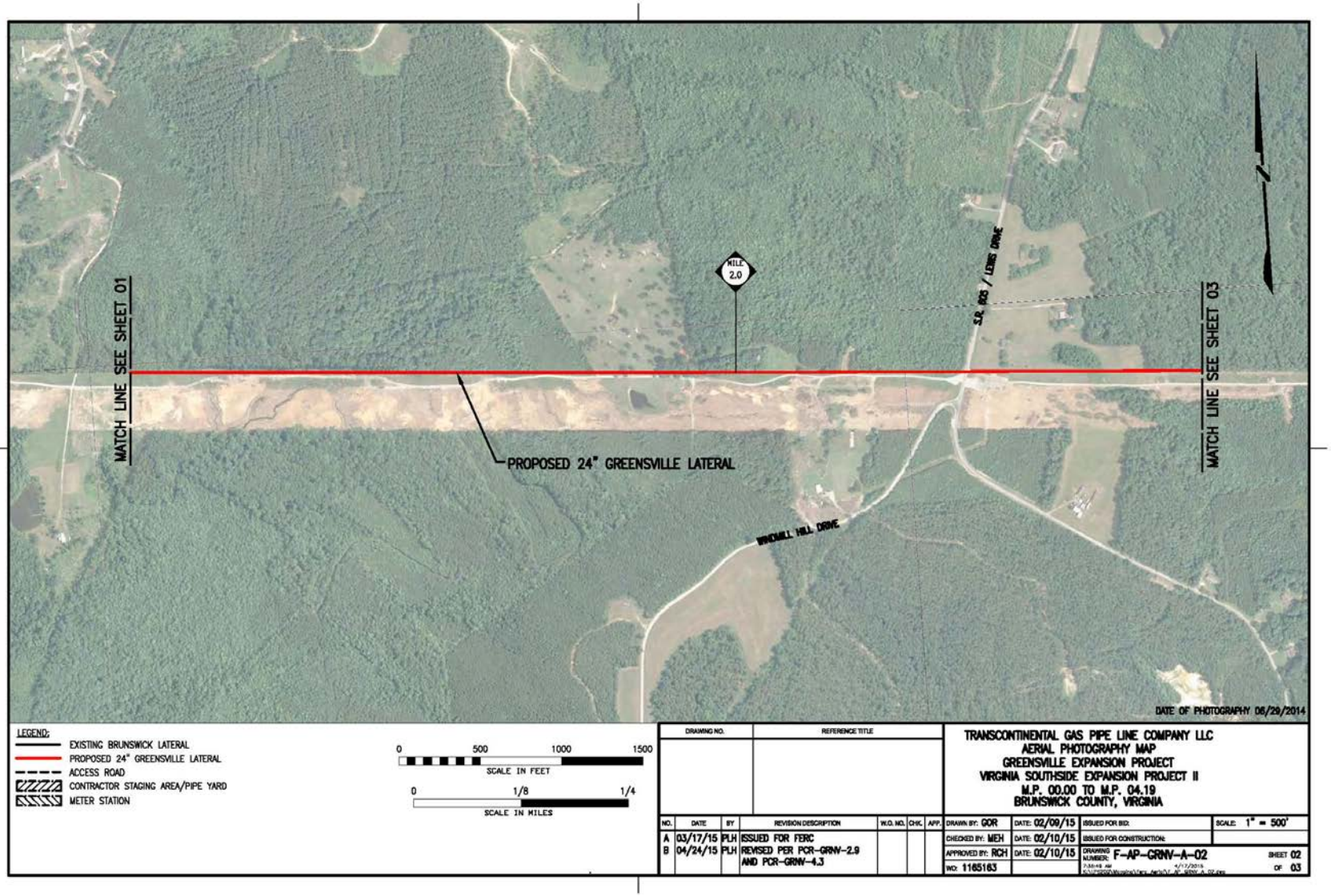


Figure A- 3. Aerial overview of proposed Greensville Lateral pipeline (Greensville and Brunswick Counties, Virginia) Part 3 of 3

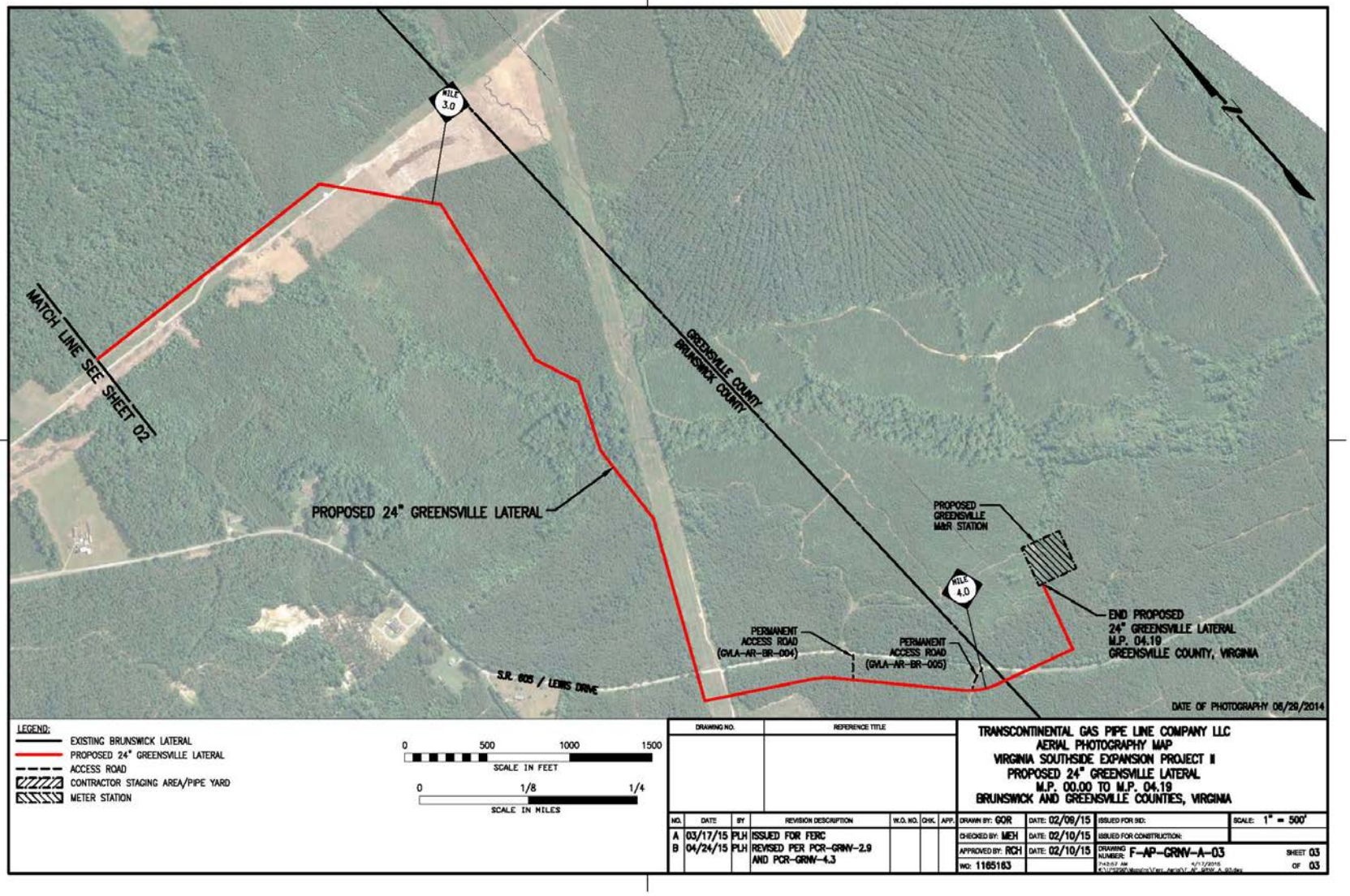


Figure A- 4. Proposed Modifications at Compressor Station 166 (Pittsylvania County, Virginia)

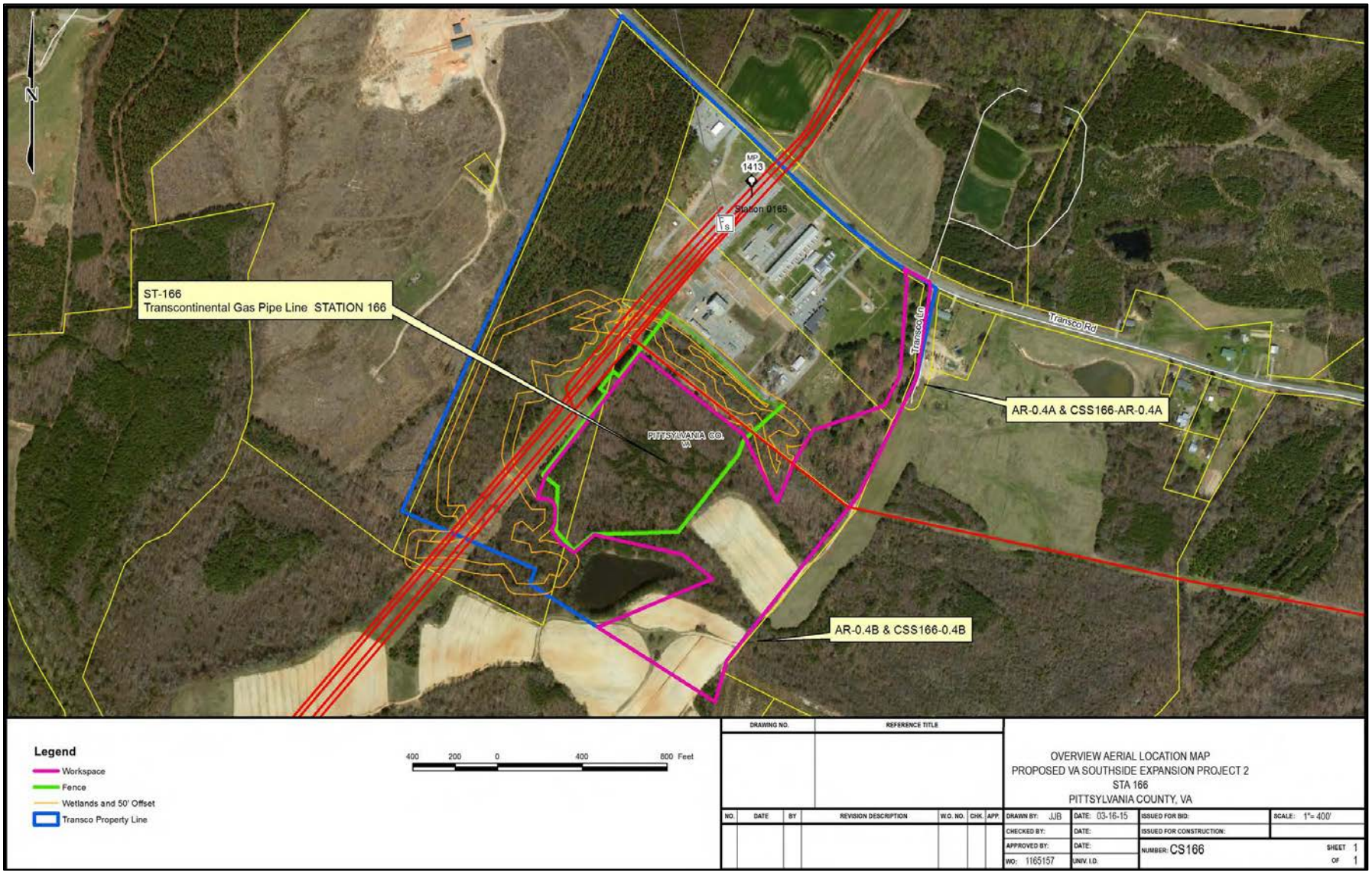


Figure A- 5. Proposed modifications at Compressor Station 185 (Prince William County, Virginia)

