VIRGINIA
STORMWATER POLLUTION PREVENTION PLAN (SWPPP)

Dominion Energy Transmission, Inc.

Name of Project: Atlantic Coast Pipeline-Virginia

Planned Construction Start Date: November 2017

Planned Construction Completion Date: December 2019

Construction Supervisor: TBD

Telephone: TBD

Project Manager (signature): TBD

Construction Contractor (signature): TBD

Environmental Inspector (signature): TBD

NOTE:
THIS PLAN MUST BE KEPT AT THE
CONSTRUCTION SITE DURING WORKING HOURS

SWPPP Prepared:
September 2017

Prepared by: Environmental Resources Management, Inc.

Professional Engineer Certification

In accordance with Article 1 (§ 54.1-400 et seq.) of Chapter 4 of Title 54.1 of the Code of Virginia, Virginia Erosion and Sediment Control Regulations (9 Virginia Administrative Code [VAC] 25-840 et seq., as amended) and Virginia Stormwater Management Program Regulations (9 VAC 25-870 et seq., as amended), I hereby certify that I have reviewed, and being familiar with the provisions of the above regulations, attest that the Erosion and Sediment Controls (ESC) and Stormwater Management (SWM) requirements in this plan have been prepared in accordance with good engineering practices, including consideration of applicable industry standards, and with the requirements of Article 1 (§ 54.1-400 et seq.) of Chapter 4 of Title 54.1 of the Code of Virginia, 9 VAC 25-840 et seq., as amended and 9 VAC 25-870 et seq., as amended.

Seal:

Daniel Goldstein, PE, CPEA
Printed Name of Registered Professional Engineer

_____
Signature of Registered Professional Engineer

Date_____

_____ Virginia
Registration No. State

DOMINION ENERGY TRANSMISSION, INC.
ATLANTIC COAST PIPELINE – VIRGINIA

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ACP	Atlantic Coast Pipeline
amsl	above mean sea level
Atlantic	Atlantic Coast Pipeline, LLC
ATWS	additional temporary workspace
BIC	Best-in-Class
BIC Program	Best-in-Class Program
BMP	best management practice
BR	Blue Ridge
BSRF	Belted Silt Retention Fence
CBPA	Chesapeake Bay Preservation Act
CFR	Code of Federal Regulations
COM Plan	Construction, Operations, and Maintenance Plan
Commission	Federal Energy Regulatory Commission
Dominion	Dominion Energy, Inc.
DETI	Dominion Energy Transmission, Inc. (formerly Dominion Transmission, Inc.)
DTI	Dominion Transmission, Inc. (now Dominion Energy Transmission, Inc.)
ECC	Environmental Construction Coordinator
EI	Environmental Inspector
EPA	U.S. Environmental Protection Agency
ESC	erosion and sediment control
ESC Plan	Erosion and Sediment Control Plan
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
GWNF	George Washington National Forest
HDD	Horizontal Directional Drilling
HUC	hydrologic unit code
IC	Incremental Control
LIDAR	Light Detection and Ranging
LOD	limits of disturbance
LRMP	Land and Resource Management Plan
M&R	metering and regulating
MACP	Mid-Atlantic Coastal Plains
MP	milepost
MS4	municipal separate storm sewer system
NP	Northern Piedmont
NWI	National Wetlands Inventory
OSHA	Occupational Safety and Health Administration
Piedmont	Piedmont Natural Gas Co., Inc.
Project	Atlantic Coast Pipeline
RECP	Rolled Erosion Control Product
RFSS	Regional Forester Sensitive Species
ROW	right-of-way
RV	Ridge and Valley

SCG	Southern Company Gas
SDS	Safety Data Sheets
SP	Southeastern Plains
SPCC Plan	Spill Prevention, Control, and Countermeasures Plan
SSD	Site-Specific Design
SSURGO	Soil Survey Geographic Database
SWM	stormwater management
SWM Plan	Stormwater Management Plan
SWPPP	Stormwater Pollution Prevention Plan
TD	Typical Design
TMDL	Total Maximum Daily Load
USACE	U.S. Army Corps of Engineers
USDOT	U.S. Department of Transportation
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VAC	Virginia Administrative Code
VACS	Virginia Agricultural Cost-Share
VDCR	Virginia Department of Conservation and Recreation
VDEQ	Virginia Department of Environmental Quality
VDGIF	Virginia Department of Game and Inland Fisheries
VDOT	Virginia Department of Transportation
VEP	Virginia Electric and Power Company
VESCH	Virginia Erosion and Sediment Control Handbook
VESCP	Virginia Erosion and Sedimentation Control Program
VPDES	Virginia Pollutant Discharge Elimination System
VSMP	Virginia Stormwater Management Program
WAP	Western Allegheny Plateau
WEG	wind erodibility group

CERTIFICATION

I certify under penalty of law I have read and understand this document and this document and all attachments were prepared in accordance with a system designed to assure qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Signature[1] :	**Date:**
Printed Name: Leslie Hartz	**Title:** Vice President, Pipeline Construction

Certification of Stormwater Pollution Prevention Plan Revisions

Amendments, modifications, and updates will be made to the Stormwater Pollution Prevention Plan (SWPPP) whenever there is a change in the design, construction, operation, or maintenance that has a significant effect on the discharge of pollutants to surface waters. Revisions may include additional or modified control measures identified in the field during construction. These small field-approved changes will be documented and dated on the construction alignment sheets, site plans, and/or inspection reports. Revisions to the SWPPP narrative will be recorded below, as necessary:

[1] Certification will be signed by a *responsible corporate officer* or by *a duly authorized representative* of that person.

A *responsible corporate officer* means: (i) a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy-making or decision-making functions for the corporation; or (ii) the manager of one or more manufacturing, production, or operating facilities, provided the manager is authorized to make management decisions that govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long-term compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for state/Commonwealth permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.

A person is a *duly authorized representative* only if:

- The authorization is made in writing by a *responsible corporate officer*;
- The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the operator. (A duly authorized representative may thus be either a named individual or any individual occupying a named position); and
- If applicable, the signed and dated written authorization is included in Appendix AA of this SWPPP. A copy will be provided to the Virginia Department of Environmental Quality and Virginia Stormwater Management Program authority, if requested.

Signature[1] :	**Date:**
Printed Name:	**Title:**
Revision 1	**Revision Description**
Signature[1] :	**Date:**
Printed Name:	**Title:**
Revision 2	**Revision Description**
Signature[1] :	**Date:**
Printed Name:	**Title:**
Revision 3	**Revision Description**
Signature[1] :	**Date:**
Printed Name:	**Title:**
Revision 4	**Revision Description**
Signature[1] :	**Date:**
Printed Name:	**Title:**
Revision 5	**Revision Description**
Signature[1] :	**Date:**
Printed Name:	**Title:**
Revision 6	**Revision Description**

1.0 INTRODUCTION

Atlantic Coast Pipeline, LLC (Atlantic) is a company formed by four major U.S. energy companies – Dominion Energy, Inc. (Dominion), Duke Energy Corporation (Duke Energy), Piedmont Natural Gas Co., Inc. (Piedmont), and Southern Company Gas (SCG). The company was created to develop, own, and operate approximately 600 miles of interstate natural gas transmission pipeline and associated laterals in West Virginia, Virginia, and North Carolina. This project, referred to as the Atlantic Coast Pipeline (ACP or Project), will deliver natural gas from supply areas in the Appalachian region to demand areas in Virginia and North Carolina.

Atlantic is seeking authorization from the Federal Energy Regulatory Commission (FERC or Commission) under 7(c) of the Natural Gas Act to construct, own, operate, and maintain the proposed facilities for the ACP system.[2] Atlantic has contracted with Dominion Energy Transmission, Inc. (DETI), formerly Dominion Transmission, Inc. (DTI), a subsidiary of Dominion, to permit, build, and operate the ACP on behalf of Atlantic.[3]

DETI is proposing to construct approximately 303.6 miles of transmission pipeline, four new metering and regulating (M&R) stations, twenty valve sites, seven pig launchers, and one new compressor station (Compressor Station 2 [Buckingham Compressor Station]) within the Commonwealth of Virginia. Aboveground valves and pig launcher/receiver sites will be co-located within the boundaries of the proposed pipeline right-of-way (ROW), compressor station, or M&R stations. A network of microwave towers will be used to facilitate system communications during operation of the ACP. The locations of the facilities are shown on Figure 1.0-1, with pipeline route details provided on construction alignment sheets (Appendix A). Site specific construction typicals are provided in Appendix C. Communication tower construction typicals are provided in Appendix D, and aboveground facility site plans are provided in Appendices E, F, G and H.

DETI will administer, implement and comply with the *2017 Standards and Specifications for Erosion and Sediment Control (ESC) and Stormwater Management (SWM) for Gas Transmission Facility Development* (Standards and Specifications) approved by the Virginia Department of Environmental Quality (VDEQ). DETI's Standards and Specifications, provided in Appendix B, are consistent with the requirements of the Virginia Stormwater Management Act, the Virginia Erosion and Sediment Control Law and associated regulations, where applicable.

This SWPPP was prepared for use by DETI and its contractors as guidance for minimizing erosion of disturbed soils and transportation of sediments; for managing the quantity and quality of post-construction stormwater runoff, as applicable; and for implementing pollution prevention measures during the construction of the Project. This SWPPP pertains to the procedures and practices to be implemented during the construction phase of the ACP. A separate SWPPP will be developed, as necessary, for post-construction operation of aboveground

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[2] Atlantic is also requesting a Blanket Certificate of Public Convenience and Necessity pursuant to Part 284, Subpart G, of the Commission's regulations authorizing open-access transportation of natural gas for others with pre-granted abandonment authority, and a Blanket Certificate of Public Convenience and Necessity pursuant to Part 157, Subpart F, of the Commission's regulations authorizing certain facility construction and operation, certain certificate amendments and abandonments.

[3] In May 2017, Dominion Transmission, Inc. (DTI) had a legal name change to Dominion Energy Transmission, Inc. (DETI).

facilities in compliance with applicable stormwater regulatory requirements associated with industrial activities.

The procedures developed in this plan are designed to accommodate varying field conditions while achieving compliance with regulatory requirements and protecting environmentally sensitive areas. Land-disturbing activities will conform, at a minimum, to the following regulations and guidelines, as appropriate and applicable:

- FERC, *Upland Erosion Control, Revegetation, and Maintenance Plan* (FERC Plan), 2013;
- FERC, *Wetland and Waterbody Construction and Mitigation Procedures* (FERC Procedures), 2013;
- Virginia Erosion and Sediment Control Regulations, (9 Virginia Administrative Code [VAC] 25-840 et seq., as amended);
- Virginia Erosion and Sediment Control and Stormwater Management Certification Regulations (9 VAC 25-850 et seq., as amended);
- VDEQ, *Virginia Erosion and Sediment Control Handbook* (VESCH), Third Ed., 1992, as amended;
- VDEQ, *Virginia Stormwater BMP Clearinghouse Stormwater Design Specifications*, 2013, as amended;
- Virginia Stormwater Management Program (VSMP) Regulations (9 VAC 25-870 et seq., as amended);
- VDEQ, *Virginia Stormwater Management Handbook*, First Edition, 1999, as amended;
- Chesapeake Bay Preservation Area Designation and Management Regulations (9 VAC 25-830 et seq., as amended); and
- DETI, 2017 *Standards and Specifications*, *Erosion and Sediment Control and Stormwater Management for Construction and Maintenance of Gas Transmission Projects in Virginia*, June 2017.

Where the pipeline crosses federal lands under management by the U.S. Forest Service (USFS), additional measures will be implemented in conformance with the following standards and guidelines:

- U.S. Department of Agriculture, Forest Service Region 8, *Revised Land and Resource Management Plan: George Washington National Forest* (LRMP), R8-MB 143A, November 2014.

DETI developed a program for steep slopes that will be used in implementing procedures where the pipeline crosses areas of steep terrain, outlined in Section 2.19.2 and Section 3.5.6. In

addition, DETI reviewed and constructed this SWPPP from the information contained in the following documents previously submitted to FERC and to the USFS, as indicated:

FERC

- Resource Reports (1-10, as applicable)
- *Karst Terrain Assessment Construction, Monitoring and Mitigation Plan*
- *Blasting Plan*
- *Spill Prevention, Control, and Countermeasures (*SPCC*) Plan*
- *Restoration and Rehabilitation Plan*
- *Streams and Waterbodies Crossing Plan*
- *Horizontal Directional Drilling (*HDD*) Design Report*

USFS

- *Construction, Operations, and Maintenance Plan* (COM Plan)

In geographic areas where multiple overlapping regulatory requirements and guidelines apply, DETI selected the more stringent or protective of the requirements and guidelines set forth by FERC, VDEQ and, where applicable, the USFS; unless otherwise agreed to in advance. In addition, incremental controls above and beyond regulatory requirements will be implemented during construction in steep slope terrain to mitigate hazards associated with potential slope instability. Appendix J shows the FERC regulatory requirements and where more stringent or protective requirements will be used during construction.

Descriptions of each component of the Project are provided in the following sections. The locations of the facilities are shown on Figure 1.0-1, with pipeline route details provided on construction alignment sheets included in Appendix A and aboveground facility site plans provided in Appendices E, F, G, and H. DETI's proposed linear projects and appurtenant facilities within the Commonwealth of Virginia are covered under the DETI Standards and Specifications (Appendix B).

Insert Figure 1.0-1

2.0 PROJECT DESCRIPTION

2.1 MAINLINE PIPELINE FACILITIES

The mainline of the ACP pipeline is comprised of two sections (AP-1 in West Virginia and Virginia, and AP-2 in North Carolina):

- AP-1 (portions within Virginia): approximately 231.8 miles of underground 42-inch outside diameter natural gas transmission pipeline in Highland, Bath, Augusta, Nelson, Buckingham, Cumberland, Prince Edward, Nottoway, Dinwiddie, Brunswick, and Greensville Counties, Virginia.

- AP-2: not located in the Commonwealth of Virginia.

2.2 LATERAL PIPELINE FACILITIES

There are three proposed lateral pipeline facilities (AP-3, AP-4, and AP-5), all of which are located in the Commonwealth of Virginia, with the exception of a small portion of AP-3 located in North Carolina:

- AP-3 (portions within Virginia): approximately 70.4 miles of underground 20-inch outside diameter natural gas lateral pipeline in Greensville and Southampton Counties and the Cities of Suffolk and Chesapeake, Virginia.

- AP-4: approximately 0.4 mile of underground 16-inch outside diameter natural gas lateral pipeline in Brunswick County, Virginia.

- AP-5: approximately 1.0 mile of underground 16-inch outside diameter natural gas lateral pipeline in Greensville County, Virginia.

2.3 COMPRESSOR STATION FACILITIES

Three compressor stations are located along the proposed ACP pipeline route, only one of which is located in the Commonwealth of Virginia:

- Compressor Station 2 (Buckingham Compressor Station): a new, natural gas-fired compressor station located at approximately milepost (MP) 191.6 of the AP-1 mainline in Buckingham County, Virginia. The Compressor Station 2 (Buckingham Compressor Station) is addressed in this SWPPP. Site-specific ESC and SWM Plans specific to the Compressor Station 2 (Buckingham Compressor Station) are included in Appendix E.

2.4 METERING AND REGULATING STATIONS

There will be four new M&R stations at receipt and/or delivery points in Virginia. One of these stations, Woods Corner M&R station, will be built on the same site and within the same fence-line as Compressor Station 2 (Buckingham Compressor Station) in Buckingham County, Virginia. Two of the M&R stations (Brunswick and Greensville) will be located within the

property boundary of electric power stations owned by Virginia Electric and Power Company (VEP) in Brunswick and Greensville Counties. Lastly, the Elizabeth River M&R station will be located in the City of Chesapeake.

The Compressor Station 2 (Buckingham Compressor Station), Woods Corner M&R, and Elizabeth River, Brunswick and Greensville M&R stations are addressed in this SWPPP. Site-specific ESC and SWM Plans specific to the Elizabeth River, Brunswick, and Greenville stations are included in Appendices F, G, and H, respectively. Compressor Station 2 (Buckingham Compressor Station) and Woods Corner M&R Station are included in Appendix E.

2.5 TELECOMMUNICATIONS

A network of microwave towers will be used to facilitate system communications during operation of the ACP. The exact design of the microwave tower network is still under development. However, new microwave towers will be installed within the footprint of Compressor Stations, M&R sites, and valve sites or will be constructed in leased space on existing microwave towers owned and operated by other parties. The footprint of these microwave towers will not include land disturbance outside of other existing or proposed facilities. Table 2.5-1 lists the proposed communication towers for Virginia. Construction typicals and site specific plans for microwave towers are located in Appendix D.

TABLE 2.5-1

Communication Towers in Virginia for the Atlantic Coast Pipeline

Pipeline Segment/Facility	County/City, State/ Commonwealth	Milepost	Scope of Work
AP-1 Mainline			
Sounding Knob [a]	Highland County, VA	NA	Located 9.5 miles east-northeast of AP-1 MP 86. Construct new megawatt antennas and shelter.
Bath County Power Station [b]	Bath County, VA	NA	Located 6 miles west of AP-1 MP 91. Construct new megawatt antennas.
Rocky Mountain MW Site [b]	Rockbridge County, VA	NA	Located 21 miles west of AP-1 MP 172. Construct new megawatt antennas.
Compressor Station 2	Buckingham County, VA	191.6	Construct new tower and shelter.
Bremo Repeater MW Site	Fluvanna County, VA	NA	Located 22.5 miles east-northeast of Compressor Station 2. Construct new megawatt antennas.
Farmville District Office	Prince George County, VA	NA	Located 6.5 miles west of AP-1 MP 224. Construct new megawatt antennas.
ACP Valve Site #18	Prince George County, VA	225.7	Construct new tower, new shelter, generator, natural gas tank.
ACP Valve Site #19	Nottoway County, VA	245.2	Construct new tower, new shelter, generator, natural gas tank.
Rawlings Substation	Brunswick County, VA	NA	Located 0.5 mile east-northeast of MP AP-1 267. Construct new megawatt antennas.
AP-3 Lateral			
Boykins Substation	Southampton County, VA	NA	Located 0.3 mile northwest of AP-3 MP 20. Construct new tower and shelter.
Southampton Substation	Southampton County, VA	NA	Located 1.2 miles north-northwest of AP-3 MP 33. Construct new tower and shelter.
Watkins Corner Substation	Southampton County, VA	NA	Located 1.4 miles north of AP-3 MP 33. Construct new tower and shelter.
Union Camp Substation	Isle of Wight County, VA	NA	Located 2.6 miles north-northeast of AP-3 MP 37. Construct new tower and shelter.