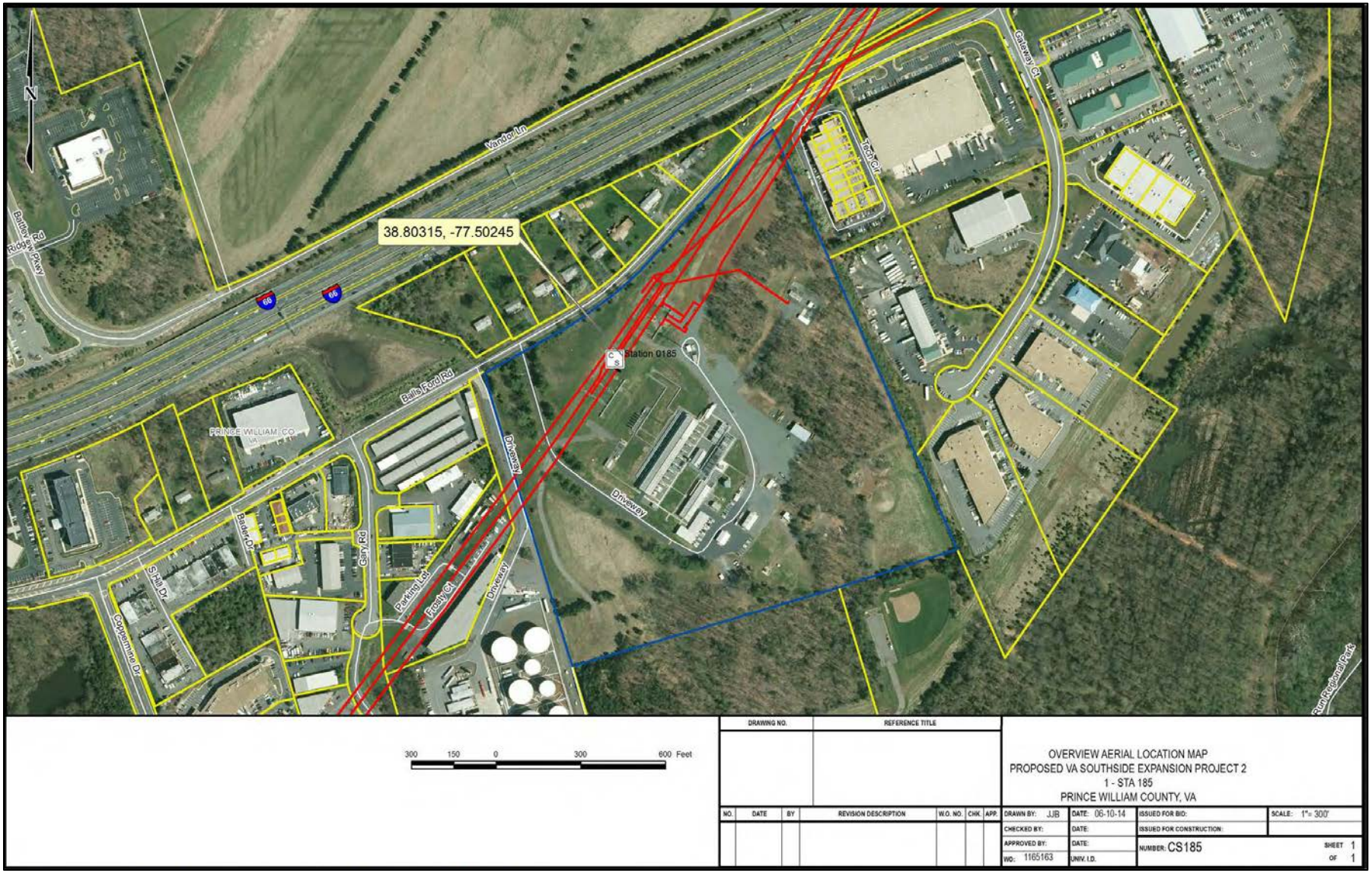


Figure A- 6. Proposed modifications at Mill Springs Meter and Regulator Station and Valve Setting (Polk County, North Carolina)

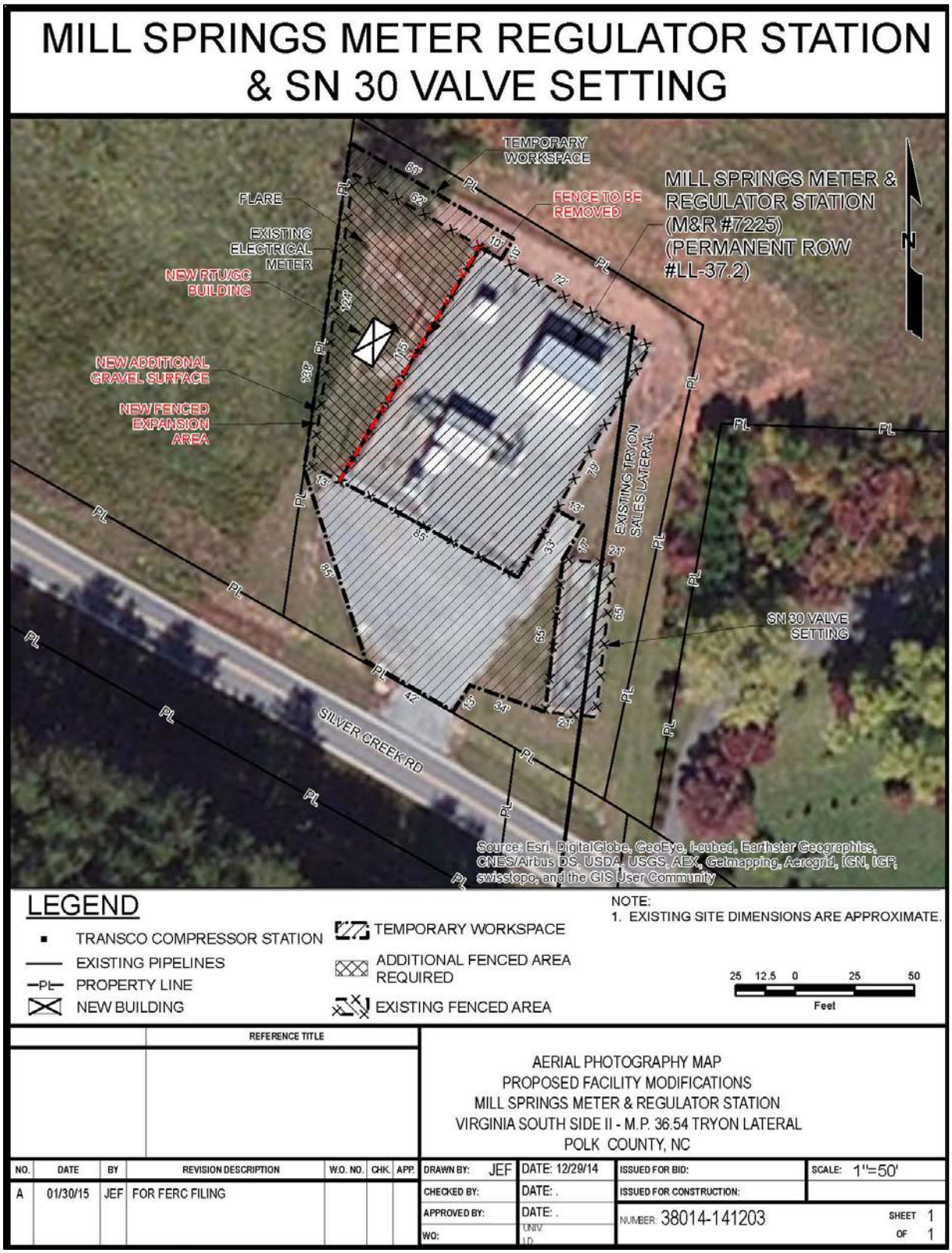


Figure A- 7. Proposed modifications at Columbus Meter and Regulator Station (Polk County, North Carolina)

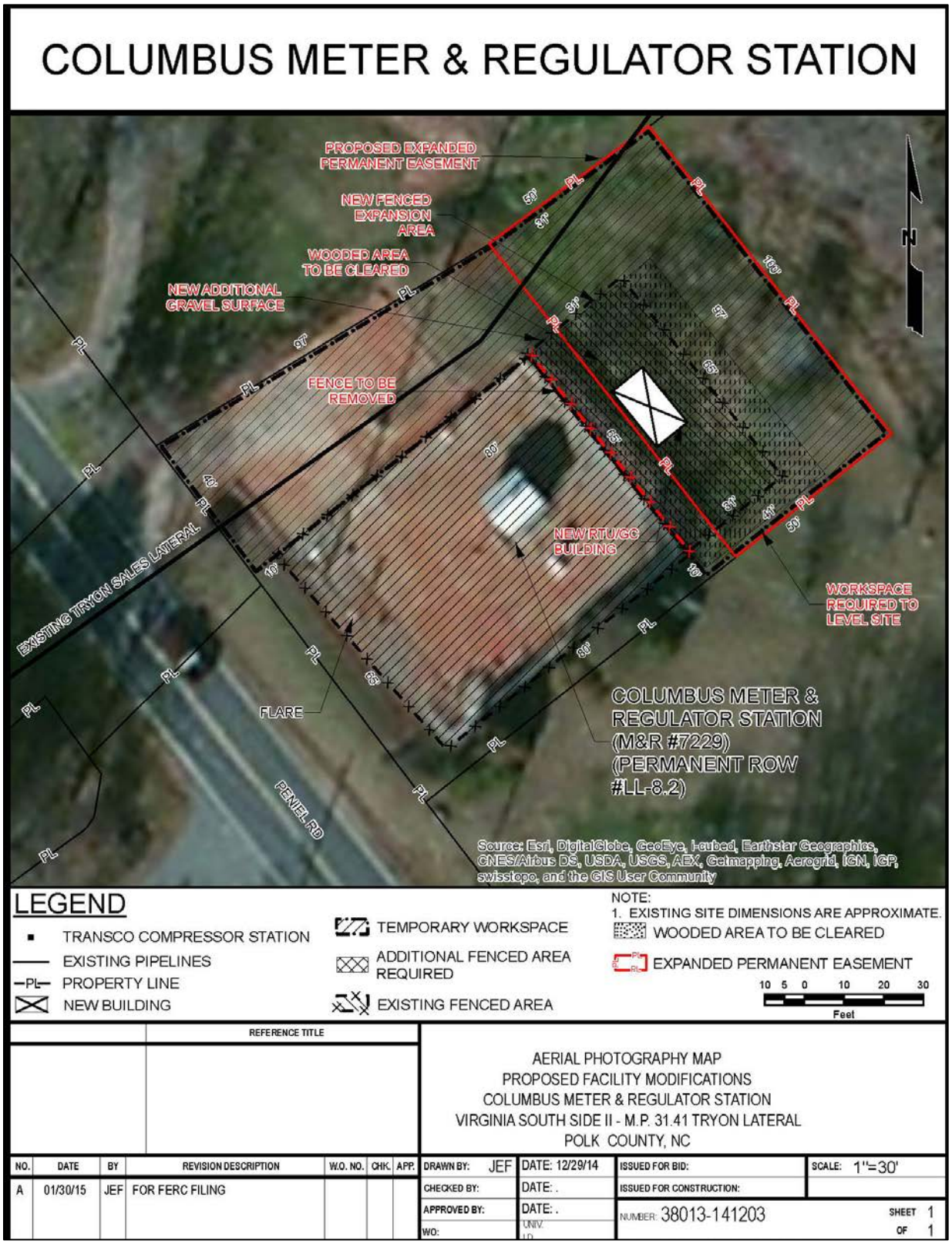


Figure A- 8. Proposed modifications at Tryon Meter and Regulator Station and Valve Setting (Polk County, North Carolina)

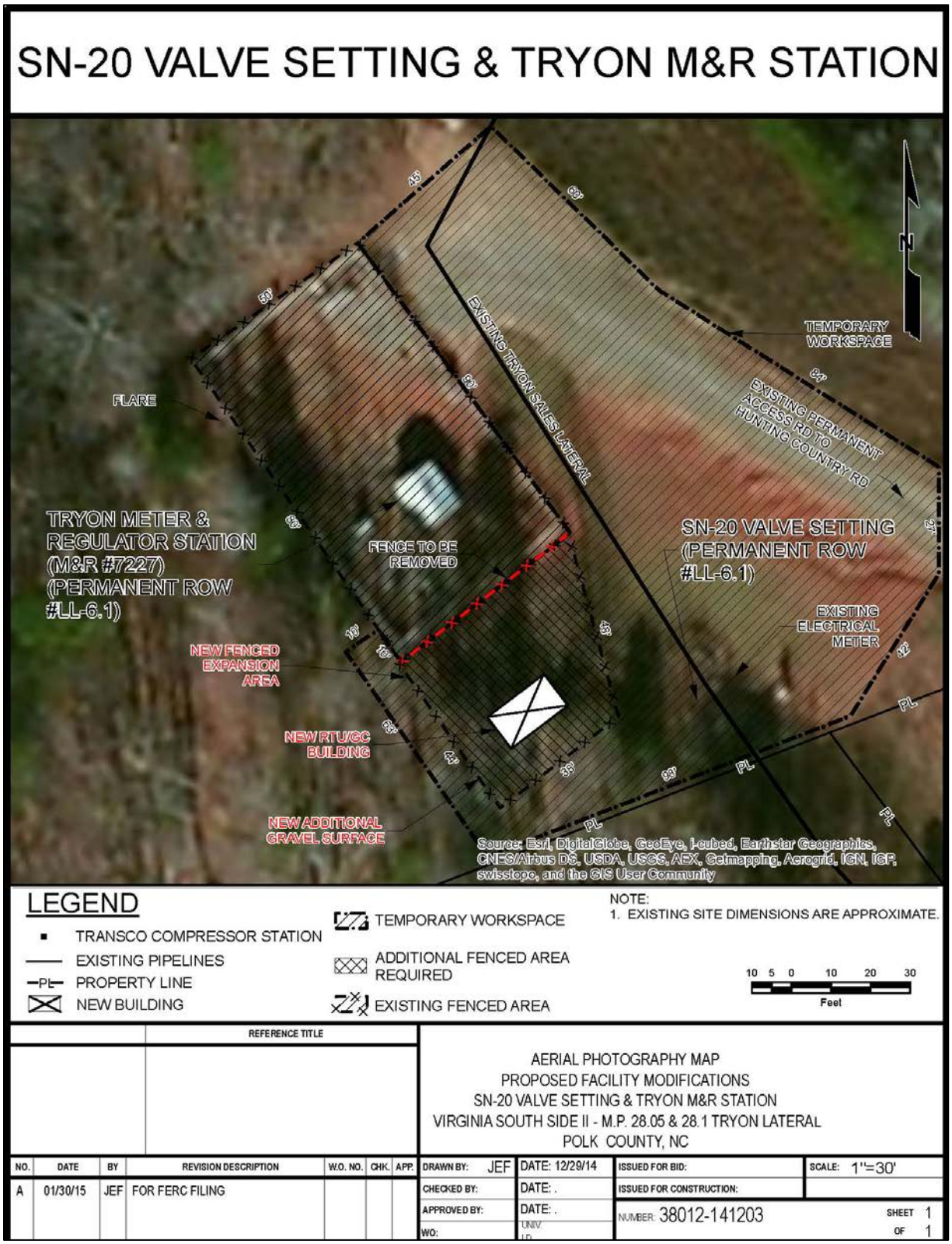


Figure A- 9. Proposed modifications at Landrum Meter and Regulator Station (Spartanburg County, South Carolina)

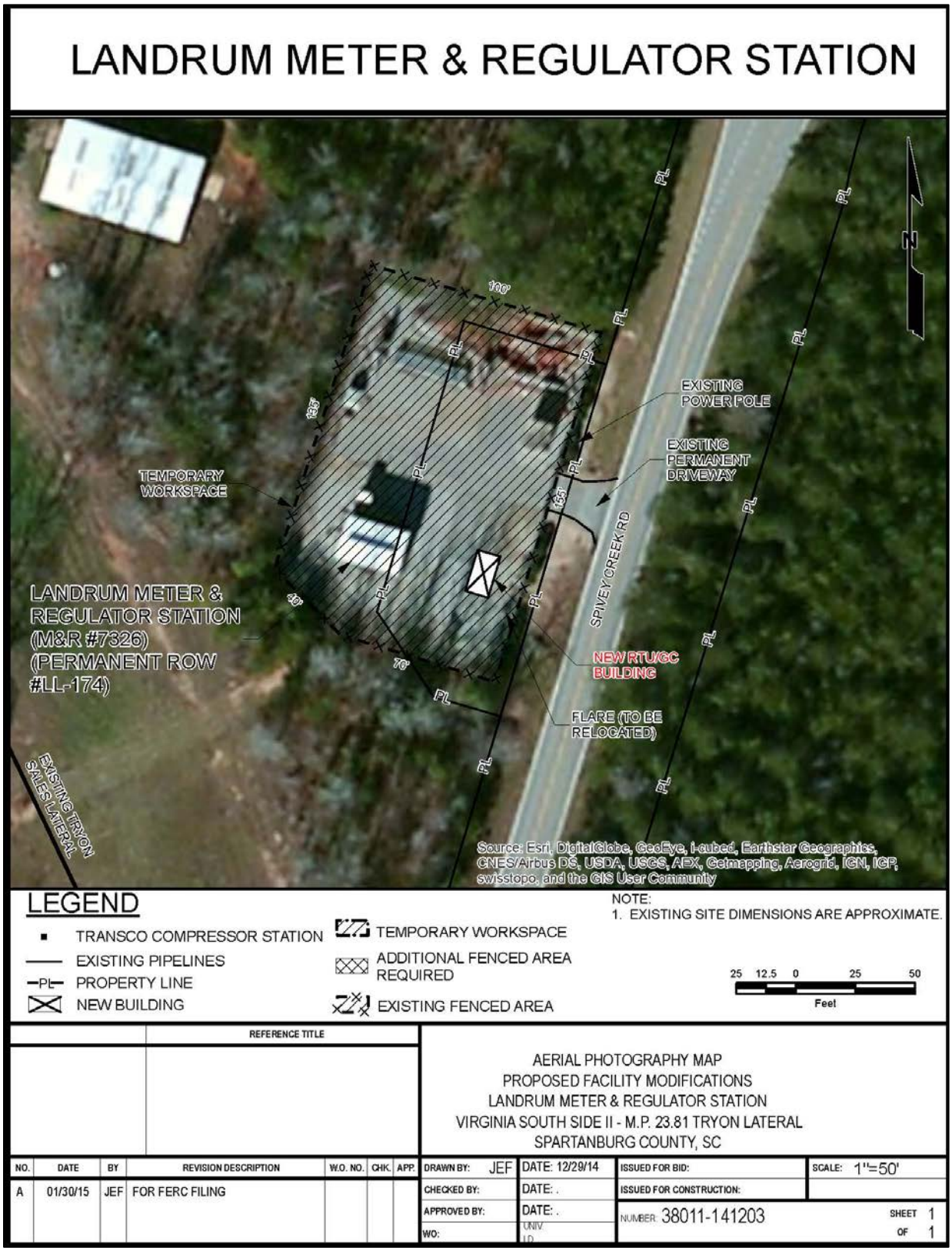


Figure A- 10. Proposed modifications at Inman Meter and Regulator Station (Spartanburg County, South Carolina)

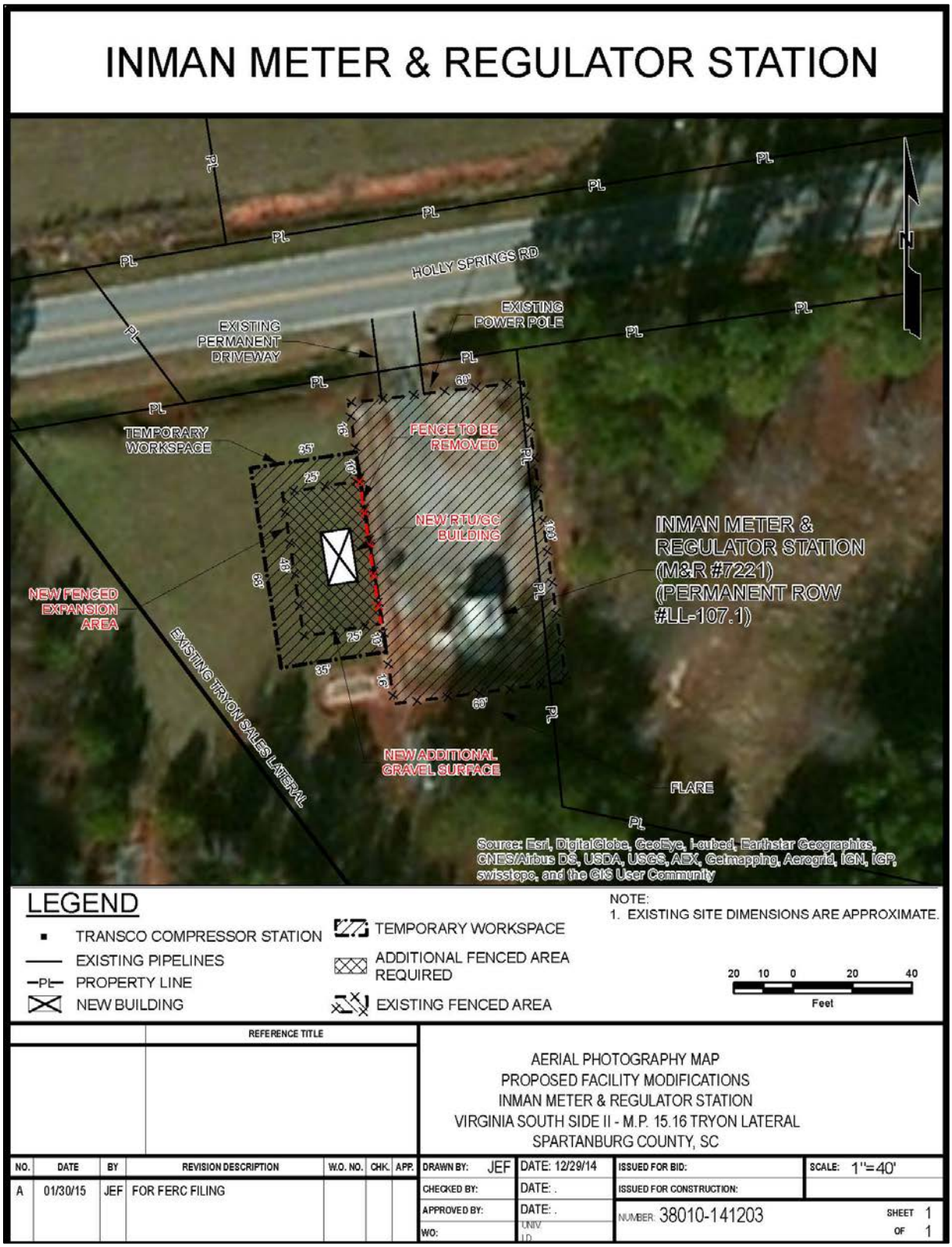


Figure A- 11. Proposed modifications at SN-10 valve setting (Spartanburg County, South Carolina)

Figure A- 12. Proposed modifications at West Startex Meter and Regulator Station (Spartanburg County, South Carolina)

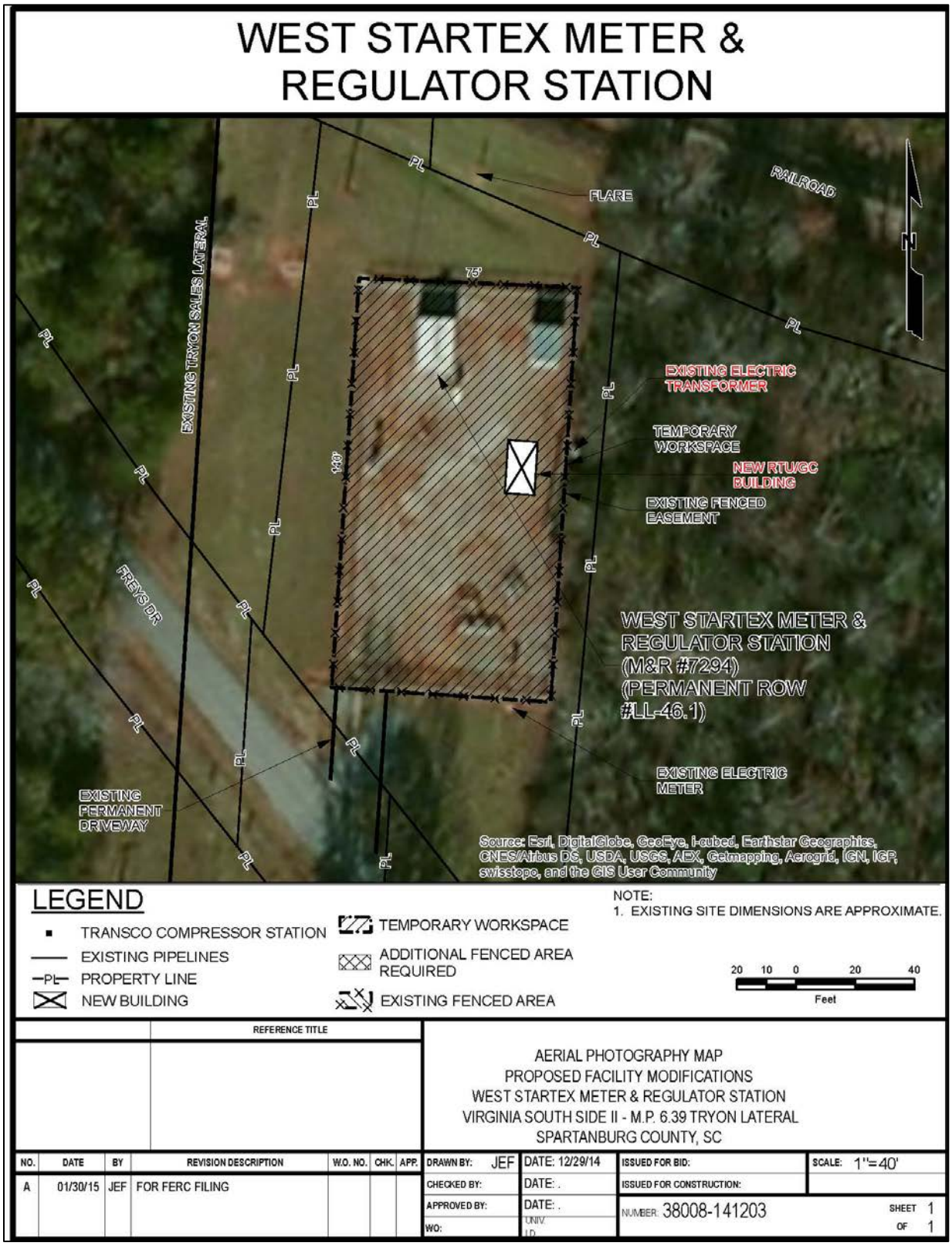


Figure A- 13. Proposed modifications at Compressor Station 140 (Spartanburg County, South Carolina)