TABLE 2.5-1

Communication Towers in Virginia for the Atlantic Coast Pipeline

Pipeline Segment/Facility	County/City, State/ Commonwealth	Milepost	Scope of Work
Holland Substation	Suffolk, VA	NA	Located 0.5 mile west of AP-3 MP 48. Construct new tower and shelter.
Suffolk Substation	Suffolk, VA	NA	Located 6 miles south of AP-3 MP 64. Construct new antennas.
Elizabeth River Repeater MW Site	City of Chesapeake, VA	NA	Located 0.3 mile northeast of AP-3 MP 81. Construct new antennas.
Elizabeth River M&R Station	City of Chesapeake, VA	82.7	Construct new tower.
AP-5 Lateral			
Greensville M&R Station	Greensville County, VA	1.0	Construct new tower.

[a] Atlantic is evaluating the option to collocate new equipment on two existing structures located between Long Run M&R and Sounding Knob. Options for these two existing structures are being evaluated; however, an exact location has not been finalized.

[b] Located within an existing authorized facility on NFS lands; therefore, no additional authorization would be required from the USFS.

2.6 OTHER ABOVEGROUND FACILITIES

Twenty valve sites at select points along the new pipelines at intervals specified by U.S. Department of Transportation (USDOT) regulations at Title 49 Code of Federal Regulations (CFR) Part 192, seven pig launcher and receiver assemblies, and eight ground beds will be located in the Commonwealth of Virginia.

The proposed pipeline route map is depicted on Figure 1.0-1. The proposed pipeline route within the Commonwealth of Virginia is depicted on Figure 2.6-1.

Insert Figure 2.6-1

2.7 LOCATION AND DESCRIPTION OF FACILITIES

2.7.1 Pipeline Facilities

DETI proposes to construct approximately 604.4 miles of natural gas transmission pipelines in West Virginia, Virginia, and North Carolina. This includes two new mainline pipelines (AP-1 and AP-2) and three new lateral pipelines (AP-3, AP-4, and AP-5).

The portions of the main and lateral pipeline route which cross through the Commonwealth of Virginia comprise approximately 303.6 miles of the total natural gas transmission pipeline. Table 2.7.1-1 provides summary information on the crossing length of each pipeline by county or city.

The AP-1 mainline will consist of 42-inch outside diameter pipeline. After entering Virginia from West Virginia, the ACP pipeline will continue for approximately 179.4 miles to the southeast, crossing through Highland, Bath, Augusta, Nelson, Buckingham, Cumberland, Prince Edward, and Nottoway Counties, and entering Dinwiddie County. In Augusta County, the pipeline will pass west and south of the Cities of Staunton and Waynesboro, and in Cumberland and Prince Edward Counties, the pipeline will pass north and east of the town of Farmville. In Dinwiddie County, near the Fort Picket Military Reservation, the pipeline will turn to the south/southeast and continue for approximately 51.8 miles to the Commonwealth of Virginia/State of North Carolina line, crossing through Brunswick and Greensville Counties. The pipeline will terminate just south of the commonwealth/state line in Northampton County, North Carolina at Compressor Station 3 (Northampton Compressor Station).

The AP-3 lateral, which will consist of 20-inch outside diameter pipeline, will originate at Compressor Station 3 (Northampton Compressor Station) in Northampton County, North Carolina, just south of the Commonwealth of Virginia/State of North Carolina line. From this point, the pipeline will extend east/northeast for approximately 83.3 miles, crossing through Northampton County, North Carolina; Greensville and Southampton Counties, Virginia; and the Cities of Suffolk and Chesapeake, Virginia. Of the 83.3 miles of AP-3 pipeline length, 70.4 miles are located in Virginia. The pipeline will pass south of the City of Franklin in Southampton County, and south of the City of Portsmouth and Chesapeake. The pipeline will terminate at the Elizabeth River M&R Station on the east side of the Southern Branch Elizabeth River in the City of Chesapeake.

The AP-4 pipeline lateral, which will consist of 16-inch outside diameter pipeline, will originate approximately at MP 279.6 of the AP-1 mainline near Lawrenceville in Brunswick County, Virginia. The lateral will extend approximately 0.4 mile west to a new interconnect with a VEP electric generating facility currently under construction.

The AP-5 pipeline lateral, which will consist of 16-inch outside diameter pipeline, will originate approximately at MP 284.4 of the AP-1 mainline in Greensville County, Virginia. The pipeline will extend approximately 1.0 mile to the south/southwest to an interconnection with a proposed VEP electric generating facility.

TABLE 2.7.1-1

Proposed Pipeline Facilities for the Atlantic Coast Pipeline Within Virginia [a, b]

Pipeline Facility	County/City and State/Commonwealth	Begin Milepost	End Milepost	Length (miles)
AP-1	Highland County, VA	83.9	91.6	10.8
	Bath County, VA	91.6	106.8	22.6
	Augusta County, VA	106.8	158.2	55.4
	Nelson County, VA	158.2	184.7	27.2
	Buckingham County, VA	184.7	211.8	27.4
	Cumberland County, VA	211.8	220.8	8.9
	Prince Edward County, VA	220.8	225.9	5.1
	Nottoway County, VA	225.9	249.0	23.2
	Dinwiddie County, VA	249.0	260.7	11.6
	Brunswick County, VA	260.7	283.0	22.3
	Greensville County, VA	283.0	300.1	17.3
Subtotal				231.8
AP-3	Greensville County, VA	12.2	12.4	0.2
	Southampton County, VA	12.4	38.6	26.2
	City of Suffolk, VA	38.6	71.3	32.7
	City of Chesapeake, VA	71.3	82.7	11.3
Subtotal				70.4
AP-4	Brunswick County, VA	0.0	0.4	0.4
Subtotal				0.4
AP-5	Greensville County, VA	0.0	1.0	1.0
Subtotal				1.0
ACP Total within Virginia				303.6

[a] The numbers in this table have been rounded for presentation purposes. As a result, the totals may not reflect the sum of the addends.

[b] The mileposts used in the FERC Application, which was filed on September 18, 2015 (FERC Accession Number 20150918-5212), were based on three-dimensional changes in topography along the proposed pipeline routes. In areas where a pipeline route has changed due to the adoption of an alternative, the mileposts in the affected area have been scaled to account for the resulting difference in the length of the route. The straight-line distance between consecutive mileposts as indicated or depicted in tables and figures in this filing may be greater than or less than 5,280 feet. The mileposts should be considered as reference points only.

2.7.2 Aboveground Facilities

In addition to the proposed pipeline facilities, one compressor station, four M&R stations, twenty valve sets, and seven pig launcher and receiver assemblies will be located in the Commonwealth of Virginia. The location of each aboveground facility by milepost and county/city is listed in Table 2.7.2-1.

TABLE 2.7.2-1

Proposed Aboveground Facilities for the Atlantic Coast Pipeline Within Virginia [a]

Aboveground Facility	County/City and State/Commonwealth	Approximate Milepost
Compressor Stations		
AP-1 Mainline		
Compressor Station 2 (Buckingham Compressor Station)	Buckingham County, VA	191.6
Metering and Regulating Stations		
AP-1 Mainline		
Woods Corner M&R Station	Buckingham County, VA	191.6
AP-3 Lateral		
Elizabeth River M&R Station	City of Chesapeake, VA	82.7
AP-4 Lateral		
Brunswick M&R Station	Brunswick County, VA	0.4
AP-5 Lateral		
Greensville M&R Station	Greensville County, VA	1.0
Valves [b]		
AP-1 Mainline		
Valve Site 8	Bath County, VA	93.2
Valve Site 9	Bath County, VA	105.6
Valve Site 10	Augusta County, VA	115.7
Valve Site 11	Augusta County, VA	130.8
Valve Site 12	Augusta County, VA	142.9
Valve Site 13	Nelson County, VA	149.7
Valve Site 14	Nelson County, VA	164.0
Valve Site 15	Nelson County, VA	178.4
Valve Site 16	Buckingham County, VA	191.6
Valve Site 17	Buckingham County, VA	206.3
Valve Site 18	Nottoway County, VA	225.7
Valve Site 19	Nottoway County, VA	245.2
Valve Site 20	Brunswick County, VA	264.8
Valve Site 21	Brunswick County, VA	279.6
Valve Site 22	Greensville County, VA	284.4
AP-3 Lateral		
Valve Site 34	Southampton County, VA	19.5
Valve Site 35	City of Suffolk, VA	39.0
Valve Site 36	City of Suffolk, VA	58.5
Valve Site 37	City of Chesapeake, VA	71.6
Valve Site 38	City of Chesapeake, VA	77.5
Pig Launcher/Receiver Sites		
AP-1 Mainline		
Site 2 (launcher/receiver)	Bath County, VA	105.6
Site 3 (launcher/receiver)	Buckingham County, VA	191.6
AP-3 Lateral		
Site 7 (receiver)	City of Chesapeake, VA	82.7
AP-4 Lateral		
Site 8 (launcher)	Brunswick County, VA	0.0
Site 9 (receiver)	Brunswick County, VA	0.4
AP-5 Lateral		

TABLE 2.7.2-1

Proposed Aboveground Facilities for the Atlantic Coast Pipeline Within Virginia [a]

Aboveground Facility	County/City and State/Commonwealth	Approximate Milepost
Site 10 (launcher)	Greensville County, VA	0.0
Site 11 (receiver)	Greensville County, VA	1.0

[a] The mileposts used in the FERC Application, which was filed on September 18, 2015 (FERC Accession Number 20150918-5212), were based on three-dimensional changes in topography along the proposed pipeline routes. In areas where a pipeline route has changed due to the adoption of an alternative, the mileposts in the affected area have been scaled to account for the resulting difference in the length of the route. The straight-line distance between consecutive mileposts as indicated or depicted in tables and figures in this filing may be greater than or less than 5,280 feet. The mileposts should be considered as reference points only.

[b] There are no valves along the AP-4 and AP-5 pipeline laterals.

2.8 EXISTING SITE CONDITIONS

DETI routed the proposed pipeline facilities adjacent to existing infrastructure to the extent practicable. Co-location reduces the amount of the development of new greenfield utility corridors and diminishes impacts on visual and environmental resources. However, the majority of the proposed pipeline facilities will be constructed along a new (greenfield) corridor due to a lack of existing pipeline infrastructure in Virginia between the proposed receipt and delivery points required for the ACP. Within Virginia, approximately 42.4 miles of the proposed pipelines are parallel to existing linear corridor facilities, including pipelines, electric transmission lines, roads, and railroads: the remainder is greenfield.

Land use types within the proposed ACP Project area were classified according to current land characteristics. Classifications were based on review of the U.S. Geological Survey's (USGS) National Gap Analysis Program Land Cover Data and recent digital aerial photography (2013) augmented by field reconnaissance (2014 and 2015) along the proposed pipeline routes. DETI identified nine primary land use types in the ACP Project area. These consist of the following:

- Agriculture – Cultivated Crop: actively cultivated cropland (e.g., wheat, grass seed, alfalfa, hay, and vegetables);
- Agriculture – Pasture: uncultivated pasture lands and hay meadows;
- Agriculture – Tree Plantation/Harvested Forest: managed tree plantations and harvested forests with shrub and grass/forb regeneration;
- Upland Forest/Woodland: conifer dominated forests and woodlands, deciduous dominated forests and woodlands, deciduous dominated savannas and glades, floodplain/riparian forests, and mixed deciduous/coniferous forests and woodlands;
- Developed – Open to Low Intensity: herbaceous areas (e.g., golf courses, road sides, parks, and air fields) and areas with a mixture of constructed materials and vegetation where impervious surfaces account for 20 to 49 percent of total cover (e.g., single-family housing units);
- Developed – Medium to High Intensity: areas with impervious surfaces accounting for 50 to 100 percent of total cover, including single-family housing units, apartment complexes, row houses, and commercial/industrial areas;

- Open Land – disturbed lands, grasslands, shrub lands, beach and shore lands, and cliff, canyon, and talus lands;
- Wetlands – wetland areas identified by field surveys or in National Wetlands Inventory (NWI) data, including palustrine and estuarine emergent wetlands and forested palustrine wetlands; and
- Open Water – areas of open water, generally with less than 25 percent cover of vegetation or soil, including inland waters of streams, river, ponds, and lakes, and coastal and near-shore estuarine and/or marine waters.

Land use types within Virginia affected by construction and operation of ACP are provided in Appendix K. The principal land use type crossed by the proposed ACP pipeline facilities in Virginia is upland forest/woodland. In descending order, the other land use types affected by the mainline and lateral pipelines are agriculture (pasture), agriculture (tree plantation/harvested forest), wetlands, agriculture (cultivated crop), open land, developed (open to low intensity), open water, and developed (medium to high intensity).

2.9 COMMON ADDRESS AND TAX REFERENCE/PARCEL NUMBER

Tax reference numbers and parcel numbers for the properties crossed by the pipeline are shown on the construction alignment sheets in Appendix A. The property location information for each of the aboveground facilities and contractor yards is as follows:

- Elizabeth River M&R Station: 2516 South Military Highway, Chesapeake, Virginia [parcel No. 0260000000340]
- Brunswick M&R Station: Co-located with the VEP Brunswick Electric Power Station, 20100 Governor Harrison Parkway, Freeman, Virginia [parcel No. 55-64D]
- Greensville M&R Station: Co-located with VEP Greensville Power Station, 2500 Rogers Road, Emporia, Virginia [parcel No. 18-35]
- Compressor Station 2 (Buckingham Compressor Station): 5297 S. James River Highway, Wingina, Buckingham County, Virginia, [parcel No. 91-60]
- Woods Corner M&R Station: Co-located with Compressor Station 2 (Buckingham Compressor Station) 5297 S. James River Highway, Virginia, Buckingham County, Virginia, [parcel No. 91-60]
- Contractor Yard Deerfield (SP4A_CY GWNF-6 Spr04-A): Augusta County, Virginia, Latitude/Longitude: 38.19654083/-79.4150238 [parcel No. 040 17]
- Contractor Yard Steeles Tavern (SP5_CYSpr05-C): Rockbridge, Virginia, Latitude/Longitude: 37.92134857/-79.2409668 [parcel No. 28-A-24D]
- Contractor Yard Emporia (SP7_CYSpr07-B): Brunswick, Virginia, Latitude/Longitude: 36.82397842/ -77.74959564 [parcel No. 7406-10-8663]

- Contractor Yard (SP3_CYSpr03-A(Revised)): Monterey, Highland County, Virginia, Latitude/Longitude: 38.38041/-79.60789

- Contractor Yard (SP4_CYSpr04-A): 206 Neil Lane, McDowell, Highland County, Virginia, Latitude/Longitude: 38.33673/-79.50346 [parcel No. 06-057.CY]

- Contractor Yard (SP6_CYSpr06-C): 8324 Knights Forest Drive, Buckingham, Buckingham County, Virginia, Latitude/Longitude: 37.54877/-78.6187 [parcel No. 09-045.AR]

2.10 EXISTING AND PROPOSED TOPOGRAPHY

Existing topography and aerial route maps for the pipeline are provided on construction alignment sheets provided in Appendix A. From the Virginia-West Virginia border at approximately MP 83.9 to the crossing of the James River at approximately MP 185.0, Segment AP-1 crosses a very distinct region characterized by a series of long, linear, parallel ridges trending northeast-southwest, known as the Valley and Ridge and Blue Ridge provinces. The valley bottoms between these ridges are generally flat, while the hillslopes on either side typically have inclinations of 40 to 70 percent. From approximately MP 123 to approximately MP 158, the route crosses the wide and relatively flat Shenandoah Valley. The proposed route in this region reaches elevations over 4,300 feet above mean sea level (amsl) at the highest peaks with ascents and descents along the pipeline route of up to 1,900 feet in elevation. From the James River southeast, the remainder of the proposed AP-1 route from approximately MPs 185.0 to 300.1 (and Segments AP-4, and AP-5) is located on a very low relief, low elevation plain. Elevation decreases from approximately 350 feet amsl at the James River to 100 feet amsl at the terminus of Segment AP-1 near the Virginia-North Carolina border. Segment AP-3 generally traverses northeast from the terminus of AP-1 through northern North Carolina and southeastern Virginia to its terminus near Chesapeake, Virginia. The topography along this segment is characterized by very low elevation and low relief coastal plains and several wide river crossings. Elevation along this segment ranges from approximately 150 feet amsl to approximately 10 feet amsl at the terminus.

Grading will be conducted prior to construction where necessary to provide a reasonably level work surface, as practicable. Upon completion of construction, DETI will:

- Restore the ground surface as closely as practicable to original contours to restore natural overland water flow patterns, aquifer recharge, and drainage patterns;

- Re-contour disturbed areas in a fashion designed to stabilize slopes, remove ruts and scars, and support successful revegetation; and

- Restore, to original or better condition, drainage ditches and culverts that are diverted or damaged during construction.

2.11 PROMINENT VEGETATION

Types of vegetation at any point along the ACP pipeline depend on the land-use type (i.e., agriculture, woodland, wetland, etc.). Refer to Appendix K for details on the land use types

affected by construction and operation of the ACP in Virginia. More specifically, land-use types can be determined from construction alignment sheets in Appendix A. In addition, the location of stream crossings and special vegetative communities, such as wetlands, are also identified on the construction alignment sheets.

In general, natural vegetation communities vary across the Commonwealth depending upon their location. The proposed ACP facilities in Virginia cross portions of seven ecoregions (areas with similar environmental resources and characteristics), including the Ridge and Valley (RV), Piedmont (P), Northern Piedmont (NP), Blue Ridge (BR), Southeastern Plains (SP), Western Allegheny Plateau (WAP) and Mid-Atlantic Coastal Plains (MACP).

2.11.1 Ridge and Valley

The RV ecoregion consists predominately of forest (56 percent) in rocky terrain. Much of the remaining areas consist of agricultural (30 percent) and developed land (9 percent). Topography is complex including thousands of caves (USGS, 2014; LandScope America, 2014). Climate in the RV is mild, supporting vegetation communities with high biodiversity including over a thousand plant species. The most common tree complexes are Appalachian oak, oak hickory, pine, northern hardwoods, oak-chestnut, eastern white pine, white oak, and Virginia pine (USGS, 2014). However, forests in the RV have been affected by logging and other forest management programs (USGS, 2014; LandScope America, 2014; USFS, 2014).

2.11.2 Blue Ridge

The BR is considered a unique ecoregion in the country because of the spatial and temporal heterogeneity of its geology, topography, and floristics (LandScope America, 2014). The land is 35 percent managed by public agencies, including the USFS (George Washington and Jefferson National Forests) and the National Park Service (Great Smoky and Shenandoah National Parks). The BR consists of approximately 80 percent forested land, 14 percent agricultural land, and 1 percent developed land (USGS, 2014; LandScope America, 2014). Climate is warm temperate to boreal supporting a variety of plant communities. Common tree species at low elevations are mixed oak; at mid elevations are oak, red spruce, tulip poplar, and chestnut; and at high elevations are spruce-fir, Fraser fir, and Balsam fir (USGS, 2014; World Wildlife, 2014).

2.11.3 Piedmont

The Piedmont ecoregion encompasses the foothills of the Appalachian Mountains and serves as a transitional zone between the mountains to the west and the coastal plain to the east. The area is characterized by broad ridges and hills, with a geology that includes igneous, metamorphic, and sedimentary rock. The region primarily consists of agricultural land and managed woodland. Climate is temperate, supporting forests dominated by hardwood. The most common tree species are oak hickory, loblolly pine, water oak, willow oak, laurel oak, cherrybark oak, American holly, bald cypress, water tupelo, and ironwood (South Carolina Department of Natural Resources, 2014).

2.11.4 Northern Piedmont

The NP ecoregion is similar to the Piedmont, serving as a link between mountains and the coastal plain. It runs through parts of New Jersey, Pennsylvania, Delaware, Maryland, Washington D.C., and Virginia. The NP is characterized by irregular plains, open valleys, and hills. The soils have a stony to limestone base which supports both forested and agricultural lands. Climate and common tree species are similar to the Piedmont (USGS, 2014).

2.11.5 Southeastern Plains

The SP is the largest ecoregion in the eastern United States, ranging from Maryland to the Gulf of Mexico. The region consists of flat plains interspersed with croplands, pastures, forests, and wetlands with primarily sandy soils. Climate is warm with much rainfall contributing to a longer growing season than in other regions. Common tree species are hickory, oak, and pine. Historically, the forests in the region mostly contained hardwoods, but much of the area is now dominated by pine, including managed pine plantations (USGS, 2014).

2.11.6 Western Allegheny Plateau

The WAP ecoregion extends across Ohio, southwestern Pennsylvania, northwestern West Virginia, and northeastern Kentucky. It is characterized by broad valleys, ridges, and rounded hills, with many lakes, marshes, and bogs throughout the region. Precipitation in the WAP is normally distributed during the year with rain being higher in Spring and Summer. The ecoregion is approximately 72 percent forested with a combination of mixed oak and mixed temperate forests. Wet hemlock forests are also present, but their range has declined significantly (USGS, 2014; LandScope America, 2014).

2.11.7 Mid-Atlantic Coastal Plain

The MACP ecoregion encompasses the coastal region extending from New Jersey to Florida. The ecoregion borders the Atlantic Ocean and contains a mix of forests, agricultural lands, and wetlands, including Chesapeake Bay shore lands. Climate is generally warm year round with humid summers and mild winters. Common tree species are bald cypress and longleaf pines (USGS, 2014).

2.12 LAND-DISTURBING ACTIVITIES AND ASSOCIATED WORK AREAS

Construction of the ACP in Virginia will affect approximately 5,427.2 acres of land total, including the permanent pipeline ROW, temporary construction ROW, additional temporary workspace (ATWS), aboveground facility sites, access roads, and pipe storage and contractor yards. Following construction, approximately 3,269.4 acres, including the temporary construction ROW, ATWS, temporary workspace at aboveground facility sites, and pipe storage and contractor yards, will revert to pre-construction conditions and uses. The remaining approximately 2,157.8 acres, including the permanent pipeline easement, permanent aboveground facility sites, and access roads, will be retained for operation of the new pipeline system. No land disturbance will take place outside of the proposed limits of disturbance (LOD). If additional ROW is needed, ACP will contact DEQ for approval and determination if any additional required ESC control measures or plan modifications are necessary

2.12.1 AP-1 Pipeline Right-of-Way

For the AP-1 mainline, the construction corridor in non-agricultural uplands will measure 125 feet in width, with a 40-foot-wide spoil side and an 85-foot-wide working side. In areas where full width topsoil segregation is required (e.g., agricultural areas, USFS lands), an additional 25 feet of temporary construction workspace will be needed on the working side of the corridor to provide sufficient space to store topsoil. In wetlands, the width of the construction ROW will be reduced to 75 feet, with 25 feet on the spoil side and 50 feet on the working side. Following construction, a 50-foot-wide permanent easement will be maintained for operation of the pipeline.

Refer to Appendix C for typical construction ROW diagrams showing general land-disturbing boundaries and construction techniques.

2.12.2 AP-3, AP-4, and AP-5 Pipeline Rights-of-Way

For the AP-3, AP-4, and AP-5 pipeline laterals, the construction corridor in non-agricultural uplands and in wetlands will measure 75 feet in width, with a 25-foot-wide spoil side and 50-foot-wide working side. In areas where full width topsoil segregation is required (e.g., agricultural areas), an additional 25 feet of temporary construction workspace will be needed on the working side of the corridor to provide sufficient space to store topsoil. Following construction, a 50-foot-wide permanent easement will be maintained for operation of each pipeline.

2.12.3 Additional Temporary Workspace

In addition to the construction ROW, ATWS will be required to stage construction activities and store equipment, materials, and spoil at wetland, waterbody, and road crossings. ATWS will also be required in areas with steep side slopes or where special construction techniques are implemented as well as at tie-ins with existing pipeline facilities, utility crossings, truck turnaround areas, and spread mobilization/de-mobilization areas.

For the AP-1 mainline, ATWS measuring 50 by 150 feet will typically be required on both sides of the corridor and both sides of the crossing at wetlands, waterbodies measuring greater than 10 feet in width, two lane roads, and railroads. ATWS measuring 25 by 100 feet will typically be required on both sides of the corridor and both sides of the crossing at waterbodies measuring less than 10 feet in width and single lane roads.

For the AP-3, AP-4, and AP-5 laterals, ATWS measuring 25 by 100 feet will typically be required on both sides of the corridor and both sides of the crossing at wetlands, waterbodies, roads, and railroads. Following construction of the pipelines, ATWS will be restored in accordance with the FERC Plan and Procedures, agency requirements, and landowner stipulations.

2.12.4 Access Roads

DETI has identified roads which will be used to provide access to the proposed ACP pipeline ROW and other facilities during construction and operation of the Projects. DETI will utilize existing roads to the extent practicable, but some new roads will need to be built in remote

areas. The ACP Project proposes to utilize roughly 116.75 miles of both private and public access roads within Virginia during construction. An estimated 8.89 miles of new roadway within Virginia will be constructed. The Project will involve 4.76 miles of hybrid existing/new access roads within Virginia (this includes access roads where a portion of the road is existing and a portion is new, to-be-constructed). In some cases, existing roads will require improvement (such as grading, gravelling, replacing or installing culverts, minor widening, and/or clearing of overhead vegetation) to safely accommodate construction equipment and vehicles. Roadwork on public lands will conform to the design standards of the land managing agency. DETI Access road locations are shown on the construction alignment sheets in Appendix A. Traffic Management Plans have been developed for the proposed project and will be implemented and followed during construction to reduce impact to traffic flow. It is anticipated the proposed project will not impact roads or traffic during the construction and operation of the project.

2.12.5 Pipe Storage and Contractor Yards

Temporary pipe storage and contractor yards will be needed to store equipment and stage construction activities for the proposed ACP pipelines and other facilities. DETI attempted to identify and select yards that have been previously disturbed by human activities and do not have an ongoing land use that precludes use of the site during construction of the Project. Where previously disturbed sites are not available, DETI selected sites with level terrain in mostly cleared areas to minimize the need for clearing, grading, and filling at each site. Site plans for the six (6) contractor yards located in Virginia are provided in Appendix I.

2.12.6 Cathodic Protection System Ground Beds

Cathodic protection will be provided by an impressed current system on each pipeline. For the ACP, DETI anticipates installing nine ground beds along the AP-1 mainline; eight ground beds along the AP-2 mainline; and one ground bed along the AP-3 lateral. Construction of the ground beds will occur in areas measuring approximately 500 feet in length by 25 feet in width, located outside the ROW, as shown within LOD on the construction alignment sheets (Attachment A). Following construction, DETI will retain easements for the ground beds measuring approximately 500 feet in length by 10 feet in width for operation of the ground beds.

2.12.7 Compressor Stations

One of the three compressor stations proposed along the natural gas transmission pipeline will be located in Virginia. Compressor Station 2 (Buckingham Compressor Station) will be built approximately at MP 191.6 in Buckingham County, Virginia, where the AP-1 mainline will intersect existing Transco transmission pipelines. The station will take natural gas from both the AP-1 mainline and the existing Transco pipelines. The station will include approximately six structures (e.g., compressor, auxiliary, office, utility gas, drum storage, and storage building[s]), with a chain-link security fence installed around the perimeter of the site. Equipment at the station will include gas filter/separators, gas coolers, inlet air filters, exhaust silencers, tanks, blowdown silencers, heaters, and auxiliary generators. The Compressor Station 2 (Buckingham Compressor Station) will affect approximately 27 acres during construction and 12 acres during operation.

2.12.8 Metering and Regulating Stations

In total, there will be four M&R stations in Virginia, one of which will be built on the same site and within the same fence-line as Compressor Station 2 (Buckingham Compressor Station) in Buckingham County, Virginia. The other three M&R stations in Virginia will be located in Brunswick and Greensville Counties, and the City of Chesapeake.

In general, each M&R station will contain one dekatherm building (used to house equipment such as gas chromatographs, communications equipment, etc.), a microwave tower, a regulation building, a storage building, and a meter building. Equipment at each station will include gas filter/separators, gas meters, a tank, and regulators, and may include gas heaters and/or odorization equipment. Each station will be surrounded by a chain-link security fence.

Additional land disturbance required to construct and operate each of the M&R stations is as follows:

- Woods Corner M&R Station (0 acres; co-located and included within the Compressor Station 2 [Buckingham Compressor Station] land disturbance area);
- Elizabeth River M&R Station (1.0 acre);
- Brunswick M&R Station (1.4 acres); and
- Greensville M&R Station (1.43 acres).

Following construction, temporary workspace not required for operation of the M&R stations at each site will be restored in accordance with the FERC Plan and Procedures, agency requirements, and landowner stipulations.

Separate ESC and SWM Plans specific to the Elizabeth River, Brunswick, and Greensville M&R Stations are provided in Appendices F, G, and H respectively. The Greensville M&R Station will be co-located with the planned VEP Greensville Power Station and the Brunswick M&R Station will be co-located with the existing VEP Brunswick Power Station. Compressor Station 2 (Buckingham Compressor Station) and Woods Corner M&R Station will be co-located and an ESC and SWM Plan covering both facilities is provided in Appendix E.

2.12.9 Valves

No additional land will be affected by construction and operation of valves. Valve construction will occur within the construction ROW for the AP-1 and AP-3 pipelines. Following construction, a 75- by 75-foot area will be maintained within the permanent pipeline easement for valves installed along the AP-1 mainline, and a 50- by 50-foot area will be maintained within the permanent pipeline easements for valves installed along the AP-3 pipeline. No valves are planned along the AP-4 or AP-5 laterals.

2.12.10 Pig Launchers and Receivers

No additional land disturbance will be required for construction and operation of the pig launcher and/or receiver assemblies installed at Compressor Station 2 (Buckingham Compressor

Station) and the four M&R stations. Construction of the launchers/receivers will be co-located within the acreage designated for land disturbance for the compressor and M&R stations (Appendix E, F, G and H).

2.13 CONSTRUCTION SCHEDULE

Subject to receipt of the required permits and regulatory approvals (anticipated in September 2017), initial construction activities (e.g., timber removal, preparation of contractor yards and access roads) are expected to begin in November 2017. DETI anticipates that pipeline construction will commence in February 2018. The ACP pipeline will be built along seven spreads in Virginia. Construction of aboveground facilities will begin in November 2017. It is anticipated that all facilities will be placed in service by the fourth quarter of 2019. Key milestone dates for the construction schedule are summarized in Table 2.13-1.

TABLE 2.13-1

Construction Schedule Key Milestone Dates

Spread [a]	Mileposts	County/City and State/Commonwealth	Begin Construction	Finish Construction [b]
ATLANTIC COAST PIPELINE				
Initial Construction Activities				
Initial Site Preparation (2018 spreads)	By spread	See below	November 2017	1Q 2018
Tree Clearing (2018 spreads) [c,d]	By spread	See below	November 2017	1Q 2018
Initial Site Preparation (2019 spreads)	By spread	See below	September 2018	1Q 2019
Tree Clearing (2019 spreads) [c,d]	By spread	See below	November 2018	1Q 2019
Construction of Pipeline				
Spread 6 (AP-1)[e]	183.3–239.6	Nelson, Buckingham, Cumberland, Prince Edward, and Nottoway Counties, VA	February 2018	4Q 2018
Spread 11 (AP-3)	0.0–83.0	Northampton County, NC, Greensville and Southampton Counties, VA, and the Cities of Suffolk and Chesapeake, VA	February 2018	4Q 2018
Spread 12 (AP-4; AP-5) [f]	0.0–0.4; 0.0– 1.1	Brunswick County, VA; Greensville County, VA	February 2018	4Q 2018
Spread 3A (AP-1) [g]	79.2–91.3	Pocahontas County, WV and Highland County, VA	April 2018	4Q 2018
Spread 4A (AP-1) [g]	103.1–125.9	Bath and Augusta Counties, VA	April 2018	4Q 2018
Spread 5 (AP-1) [e]	125.9–183.3	Augusta and Nelson Counties, VA	February 2019	4Q 2019
Spread 7 (AP-1)	239.6–300	Nottoway, Dinwiddie, Brunswick, and Greensville Counties, VA, and Northampton County, NC	February 2019	4Q 2019
Spread 4 (AP-1)	91.3–103.1	Highland, Bath, and Augusta Counties, VA	April 2019	4Q 2019
Construction of Compressor Stations				
Compressor Station 2 (Buckingham Compressor Station)	191.5	Buckingham County, VA	November 2017	4Q 2019
Construction of Metering and Regulating Stations				

TABLE 2.13-1

Construction Schedule Key Milestone Dates

Spread [a]	Mileposts	County/City and State/Commonwealth	Begin Construction	Finish Construction [b]
Woods Corner	191.5	Buckingham County, VA	November 2017	4Q 2019
Brunswick	0.4	Brunswick County, VA	January 2018	3Q 2019
Greensville	1.1	Greensville County, VA	February 2018	3Q 2019
Elizabeth River	83.0	City of Chesapeake, VA	April 2018	3Q 2019

[a] The number and timing of the construction spreads are subject to change dependent upon construction and permit requirements.

[b] The finish construction date refers to the end of mechanical construction; additional restoration and post-construction activity is expected to occur in the Project area beyond the timeframe reflected here. 1Q = first quarter; 2Q = second quarter; 3Q = third quarter; 4Q = fourth quarter.

[c] The start of tree clearing is dependent upon the results of the environmental surveys and agency consultations.

[d] Including tree clearing for aboveground facilities, access roads, and contractor yards. Tree clearing for construction spreads 1-1, 1-2, 3, 4, Blue Ridge Parkway HDD and James River HDD will take place in 2018.

[e] Blue Ridge Parkway and James River HDDs will be constructed in 2018.

[f] Spread 12 will be completed with spread 11 and is counted as one spread.

[g] Hydrostatic test and remaining cleanup will be completed by the 3rd quarter of 2019.

2.14 ADJACENT PROPERTIES

DETI will use a combination of management practices and control measures to limit the erosion and transport of soil to adjacent properties and waterbodies. Erosion and sediment control measures are discussed in Section 3.0 of this SWPPP. DETI will control discharges of sediment from areas of land disturbance through the proper use of ESC measures (both structural and vegetative). In addition, consideration of critical or sensitive environmental areas during routing of the pipeline was used to avoid or minimize the effect on adjacent wetlands, waterbodies, karst features, steep slopes, as well as threatened and endangered species that could potentially be affected by land disturbance. Incremental ESCs will be utilized as necessary to protect critical or sensitive environments located adjacent to land disturbance, as indicated on the construction alignment sheets, aboveground facility site plans, and contractor yard site maps.

2.15 OFF-SITE AREAS

This SWPPP addresses land-disturbing activities in the following areas: permanent pipeline ROW, temporary construction ROW, ATWS, access roads, contractor yards, M&R stations, and pig launchers/receivers. Project plans do not include any additional off-site land-disturbing activities (such as borrow sites or disposal areas). Similar to adjacent properties, DETI will minimize any potential impact to off-site areas during construction of the Project.