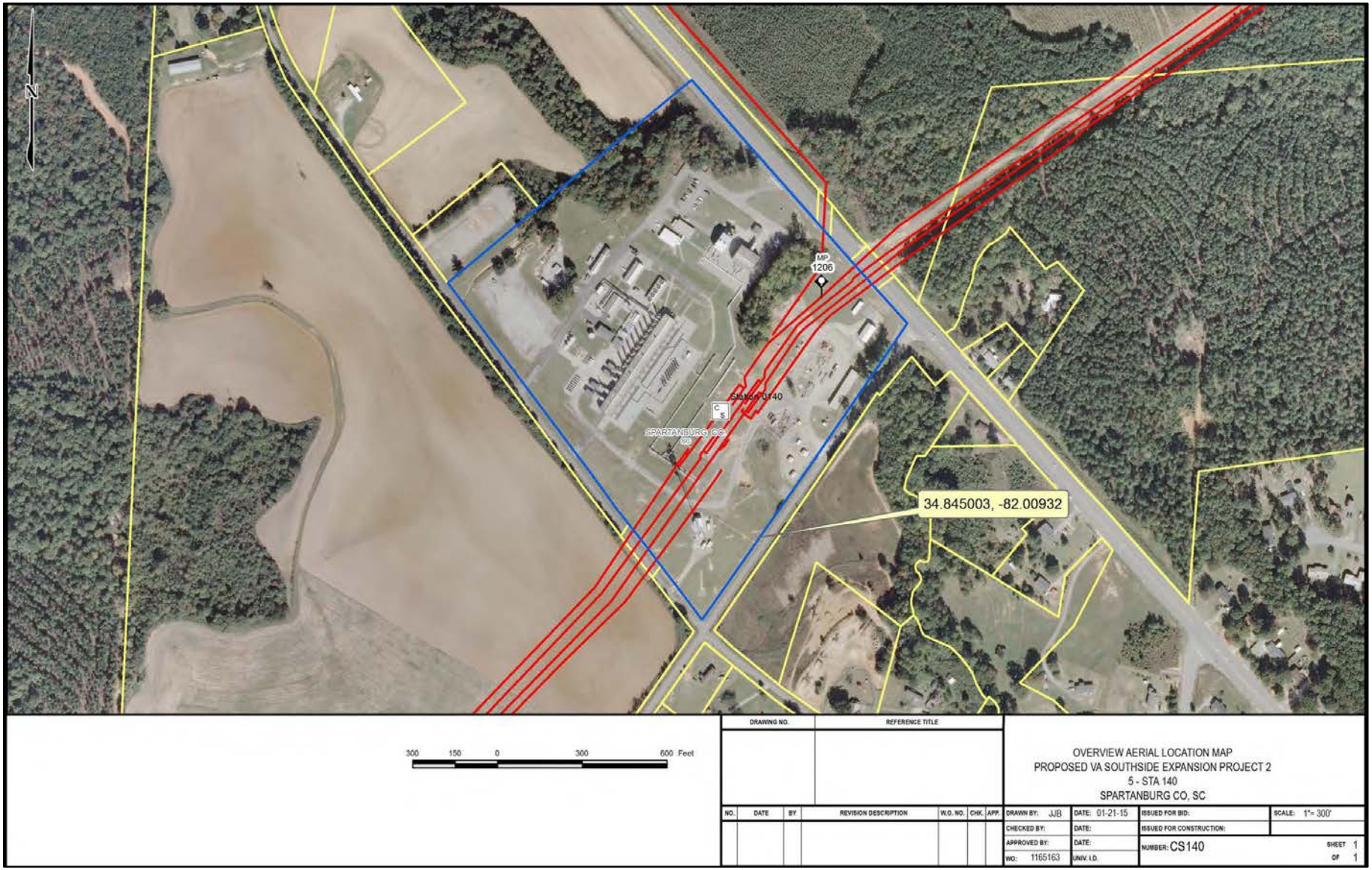


Figure A- 14. Proposed modifications at Startex and Moore Meter and Regulator Station (Spartanburg County, South Carolina)

Figure A- 15. Proposed modifications at dripline bottle location (Spartanburg County, South Carolina)

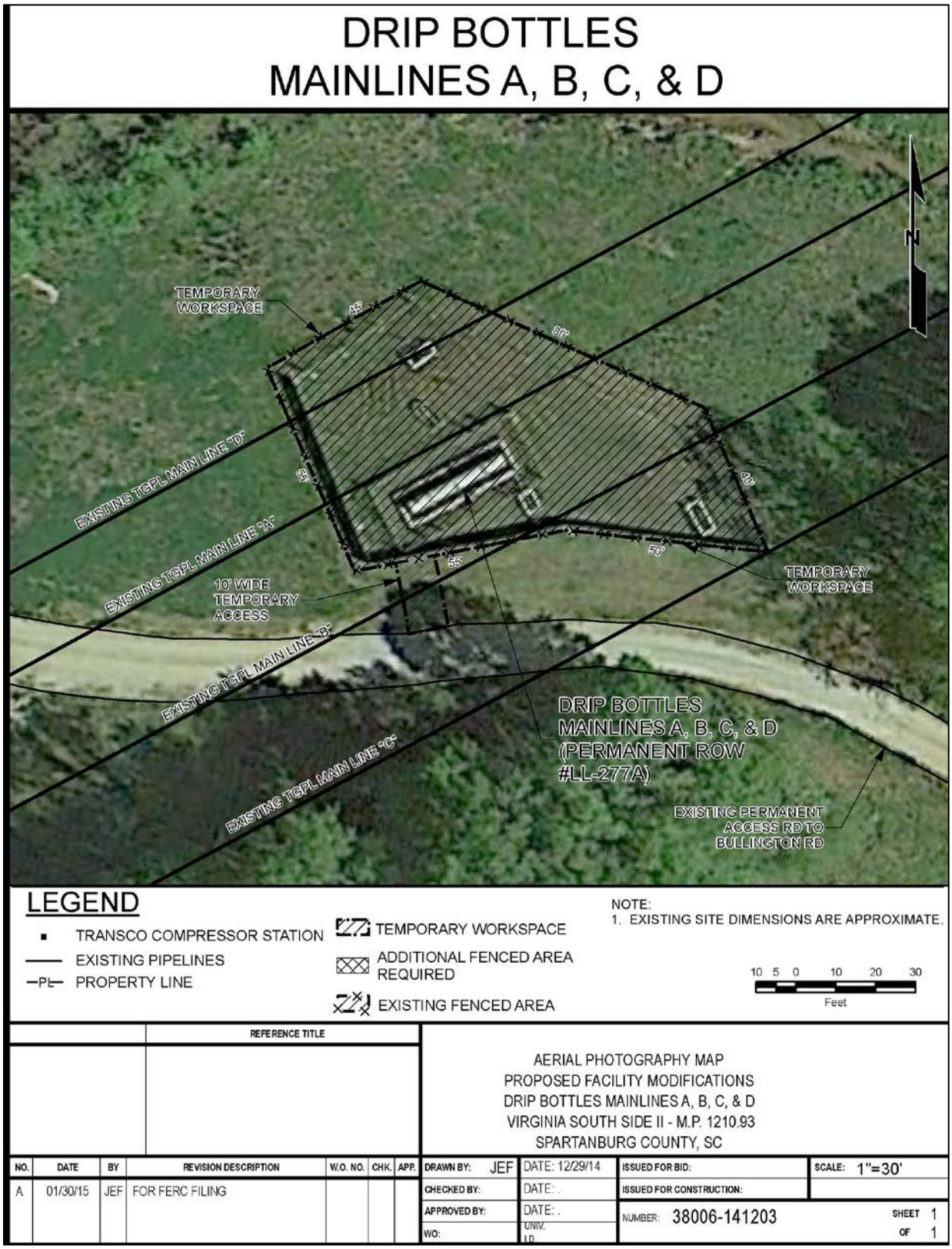


Figure A- 16. Proposed modifications at valve setting location (Spartanburg County, South Carolina)

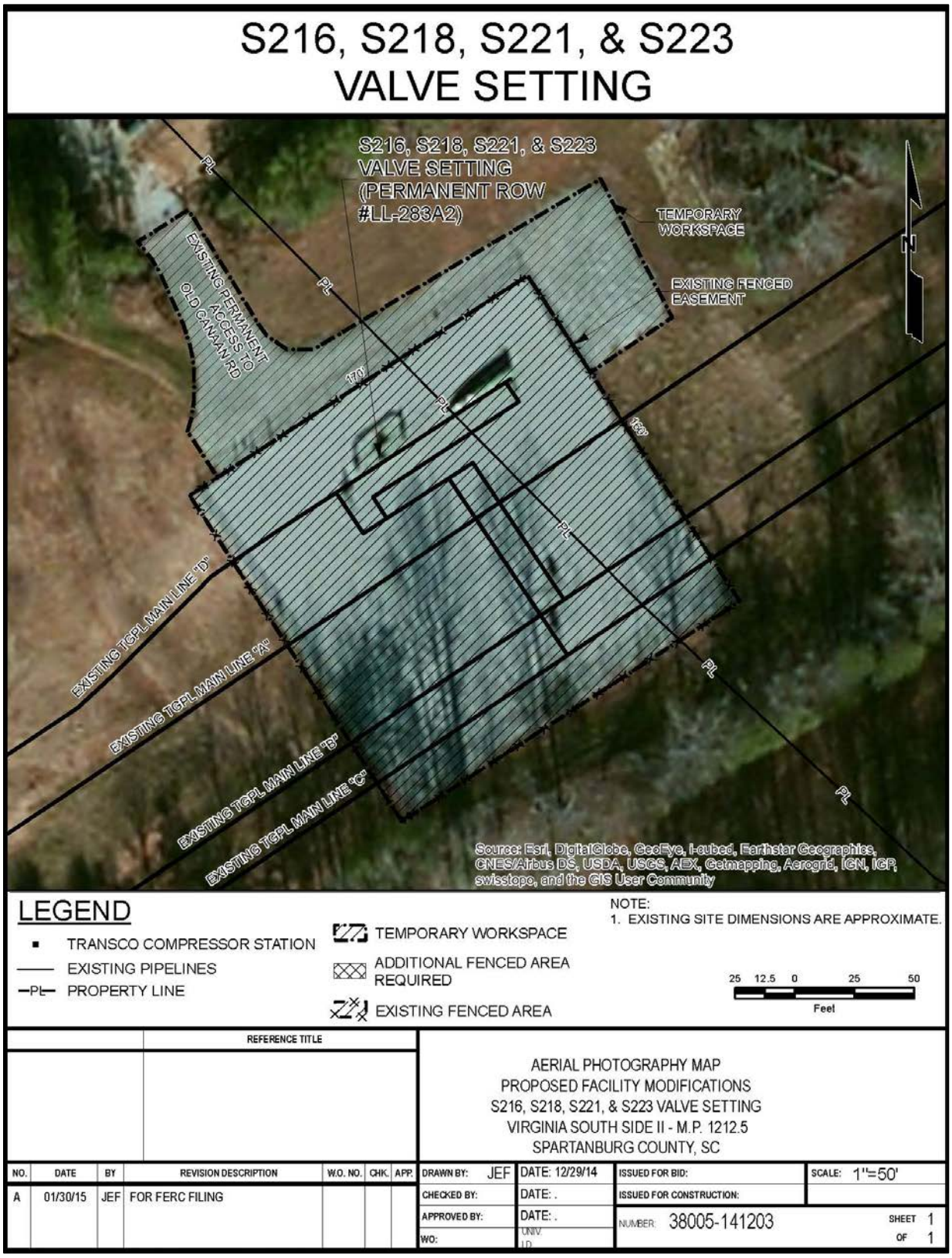


Figure A- 17. Proposed modifications at Spartanburg Meter and Regulator Station (Spartanburg County, South Carolina)