2.16 SOILS

Soil characteristics along and within the proposed ACP facilities were identified and assessed using the Soil Survey Geographic (SSURGO) database (Soil Survey Staff, 2015a). This database is a digital version of the county soil surveys developed by the U.S. Department of Agriculture's Natural Resources Conservation Service for use with geographic information systems. The database provides a detailed level of soils information and is standardly used for natural resource planning and management. SSURGO is linked to an attribute database that gives the proportionate extent of the component soils and their properties for each soil map unit. SSURGO attribute data consist of physical properties, chemical properties, and interpretive groupings. Attribute data apply to the whole soil (e.g., hydric soils, prime farmland soils, or slope class), as well as to layer data for soil horizons (e.g., texture or permeability). The soil attribute data can be used in conjunction with spatial data to describe soils in a particular area.

Soils along the proposed pipeline routes and in other work areas were evaluated to identify prime farmland and major soil characteristics that could affect construction or increase the potential for construction-related soil impacts. The SSURGO database was queried for attribute data pertaining to prime farmland and hydric soils, compaction prone soils, water and wind erodible soils, rocky soils, shallow bedrock, soils with revegetation concerns, and topsoil depth, as described below. Additional information about the soils was obtained from the Official Soil Series Descriptions (Soil Survey Staff, 2015b).

2.16.1 Prime Farmland and Hydric Soils

Both prime farmland and hydric soil designations are direct attributes in the SSURGO database. Percentage and acreage of prime farmland and hydric soils were determined by a simple query of the database.

2.16.2 Compaction-Prone Soils

Compaction-prone soils were identified by querying the SSURGO database for component soil series that have: 1) a surface texture of sandy clay loam or finer; and 2) a drainage class of somewhat poorly, poorly, or very poorly drained.

2.16.3 Highly Erodible and Highly Wind Erodible Soils

Highly erodible soils were identified based on three soil parameters present in the SSURGO database that are directly related to the susceptibility of a soil to erosion by water or wind: land capability subclass, slope, and wind erodibility group (WEG). Map units with a land capability subclass designation of 4e through 8e, which are considered to have severe to extreme erosion limitations for agricultural use, and/or an average slope greater than 8 percent, were identified as susceptible to water erosion.

A separate grouping for wind erosion was developed because management and construction mitigation techniques used to minimize wind erosion hazards are different from those used to minimize water erosion. Wind erodibility was assessed based on WEG designations. A WEG is a grouping of soils that have similar surface-soil properties affecting their resistance to soil blowing, including texture, organic matter content, and aggregate stability. Soils in WEG 1 and 2 include sandy-textured soils with poor aggregation that are particularly susceptible to wind erosion.

During construction and post-construction, temporary/permanent slope breakers, sediment barriers, trench breakers and temporary/ permanent soil stabilization will be used as ESC measures for highly erodible soils, as discussed further in Section 3.0. In addition, soil erosion characteristics are evaluated as part of DETI's Best-in-Class (BIC) Program when selecting incremental controls in steep terrain. Details of the BIC Program are provided in Section 3.5.6 of this SWPPP.

2.16.4 Revegetation Concerns

Soils with revegetation concerns were identified by querying the SSURGO database for component soil series that have: 1) a surface texture of sandy loam or coarser and are moderately well to excessively drained; and/or 2) have an average slope greater than 8 percent.

2.16.5 Rocky Soils

Soils with significant quantities of rock were identified by querying the SSURGO database for component soil series with one or more soil horizons that: 1) have a cobbley, stony,

bouldery, channery, flaggy, very gravelly, or extremely gravelly modifier to the textural class; and/or 2) contain greater than 5 percent (by weight) of rocks larger than 3 inches.

2.16.6 Shallow Bedrock

Shallow-to-bedrock soils were identified by querying the SSURGO database for component soil series that have a bedrock contact within 60 inches of the soil surface. DETI's *Blasting Plan* outlines the procedures and safety measures the Contractor will adhere to while conducting blasting activities and is provided in Appendix L.

Appendix M lists the various soil mapping units crossed by the proposed ACP pipeline segments and provides general information about the nature and properties of each soil and/or map unit crossed and the acreage impacts by soil mapping unit. The locations of soil mapping units crossed by the ACP pipeline are indicated on the construction alignment sheets in Appendix A. Soils present at each aboveground facility and contractor yards are identified in the ESC Plans developed for each of these sites.

Additionally, an Order 1 Soil Survey (Survey) was performed between May 9 and June 22, 2016 along the available sections of the approximately 15-mile portion of the route in the Warm Springs and North River Districts in the George Washington National Forest (GWNF). Due to access restrictions associated with cultural resource clearance, a full Survey was not completed in an approximately 1.2 mile section of the route located near MP 155 and MP 156 in the GWNF Pedlar Ranger District. The results of the Order 1 Soil Survey were included in the COM Plan submitted on August 22, 2016 to the USFS.

2.17 RECEIVING WATERS

The USGS has organized watersheds of the United States into seven successively smaller levels of subdivisions using hydrologic unit codes (HUC). Regions (level one) are the largest watersheds (two-digit HUCs), followed by sub-regions (four-digit HUCs), basins (six-digit HUCs), and sub-basins (eight-digit HUCs), which are further divided into smaller watersheds. Information on the basins and watersheds crossed by the proposed ACP pipeline and contractor yards are summarized in Table 2.17-1. The receiving waters from the aboveground facilities covered under this SWPPP are shown in Appendices E, F, G and H.

ACP does not intend to connect and/or discharge into a municipal Separate Storm Sewer System (MS4). Any accidental discharges from the ACP Project, as covered by this SWPPP, including the permanent pipeline ROW, temporary construction ROW, ATWS, access roads, contractor yards, M&R stations, and pig launchers/receivers, will be reported, as stated in Section 10.9 of this plan, under Reports of Unauthorized Discharges. Section 3.0 outlines ESCs to be used during construction that will prevent discharges from entering adjacent waters.

TABLE 2.17-1

Watersheds Crossed by the Atlantic Coast Pipeline Within Virginia [a]

Pipeline Segment/Regional Watershed/Sub-Region	Approximate Mileposts	County/City and State/Commonwealth	Hydrologic Unit Code (HUC)-12/ Subbasin Name
AP-1			
Mid-Atlantic Regional Watershed			
Lower Chesapeake (James)	83.9–118.1; and 158.2–247.3	Highland, Bath, Augusta, Nelson, Buckingham, Cumberland, Prince Edward and Nottoway Counties, VA	020802010101/Dry Branch-Jackson River 020802010102/Bolar Run-Jackson River, 020802010202/Jim Dave Run-Back Creek,020802010604/Davis Run-Bullpasture River 020802010701/Scotchtown Draft-Cowpasture River, 020802010702/Dry Run, 020802010704/Lick Run-Stuart Run, 020802020101/Chair Draft-Calfpasture River, 020802020102/Ramseys Draft, 020802020103/Holloway Draft-Calfpasture River, 020802020104/Hamilton Branch, 020802020106/Cabin Creek-Mill Creek, 020802030702/Rucker Run, 020802030804/Sycamore Creek-James River, 020802030902/South Fork Rockfish River, 020802030903/Buck Creek-Rockfish River, 020802031002/Dutch Creek-Rockfish River, 020802031003/Beaver Creek-Rockfish River, 020802031301/Grease Creek-Slate River, 020802031302/Meadow Creek-North River, 020802031303/Horsepen Creek-Slate River, 020802031304/Ripley Creek-Walton Fork, 020802050201/Bishop Creek-Willis River, 020802050202/Whispering Creek-Willis River, 020802050203/Little Willis River, 020802070205/Ducker Creek-Appomattox River, 020802070401/Saylers Creek, 020802070402/Angola Creek-Appomattox River, 020802070501/Little Creek-Flat Creek, 020802070701/Little Creek-Deep Creek, 020802070702/Cellar Creek, 020802070703/West Creek 020802020104/ Hamilton Branch
Potomac	118.1–158.2	Augusta Counties, VA	020700050101/Edison Creek-Middle River, 020700050102/Buffalo Branch-Middle River, 020700050103/Jennings Branch, 020700050105/Moffett Creek, 020700050201/Folly Mills Creek-Christians Creek, 020700050202/Barterbrook Branch-Christians Creek, 020700050301/Lewis Creek, 020700050702/Canada Run-South River, 020700050703/Inch Branch-Back Creek

TABLE 2.17-1 (cont'd)

Watersheds Crossed by the Atlantic Coast Pipeline Within Virginia

Pipeline Segment/Regional Watershed/ Sub-Region	Approximate Mileposts	County/City and State/Commonwealth	Hydrologic Unit Code (HUC) – 12/ Subbasin Name
Atlantic-Gulf Regional Watershed			
Chowan-Roanoke	247.3–283.0	Nottoway, Dinwiddie, Brunswick, Rockbridge, and Greensville Counties, VA	030102010203/Red Oak Creek-Nottoway River, 030102010204/Tommeheton Creek, 030102010301/Beaver Pond Creek-Nottoway River, 030102010302/Waqua Creek, 030102010304/Sturgeon Creek, 030102010501/Butterwood Creek, 030102011001/Slagles Lake-Three Creek, 030102011002/Maclins Creek, 030102040602/Reedy Creek, 030102040603/Douglas Run-Meherrin River, 030102040604/Falling Run-Meherrin River, 030102040703/Cattail Creek-Fontaine Creek, 030102040705/Jacks Swamp, 030102040706/Mill Swamp-Fontaine Creek 020700050103/ Jennings Branch 020802020402/ Upper South River 030102040602/ Reedy River
AP-3			
Atlantic-Gulf Regional Watershed			
Chowan-Roanoke	0.0–53.0; and 71.3–71.3	Southampton County, VA and City of Suffolk and City of Chesapeake, VA	030102011202/Darden Pond-Mill Swamp, 030102011205/Mill Creek, 030102011206/Round Gut-Nottoway River, 030102020504/Kingsale Swamp, 030102020505/Union Camp Holding Pond-Blackwater River, 030102030101/Jones Swamp, 030102030102/Chapel Swamp-Somerton Creek, 030102040902/Buckhorn Swamp-Meherrin River, 030102040904/Lower Tarrara Creek, 030102050604/Lake Drummond-Dismal Swamp
Mid-Atlantic Regional Watershed			
Lower Chesapeake (James)	53.0–71.3; and 71.7–82.6	City of Suffolk and City of Chesapeake, VA	020802080101/Speights Run-lake Kilby, 020802080102/Cohoon Creek, 020802080103/Lake Prince, 020802080104/Western Branch Reservoir, 020802080105/Cedar Lake-Nansemond River, 020802080106/Bennett Creek-Nansemond River, 020802080205/Western Branch Elizabeth River 020802080203/Deep Creek-Southern Branch Elizabeth River
AP-4			
Atlantic-Gulf Regional Watershed			
Chowan-Roanoke	0.0–0.4	Brunswick County, VA	030102040602/Reedy Creek
AP-5			
Atlantic-Gulf Regional Watershed			

Chowan-Roanoke	0.0–1.1	Greensville County, VA	030102040603/Douglas Run-Meherrin River
Contractor Yards			
AP-1			
Atlantic-Gulf Regional Watershed			
Chowan-Roanoke	274.8	(CY Spr 07-B) Brunswick County, VA	030102040602/Reedy Creek
Mid-Atlantic Regional Watershed			
Lower Chesapeake	157.2	(CY Spr 05-C) Rockbridge County, VA	020802020402/Upper South River
	109.2	(CY GWNF-6 Spr 04-A) Augusta County	020802020104/Hamilton Branch

[a] Source: USGS, 1994

2.18 EXCEPTIONAL AND IMPAIRED WATERS

Title 9 of VAC Agency 25, Chapter 260, Section 30 (9 VAC 25-260-30) outlines an anti-degradation policy that establishes three classes for waters of the Commonwealth of Virginia. The three classes are defined as follows:

- Tier 1: waters where existing water quality and uses need to be maintained;
- Tier 2: waters that are exceeding water quality standards; and
- Tier 3: exceptional waters where no new discharges of pollution are allowed; these waters are required to be listed in the VAC.

VDEQ states Tier 1 and Tier 2 waters are determined on a case-by-case basis during the permitting period. Therefore, streams cannot be categorized at this time as a Tier 1 or Tier 2 for the proposed ACP facilities. The proposed ACP facilities do not cross Tier 3 exceptional waters identified in 9 VAC 25-260-30 A.

DETI reviewed the 2012 list of 305(b)/303(d) Impaired Waters for the Commonwealth of Virginia to identify crossings of waterbodies identified as impaired or for which a Total Maximum Daily Load (TMDL) wasteload allocation has been established and approved for (i) sediment or a sediment-related parameter (i.e., total suspended solids or turbidity) or (ii) nutrients (i.e., nitrogen or phosphorus) (VDEQ, 2015). Waterbodies crossed by the proposed ACP facilities that are included on the U.S. Environmental Protection Agency (EPA)-approved 305(b)/303(d) impaired waters list are identified in Table 2.18-1. There are twenty-four (24) 305(b)/303(d) impaired streams crossed by the ACP pipeline in Virginia. None of the twenty-four waterbodies crossed has an impairment or established and approved TMDL for (i) sediment or a sediment-related parameter (i.e., total suspended solids or turbidity), or (ii) nutrients (i.e., nitrogen or phosphorus). Therefore, these 24 waterbodies crossed do not have a wasteload allocation assigned to construction activities nor any additional TMDL measures applied during construction. However, the EPA issued the Chesapeake Bay TMDL on December 29, 2010. The Chesapeake Bay TMDL addresses all segments of the Bay and its tidal tributaries and establishes a wasteload allocation to reduce nitrogen, phosphorus, and sediment discharges into

the Bay. The location of the Chesapeake Bay TMDL watershed is shown on Figure 2.18-1. Construction activities located within the Chesapeake Bay TMDL Watershed (see Figure 2.18-1) will have additional Chesapeake Bay TMDL watershed measures required during construction, in addition to ESC measures outlined in Section 3.0.

Construction activities located outside of the Chesapeake Bay TMDL Watershed (see Figure 2.18-1) do not have the additional Chesapeake Bay TMDL watershed measures required during construction; however, DETI has voluntarily committed to apply the same measures across the project regardless of location within an exceptional or impaired waterbody watershed.

TABLE 2.18-1

Impaired Waterbodies Crossed by the Atlantic Coast Pipeline Within Virginia

Pipeline Segment/County/ City and State [a]	Milepost	Waterbody Name	Proposed Crossing Method [b]	Impairment Cause
AP-1				
Highland County, VA	91.5	Jackson River	Dam and Pump/Flume	*Escherichia Coli* (*E. Coli*) and Temperature
Bath County, VA	94.1	Laurel Run	Dam and Pump	pH
Augusta County, VA	152.9	Mills Creek	Flume/Dam and Pump	Benthic-Macroinvertebrate Bioassessments
Augusta County, VA	153.4	Orebank Creek	Flume/Dam and Pump	pH
Augusta County, VA	153.8	Back Creek	Flume/Dam and Pump	Benthic-Macroinvertebrate Bioassessments and E. coli
Nelson County, VA	184.7	James River	HDD	Mercury in Fish and PCB in Fish
Buckingham County, VA	201.2	Horsepen Creek	Dam and Pump	Benthic-Macroinvertebrate Bioassessments
Nottoway County, VA	240.6	Woody Creek	Dam and Pump/Flume	E. Coli, Dissolved Oxygen
Greensville County, VA	299.6	Fontaine Creek	Dam and Pump/Flume	E. Coli, Dissolved Oxygen, and Mercury in Fish
AP-3				
Southampton County, VA	12.4	Meherrin River	Cofferdam	Mercury in Fish
Southampton County, VA	32.6	Nottoway River	HDD	Benthic-Macroinvertebrate Bioassessments and Mercury in Fish
Southampton County, VA	36.3	UNT to Blackwater River	Flume	Mercury in Fish
Southampton County, VA	37.0	UNT to Blackwater River	Open Cut (wetland)	Mercury in Fish
Suffolk County, VA	38.6	Blackwater River	HDD	Dissolved Oxygen and Mercury in Fish
City of Suffolk, VA	39.4	UNT to Blackwater River	Dam and Pump	Mercury in Fish
City of Suffolk, VA	40.1	UNT to Blackwater River	Dam and Pump	Mercury in Fish
City of Suffolk , VA	40.2	UNT to Blackwater River	Dam and Pump	Mercury in Fish
City of Suffolk, VA	41.4	UNT to Blackwater River	Dam and Pump/Flume	Mercury in Fish
City of Suffolk, VA	42.3	UNT to Blackwater River	Dam and Pump/Flume	Mercury in Fish
City of Suffolk, VA	42.7	UNT to Blackwater River	Dam and Pump/Flume	Mercury in Fish
City of Suffolk, VA	44.2	UNT to Kingsale Swamp	Dam and Pump/Flume	Mercury in Fish

TABLE 2.18-1

Impaired Waterbodies Crossed by the Atlantic Coast Pipeline Within Virginia

Pipeline Segment/County/ City and State [a]	Milepost	Waterbody Name	Proposed Crossing Method [b]	Impairment Cause
City of Suffolk, VA	44.6	UNT to Kingsale Swamp	Dam and Pump/Flume	Mercury in Fish
City of Suffolk, VA	45.1	UNT to Kingsale Swamp	Dam and Pump/Flume	Mercury in Fish
City of Suffolk, VA	46.1	UNT to Kingsale Swamp	Dam and Pump/Flume	Mercury in Fish

[a] Virginia Department of Environmental Quality (VDEQ). 2016. *Final 2012305(b)/303(d) Water Quality Assessment Integrated Report; GIS Data*. Available online at: http://www.deq.virginia.gov/Programs/Water/WaterQualityInformationTMDLs/WaterQualityAssessments/2014305(b)303(d)IntegratedReport.aspx. Accessed January 2017.

[b] Open Cut (wetland) – indicates the impaired waterbody at the point the project crosses the feature does not have a defined channel and is documented as a wetland.

Note: No impaired waterbodies are crossed by AP-4 or AP-5.