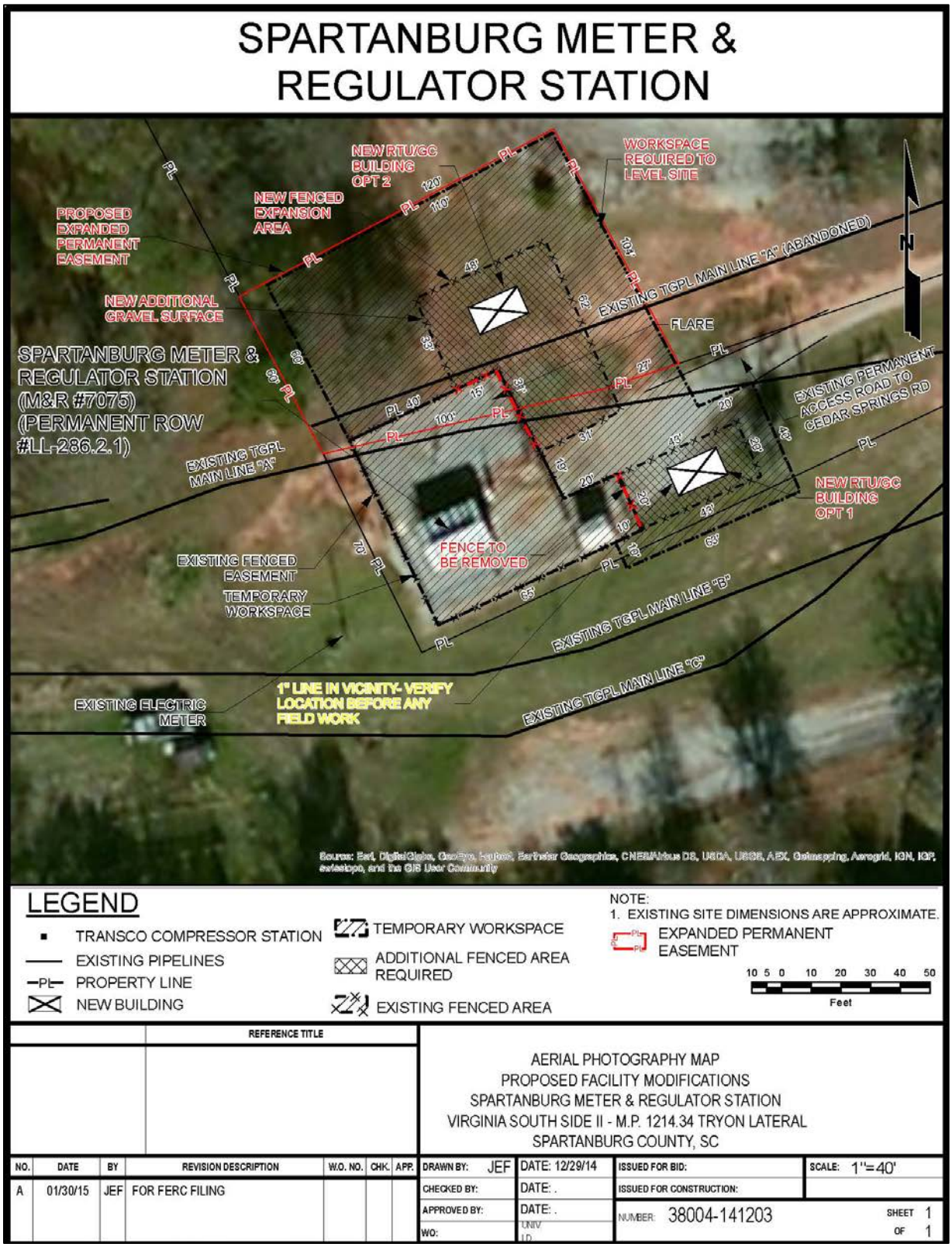


Figure A- 18. Proposed modifications at South Union Meter and Regulator Station (Spartanburg County, South Carolina)

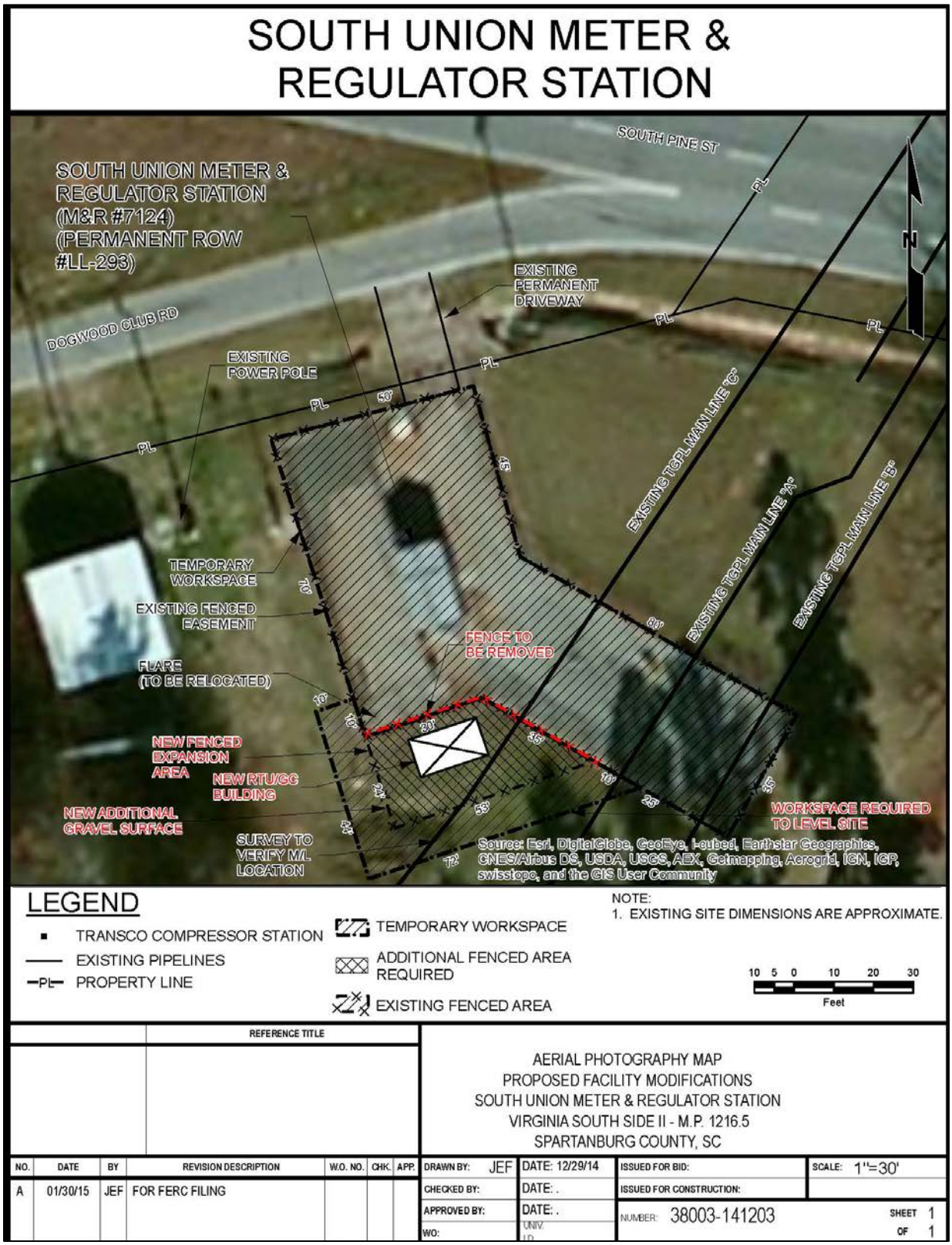


Figure A- 19. Proposed modifications at valve setting location (Spartanburg County, South Carolina)

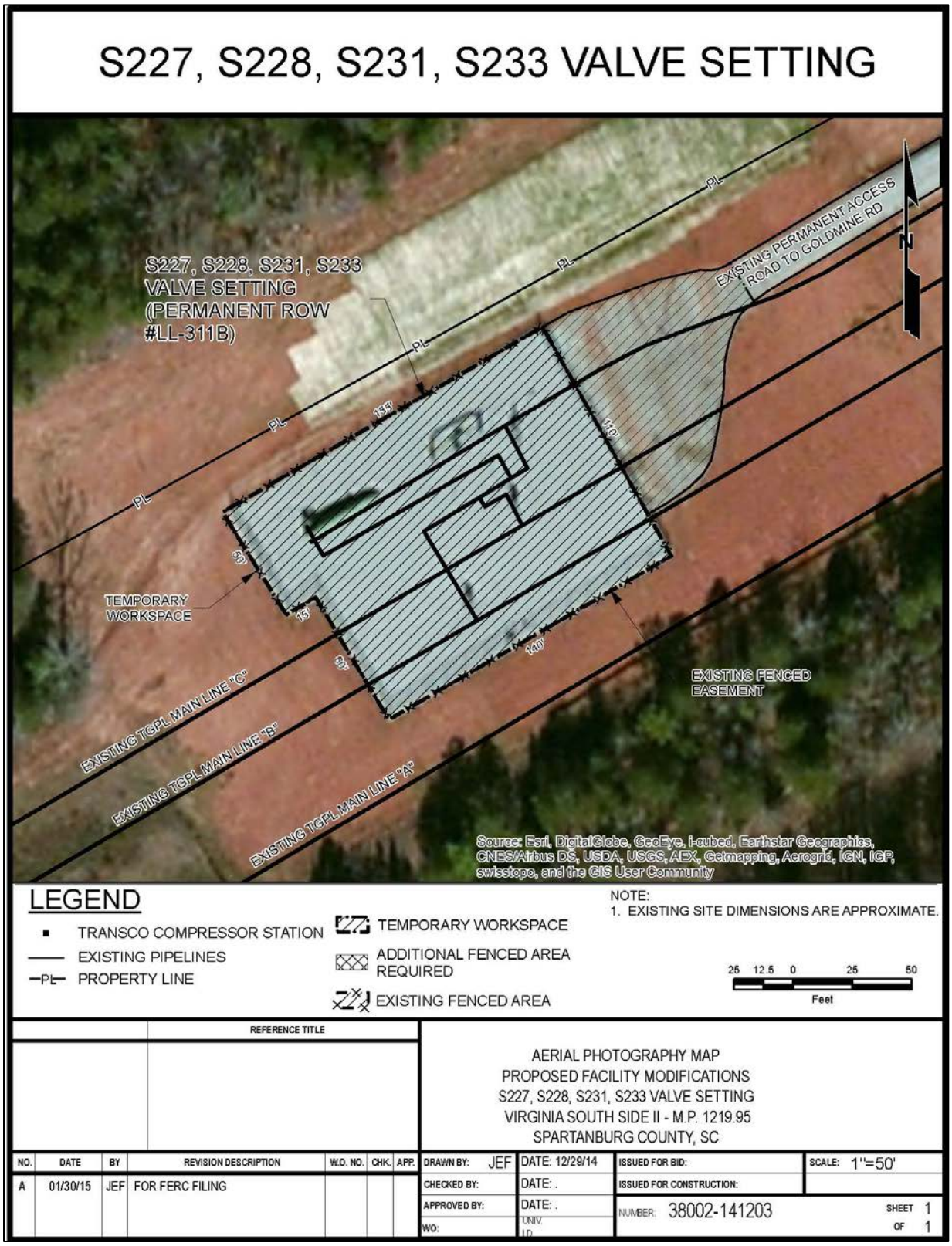
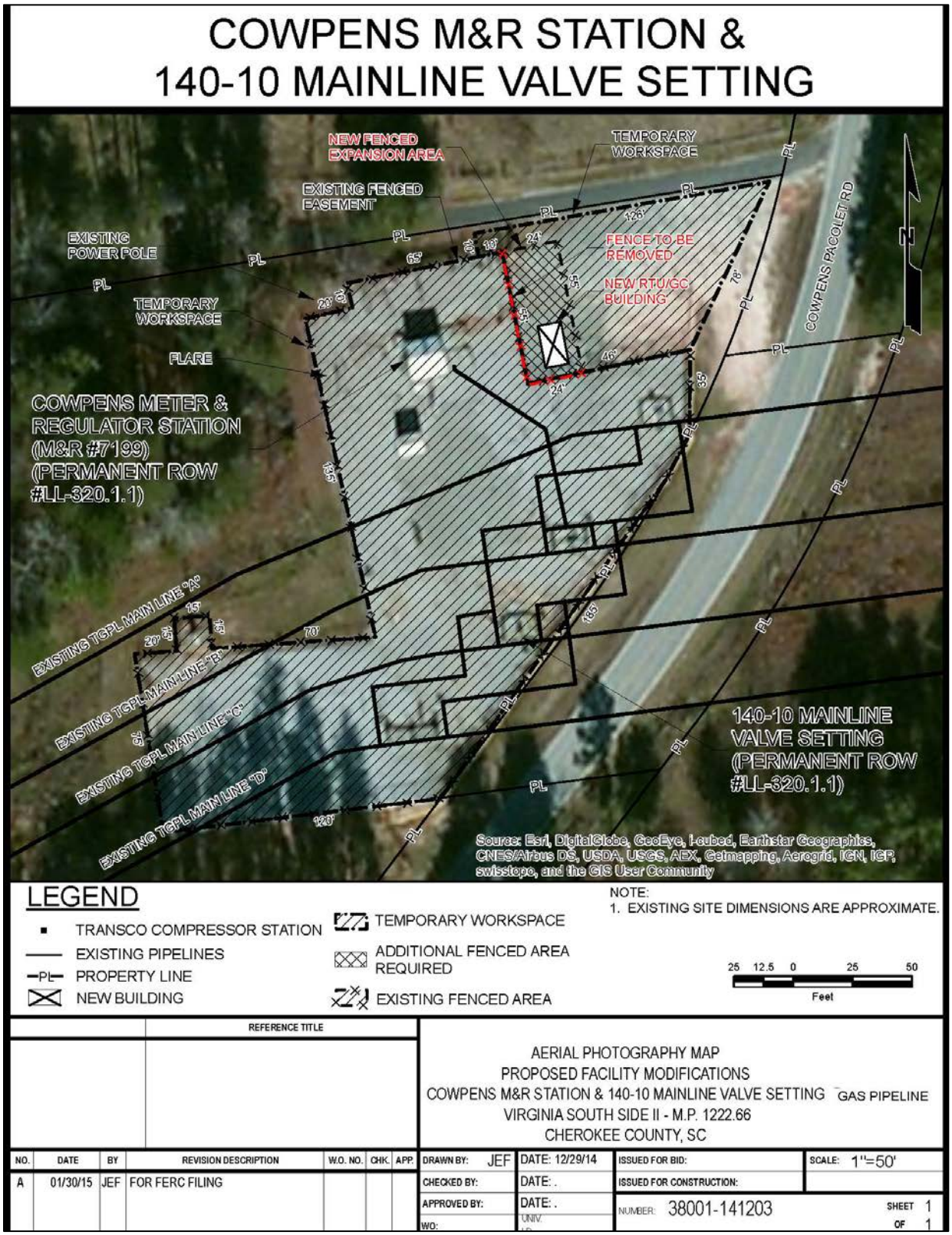


Figure A- 20. Proposed modifications at Cowpens Meter and Regulator Station and mainline valve setting (Spartanburg County, South Carolina)



Appendix B - Site-Specific Construction Plan for Constructing Near Residence

NOTES:

1. TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC (TRANSCO) HAS PREPARED THIS RESIDENTIAL CONSTRUCTION PLAN TO INCLUDE DIMENSIONED SITE PLANS FOR EACH RESIDENCE LOCATED WITHIN 50 FEET OF CONSTRUCTION WORK AREAS. THE SITE PLANS SHOW THE LOCATION OF EACH OF THESE RESIDENCES IN RELATION TO THE NEW PIPELINE AND CONSTRUCTION WORK AREAS PROPOSED FOR THE VIRGINIA SOUTHSIDE EXPANSION PROJECT II.