Therefore, in accordance with Virginia Stormwater Management Act, the Virginia Erosion and Sediment Control Law and associated regulations, where applicable, the following will be implemented for construction activities across the entire Project area:

- Permanent or temporary soil stabilization will be applied to denuded areas within 7 days after final grade is reached on any portion of the site.
- Nutrients will be applied in accordance with manufacture's recommendations or an approved nutrient management plan and will not be applied during rainfall events.
- Inspection requirements are as follows:
    - Inspections will be conducted at a frequency of at least once every four business days and
    - Representative inspections used by linear construction projects will include all outfalls discharging to surface waters identified as impaired or for which a TMDL wasteload allocation has been established. Representative inspections occur once temporary or permanent soil stabilization has been installed and vehicle access may compromise the temporary or permanent soil stabilization and potentially cause additional land disturbance increasing the potential for erosion. Runoff from the temporary or permanently stabilized pipeline ROW will generally occur as sheet flow and will not be discharged through discrete outfalls. In the event that an outfall is present along the pipeline ROW, representative inspections will include those discrete outfalls. Proposed access roads will be covered under the general inspections requirements, outlined in Section 8.3, due to accessibility to the roadway.

Insert Figure 2.18-1

2.19 CRITICAL OR SENSITIVE ENVIRONMENTAL AREAS

Pre-construction assessments and field surveys were completed by DETI to delineate the location of critical or sensitive environmental areas within the areas of land disturbance proposed by the ACP Project, on properties where survey permission was granted by the landowner, from 2014 and onwards. The survey area for the ACP consisted of a 300-foot-wide corridor centered on the proposed pipeline centerlines, a 50-foot-wide corridor centered over access roads, and the construction footprints at aboveground facility sites. The survey area for the Project encompassed potential areas required for installation of the proposed pipelines (i.e., the construction ROW, ATWS, staging areas, and access roads) and the aboveground facilities (i.e., compressor and M&R stations and other facilities). Consideration of critical or sensitive environmental areas during routing of the pipeline was used to avoid or minimize the potential effect on wetlands, waterbodies, karst features, steep slopes, as well as threatened and endangered species and historic resources. A general description of each critical or sensitive area is provided in this section of the SWPPP. Areas where field survey were unable to be performed, the use of a desk-top review i.e., topographic maps or Light Detection and Ranging (LIDAR) were used to assess critical or sensitive environmental areas within the areas of land disturbance proposed by the ACP Project. Incremental ESCs utilized as necessary to avoid impact to these areas, are discussed in greater detail in Section 3.5 of this SWPPP and are shown on the construction alignment sheets in Appendix A.

2.19.1 Karst Areas

The format and manner in which the mitigation and remedial activities will be undertaken and reported are addressed in a *Karst Terrain Assessment, Construction, Monitoring and Mitigation Plan* (Appendix N). The ESCs implemented in karst terrain can be found in Section 3.5.9.

The proposed ACP Project will cross two distinct regional provinces of karst geology in Virginia, from east to west:

- The Great Valley subsection of the Valley and Ridge physiographic province, encompassing the portion of Augusta County, Virginia from the Blue Ridge on the east to Little North Mountain on the west; and

- The Folded Appalachian subsection of the Ridge and Valley physiographic province, encompassing the westernmost section of Augusta County, and all of Bath County and Highland County, Virginia, and extending from the North Mountain area on the east to the Allegheny Mountain on the west.

These areas have the potential to contain surface karst features (e.g., sinkholes and karst related subsidence, cave entrances, closed depressions, and sinking and losing streams). A detailed desktop assessment and field survey were conducted by a geotechnical expert to identify karst features along the proposed pipeline route in these areas. The desktop review generally extended 0.25 mile from either side of the centerline of the proposed pipeline and alternate routes, and 150 feet from the centerline for the field review. However, if observed or mapped karst features received drainage from the proposed pipeline work area, these features were

delineated to the extent possible, and included in the assessment. The location of identified karst features are shown on the construction alignment sheets in Appendix A.

2.19.2 Steep Terrain

The westernmost portion of the proposed AP-1 mainline in Virginia will be constructed in steep, mountainous terrain. Slope instability in the form of landslides, landslips, or surficial slumping can present a significant hazard to pipeline routing, design, construction, and operation in steep slope areas if proper planning and mitigation are not considered in advance. When routing the ACP, the goal was to do so perpendicularly to topographic contours and to minimize routing on steep slopes to the extent practicable, in accordance with DETI's program for steep slopes, which includes considerations for slips associated with pipeline construction during routing as well as engineering design, pre-construction planning, construction, and post-construction. Steep slopes have been avoided during routing to the maximum extent practicable and are limited to approximately 46 miles of slopes with an inclination of 30 percent or greater and a length of 100 feet or greater. DETI's Best-in-Class Program (BIC Program) was designed to proactively address slopes greater than 30 percent and identify mitigation measures beyond standard practices. Details of the BIC Program are provided in Section 3.5.6 of this SWPPP.

2.19.3 Wetlands

During the routing phase of the Project, U.S. Fish and Wildlife Service (USFWS) NWI data, was used to provide a preliminary analysis of wetland resources and to assess where wetland impacts could be avoided or minimized. NWI data was also used to estimate the number, size, and locations of wetlands along the proposed pipeline routes prior to conducting wetland delineations in the field.

DETI began conducting field surveys during the 2014 field season on properties where survey permission was granted by the landowner, to identify and delineate wetlands within the ACP pipeline construction corridors and other work areas. The wetland delineation study area for the ACP consisted of a 300-foot-wide corridor centered on the proposed pipeline centerlines, a 50-foot-wide corridor centered over access roads, and the construction footprints at aboveground facility sites. The wetland delineation for the Project encompassed potential areas required for installation of the proposed pipelines (i.e., the construction ROW, ATWS, staging areas, and access roads) and the aboveground facilities (i.e., compressor and M&R stations and other facilities). Within Virginia, the survey progress is 99.6 percent complete for the mainline pipeline, 100 percent for the M&R and pig launcher/receiver sites, 100 percent complete for the compressor stations, 100 percent complete for the Contractor Yards, and 90 percent complete for the Access Roads.

Wetland crossings were avoided when possible; however, the proposed ACP mainline facilities in Virginia will have 453 wetland crossings along AP-1. The proposed ACP lateral pipeline facilities will have 323 wetland crossings along AP-3 in Virginia, and no wetland crossing along AP-4 and AP-5. The data summarizing the number of wetlands crossings are based on field surveys conducted to date. In areas where a survey has not yet been completed due to access not being granted, NWI data was used to estimate the potential impact to wetlands.

The location of wetlands crossed and crossing methods along the pipeline route are shown in Appendix O and the construction alignment sheets in Appendix A.

Aboveground facilities (i.e., compressor stations, M&R stations, and valves) have been sited such that impacts on wetlands will be avoided and minimized to the maximum extent practicable. Construction of ACP Elizabeth River M&R station will impact 0.4 acre of wetlands, of which 0.4 acre will be permanently filled for operation of the facilities. The location of the wetlands is shown on the site plan in Appendix F. The construction and operation of the remaining aboveground facilities will not impact wetlands.

Within Virginia, access roads will cross a total of 10,748 feet of wetlands and will result in 12.5 acres of impacts, as shown on the construction alignment sheets in Appendix A. The ESCs implemented in wetlands can be found in Section 3.5.12.

A total of 1.6 acres of wetlands occur within the boundaries of contractor yard sites. DETI will avoid permanent impacts on wetlands and minimize temporary impact to the maximum extent practicable for crossing wetlands for access and otherwise avoiding use of wetland areas within contractor yards.

2.19.4 Waterbodies

Waterbodies are defined by FERC as "any natural or artificial stream, river, or drainage with perceptible flow at the time of crossing, and other permanent waterbodies such as lakes and ponds." FERC categorizes surface waters as major, intermediate, or minor waterbodies based on the width of the water's edge at the time of crossing. Major waterbodies are greater than 100 feet wide, intermediate waterbodies are between 10 feet and 100 feet wide, and minor waterbodies are 10 feet wide or less.

Waterbodies were avoided where possible. All waterbodies crossed and crossing methods within Virginia are show in Appendix P. The ESCs implemented in waterbodies can be found in Section 3.5.11. Major waterbodies crossed by the ACP include the following: AP-1 crosses the Cowpasture River, James River, Appomattox River, and the Meherrin River. AP-3 crosses the Meherrin River, Nottoway River, Blackwater River, Prince Lake Reservoir, Western Branch Reservoir, Western Branch Nansemond River, Nansemond River, and South Elizabeth River. Each of these rivers could potentially receive overland flow from construction activities. Site specific construction plans for major waterbodies are located in Appendix Q.

2.19.5 Threatened and Endangered Species

DETI has consulted with the USFWS Ecological Services Field Office in Virginia to identify federally and Commonwealth-listed endangered, threatened, and proposed species as potentially occurring in the ACP Project area. Nineteen federally listed and protected species may occur within the ACP footprint:

- red-cockaded woodpecker;
- Madison Cave isopod;
- Roanoke logperch;

- gray bat;
- Indiana bat;
- northern long-eared bat;
- Virginia big-eared bat;
- dwarf wedgemussel;
- James spinymussel;
- American chaffseed;
- eastern prairie fringed orchid;
- Michaux's sumac;
- shale barren rock cress;
- small whorled pogonia;
- swamp pink;
- Virginia sneezeweed;
- northeastern bulrush;
- common bottlenose dolphin; and
- harborseal.

DETI has prepared a Biological Assessment at the request of FERC, to initiate formal consultation with the USFWS and the National Oceanic and Atmospheric Administration's National Marine Fisheries Service. As part of consultations with the USFWS, species-specific field or habitat surveys have or will be completed for several species as identified by USFWS Virginia Ecological Services Field Office. Additional steps for avoidance or mitigation will be discussed as part of the consultations with the USFWS as applicable. If appropriate and applicable, specific BMPs will be used to address identified potential endangered, threatened, and proposed species as part of this SWPPP and will be identified on the Construction Alignment Sheets. Field surveys and consultations with the USFWS regarding these species resulted in re-routing of construction activities to avoid impacts where possible and the implementation of incremental ESC measures to provide additional protection.

Additionally, the USFS maintains Regional Forester Sensitive Species (RFSS) lists for the GWNF, for the management of sensitive species. DETI has prepared a Biological Evaluation to examine potential impacts on the RFSS on USFS lands. Numerous RFSS listed species were evaluated as part of the Biological Evaluation. As part of consultations with the GWNF, species specific field or habitat surveys have or will be completed for several species as identified by the GWNF. Additional steps for avoidance or mitigation will be discussed as part of the consultations with the GWNF as applicable. If appropriate and applicable, specific BMPs will be used to address identified potential RFSS as part of this SWPPP and will be identified on the Construction Alignment Sheets.

Virginia has separate laws protecting threatened and endangered species. DETI requested and received data on known occurrences of Commonwealth-listed species in Virginia from the Virginia Department of Conservation and Recreation (VDCR) Natural Heritage Program. DETI additionally has consulted and continues to consult with the Virginia Department of Game and Inland Fisheries and VDCR regarding impacts on Commonwealth-listed threatened and endangered species. See Section 3.5.13 for ESCs for threatened and endangered species.

2.19.6 Public Lands

A majority of the proposed ACP pipeline facilities within Virginia (289.6 miles; 94 percent) will be built across privately owned lands. In addition to private lands, the proposed route of the AP-1 mainline will cross publicly managed land in Virginia, as follows:

- 15.9 miles of USFS lands in the GWNF, including a crossing of the Appalachian National Scenic Trail (Appalachian Trail);
- 0.1 mile of National Park Service lands at the Blue Ridge Parkway; and
- 1.2 miles of Commonwealth lands in Virginia in the James River Wildlife Management Area.

Further discussion of ESC measures is provided in Section 3.6 of this plan.

2.19.7 Chesapeake Bay Protection Areas

The Chesapeake Bay Preservation Act (CBPA) was enacted to protect, preserve, and improve the waters of the Chesapeake Bay and its tributaries. The CBPA is implemented through the Chesapeake Bay Preservation Area Designation and Management Regulations (9 VAC 25-830 et seq.), which requires localities within Tidewater Virginia[4] to enact ordinances to implement and enforce the requirements of the CBPA. In addition, any locality not included within Tidewater Virginia may elect to incorporate CBPA requirements into its local ordinances. The ACP Project crosses two localities with local CBPA ordinances, the City of Chesapeake and the City of Suffolk.

In accordance with 9 VAC 25-830-150.B.1, a linear gas pipeline and its appurtenant structures are compliant with the Chesapeake Bay Preservation Area Designation and Management Regulation by constructing, installing, operating, and maintaining the gas pipeline and appurtenant structures in accordance with (i) regulations promulgated pursuant to the Erosion and Sediment Control Law and the Virginia Stormwater Management Act, (ii) an ESC Plan and a SWM Plan approved by the VDEQ, or (iii) local water quality protection criteria at least as stringent as the above state requirements.

DETI will construct, install, operate, and maintain the ACP Project in accordance with VDEQ-approved Standards and Specifications which are consistent with the requirements of the Virginia Stormwater Management Act, the Virginia Erosion and Sediment Control Law and associated regulations, where applicable. As such, the ACP Project will be compliant with the Chesapeake Bay Preservation Area Designation and Management Regulation. The ESC and

[4] In accordance with §62.1-44.15:68 of the CBPA, "Tidewater Virginia" means the following jurisdictions: The Counties of Accomack, Arlington, Caroline, Charles City, Chesterfield, Essex, Fairfax, Gloucester, Hanover, Henrico, Isle of Wight, James City, King and Queen, King George, King William, Lancaster, Mathews, Middlesex, New Kent, Northampton, Northumberland, Prince George, Prince William, Richmond, Spotsylvania, Stafford, Surry, Westmoreland, and York, and the Cities of Alexandria, Chesapeake, Colonial Heights, Fairfax, Falls Church, Fredericksburg, Hampton, Hopewell, Newport News, Norfolk, Petersburg, Poquoson, Portsmouth, Richmond, Suffolk, Virginia Beach, and Williamsburg.

SWM Plans contained in this SWPPP were prepared to ensure compliance with the Standards and Specifications as well as other federal regulations.

2.19.8 Agricultural Cost Share Conservation Areas

The Virginia Agricultural Cost Share (VACS) Program provides funding to farmers for the installation of BMPs that improve and protect water quality, including crop management practices as well structural facilities. DETI consulted with the VDCR to identify potentially impacted VACS Program BMPs within 1,000 feet of the centerline of the pipeline ROW. In total, 146 property locations were identified within the search distance and have specific BMPs associated with each location.

- Long Term Continuous No-Till Planting Systems (CCI-CNT)
- Filter Strip (CP-21)
- Riparian Forest Buffer (CP-22)
- Riparian Forest Buffer (CRFR-3)
- Buffer Length Recording (CRLF-1)
- Stream Exclusion (CRSL-6)
- Reforestation of Erodible Crop and Pastureland (FR-1)
- Woodland Buffer Filter Area (FR-3)
- Livestock Exclusion with Riparian Buffers for TMDL Implementation (LE-1T))
- Permanent Vegetative Cover on Cropland (SL-1)
- Stream Exclusion with Grazing Land Management (SL-6)
- Extension of CREP Watering System (SL-7)
- Small Grain Cover Crop for Nutrient and Residue Management (SL-8B)
- Harvestable Cover Crop (SL-8H)
- Sediment Retention, Erosion or Water Control Structure (WP-1)
- Streambank Stabilization (WP-2A)
- Sod Waterway (WP-3)
- Animal Waste Control Facility (WP-4)
- Composting Facility (WP-4C)

Where the above VACS Program BMPs are crossed by the ACP pipeline, the area will be restored to pre-existing conditions in accordance with landowner requirements. In the rare event that a riparian forest buffer is crossed, the area will not be restored to pre-existing land cover since the permanent ROW must be restored to open herbaceous cover for proper operation and maintenance of the pipeline. Further details on permanent ROW restoration and maintenance procedures are located within Appendix R. The property locations with specific BMPs for Agricultural Cost Share Conservation Areas are located in Appendix S.

2.19.9 Historic Preservation

A Phase I archaeological survey was performed for the Project. The survey study area included a 300-foot-wide corridor centered on the centerlines of the proposed AP-1, AP-3, AP-4 and AP-5 mainlines through Virginia, as well as aboveground and ancillary facilities, including compressor stations, M&R stations, valves, pig launcher/receiver sites, access roads, contractor

yards, and other work areas. Aboveground historic resources surveys have been conducted to document and record standing structures and other aboveground resources greater than 50-years in age within the survey corridor or within the viewshed of the proposed ACP facilities.

3.0 EROSION AND SEDIMENT CONTROL MEASURES

All ESC measures to be undertaken as part of this Project will be done in accordance with the VDEQ-approved DETI Standards and Specifications. These standards and specifications will be met through the implementation of the FERC Plan and Procedures; Minimum Standards of the Virginia Erosion and Sedimentation Control Regulations (9VAC25-840-40); by the design, construction, and maintenance of the ESCs in accordance with the VESCH (1992, 3rd Edition); and the application of environmental site design principles.

Specific USFS ESC requirements will be implemented where the pipeline crosses the GWNF, and these requirements are addressed in Section 3.6.

If there is a conflict between the regulations listed above, then the contractor will adhere to the more stringent plan, unless otherwise agreed to in advance. A table is provided in Appendix J, which lists the FERC regulations and whether more stringent regulations will be applied during construction.

DETI will amend the SWPPP whenever there is a change in the design, construction, operation, or maintenance that has a significant effect on the discharge of pollutants to surface waters and that has not been previously addressed in the SWPPP. Revisions may include additional or modified control measures identified in the field during construction. These minor, field-approved changes will be documented on the construction alignment sheets, site plans, and/or inspection reports. In the event that a FERC variance is necessary, the FERC variance request forms and approvals will be adopted and incorporated by reference into the SWPPP. The FERC variance process is discussed further in Section 10.2.

3.1 GENERAL PIPELINE CONSTRUCTION

Pipeline construction workspace requirements are a function of pipe diameter, equipment size, topography, geological rock formations, location of construction such as at road crossings or river crossings, pipeline crossovers, methods of construction such as boring or open-cut construction, or existing soil conditions encountered during construction. As the diameter of the pipeline being installed increases, so does the depth of trench, excavated spoil material, equipment size, and ultimately the amount of construction work space that will be required to construct a project. All workspace locations for a given project will be shown on the construction alignment sheets.

Additional construction ROW may be required at specific locations including, but not limited to, steep side or vertical slopes, road crossings, pipeline crossovers, areas requiring supplemental topsoil segregation, and staging areas associated with wetland and waterbody crossings.

All construction activities, including staging areas and additional spoil storage areas, are restricted to the construction ROW limits identified on the construction alignment sheets, except for specific activities in limited, non-wetland, and non-riparian areas that are allowed by the FERC Plan and Procedures (i.e., slope breakers, energy-dissipating devices, dewatering structures, and drain tile system repairs). Use of these limited areas is subject to landowner or

land management agency approval and compliance with all applicable survey, permit, and reporting requirements; therefore, prior DETI approval is required to use these areas. In some cases, federal, Commonwealth, and local permits and authorizations may require additional approvals.

Minor field realignments and workspace shifts are addressed in DETI's Standards and Specifications (Appendix B).

Cross-country pipeline construction typically proceeds in assembly line fashion, with multiple stages of construction occurring simultaneously at different locations to minimize the time needed to complete the project. The stages of construction include: survey and flagging, clearing and mowing, grubbing and grading, trenching, pipe assembly (including stringing, bending, welding, testing, coating, and lowering-in), backfilling, hydrostatic testing, final grading, and restoration. The ESC measures to be installed for each of these stages are described below. Typical pipeline construction details and associated general ESC measures are provided in Appendix C. ESC measures to be utilized along the pipeline alignment are depicted on the construction alignment sheets in Appendix A.

Site Preparation

- Survey and flag the construction ROW and mark environmentally sensitive areas.
- Install rock access pads.
- Install safety fences prior to ESC installation.
- Conduct initial clearing, limited to that necessary to install temporary sediment barriers.
- Install perimeter ESCs prior to any bulk earth-moving activity (road grading, road use, log skidding, etc.).
- Conduct progressive clearing with installation of temporary sediment barriers and temporary equipment bridges keeping pace with clearing.
- Modify access roads by grading and installing stone where needed.
- Grade the ROW and segregate topsoil where necessary.
- Install temporary slope breakers, also referred to as temporary ROW diversions or water bars, as needed to reduce runoff velocity and divert water off the construction ROW.

Pipe Installation

- Excavate trench to accommodate new pipeline segment.
- String pipe, bend the pipe joints.

- Weld the pipe, inspect welds.
- Lower the pipe into the trench.
- Install permanent trench plugs.
- Backfill the trench.
- Install hydrostatic test dewatering structures.
- Hydrostatically test the pipe and dewater.
- Bring the pipeline to gas service.
- Final grade ROW and temporary workspaces to original contours to the extent practicable.
- Install permanent interceptor dikes.
- Replace segregated topsoil.

Restoration

- Conduct ROW restoration and cleanup. As soon as slopes, channels, ditches, and other disturbed areas reach final grade, they must be stabilized.
- Apply soil amendments, permanent seed, mulch, and/or erosion control fabric.
- Restore temporary access roads or any paved surfaces to original condition.
- Remove temporary sediment barriers from an area when replaced by permanent erosion control measures or when the area has been successfully restored to uniform perennial vegetation. Temporary erosion control BMPs will not be removed until inspection by the Environmental Inspector (EI) to confirm site stabilization.
- Engage a qualified drain tile specialist, as needed, to conduct or monitor repairs to drain tile systems affected by construction.

3.1.1 Survey and Flagging

- The limits of the approved work areas, boundaries of environmentally sensitive areas, and the location of the facilities must be marked in the field prior to the start of mechanized activities. Environmentally sensitive areas are those that are more susceptible to serious erosion problems and thus may require enhanced ESC measures. Examples of such areas may include steep slopes and sinkholes down-gradient of project activities. Examples of specialized controls that may be used in these areas include specialized pipeline construction methods that combine

several construction stages, thereby reducing earth disturbance. Additional details for working in environmentally sensitive areas can be found below in Section 3.5, Special Construction Procedures.

- The limits of approved work areas (i.e., the construction ROW, temporary and additional temporary workspace, and staging areas) will be established and visibly marked before clearing. The locations of approved access roads will be flagged and marked with signs.

- Signs and highly visible flagging will also be used to mark the boundaries of sensitive resource areas, including waterbodies and wetlands, and/or areas with special requirements along the construction work area, in accordance with the construction alignment sheets. Orange plastic fencing may be more useful than flagging to assure that equipment operators stay out of critical areas. Only unavoidable work should take place within critical areas and their buffers.

- Per VESCH **Std. & Spec. 3.01 (Safety Fence)**, safety fencing will be installed as needed during grading at public access points or around open unattended excavations to warn pedestrians of possible hazards. Stakes will be installed to the maximum extent of 18" as practical in the field to ensure the functionality of the safety fence. In areas where adequate embedment depth cannot be achieved, due to terrain/substrate constraints; additional measures including but not limited to sandbags, mounded earth, etc. will be utilized to secure the fence. In addition, lights, signs and other warnings are required at road entrances and road crossings (see Virginia Department of Transportation (VDOT) permits and regulations).

- Safety fencing may also be used to identify sensitive areas to be protected during construction or to highlight hazards along the ROW (e.g., a single-strand electric fence). Safety fencing may not be substituted for wire fencing in active pastures.

- Flagging or marking will be maintained throughout construction.

- Trees to be protected will be flagged by the EIs and if determined necessary, protected with fencing or armoring prior to clearing (e.g., existing snags or large diameter trees on the edge of the construction ROW to be saved or protected for green recruitment or habitat/shade trees).

- Per VESCH **Std. & Spec. 3.38 (Tree Preservation and Protection)**, at a minimum, the limits of clearing will be located outside the drip line of any tree to be retained within the LOD and, in no case, closer than five feet to the trunk of any tree to be retained within the LOD. In addition, heavy equipment, vehicular traffic, or stockpiles will not be permitted within the drip line of any tree to be retained within the LOD.

3.1.2 Construction Entrance

In accordance with VESCH **Std. & Spec 3.02 (Stone Construction Entrance)**, a construction entrance will be constructed at any point where construction equipment leaves the ROW and enters a paved public road or other paved surface. Typically, a construction entrance is comprised of filter fabric overlain by 6 inches of coarse aggregate (VDOT #1) extending a minimum of 70 feet from the edge of the pavement. The area of the entrance must be excavated 3-inches prior to laying the filter fabric underliner. The entrance must extend the full width of the vehicular ingress and egress area and have a minimum 12-foot width. Conveyance of surface water through culverts under the entrance will be provided, as necessary. If such as conveyance is impossible, the construction of a "mountable" berm with 5:1 slopes will be permitted.

The construction entrance must function to remove mud from vehicles and equipment leaving the ROW. As mud accumulates on the entrance, clean stone must be added or the tire mats lifted and shaken to remove mud. Any mud that is carried onto the pavement must be thoroughly removed by the end of the day by shoveling or sweeping. The mud will be returned to the ROW. The use of water to remove sediment tracked onto roadways is permitted only after sediment is removed as stated above.

If the majority of the mud is not removed by the vehicles traveling over the stone, then tires of the vehicles must be washed before entering the public road. A wash rack may be used to make washing more convenient and effective. Wash water must be carried away from the entrance to a settling area to remove sediment before discharge.

Maintenance of the construction entrance may require periodic top dressing with additional stone and cleanout of any structures used to trap sediment. Additionally, the construction entrance may need to be shoveled then swept, followed by washing of the entrance to remove any sediment build up. If any inadvertently sediment tracking occurs on the public roadway, the road will be cleaned thoroughly by the end of each day.

3.1.3 Clearing and Mowing

Clearing operations include the removal of vegetation within the construction ROW. Various clearing methods are employed depending on tree size, contour of the land, and the ability of the ground to support clearing equipment. Vegetative clearing can be accomplished either by hand or by cutting equipment. The following procedures will be standard practice during clearing:

- Construction activities and ground disturbance will be confined to within the construction ROW shown on the construction alignment sheets.

- Brush and trees will be felled into the construction ROW to minimize damage to trees and structures adjacent to the ROW. Trees that inadvertently fall beyond the edge of the ROW will be immediately moved onto the ROW and disturbed areas will be immediately stabilized, per landowner approval.

- Felled timber that is merchantable will be moved to a loading area for trucking to nearby mills. Non-merchantable timber will be burned, chipped, hauled off site, or salvaged for use during restoration activities. After it is cut, non-merchantable timber that will be salvaged for restoration will be flagged, quantified, labeled, and placed along the edge of the construction ROW or at the nearest staging area.

- Vegetation will be cut at ground level and un-merchantable timber (i.e., brush, stumps, slash and tree tops) may be disposed of by chipping and distribution along the upland ROW or by burning, if allowed. Burning must be avoided if practicable. Merchantable timber will be cut and stacked along the outboard edge of the construction ROW in upland areas as directed by the landowner or the Construction Supervisor. According to VESCH **Std. & Spec. 3.38 (Tree Preservation and Protection)**, fires will not be permitted within 100 feet from the drip line of any trees to be retained within the LOD. Fires will be limited in size to prevent adverse effects on trees, and kept under surveillance.

- Slash will be ground up and used as mulch on the ROW, hauled to an approved disposal site, or burned; and additionally could be chipped and blown off the construction ROW with the landowner's approval.

- Stumps excavated from the trench line that cannot be ground to mulch on site will be placed along the edge of the construction ROW or in temporary extra workspaces. Stumps will be hauled from the extra workspaces to an approved disposal site, used on the ROW for restoration purposes, burned, or disposed of according to land managing agency or landowner specifications.

- Existing surface drainage patterns will not be altered by the placement of timber or brush piles at the edge of the construction ROW.

- Where ground skidding is used, the following measures will be implemented to minimize soil disturbance:

    - Low ground weight (pressure) vehicles will be used, where feasible.

    - The removal of soil duff layers will be avoided to maintain a cushion between the soil, logs, and logging equipment.

    - Designed skid trails will be used to restrict detrimental soil disturbance (e.g., compaction and displacement) to a smaller area of the ROW over the pipeline trenching area.

- ESC measures will be installed prior to mechanized clearing of trees, brush, and vegetation.

3.1.4 Wind Erosion Control

Consistent with VESCH **Std. & Spec. 3.39 (Wind Erosion Contro**l), the following temporary sediment controls will be used, as applicable, to minimize the surface and air movement of dust during land disturbing and construction activities:

- In areas with little or no construction traffic, a vegetatively stabilized surface will reduce dust emissions.

- Mulch will be used in areas without heavy traffic pathways. The Restoration and Rehabilitation Plan attached as Appendix R includes recommendations provided by county Natural Resources Conservation Service offices and other commonwealth and federal agencies regarding seeding mixtures and soil amendments. Some of the recommendations provided include specifications on the use of mulch and/or tackifiers to control soil erosion (i.e., wind and water soil erosion) during the construction and restoration of the pipeline. The information provided includes recommendations on the type of mulch material, application rates, soil binders, and tackifiers.

- Tillage should be used only in an emergency situation before wind erosion begins. Plowing on the windward side of the site with chisel-type plows spaced approximately 12 inches apart.

- The contractors will have one or more water trucks available per spread that will load water from approved permitted sources to spray areas for dust control.

- Use of spray-on adhesives may be used on mineral soils only.

- Use crushed stone or course gravel to stabilize roads and other areas during construction.

- A board fence, wind fence, or sediment fence may be used to control air currents and blowing soil. Place barriers perpendicular to prevailing air currents at intervals of about 15 times the barrier height.

- Calcium chloride may be applied by a mechanical spreader as loose, dry granules or flakes at a rate that keeps the surface moist but not so high as to cause water pollution or plant damage.

Finally, after land disturbing activities are complete, permanent vegetation and site stabilization will provide long-term protection against wind erosion.

3.1.5 Install Temporary Sediment Barriers and Diversions

Sediment barriers, which are temporary sediment controls intended to minimize the flow and deposition of sediment beyond approved workspaces or into sensitive resource areas, will be installed following vegetative clearing operations. The primary sediment barrier methods to be

used on the ACP Project will be silt fencing and temporary diversion dikes. General requirements are as follows:

- Install temporary sediment barriers at the base of slopes greater than 5 percent where the base of the slope is less than 50 feet from a road crossing, waterbody and/or wetland until revegetation is complete. Leave adequate room between the base of the slope and the sediment barrier to accommodate ponding of water and sediment deposition. For silt fencing, an effort should be made to locate the fencing at least 5 to 7 feet beyond the toe of the slope.

- Where wetlands or waterbodies are adjacent to and downslope of construction work areas, install sediment barriers along the edge of these areas, as shown on the construction alignment sheets.

- In accordance with FERC Plan, inspect temporary sediment barriers daily in areas of active construction to ensure proper functioning and maintenance. In other areas with no construction or equipment operation, sediment barriers will be inspected and maintained on a weekly basis and immediately within 24 hours of each 0.5- inch rainfall event. Section 8.1.1 further discusses inspection details and procedures to be performed in compliance with the Virginia Stormwater Management Act, the Virginia Erosion and Sediment Control Law and associated regulations, where applicable..

- Sediment removed from erosion controls will be disposed by adding to existing on-site soil stockpiles and stabilizing, or will be reused on site within the construction ROW and outside of any wetlands, streams, or riparian areas. Per Minimum Standard 2, during construction of the project, soil stock piles and borrow areas will be stabilized or protected with sediment trapping measures. DETI is responsible for the temporary protection and permanent stabilization of soil stockpiles on site as well as borrow areas and soil intentionally transported from the project site.

- Maintain temporary sediment barriers in place until permanent revegetation measures are successful or the upland areas adjacent to wetlands, waterbodies, or roads are stabilized.

- Remove temporary sediment barriers from an area when replaced by permanent erosion or sediment control measures or when the area has been successfully restored to perennial vegetation. Per Minimum Standard 3, permanent vegetation will not be considered established until a ground cover is achieved that is uniform, is mature enough to survive, and will inhibit erosion.

3.1.5.1 Silt Fencing

Silt fencing constructed of synthetic filter fabric stretched across and attached to supporting posts, and in some cases a wire support fence, will be placed across or at the toe of a slope or in a minor drainage way to intercept and detain sediment and decrease flow velocities

from drainage areas of limited size. Silt fencing is applicable where sheet and rill erosion or small concentrated flows may be a problem. In accordance with VESCH **Std. & Spec 3.05 (Silt Fence),** DETI will adhere to the following general construction and maintenance specifications if congruent with the manufacturer's recommended installation and use. In the event of conflicting specifications, DETI will always follow the manufacturer's recommendations on proper installation and use of a product.

- Silt fencing will be used where the size of the drainage area is not more than 0.25-acre per 100 feet of silt fence length; the maximum slope length behind the barrier is 100 feet; and the maximum gradient behind the barrier is 50 percent (2:1).

- Silt fencing can be used in minor swales or ditches where the maximum contributing drainage area is no greater than 1 acre and flow is no greater than 1-cubic foot per second. In ditches or swales where higher velocity flow is expected, rock check dams should be used in place of silt fence.

- Silt fencing will not be used in areas where rock or other hard surface prevents the full and uniform depth anchoring of the barrier.

- If steel posts are utilized, they must have a minimum weight of 1.33 pounds per linear foot and have a minimum length of 5 feet. Posts will be placed a maximum of 6 feet apart.

- The height of the fence will be a minimum of 16 inches above grade and will not exceed 34 inches above ground elevation.

- Filter cloth will be spliced together only at support posts with a minimum 6-inch overlap.

- A trench will be excavated approximately 4-inches wide and 4-inches deep on the upslope side of the proposed location of the measure.

- When wire support is not used, extra-strength filter fabric will be fastened to the upslope side of the posts using 1-inch long (minimum) heavy-duty wire staples or tie wires and eight inches of the fabric will be extended into the trench. The posts will be placed a maximum of 6 feet apart.

- When wire support is used, the wire mesh fence must be fastened securely to the upslope side of the posts using heavy duty wire staples at least 1-inch long, tire wires, or hog rings. The wire will extend into the trench a minimum of 2-inches and will not extend more than 34 inches above the ground surface. The standard-strength fabric will be stapled or wired to the wire fence, and 8 inches of the fabric will be extended into the trench. The posts will be placed a maximum of 10 feet apart.

- If silt fence is to be constructed across a ditch line or swale, the measure must be of sufficient length to eliminate end flow and the configuration will resemble an

arc with the ends oriented upslope. Extra-strength filter fabric must be used for ditch lines or swales with a maximum 3-foot spacing of posts.

- The 4 by 4-inch trench will be backfilled and the soil compacted over the filter fabric.

- Remove accumulated sediments when sediment reaches half the aboveground height of the fence.

- Silt fences will be removed and discarded properly after project completion. Soils will be stabilized and seeded accordingly. Permanent erosion control protective measures will be utilized if seeding alone will not stabilize the site and provide soil stability.

Belted Silt Retention Fence

The primary silt fence product planned for use on the ACP Project is a patented Belted Silt Retention Fence (BSRF) product which is available in two designs used to address different site conditions, as follows:

- BSRF Priority 1 (green band) is a heavy-duty silt fence constructed with a 36-inch, non-woven, spun-bond fabric with an internal scrim incorporated into the fabric for additional strength and durability. The system utilizes wood stakes spaced at 4-feet and a specific method of attachment. The system is functionally equivalent to wire back and metal steel post silt fence and is designed for the protection of high priority areas, including wetlands and waterbodies.