2. OTHER KNOWN UTILITIES ARE ALSO DEPICTED ON THE SITE PLANS. PRIOR TO CONSTRUCTION, THE STATE ONE CALL CENTER WILL BE NOTIFIED TO VERIFY THE LOCATION OF THESE UTILITIES AND IDENTIFY ANY UNKNOWN UTILITIES WHICH MIGHT EXIST WITHIN THE CONSTRUCTION RIGHT OF WAY. TRANSCO WILL ALSO CONTACT INDIVIDUAL PROPERTY OWNER(S) TO IDENTIFY AND LOCATE ANY OTHER UTILITIES THAT MIGHT EXIST WITHIN THE CONSTRUCTION RIGHT OF WAY. THESE UTILITIES WILL BE IDENTIFIED AND MARKED BY THE RESPECTIVE UTILITY COMPANIES PRIOR TO CONSTRUCTION.

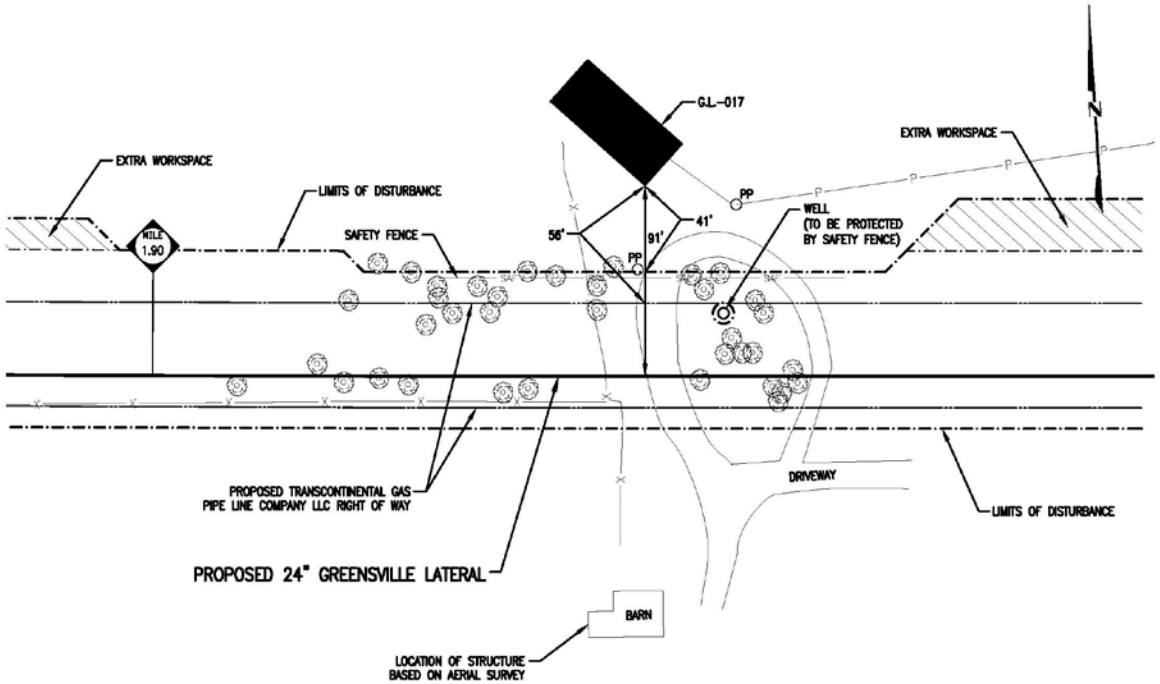
3. ANY NEARBY STRUCTURES, RESIDENTIAL FEATURES AND TREES LOCATED WITHIN THE CONSTRUCTION WORK AREAS WHICH WILL NOT BE REMOVED DURING CONSTRUCTION ARE NOTED ON THE SITE PLAN.

4. TO MINIMIZE IMPACTS TO RESIDENCES, THE FOLLOWING CONSTRUCTION TECHNIQUES SHALL BE UTILIZED: DRAG SECTION OR STOVE PIPE (IF NEEDED). EXCAVATION OF THE TRENCH WILL NOT BE INITIATED UNTIL THE PIPE IS READY FOR INSTALLATION. THE PIPE TRENCH SHALL BE BACKFILLED IMMEDIATELY UPON COMPLETION OF THE PIPELINE INSTALLATION. DETAILS OF THESE CONSTRUCTION TECHNIQUES ARE DESCRIBED BELOW.
   a. DRAG SECTION: THE DRAG SECTION TECHNIQUE INVOLVES THE INSTALLATION OF SHORT SECTIONS (TWO OR MORE JOINTS) OF PIPE CALLED DRAG SECTIONS. THE CONTRACTOR WILL BEGIN THE DRAG SECTION INSTALLATION BY CLEARING AND GRADING A SHORT SECTION OF THE RIGHT OF WAY. INDIVIDUAL JOINTS OF PIPE WILL THEN BE HAULED TO THE WORK AREA AND LAID OUT FOR FABRICATION. THE CONTRACTOR WILL THEN FABRICATE THE DRAG SECTION BY WELDING TOGETHER TWO OR MORE PIPE JOINTS. THE CONTRACTOR WILL EXCAVATE THE TRENCH. THE AMOUNT OR LENGTH OF TRENCH EXCAVATED AT ANY GIVEN TIME WILL BE LIMITED TO THE MINIMUM NECESSARY TO INSTALL THE DRAG SECTION. THE PIPE SECTION WILL THEN BE LOWERED INTO THE TRENCH, THE TIE-IN WELD WILL BE PERFORMED, X-RAYED AND COATED, AND THEN THE PIPE SECTION IS BACKFILLED.
   b. STOVE PIPE (IF NEEDED): THE STOVE PIPE INSTALLATION TECHNIQUE IS SIMILAR TO THE DRAG SECTION TECHNIQUE DESCRIBED ABOVE, EXCEPT IT IS LIMITED TO THE INSTALLATION OF ONE JOINT OF PIPE AT A TIME. THE TYPICAL SEQUENCE OF ACTIVITIES FOR STOVE PIPE INSTALLATION IS AS FOLLOWS: THE RIGHT OF WAY IS CLEARED AND GRADED, THE PIPE JOINT IS HAULED TO THE WORK AREA, THE TRENCH IS EXCAVATED, THE PIPE JOINT IS INSTALLED, WELDED (TIED-IN), X-RAYED, COATED, AND THEN THE TRENCH IS BACKFILLED. THIS PROCESS WILL BE REPEATED UNTIL THE WORK HAS BEEN COMPLETED IN THE AREA OF CONCERN.

5. TRANSCO WILL NOTIFY LANDOWNERS, IN WRITING, AT LEAST TWO (2) WEEKS PRIOR TO THE START OF CONSTRUCTION. TRANSCO'S LAND AGENT WILL THEN FOLLOW-UP WITH EACH LANDOWNER AT LEAST ONE (1) WEEK PRIOR TO THE START OF CONSTRUCTION.

6. AFTER COMPLETION THE CONSTRUCTION WORK AREAS WILL BE RESTORED IN ACCORDANCE WITH APPLICABLE PERMIT REQUIREMENTS, THE PROJECT-SPECIFIC VERSION OF FERC'S UPLAND EROSION CONTROL REVEGETATION AND MAINTENANCE PLAN AND THE SOIL EROSION AND SEDIMENT CONTROL PLAN.

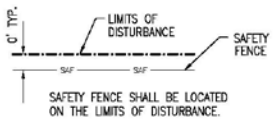
7. LAND REPRESENTATIVE WILL DISCUSS ACCESS TO RESIDENCES PRIOR TO CONSTRUCTION AND INCLUDE THAT INFORMATION IN THE CONSTRUCTION LINE LIST. THE CONSTRUCTION LINE LIST WILL BE INCLUDED IN THE CONSTRUCTION CONTRACT . ADDITIONALLY, INSPECTORS ASSIGNED TO THE PROJECT WILL ENSURE THAT THE REQUIREMENTS IN THE LINE LIST ARE FOLLOWED.



8. AT A MINIMUM, CONSTRUCTION SAFETY PERIMETER FENCING SHALL BE INSTALLED AND MAINTAINED ALONG THE WORK AREA AS SHOWN ON THE SITE PLAN.

9. UTILIZE CONTROLS AS NECESSARY TO MITIGATE DUST, NOISE, AND VIBRATIONS DURING CONSTRUCTION.

0 50 100 150
SCALE IN FEET



SAFETY FENCE SHALL BE LOCATED ON THE LIMITS OF DISTURBANCE.

WOOD GROUP MUSTANG, INC.
PROJECT NO: 104444
ONE METROPLEX DRIVE, SUITE 100
BIRMINGHAM, ALABAMA 35209

DRAWING NO.	REFERENCE TITLE

NO	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
A	03/17/15	PLH	ISSUED FOR FERC			

TRANSCONTINENTAL GAS PIPE LINE COMPANY LLC
VIRGINIA SOUTHSIDE EXPANSION PROJECT II
PROPOSED 24" GREENSVILLE LATERAL
RESIDENTIAL CONSTRUCTION PLAN
ON THE PROPERTY OF
TRACT NO. GL-017
BRUNSWICK COUNTY, VIRGINIA

Williams

DRAWN BY: JWP	DATE: 02/09/15	ISSUED FOR BID:	SCALE: 1" = 50'
CHECKED BY: MEH	DATE: 02/10/15	ISSUED FOR CONSTRUCTION:	REVISION:
APPROVED BY: RCH	DATE: 02/10/15	DRAWING NUMBER: 24-1327-55-26-A/1.93	SHEET 1 OF 1
NO: 1165163			

Appendix C – Federally and State-Listed Species Potentially Occurring within the Virginia Southside Expansion Project II construction area

Common Name	Scientific Name	County, State	Federal Status	State Status	Habitat Description	Assessment Result	Potential Effect
Mammals							
Northern long-eared bat	*Myotis septentrionalis*	All	T	--	Found during summer underneath bark, in cavities, or crevices of live or dead trees. Hibernate in caves and mines with high humidity.	The project is located within the known range of the northern long-eared bat and hardwood forests containing suitable summertime roosting and foraging habitats.	No effect
Fish							
Alewife	*Alosa pseduoharengus*	Prince William County, VA	S	--	Live most of life in ocean; return to rivers to spawn	Migration impeded largely by dams and impoundments	No effect
Atlantic sturgeon	*Acipenser oxyrinchus*	Prince William County, VA	E	E	Lives at the bottom of freshwater rivers during spawning season; lives most of life in ocean	Migration impeded largely by dams and impoundments	No effect
Blueback herring	*Alosa aestivalis*	Prince William County, VA	S	--	Live most of life in ocean; return to rivers to spawn	Migration impeded largely by dams and impoundments	No effect
Bridle shiner	*Notropis bifrenatus*	Prince William County, VA	--	I	Silty, sandy river bottoms with a lot of aquatic vegetation; prefers quiet areas of streams; can also be found in ponds and lakes	Migration impeded largely by dams and impoundments	No effect
Reptiles							
Spotted turtle	*Clemmys guttata*	Prince William County, VA	CC	--	Woodland streams, meadows, wetlands, wet pastures, ditches	Suitable habitat is in the project area	No effect
Timber rattlesnake	*Crotalus horridus*	Prince William County, VA	CC	--	Hardwood and pine forests, agricultural areas, lowland cane thickets, wetlands	Suitable habitat is in the project area	No effect
Wood turtle	*Glyptemys insculpta*	Prince William County, VA	--	T	Shallow, clear streams with sandy substrate; forests and grasslands near water	Suitable habitat is in the project area	No effect

Common Name	Scientific Name	County, State	Federal Status	State Status	Habitat Description	Assessment Result	Potential Effect
Insects							
Appalachian grizzled skipper butterfly	*Pyrgus wyandot*	Prince William County, VA	S	T	Northern Michigan, Appalachian highlands, open areas in hardwood forests, recently disturbed areas	Suitable habitat is in the project area	No effect
Buffalo Springs caddisfly	*Ceratopsyche etnieri*	Prince William County, VA	S	--	Southern Appalachian mountains, clear streams	Suitable habitat is in the project area	No effect
Dotted skipper butterfly	*Hesperia attalus slossonae*	Prince William County, VA	S	--	Woodland meadows, pine barrens, short-grass prairies	Suitable habitat is in the project area	No effect
Persius duskywing butterfly	*Erynnis persius persius*	Prince William County, VA	S	--	Pine barrens, oak savannahs, streamsides, marshes	Suitable habitat is in the project area	No effect
Regal fritillary butterfly	*Speyeria idalia idalia*	Prince William County, VA	S	--	Mixed grass and tallgrass prairies	Suitable habitat is in the project area	No effect
Mollusks							
Brook floater	*Alasmidonta varicosa*	Prince William County, VA	--	E	Rocky areas with moderate to swift currents; prefers small streams and rivers	Suitable habitat is not present in project area	No effect
Green floater	*Lasmigona subviridis*	Brunswick and Greensville, VA	--	T	Low gradient creeks and medium size rivers with moderate gradient and pools.	Suitable habitat potentially present in the Project area. Field surveys did not indicate the presence of this species.	No effect
Atlantic pigtoe	*Fusconaia masoni*	Brunswick and Greensville, VA	--	T	High gradient, medium size rivers with moderate gradients and riffles.	Suitable habitat potentially present in the Project area. Field surveys did not indicate the presence of this species.	No effect
Yellow lance	*Elliptio lanceolata*	Prince William County, VA	S/CC	--	Freshwater, gravel or coarse to medium-sized sand substrates, several sizes of waterbodies, clear water	Suitable habitat is not present in project area	No effect

Common Name	Scientific Name	County, State	Federal Status	State Status	Habitat Description	Assessment Result	Potential Effect
Plants							
American chaffseed	*Schwalbea americana*	Greensville, VA	E	--	Acidic, sandy or peaty soils in open pine flatwoods, pitch pine lowland forests, seepage bogs, palustrine pine savannahs, and other grass- and sedge-dominated plant communities.	Species-specific surveys conducted July 24 and 25, 2014 did not identify any individuals present within area of potential habitat. a	No effect
Harparella	*Ptilimnium nodosum*	Prince William County, VA	E	--	Rocky, gravel shoals, sandbars, along margins of clear and swift-moving streams	Suitable habitat is not present in project area	No effect
Michaux's sumac	*Rhus michauxii*	Brunswick and Greensville, VA	E	T	Savannas, hardwood-dominated forests, sandy or rocky open lands. Fire dependent for reproduction.	Suitable habitat is present in project area; field surveys did not find species.	No effect
Birds							
American bittern	*Botaurus lentiginosus*	All	BCC	II	Large (>5 acres) open-water areas, large wetland complexes, wood swamps, and bogs	Suitable habitat is not present in project area	No adverse effect
American black duck	*Anas rubripes*	Prince William County, VA	--	II	Woodland ponds, coastal salt marshes, lakes, estuaries, bays, ponds	Suitable habitat is present in project area	No adverse effect
Bald eagle	*Haliaeetus leucocephalus*	All	S/BCC	--	Large (>5 acres) open-water areas, large wetland complexes, wood swamps, and bogs	The nearest known next is 1.7 miles east of project area.	No adverse effect
Black-billed cuckoo	*Coccyzus erythropthalmus*	All	--	--	Woodlands and thickets; more likely found in large areas of deciduous woods than coniferous woods.	Suitable habitat is present in project area	No adverse effect; vegetation clearing would occur outside of breeding/nesting season

Common Name	Scientific Name	County, State	Federal Status	State Status	Habitat Description	Assessment Result	Potential Effect
Black-throated green warbler	*Dendroica virens*	Prince William County, VA	--	I	Coniferous forests, mixed forests, cypress swamps	Suitable habitat is present in project area	No adverse effect; vegetation clearing would occur outside of breeding/nesting season
Blue-winged warbler	*Vermivora cyanoptera*	Prince William County, VA	--	--	Forest and field edges that are shaded by large trees.	Suitable habitat is present in project area	No adverse effect; vegetation clearing would occur outside of breeding/nesting season
Brown-headed nuthatch	*Sitta pusilla*	All	BCC	--	Pine forests, mature forests, dead trees	Suitable habitat is present in project area	No adverse effect; vegetation clearing would occur outside of breeding/nesting season
Cerulean warbler	*Dendroica cerulea*	Prince William County, VA	--	II	Mature deciduous forests, ridge tops, and steep upper slopes	Suitable habitat is present in project area	No adverse effect; vegetation clearing would occur outside of breeding/nesting season
Fox sparrow	*Passerella liaca*	All	BCC	--	Wooded undergrowth of conifer and deciduous woods, woodland thickets, and scrub/brush habitat	Suitable habitat is present in project area	No adverse effect; vegetation clearing would occur outside of breeding/nesting season
Golden-winged warbler	*Vermivora chrysoptera*	Prince William County, VA	--	I	Large (>5 acres) open-water areas, large wetland complexes, wood swamps, and bogs	Suitable habitat is not present in project area	No effect
Kentucky warbler	*Oporornis formosus*	All	BCC	--	Deciduous forest with dense understory; avoids edge habitat	Suitable habitat is not present in project area (it is mostly edge habitat).	No effect
Henslow's sparrow	*Ammodramus henslowii*	Prince William County, VA	T	--	Wet, shrubby fields, grasslands, marshes, pine forests	Suitable habitat is present in project area	No adverse effect; vegetation clearing would occur outside of breeding/nesting season

Common Name	Scientific Name	County, State	Federal Status	State Status	Habitat Description	Assessment Result	Potential Effect
King rail	*Rallus elegans*	Prince William County, VA	--	II	Freshwater wetlands in the eastern U.S. and Canada	Suitable habitat is present in project area	No adverse effect; vegetation clearing would occur outside of breeding/nesting season
Least bittern	*Ixobrychus exilis*	All	BCC	--	Large (>5 acres) open-water areas, large wetland complexes, wood swamps, and bogs	Suitable habitat is not present in project area	No effect
Little blue heron	*Egretta caerulea caerulea*	Prince William County, VA	--	II	Freshwater lakes, swamps, streams, rivers, ponds, flooded agricultural fields, canals, and ditches	Suitable habitat is present in project area	No adverse effect; vegetation clearing would occur outside of breeding/nesting season
Loggerhead shrike	*Lanius ludovicianus*	Prince William County, VA	T	--	Open fields with scattered shrubs and trees	Suitable habitat is present in project area	No adverse effect; vegetation clearing would occur outside of breeding/nesting season
Northern saw-whet owl	*Aegolius acadius*	Prince William County, VA	--	II	Coniferous and deciduous forests, use old nests and dead trees	Suitable habitat is present in project area	No adverse effect; vegetation clearing would occur outside of breeding/nesting season
Peregrine falcon	*Falco peregrinus*	Prince William County, VA	T	--	Widespread through habitats; migrate along mountain ranges, sea coast, barrier islands, and long lake shores	Suitable habitat is present in project area	No adverse effect; vegetation clearing would occur outside of breeding/nesting season
Pied-billed grebe	*Podilymbus podiceps*	All	BCC	--	Large (>5 acres) open-water areas, large wetland complexes, wood swamps, and bogs	Suitable habitat is not present in project area	No adverse effect
Prairie warbler	*Dendroica discolor*	All	BCC	--	Previously disturbed areas that are re-growing (such as old fields, pastures, clear-cuts, and power line rights-of-ways).	Suitable habitat is not present in project area (area is continuously disturbed by mowing)	No adverse effect

Common Name	Scientific Name	County, State	Federal Status	State Status	Habitat Description	Assessment Result	Potential Effect
Prothonotary warbler	*Protonotaria citrea*	All	BCC	--	Large (>5 acres) open-water areas, large wetland complexes, wood swamps, and bogs	Suitable habitat is not present in project area	No adverse effect
Red crossbill	*Loxia curvirostra*	All	--	I	Conifer forests and groves	Suitable habitat is present in project area	No adverse effect; vegetation clearing would occur outside of breeding/nesting season
Red-headed woodpecker	*Melanerpes erythrocephalus*	All	BCC	--	Deciduous forest, open areas, orchards, wooded creek valleys	Suitable habitat is present in project area	No adverse effect; vegetation clearing would occur outside of breeding/nesting season
Rusty blackbird	*Euphagus carolinus*	All	BCC	--	Large (>5 acres) open-water areas, large wetland complexes, wood swamps, and bogs	Suitable habitat is not present in project area	No adverse effect
Short-billed dowitcher	*Limnodromus griseus*	All	--	--	Forest clearings, mudflats, tidal marshes, bogs, nest on the ground	Suitable habitat is present in project area.	No adverse effect; vegetation clearing would occur outside of breeding/nesting season
Short-eared owl	*Asio flammeus*	All	BCC	--	Open land, marshes, grassland, tundra	Suitable habitat is present in project area.	No adverse effect; vegetation clearing would occur outside of breeding/nesting season
Swainson's warbler	*Limnothlypis swainsonii*	Prince William County, Virginia	--	II	Flood marshes and cane breaks	Suitable habitat is present in project area.	No adverse effect; vegetation clearing would occur outside of breeding/nesting season
Upland sandpiper	*Bartramia longicauda*	Prince William County, Virginia	T	--	Open grassy areas, pastures, lawns	Suitable habitat is present in project area.	No adverse effect; vegetation clearing would occur outside of breeding/nesting season

Common Name	Scientific Name	County, State	Federal Status	State Status	Habitat Description	Assessment Result	Potential Effect
Winter wren	*Troglodytes troglodytes*	Prince William County, Virginia	--	II	Conifer forests close to water, woodland underbrush, dense understory	Suitable habitat is present in project area.	No adverse effect; vegetation clearing would occur outside of breeding/nesting season
Wood thrush	*Hylocichla mustelina*	All	BCC	--	Mid-successional to mature forests with a moderate understory. Mostly an interior forest species, but has also been observed in edge habitat.	Suitable habitat is present in project area	No adverse effect; vegetation clearing would occur outside of breeding/nesting season
Worm eating warbler	*Helmitheros vermivorum*	All	BCC	--	Deciduous forest interior areas in large tracts of forest	Suitable habitat is not present in project area (it is mostly edge habitat).	No adverse effect
Yellow-bellied sapsucker	*Sphyrapicus varius*	Prince William County, Virginia	--	I	Young, deciduous forests; some populations found in mountain regions	Suitable habitat is present in project area	No adverse effect; vegetation clearing would occur outside of breeding/nesting season
Yellow-crowned night heron	*Nyctanassa violacea violacea*	Prince William County, Virginia	--	II	Inland wetlands, rivers, lakes, lagoons, tidal mudflats, barrier beaches, mangroves, rocky coasts	Suitable habitat is present in project area	No adverse effect; vegetation clearing would occur outside of breeding/nesting season

a/ Sources: USFWS 2008; USFWS, 2015a; Van Alstine, 2014
BCC = U.S. Fish and Wildlife Service Bird of Conservation Concern; CC = collection concern; E = endangered; T = Threatened
S = Treat as federally protected because of similarity of appearance to listed species
I = Virginia Wildlife Action Plan Tier I - Critical Conservation Need
II = Virginia Wildlife Action Plan Tier II - Very High Conservation Need
III = Virginia Wildlife Action Plan Tier III - High Conservation Need
IV = Virginia Wildlife Action Plan Tier IV - Moderate Conservation Need

Appendix D – Required Permits for the Non-Jurisdictional Power Station

Certificates/Permits/ Approvals	Administering Agency	Expected Approval/ Permit Receipt Date
Federal		
Clean Water Act, Section 404	U.S. Army Corps of Engineers – Norfolk District	Received 10/21/2015
Threatened and Endangered Species Coordination	U.S. Fish and Wildlife Service	Received 10/21/2015
Federal Aviation Administration Part 77 – Airspace Obstruction Analysis (construction equipment)	Federal Aviation Administration	Anticipated 2nd – 3rd Quarter 2016
State		
Electric Generation Facility Permitting – Code of Virginia, Title 56 Chapter 10; 20 Virginia Administrative Code (VAC) 5-10, 20 VAC 5-300; and 20 VAC 5-302	Virginia State Corporation Commission, Division of Energy Regulation	Anticipated 4/1/2016
Prevention of Significant Deterioration (PSD) Air Permit Clean Air Act, Part C 9 VAC 5-80	Virginia Department of Environmental Quality, Air Quality Division	Anticipated 3/31/2016
PSD Air Permit Clean Air Act, Part C 9 VAC 5-80 Article 8 Or Minor New Source Review Air Permit 9 VAC 5-80 Article 6 Or Virginia General Permit 9 VAC 500-540	Virginia Department of Environmental Quality, Air Quality Division	N/A
Virginia Water Protection Permit Program– Clean Water Act, Section 401 Virginia State Water Control Law, Title 62.1	Virginia Department of Environmental Quality, Water Quality Division Virginia Marine Resources Commission	10/21/2015
Virginia Pollutant Discharge Elimination System (VDPES) Permit – Discharges of Stormwater from Construction Activities Virginia Stormwater Management Act 4 VAC 50-60; 9 VAC 25-31; 9 VAC 25-151	Virginia Department of Environmental Quality, Water Quality Division	Received 5/11/2015
VPDES Permit – Discharges of Stormwater Associated with Industrial Activities 9 VAC 25-31; 9 VAC 25-151	Virginia Department of Environmental Quality, Water Quality Division	Anticipated 2nd – 3rd Quarter 2018
Rare, Threatened and Endangered Species and Critical Habitat Consultation	Virginia Department of Conservation and Recreation and Virginia Department of Game and Inland Fisheries	Received 10/21/2015
Cultural Resources Consultation	Virginia Department of Historic Resources	Received 10/21/2015