- BSRF Priority 2 (black band) is a medium-duty silt fence constructed with a 36-inch, non-woven, spun-bond fabric that is calendared on one side. The system utilizes wood stakes spaced at 6-feet and a specific method of attachment.

Drawings and specifications for the two BSRF products are provided in Appendix A.

3.1.5.2 Compost Filter Sock

Compost filter sock will be used to collect and covey runoff from disturbed areas particularly in locations requiring enhanced protection. The proposed compost filter socks will be used to catch and treat potentially sediment-laden runoff from disturbed areas. Additional perimeter controls (i.e., additional compost filter sock) may be necessary at the contractor's discretion should unexpected erosion be encountered during grading activities.

- Sediment control logs such as coir logs or compost filter logs will be used on equipment bridges or on mats across the travel lane.

- Sediment barriers and traps proposed for use during construction primarily include compost type BMPs and are selected and designed based on site-specific conditions, including slope and soil type.

- Inspect temporary stream crossings after runoff-producing rains for sediment blockage. Sediment deposits will be cleaned from the log when it reaches half the height of the compost filter sock.

3.1.5.3 Temporary Diversion Dike

A temporary ridge of compacted soil constructed at the top of a sloping disturbed area will be used to divert stormwater runoff from upslope drainage areas away from the unprotected slope. Temporary diversion dikes can also be constructed at the base of a slope to protect adjacent and downstream areas by diverting sediment-laden runoff from a disturbed area to a sediment-trapping control measure. A temporary diversion dike is effective when the control limits of a silt fence are exceeded. The temporary diversion dike must be installed as a first step in the land-disturbing activity at locations shown on the construction alignment sheets and must be functional prior to upslope land disturbance. In accordance with VESCH **Std. & Spec 3.09 (Temporary Diversion Dike)**, DETI will adhere to the following general construction and maintenance specifications:

- The maximum allowable drainage area is 5 acres.
- The minimum height measured on the upslope side of the dike is 18 inches.
- The dike should be compacted to prevent failure and have side slopes 1.5:1 or flatter with a minimum base width of 4.5 feet.
- The channel behind the dike will have a parabolic or trapezoidal cross-section shape to avoid high velocity flow which could arise in a v-shaped ditch. The channel will have a positive grade to a stabilized outlet.
- The diversion dike and channel will be stabilized immediately following installation with temporary or permanent vegetation. Where channel slope is greater than 2 percent, Rolled Erosion Control Product (RECP), or equivalent, will be used to stabilize soil until vegetation is established.

The temporary diversion dike will be inspected and repairs made to the dike, flow channel, outlet, or sediment trapping area, as necessary. Once every day in active construction areas, whether a storm event has occurred or not, the measure will be inspected and repairs made if needed. Damages caused by construction traffic or other activity must be repaired before the end of each working day.

3.1.5.4 Temporary Sediment Trap

A temporary ponding area formed by constructing an earthen embankment with a stone outlet may be used to detain sediment-laden runoff from small disturbed areas (where total drainage area is less than 3 acres) to allow sediment to settle out prior to discharge. The sediment trap may be constructed either independently or in conjunction with a temporary diversion dike as a suitable option for outlet control. The temporary sediment trap must be installed as a first step in the land-disturbing activity at locations shown on the construction

alignment sheets and must be functional prior to upslope land disturbance. In accordance with VESCH **Std. & Spec 3.13 (Temporary Sediment Trap)**, DETI will adhere to the following general construction and maintenance specifications:

- The maximum useful life of a temporary sediment trap is 18 months. Traps will be replaced should the construction period exceed 18 months. Sediment traps may need to be replaced sooner than 18-months (on an as needed basis) if at any time they cease to be effective. This will be determined based on the regularly scheduled inspections of these traps. Erosional control inspection and maintenance will continue on all parts of the project at all times until the landscape is deemed stable.

- The total contributing drainage area to a sediment trap is less than 3 acres.

- The sediment trap must be designed to have an initial storage volume of 134 cubic yards per acre of drainage area with a minimum 2:1 length to width ratio, if possible. Half of the 134 cubic yards per acre of storage volume must be in the form of a permanent pool or wet storage.

- Side slopes of the excavated area should be no steeper than 1:1 and the maximum depth of excavation within the wet storage area should be 4 feet.

- Outlet requirements include a combined coarse aggregate/riprap stone section of the embankment (VDOT #3, #357 or #5 Coarse Aggregate and Class I riprap). Filter cloth will be placed at the stone-soil interface. The length of the stone outlet will be detailed on the construction alignment sheets and will be designed at 6 feet times the total drainage area in acres. The crest of the stone outlet must be at least 1.0 foot below the top of the embankment.

- The maximum height of the embankment will be 5 feet measured to the base of the stone outlet. Side slopes of the embankment will be 2:1 or flatter.

- Fill material will be free of roots or other woody vegetation, large stones, or organic matter and compacted in 6-inch lifts.

- The temporary sediment trap will be stabilized immediately following installation with temporary or permanent vegetation.

- Remove accumulated sediments when sediment reaches half the design storage volume. Sediment removed will be deposited in a disturbed area in a manner that it will not erode and cause sedimentation problems.

- Stone will be replaced if it becomes choked with sediment.

3.1.6 Grubbing and Grading

The construction ROW will be graded as needed to provide a level workspace for safe operation of heavy equipment used in pipeline construction. The following procedures will be standard practice during grading.

3.1.6.1 Topsoil Segregation

During construction, topsoil and subsoil will be disturbed by grading of the ROW, trench excavation, and by heavy equipment moving along the ROW. The potential mixing of topsoil with the subsoil from these activities could result in a loss of soil productivity. Implementation of proper topsoil segregation will help promote post-construction revegetation success, thereby minimizing loss of crop productivity and the potential for long-term problems with erosion.

Topsoil segregation methods will be used in all residential areas (except where the topsoil is being replaced), wetlands (except areas where standing water is present or soils are saturated), cultivated or rotated croplands, managed pastures, hayfields, and other areas at the landowner's or land managing agency's request. Either the "ditch plus spoil side" or the "full ROW" segregation method will be used. All topsoil and spoil from minor and intermediate waterbody crossings, will be placed in the construction ROW at least 10 feet from the water's edge or in additional extra work areas where the topsoil and spoil will be placed at least 50 feet away from the water's edge, except where the adjacent upland consists of cultivated or rotated cropland or other disturbed land. In accordance with VESCH **Std. & Spec 3.30 (Topsoiling)** and the FERC Plan, DETI will adhere to the following general construction and maintenance specifications:

- Prevent the mixing of topsoil with subsoil by stripping topsoil from either the full work area or from the trench and subsoil storage area ("ditch plus spoil side" method).
- Segregate at least 12 inches of topsoil in deep soils with more than 12 inches of topsoil. In soils with less than 12 inches of topsoil, make every effort to segregate the entire topsoil layer.
- Within wetlands, segregate the top 12 inches of topsoil within the trenchline, except in areas where standing water is present or soils are saturated.
- In residential areas, importation of topsoil (i.e., topsoil replacement) is an acceptable alternative to topsoil segregation.
- Maintain separation of salvaged topsoil and subsoil throughout construction activities.
- Leave gaps in the topsoil piles and spoil piles for the installation of temporary slope breakers to allow water to be diverted off the construction ROW.

- Never use topsoil for padding the pipe, constructing temporary slope breakers, trench breakers or trench plugs, improving or maintaining roads, fill material, or for constructing sediment barriers of any kind.

- Stabilize topsoil piles and minimize loss due to wind and water erosion with use of sediment barriers, mulch, temporary seeding, or functional equivalents.

- Topsoil operations (stripping and replacement) should not be performed when the soil is wet or frozen.

- Per Minimum Standard 4, perimeter dikes, berms, sediment basins, and other sediment controls will be in place prior to stripping. These practices must be maintained during land disturbing activities.

- Side slopes of the stockpile will not exceed 2:1.

- Perimeter controls must be placed around the stockpile immediately.

- Seeding of stockpile will be completed within 7 days of the formation of the stockpile if it is to remain dormant for longer than 14 days in accordance with VESCH **Std. & Spec. 3.31 (Temporary Seeding)** and Minimum Standard #1 and #2. Stabilization of stockpiles with a temporary cover (i.e., mulch) in accordance with **VESCH Std. & Spec. 3.35 (Mulching)** is also acceptable.

- If during routine inspections, it is observed that temporary seed is not successfully establishing on temporary stockpiles within 14 days, the appropriate soil amendments (lime and fertilizer) will be considered and if needed, will be incorporated in accordance with ESC Technical Bulletin #4. Temporary and permanent stabilization will be applied strictly in accordance with MS-1.

- Prior to dumping and spreading topsoil, the subgrade will be loosened by discing or scarifying to a depth of at least 2 inches to ensure bonding of the topsoil and subsoil.

- Topsoil will be uniformly distributed to a minimum compacted depth of 2 inches on 3:1 slopes or steeper slopes and 4 inches on flatter slopes.

- Topsoil will be tested by a recognized laboratory for the following criteria:

    - organic matter content will be not less than 1.5 percent by weight;

    - pH range will be from 6.0-7.5. If pH is less than 6.0, lime will be added in accordance with soil test results or in accordance with the recommendations of the vegetative establishment practice being used; and

    - soluble salts will not exceed 500 parts per million.

- In areas which are not going to be mowed, the surface should be left rough by not fine grading in accordance with VESCH **Std. &Spec. 3.29 (Surface Roughening)**.

- No sod or seed will be placed on soil that has been treated with soil sterilants until sufficient time has elapsed to permit dissipation of toxic materials.

3.1.6.2 Tree Stump Removal and Disposal

- Remove tree stumps in upland areas along the entire width of the permanent ROW to allow adequate clearance for the safe operation of vehicles and equipment. Stumps within the temporary ROW will be removed or ground below the surface in accordance with DETI construction specifications to allow the safe passage of equipment, as determined by the Chief Inspector or EI. The USFS requirements for tree removal will be addressed within Section 3.6 and within the COM Plan.

- In wetlands, limit pulling of tree stumps and grading activities to directly over the trenchline. Do not grade or remove stumps or root systems from the rest of the construction ROW in wetlands unless the Chief Inspector and/or EI determine that safety-related construction constraints require grading or the removal of tree stumps from under the working side of the construction ROW.

- No burning of tree stumps will take place within wetlands.

- Dispose of stumps by one of the following methods with the approval of the Chief Inspector and the landowner and in accordance with regulatory requirements:

    - burned on the construction ROW;

    - chipped, spread across the construction ROW in upland areas, and plowed in;

    - used as erosion control mix material; and

    - hauled off site for disposal at an appropriately licensed disposal facility.

- Non-merchantable timber that can be salvaged for restoration will be flagged, quantified, labeled, and placed along the edge of the construction ROW or at the nearest staging area.

3.1.6.3 Rock Management

Rock, including blast rock, will be used, removed, or disposed in one of the following ways:

- Rock excavated from the trench may be used to backfill the trench only to the top of the existing bedrock profile (rock that is not returned to the trench will be

considered construction material or waste, unless approved for use as mulch or for some other use on the construction work areas by the land owner or land managing agency);

- Windrowed per written landowner agreement with DETI;
- Removed and disposed of at a DETI-approved landfill; or
- Used as riprap for streambank stabilization as allowed by applicable regulatory agency(ies) and provided the rock is uncontaminated and free of soil and other debris. Per VESCH **Std. & Spec. 3.19 (Riprap)**, stone for riprap will consist of field stone or rough unhewn quarry stone of approximately rectangular shape. The stone will be hard and angular and of such quality that it will not disintegrate on exposure to water or weathering and it will be suitable in all respects for the purpose intended. The specific gravity of the individual stones will be at least 2.5. Rubble concrete may be used provided it has a density of at least 150 pounds per cubic foot, and otherwise meets the requirement of the VESCH standard and specification.

A Blasting Plan was developed for the project and is located within Appendix L.

3.1.6.4 Temporary Slope Breakers

Temporary slope breakers, also called temporary ROW diversions or water bars, are temporary erosion control measures intended to reduce runoff velocity and divert water off the construction ROW. Temporary slope breakers may be constructed of materials such as compacted soil, silt fence, staked straw bales, or sand bags. Segregated topsoil may not be used for constructing temporary slope breakers. In accordance with VESCH **Std. & Spec. 3.11 (Temporary Right-of-Way Diversion)** and the FERC Plan, DETI will adhere to the following general construction and maintenance specifications:

- Install temporary slope breakers on disturbed areas as necessary following topsoil removal and grading operations to avoid excessive erosion. Unless otherwise specified by permit conditions, temporary slope breakers must be installed on slopes at the recommended spacing interval indicated below (closer spacing should be used if necessary). The VESCH spacing requirements, which are listed in Table 3.1.6-1 below, are recommended since they are more stringent than FERC Plan requirements.

TABLE 3.1.6-1

Recommended Spacing for Temporary Slope Breakers (VESCH Std. & Spec. 3.11)

Trench Slope	Distance (feet)
Less than 7%	100
7–25%	75
25–40%	50
Over 40%	25

NOTE: Slope breaker spacing in areas of steep terrain may be decreased as a result of the steep slopes BIC Program described in Section 3.5.6. Accordingly, this table may be revised to reflect more stringent spacing requirements.

- The temporary diversion should be constructed completely across the disturbed portion of the ROW.
- Positive grade with 2 to 8 percent or above slope should be provided to a stabilized outlet, as needed; steeper grading may be utilized as necessary to promote positive drainage. Approval for installation of temporary ROW diversions with a fall slope exceeding 8 percent will be coordinated on a case-by-case basis.
- Direct the outfall of each slope breaker to a stable, well vegetated area (flow length of at least 75 feet) or construct an energy-dissipating device (silt fence, staked straw bales, erosion control fabric, coir log, rock aprons, etc.) at the end of the slope breaker.
- Position the outfall of each temporary slope breaker to prevent sediment discharge into wetlands, waterbodies, or other sensitive resource areas.
- Each diversion should exit onto stabilized ground. It should never exit onto the ROW where it can run down to the next diversion.
- Install temporary slope breakers on slopes greater than 5 percent where the base of the slope is less than 50 feet from waterbody, wetland, and road crossings.
- Minimum allowable height of the diversion is 18 inches, installed by machine or hand-compacted in 8-inch lifts.
- Side slopes should be 2:1 or flatter to allow the passage of construction traffic, along with a minimum base width of 6 feet.
- In accordance with the FERC Plan, inspect temporary slope breakers daily in areas of active construction to insure proper functioning and maintenance. In other areas, the slope breakers will be inspected and maintained on a weekly basis and within 24 hours of each 0.5-inch rainfall event. Section 8.1.1 further discusses inspection details and procedures to be performed in compliance with the Virginia Stormwater Management Act, the Virginia Erosion and Sediment Control Law, and associated regulations, where applicable. Slope breakers which will not be subject to construction traffic should be stabilized with temporary seeding.

Remove temporary measures when replaced by permanent measures or when permanent stabilization is achieved (uniform perennial vegetative cover).

3.1.6.5 Timber Mat Stabilization

DETI utilizes construction timber mats to provide access through areas such as wetlands and waterbodies, some agricultural fields, steep slopes, and other areas as determined by the Construction Supervisor. This practice reduces soil compaction and provides a stable travel lane for contractors along the project ROW, thus minimizing land disturbance. The materials used to construct the timber matting will be able to withstand the anticipated loading of the construction traffic. This practice may be incorporated in addition to the VESCH-related practices and requirements. The timber mats over waterbody crossings will be cleaned at the end of each day to remove excess accumulation of sediment.

The use of construction timber may generally not constitute soil disturbance or a change in hydrology. Therefore, the installation of timber mat access roads and work pads is not considered a regulated land-disturbing activity and these areas are generally not included in land disturbance area calculations.

3.1.6.6 Temporary Stabilization

When acceptable final grade cannot be achieved (e.g., during winter or early spring construction), when permanent seeding cannot be applied due to adverse soil and weather conditions, or any time an area will remain idle for more than 14 days, temporary stabilization (temporary seed, mulch, additional sediment barriers as directed by the EI) must be applied within 7 days to that area. ESC measures will be monitored and maintained until conditions improve and final restoration can be completed.

3.1.7 Trenching

The trench centerline will be staked after the construction ROW has been prepared. In general, a trench will be excavated to a depth that will permit burial of the pipe with a minimum of 3 feet of cover.

The following procedures will be standard practice during ditching:

- Flag drainage tiles damaged during ditching activities for repair.
- Place spoil in additional extra work areas or at least 10 feet away from the waterbody's edge in the construction ROW. Spoil will be contained with ESC devices to prevent spoil materials or sediment-laden water from transferring into waterbodies and wetlands or off of the ROW.
- If temporary erosion or sediment controls are damaged or removed during trenching, they will be repaired and/or replaced before the end of the work day.

3.1.7.1 Trench Breakers

Permanent sacks of subsoil or sand, polyurethane foam, bentonite clay, or possibly cement (in areas of steep terrain) bags installed around the pipe will remain in the trench to prevent subsurface channeling of water along the trench. Topsoil will not be used in trench

breakers. Trench breakers are not employed in trenchless pipeline construction such as HDD or for non-linear facilities (e.g., compressor stations, M&R stations).

The need for and spacing of trench breakers will be indicated on the construction alignment sheets in Appendix A. Trench breakers will be installed at the same spacing as and upslope of permanent slope breakers unless determined otherwise by the certifying Professional Engineer.

In agricultural fields and residential areas where slope breakers are not typically required, trench breakers will be installed at the same spacing as if permanent slope breakers were required. In agricultural lands, trench breakers will be installed to a depth that does not encroach into the typical plow zone.

Permanent trench breakers will be installed at the base of slopes greater than 5 percent where the base of the slope is less than 50 feet from a waterbody or wetland and where needed to avoid draining a waterbody or wetland.

Trench breakers must be installed at wetland boundaries or the trench bottom must be sealed, as specified in the FERC Procedures. Trench breakers will not be installed within a wetland.