Certificates/Permits/ Approvals	Administering Agency	Expected Approval/ Permit Receipt Date
Aboveground Storage Tank Permitting – Virginia State Water Control Law, Title 62.1; 9 VAC 25-91; and 9 VAC 25-640	Virginia Department of Environmental Quality, Water Quality Division	Anticipated 1st – 2nd Quarter 2018
Virginia Department of Transportation Entrance Permit(s)	Virginia Department of Transportation	Anticipated 1st Quarter 2016
Virginia Department of Aviation – Airspace Obstruction Analysis (construction equipment)	Virginia Department of Aviation	Anticipated 2nd – 3rd Quarter 2016
Local		
Land Disturbing Permit, includes Erosion and Sediment Control Plan	Brunswick County, Greensville County, or both – Department of Building and Zoning	Received 10/29/2015
Water Supply Agreement	Greensville County Water and Sewer Authority	Received 4/20/2015
Industrial User Wastewater Discharge Permit – Discharges of Wastewater	City of Emporia	Anticipated 2nd – 3rd Quarter 2018
Aboveground Storage Tank Registration	Local Emergency Planning Committee	N/A
Site Plan Approval	Brunswick County, Greensville County, or both	Received 10/29/2015
Special Use Permit	Brunswick County, Greensville County, or both – Board of Supervisors	Received 5/20/2015
Building Permit(s)	Brunswick County, Greensville County, or both	Anticipated 3rd – 4th Quarter 2016
Building Inspections	Brunswick County, Greensville County, or both	Anticipated 1st – 2nd Quarter 2018
Construction Water Well(s)	Brunswick County, Greensville County, or both	Received 9/6/2015

Appendix E - Other Projects Evaluated for Cumulative Impacts with the Virginia Southside Expansion Project II

Project	Description	Estimated Construction Date	Location Relative to the Proposed Project	Resources Potentially Affected /b	Region of Influence	Acreage within 0.5 Mile of the Proposed Project /a
Baseline Conditions - Would not contribute to cumulative impacts						
Piedmont BioProducts, LLC	A renewable resource company that uses bio-based feedstock to help generate clean energy alternatives in Pittsylvania County, VA.	Existing facility	Located about 7.4 miles northwest of Compressor Station 166.	•Geology •Soils •Vegetation •Wetlands •Water quality •Wildlife •Fisheries •Air Quality •Noise	•0.5 miles for on geology, soils, vegetation, wildlife, cultural resources, and land use •Banister River watershed (HUC 03010105) for water quality, wetlands, and fisheries •Pittsylvania County for air quality	0
Pittsylvania County Public Safety Communications System	Consists of eight communication towers located throughout the county.	Complete	One tower is located about 3.1 miles west of Compressor Station 166.	•Water resources •Fisheries	•Banister River watershed (Cherrystone Creek HUC 030101050104) •Pittsylvania County for air quality	0
Transco Virginia Southside Expansion Project CP13-30-000	Installation of 91 miles of pipeline along Transco's existing South Virginia Lateral, 7 miles of new natural gas pipeline designated as the Brunswick Lateral, and one new compressor station (Station 166) located adjacent to the existing Compressor Station 165.	January 2014 to September 2015	The Greensville Lateral will start at MP 5.20 of the Brunswick Lateral and will partially overlap the ROW for the Brunswick Lateral.**/c**	•Geology •Soils •Vegetation •Wetlands •Water quality •Wildlife •Fisheries •Air Quality •Noise	•Meherrin River watershed (Reedy Creek HUC 030102040204) •Brunswick County for air quality	11
			Construction of Compressor Station 166 will have been completed as a part of VSEP I at the time of construction for the proposed VSEP II.		•Banister River watershed (Cherrystone Creek HUC 030101050104) •Pittsylvania County for air	39

Project	Description	Estimated Construction Date	Location Relative to the Proposed Project	Resources Potentially Affected /b	Region of Influence	Acreage within 0.5 Mile of the Proposed Project /a
					quality	
VEPCO Brunswick County Power Station	Construction of a 1,358-megawatt natural gas-fired power station.	Spring 2014 to May 2016	Located about 1.5 miles north of the Greensville Lateral at MP 0.	•Water resources	VEPCO Brunswick County Power Station	Construction of a 1,358- megawatt natural gas-fired power station.
Transco Leidy Southeast Project CP13-551-000	Installation of 30 miles of pipeline looping in Pennsylvania and New Jersey, the addition of 71,900 horsepower at four existing compressor stations, and modifications at several existing aboveground facilities.	January 2015 to January 2016	Minor piping and valve modifications (no addition of compression) will occur at Compressor Station165, located next to Compressor Station 166.	•Geology •Soils •Vegetation •Wetlands •Water quality •Wildlife •Fisheries •Air Quality •Noise	•Banister River watershed (Cherrystone Creek HUC 030101050104) •Pittsylvania County for air quality	7
Within region of influence and construction timeframe - Could contribute to cumulative impacts						
Relocation of State Route 605 segment	Relocation of State Route 605 segment for Power Station construction	Unknown at this time, but likely concurrent with Power Station construction	Within 0.25 mile of the Greensville M&R Station	•Geology •Soils •Vegetation •Wetlands •Water quality •Wildlife •Fisheries •Air Quality •Noise	•Meherrin River (Douglas Run-Meherrin River HUC 030102040603) • Greensville County for air quality	Entire project; estimated acreage unavailable, <25 acres

Project	Description	Estimated Construction Date	Location Relative to the Proposed Project	Resources Potentially Affected /b	Region of Influence	Acreage within 0.5 Mile of the Proposed Project /a
Power Station	Proposed natural gas fired energy generating facility to supply 1,580 megawatts of electricity.	Land clearing in 2015 Construction starts 2nd Quarter 2016	The proposed Greensville M&R Station will be constructed within the VEPCO property.	•Geology •Soils •Vegetation •Wetlands •Water quality •Wildlife •Fisheries •Air Quality •Noise	•Meherrin River (Douglas Run-Meherrin River HUC 030102040603) • Greensville County for air quality	240
Atlantic Coast Pipeline Project CP15-554-000	Installation of 564 miles of new natural gas pipelines and ancillary facilities and three new compressor stations in West Virginia, Virginia, and North Carolina.	September 2016 to November 2018	A portion of the Atlantic Coast Pipeline AP-5 lateral ends at a proposed meter station next to the proposed Greensville M&R Station within the VEPCO property.	•Geology •Soils •Vegetation •Wetlands •Water quality •Wildlife •Fisheries •Air Quality •Noise	•Meherrin River (Douglas Run-Meherrin River HUC 030102040603) • Greensville County for air quality	8
Transco Dalton Expansion Project CP15-117-000	Installation of about 115 miles of new natural gas pipelines and ancillary facilities and one new compressor station located in Georgia. The project also includes modification of existing facilities, including Compressor Station 165 (adjacent to Compressor Station 166).	July 2016 to May 2017	Compressor Station 165, where minor modifications (no addition of compression) will occur, is located next to Compressor Station 166.	•Geology •Soils •Vegetation •Wetlands •Water quality •Wildlife •Fisheries •Air Quality •Noise	•Banister River watershed (Cherrystone Creek HUC 030101050104) •Pittsylvania County for air quality	18

Project	Description	Estimated Construction Date	Location Relative to the Proposed Project	Resources Potentially Affected /b	Region of Influence	Acreage within 0.5 Mile of the Proposed Project /a
Atlantic Sunrise Project CP15-138-000	The ASR includes 195.2 miles of new natural gas pipelines, 2.5 miles of pipeline replacement, two new compressor stations, and modifications of existing facilities. Some of the modifications have been proposed at Compressor Station 185, where modifications for VSEP II would also occur. About 13.7 acres of land within 0.5 miles of the VSEP II would be affected by ASR construction.	July 2016 to July 2017	Minor piping and valve modifications (no addition of compression) will occur at Compressor Station 185.	•Geology •Soils •Vegetation •Wetlands •Water quality •Wildlife •Fisheries •Air Quality •Noise	•Middle Potomac-Anacostia-Occoquan Watershed (Middle Bull HUC 020700100703) •Prince William County for air quality	13.7
			2.5 miles of pipeline would be replaced on Transco's mainline from MP 1578.7 to MP 1581.0 (about 2.1 miles southwest of Compressor Station 185).	•Geology •Soils •Vegetation •Wetlands •Water quality •Wildlife •Fisheries •Air Quality •Noise	•Middle Potomac-Anacostia-Occoquan Watershed (Middle Bull HUC 020700100703) •Prince William County for air quality	0
Greensville-Rogers Road transmission line No. 596	One transmission line interconnect between the Power Station and Rogers Road Station	4th Quarter 2016	Both the Greensville M&R Station and the Greensville-Rogers Road transmission line No. 596 are located entirely within the Power Station.	•Geology •Soils •Vegetation •Wetlands •Water quality •Wildlife •Fisheries •Air Quality •Noise	•Meherrin River (Douglas Run-Meherrin River HUC 030102040603) • Greensville County for air quality	Acreage contained within Power Station acreage

Project	Description	Estimated Construction Date	Location Relative to the Proposed Project	Resources Potentially Affected /b	Region of Influence	Acreage within 0.5 Mile of the Proposed Project /a
Carson-Rogers Road transmission line No. 585 and Rogers Road-Heritage transmission line No. 503	Two transmission line interconnects between existing transmission lines and the Power Station	4th Quarter 2016	Both the Greensville M&R Station and *part* of the two transmission line interconnects are located within the Power Station.	•Geology •Soils •Vegetation •Wetlands •Water quality •Wildlife •Fisheries •Air Quality •Noise	•Meherrin River (Douglas Run-Meherrin River HUC 030102040603) • Greensville County for air quality	35 **/e**
Mountain Valley Pipeline Project	Installation of 301 miles of new natural gas pipelines, three compressor stations and other ancillary facilities in West Virginia and Virginia. The project will end at Compressor Station 165.	December 2016 to November 2018	Terminating at existing Compressor Station 165, located next to Compressor Station 166.	•Geology •Soils •Vegetation •Wetlands •Water quality •Wildlife •Fisheries •Air Quality •Noise	•Banister River watershed (Cherrystone Creek HUC 030101050104) •Pittsylvania County for air quality	12
Outside of Construction time frame - Would not contribute to cumulative impacts						
Virginia Uranium, Inc.	Uranium deposit (Coles Hill) with plans for future mining in Pittsylvania County, VA.	N/A	Uranium mining is not currently allowed in VA. Coles Hill is located about 3.5 miles northeast of Compressor Station 166.	•Geology •Soils •Vegetation •Wetlands •Water quality •Wildlife •Fisheries •Air Quality •Noise	•Banister River watershed (Cherrystone Creek HUC 030101050104) •Pittsylvania County for air quality	N/A **/f**

Project	Description	Estimated Construction Date	Location Relative to the Proposed Project	Resources Potentially Affected /b	Region of Influence	Acreage within 0.5 Mile of the Proposed Project /a
Tobacco Heritage Trail	The trail runs throughout Brunswick and Mecklenburg Counties, VA, with future plans to expand throughout Charlotte, Halifax, and Lunenburg Counties, VA.	Unknown **/g**	A planned portion of the trail will parallel and cross the Greensville Lateral; however, the trail is being funded by grants and is not anticipated to be constructed in the foreseeable future.	•Geology •Soils •Vegetation •Wetlands •Water quality •Wildlife •Fisheries •Air Quality •Noise	•Meherrin River (Douglas Run-Meherrin River HUC 030102040603) • Greensville County for air quality	N/A **/g**

a/ Acreage is approximate and was estimated using desktop tools and publicly available information.

b/ The proposed project would not affect cultural resources.

c/ Both the Brunswick Lateral and VSEP II would cross an unnamed tributary of Reedy Creek (Stream 2) and Reedy Creek (Stream 7). Both crossings associated with VSEP II are located downstream of the Brunswick Lateral.

d/ Acreage impacts and resources potentially affected are captured within the Power Station impacts.

e/ Acreage presented is only that which will occur outside of the Power Station.

f/ Project is not reasonably foreseeable; therefore, cumulative impacts are not addressed.

g/ Based on consultations with Southside Planning District Commission (Wells, 2016), this project is not reasonably foreseeable; therefore, cumulative impacts are not addressed.