3.1.8 Trench and Site Dewatering

Dewatering may be periodically conducted to remove accumulated groundwater or precipitation from the construction ROW, including from within the trenchline. The need for erosion controls as well as the type of control used will vary depending on the type and amount of sediment within the water, and volume and rate of discharge.

3.1.8.1 Geotextile Bag/Dewatering Filter Bag

DETI utilizes geotextile bags for dewatering and velocity reduction on a majority of pipeline construction projects as well as the straw bale dewatering practice illustrated in the VESCH **Std. & Spec. 3.26 (Dewatering Structure)**. The purpose, definition, conditions of application and planning considerations are identical. Design criteria and specifications vary by dewatering bag manufacturer; a variety of geotextile dewatering bag products are available on the market. The manufacturers' guidance on the use, design, sizing, maintenance, and application of the geotextile dewatering bag will be followed.

- Conduct dewatering (on or off the construction ROW) in such a manner that does not cause erosion and does not result in silt-laden water flowing into any waterbody, wetland, or off-site property.

- Elevate and screen the intake of each hose used to withdraw the water from the trench to minimize pumping of deposited sediments.

- A dewatering bag may not be needed if there is a well-stabilized, vegetated area on site to which water can be discharged. The area must be stabilized so that it can filter sediment and at the same time withstand the velocity of the discharged

water without eroding. Per VESCH **Std. & Spec 3.26 (Dewatering Structure)**, a minimum filtering length of 75 feet must be available in order for such a method to be feasible.

- Remove dewatering structures as soon as practicable after the completion of dewatering activities.

- Remove dewatering structures as soon as practicable after the completion of dewatering activities. If sediment build-up prevents the bag from functioning properly, or the bag becomes half full of sediment, discard and replace with a new bag.

3.1.8.2 VESCH Standard Dewatering Structure

As warranted by site conditions, a standard dewatering structure may be used per the construction and maintenance specifications in VESCH **Std. & Spec 3.26 (Dewatering Structure)**, including the use of a portable sediment tank, filter box, or straw bale/silt fence pit. The dewatering structure must be sized (and operated) to allow pumped water to flow through the filtering device without overtopping the structure. The filtering devices must be inspected frequently and repaired or replaced once the sediment build-up prevents the structure from functioning as designed or has reached one-third of its capacity. The accumulated sediment which is removed from a dewatering device must be spread on site and stabilized or disposed of at an approved disposal site.

In some cases, DETI could use a modified dewatering structure in combination with a filter bag. The structure is similar to the straw bale/silt fence pit described in the VESCH, but the wet storage area is not excavated 3 ft. below the perimeter measures since the structures are placed off the right-of-way in well vegetated areas. The filter bag discharges into the dewatering structure for additional filtration through the straw bales. Additional energy dissipating devices may be installed downgradient of the dewatering structure, as necessary.

It is noted that filter bags are often installed off the right-of-way to avoid discharge to denuded areas on the right-of-way and to benefit from additional filtration provided by the vegetation that exists off the right-of-way. Prior to installing a dewatering structure off the right-of-way appropriate coordination with the landowner will occur. Installation and removal of the referenced dewatering practice does not involve ground disturbance.

3.1.9 Pipe Installation

During all phases of the pipe installation process, ensure that roadway crossings and access points are safe and in an accessible condition. Repair damaged temporary erosion controls by the end of the work day. If portions of slope breakers are removed from the travel lane to facilitate safe work conditions, they will be restored prior to the end of the work day. Pipe installation will commence according to DETI construction and implementation plans and generally consist of stages such as stringing and bending, welding, and lowering-in and tie-ins.

3.1.10 Backfilling

Backfilling consists of covering the pipe with the earth removed from the trench or with other fill material hauled to the site when the existing trench spoil is not adequate for backfill. Backfilling will follow lowering-in of the pipeline as close as is practical.

In areas where the trench bottom is irregularly shaped due to consolidated rock or where the excavated spoil materials are unacceptable for backfilling around the pipe, padding material may be required to prevent damage to the pipe. This padding material will generally consist of sand or screened spoil materials from trench excavation.

3.1.11 Hydrostatic Testing

A pipeline must undergo hydrostatic testing after backfilling and before placing it into operation in order to establish the Maximum Allowable Operating Pressure. Pressure testing may also be conducted on a pipe segment prior to lowering-in as directed by the Construction Supervisor. Hydrostatic testing is often conducted while clean-up activities are ongoing. The test manifold locations may be restored out of sequence with the rest of the ROW. If portions of the restored ROW must be disturbed again in order to complete pressure testing, ESC measures will be implemented to meet the same standards applied during the rest of construction.

Commonwealth-designated exceptional value waters, waterbodies that provide habitat for federally listed threatened or endangered species, and waterbodies designated as public water supplies or any streams will not be used for discharging hydrostatic test water, unless appropriate federal, state, and/or local permitting agencies grant written permission. Hydrostatic test manifolds will be located outside wetlands and riparian areas to the maximum extent practicable.

After backfilling and all other construction activities that could affect the pipeline are complete, each pipeline will be hydrostatically tested in sections to verify that each system is free from leaks and will provide the required margin of safety at operating pressures. Individual sections of pipeline to be tested will be determined by water availability and terrain conditions. Water for hydrostatic testing will be obtained from potable water sources such as a local water municipality or from non-potable surface water sources in accordance with Commonwealth regulations and required permits. As practicable, water will be transferred from one test section to another to reduce the amount of water that is required for testing.

During withdrawal from surface waters, if applicable, access to the withdrawal point will be from an approved construction work area or at a public crossing. The intake hose will be screened and positioned above the streambed to prevent entrainment of debris or stream sediment and to minimize the potential for entrainment of fish. Adequate flow rates to protect aquatic life, provide for waterbody uses, and provide for downstream withdrawals of water by existing users will be maintained. The rate of withdrawal will be regulated so as not to visibly lower the stream flow.

Once hydrostatic testing is complete, the test water will be discharged in accordance with the FERC Plan and Procedures and applicable permits through an approved discharge structure to remove turbidity or suspended sediments (i.e., dirt left in the pipe during construction) and prevent scour and erosion. The energy dissipating dewatering device will be sized to

accommodate the rate and volume of discharge. DETI utilizes geotextile bags for dewatering and velocity reduction on a majority of pipeline construction projects; however, straw bale dewatering practices, as illustrated in the VESCH (**Std. & Spec. 3.26 Dewatering Structure**), may also be used. Refer to Section 3.1.8 for a description of dewatering practices. Alternatively, the water will be hauled off site for disposal at an approved location.

In Virginia, hydrostatic test water is covered under a General Permit for Discharges from Petroleum Contaminated Sites, Groundwater Remediation, and Hydrostatic Tests (VAG83). Discharges of water from hydrostatic tests are automatically covered under the permit, and dischargers are not required to submit a registration statement to apply for permit coverage.

These discharges are subject to effluent limitations and monitoring requirements. Discharge Monitoring Reports are not required to be submitted to the VDEQ, but must be retained by the owner for at least 3 years from the completion date of the project.

DETI will notify appropriate state agencies of intent to use specific sources at least 48 hours before testing activities, unless the state agencies waive this requirement in writing. Owners have to notify the VDEQ's regional office in writing within 14 days of the completion of the discharge. The notification has to include the owner's name and address, the type of discharge that occurred, the physical location of the discharge work, and the receiving stream. If the discharge is to an MS4, the owner also has to notify the MS4 owner within 14 days of the completion of the discharge.

DETI will perform 100 percent radiographic inspection of all pipeline section welds or hydrotest the pipeline sections before installation under waterbodies or wetlands. If pumps used for hydrostatic testing are within 100 feet of any waterbody or wetland, secondary containment and refueling of these pumps will be addressed in the contractor's SPCC Plan. DETI will file with FERC before construction a list identifying the location of all waterbodies proposed for use as a hydrostatic test water source or discharge location.

3.1.12 Water Impoundments

DETI will utilize aboveground water impoundment structures to temporarily store water needed for hydrostatic testing. Water for hydrostatic testing will be withdrawn from adjacent surface waters and/or municipal sources and will be pumped to the water impoundments gradually over a 30- to 90-day period without impacting downstream users of water or exceeding allowable water withdrawal rates. The water impoundments will be constructed in ATWS and will be circular in configuration with a diameter of approximately 190 feet and a height of approximately 15 feet.

Nine water impoundments will be erected to support activities along the ACP in Virginia as shown on the Construction Alignment Sheets in Appendix A.

3.1.13 Restoration and Final Cleanup

Restoration of the ROW will begin after pipeline construction activities have been completed. Restoration measures include the re-establishment of final grades and drainage patterns as well as the installation of permanent ESC devices to minimize post-construction

erosion. DETI is required by FERC to restore the ground surface as closely as practicable to original contours to restore natural overland water flow patterns, aquifer recharge, and drainage patterns (FERC Plan Section V.A.5). FERC has an established process to review and approve any changes to this requirement in advance while in the field. The FERC variance request process is discussed further in Section 10.2.

In accordance with Minimum Standard 18, all temporary ESC control BMPs will be removed 30 days after DETI has determined final site stabilization is achieved or after the temporary BMPs are no longer needed. Trapped sedimentation will be removed or stabilized on site. Disturbed soil resulting from removal of the BMPs or vegetation will be permanently stabilized. Per Virginia Minimum Standard 3, permanent stabilization is achieved when vegetation is established that is uniform, mature enough to survive and will inhibit erosion.

- The Contractor will make every reasonable effort to complete final cleanup of an area (including final grading, topsoil replacement and installation of permanent erosion control structures) within 20 days after backfilling the trench in that area (within 10 days in residential areas). If seasonal or other weather conditions prevent compliance with these timeframes, continue to inspect and maintain temporary ESCs (i.e., temporary slope breakers, sediment barriers, and mulch) until conditions allow completion of cleanup. Temporary soil stabilization (temporary seed, mulch, additional sediment barriers as directed by the EI) will be applied within 7 days to denuded areas that may not be at final grade but will remain dormant for longer than 14 days.

- As soon as slopes, channels, ditches, and other disturbed areas reach final grade, they must be stabilized. The disturbed ROW will be seeded as soon as possible and within no more than 7 days of final grading, weather and soil conditions permitting.

- Grade the ROW to pre-construction contours, with the exception of the installation of any permanent measures required herein.

- Grading practices such as stair-stepping or grooving slopes or leaving slopes in a roughened condition by not fine-grading will be used on slopes steeper than 3:1 in accordance with VESCH **Std. & Spec. 3.29 (Surface Roughening)** on slopes steeper than 3:1 or that have received final grading but will not be stabilized immediately.

- Spread segregated topsoil back across the graded ROW to its original profile.

- Remove excess rock from at least the top 12 inches of soil in all cultivated or rotated cropland, managed pastures, hayfields, residential areas, as well as other areas at the landowner's request. The size, density, and distribution of rock on the construction ROW will be similar to adjacent areas not disturbed by construction. The landowner or land managing agency may approve other provisions in writing.

- A travel lane may be left open temporarily to allow access by construction traffic if the temporary ESC structures are installed, regularly inspected, and maintained. When access is no longer required, the travel lane must be removed and the ROW restored.

- Remove construction debris (used filter bags, skids, trash, etc.) from construction work areas unless the landowner or land managing agency approves leaving material on site for beneficial reuse, stabilization, or habitat restoration. Grade or till the ROW to leave the soil in the proper condition for planting.

- For construction activities occurring in winter, conditions such as frozen soils or snow cover could delay successful soil compaction mitigation or seeding activities. In these conditions, DETI will follow its *Winter Construction Plan* and resume clean-up and restoration efforts the following spring. DETI will monitor and maintain temporary erosion controls (e.g., temporary slope breakers, sediment barriers, or mulch) until conditions allow for completion of cleanup and installation of permanent erosion control structures.

3.1.13.1 Permanent Slope Breakers

Permanent slope breakers will be installed during final grading, where required, to slow runoff velocity and direct water off the ROW and prevent sediment deposition into sensitive resources. Permanent slope breakers may be constructed of materials such as soil, stone, or some functional equivalent. In accordance with the FERC Plan, DETI will adhere to the following general construction and maintenance specifications:

- Construct and maintain permanent slope breakers in all areas, except cultivated areas and lawns, unless requested by the landowner, using spacing shown on the construction alignment sheets.

- Spacing for permanent slope breakers will be as follows in Table 3.1.13-1:

TABLE 3.1.13-1

Recommended Spacing for Permanent Slope Breakers (FERC V.B.2)

Trench Slope	Distance (feet)
5-15	300
>15-30	200
>30	100

NOTE: Slope breaker spacing in areas of steep terrain may be decreased as a result of the steep slopes BIC Program described in Section 3.5.6. Accordingly, this table may be revised to reflect more stringent spacing requirements.

- Construct permanent slope breakers with enough slope to divert surface flow to a stable vegetative area without causing water to pool or erode behind the slope breaker: steeper grading may be utilized as necessary to promote positive drainage. In the absence of a stable vegetative area, install an energy-dissipating device at the end of the breaker.

- Per the FERC Plan, slope breakers may extend slightly (about 4 feet) beyond the edge of the temporary construction ROW to effectively drain water off the disturbed area. Where permanent breakers extend beyond the edge of the temporary construction ROW, they are subject to compliance with all applicable survey and permit requirements. Analysis has been performed to confirm that the flow leaving the permanent waterbars is sheet flow and therefore can be discharged to a well-vegetated area. Further discussion is located in Appendix X.

- Where drainage is insufficient in upland areas, install a rock-lined drainage swale as approved by the EI. The drainage swale is generally 8 feet wide and a maximum of 18 to 24 inches deep.

The permanent slope breakers will be constructed in accordance with FERC Plan requirements. Installed primarily as an erosion control measure, the slope breakers also provide incremental benefit to stormwater management in the near-term post-construction period (i.e., during the vegetative establishment period) as discussed in Section 5.0 and Appendix X.

3.1.13.2 Soil Stabilization Blankets and Matting

Erosion control fabric or blankets are used during restoration, including as mulch, to slow down stormwater and stabilize soil until vegetation becomes established. Care will be taken to avoid areas of steep slopes as much as practicable; however, areas which could not be avoided will be addressed with slope breakers and RECP. RECPs must be consistent with VESCH **Std. and Spec. 3.36 (Soil Stabilization Blankets and Matting)** and VDOT Road and Bridge Standards for EC-2 Types 1-4 and EC-3 Typles 1-3, as needed (VDOT 2017). RECPs are also suitable as an effective vegetation stabilization technique on waterbody banks, vegetated channels, and the swale side of permanent slope breakers where moving water is likely to wash out new plantings.

- Soil stabilization blankets will be used on slopes of 3:1 or greater and in stormwater conveyance channels. The location of these slopes along the pipeline ROW are indicated with the steep slopes band on the Construction Alignment Sheets.

- As shown on the detail drawings, soil stabilization blankets must be installed vertically downslope on steep slopes and on shallow slopes the mats can be installed across the slope.

- Slope surface must be smooth with minimum rocks, lumps, grass, and sticks such that the blanket can be placed flat on the surface for uniform soil contact. As part of DETI's 2017 Standards and Specifications, VDEQ approved a deviation to the provision within VESCH **Std. and Spec. 3.36 (Soil Stabilization Blankets and Matting)** to remove all "clods and rocks" more than 1" in diameter. Erosion control blankets and matting will be installed according to manufacturers' specifications and in a way that achieves intimate contact with soils/substrate to help reduce the potential for erosion underneath the installed fabric.

- Seed is applied to the graded slope prior to installation of the blanket. Seed should be lightly raked into the soil.

- The blanket will be rolled from the top of the slope or top of the channel downgradient toward the toe of the slope or channel outlet and keyed into a 6 inch deep trench at the top of the slope.

- Upslope ends will be buried in an anchor slot not less than 6-inches deep and tamped to firmly embed the material.

- Adjacent blankets will be overlapped by a minimum of 2 inches and stapled together. The edges of the material will be stapled together every 3 feet.

- The blankets will be anchored with staples or other appropriate devices in accordance with the manufacturers' recommendations.

- On highly erodible soils and on slopes steeper than 4:1, erosion check slots may be made by inserting a fold of a separate piece of material into a 6-inch trench and tamping firmly. Staple the fold to the main blanket at minimum 12-inch intervals across the upgradient and downgradient portion of the blanket. The need for and spacing of check slots will based on manufacturers' recommendations.

- Join a new roll of material by creating an anchor slot as with the upslope ends and overlapping the end of the upgradient roll a minimum of 12 inches and stapling across the end of the previous roll just below the anchor slot.

- The terminal end of the material is folded with 4 inches of material underneath and stapled every 12 inches at minimum.

- Fiber-reinforced matrix products may be used as an alternative to RECPs to facilitate the establishment of vegetation at the discretion of DETI.

3.1.13.3 Soil Compaction

Soil compaction resulting from construction activities may reduce the potential for successful revegetation. Fine-textured soils with poor internal drainage that are moist or saturated during construction are the most susceptible to compaction and rutting. DETI will minimize impacts by implementing the mitigation measures for compaction and rutting as described in the FERC Plan and Procedures. DETI will test for soil compaction using penetrometers or other appropriate devices:

- In residential and agricultural areas (e.g., active croplands, pastures, nurseries, and orchards) disturbed by construction activities;

- In other areas requested by the land managing agency or landowner;

- In undisturbed areas adjacent to the construction workspace with the same soil type under similar moisture conditions to approximate pre-construction conditions; and

- In areas identified by the EIs, who will be responsible for conducting subsoil and topsoil compaction testing and determining the need for corrective measures.

Compaction impacts will be mitigated through the use of tillage equipment during restoration activities such as a paraplow or similar implement. In areas where topsoil segregation occurs, plowing with a paraplow or other deep tillage implement to alleviate subsoil compaction will be conducted before replacement of the topsoil. In rocky or heavily rooted soils, compaction may be impossible to measure and rectify without additional damage. If compaction testing is impeded by rock or roots, DETI may conclude that there is a suitable amount of large material in the soil to rectify potential compaction. Soil compaction will be remediated prior to re-spreading of salvaged topsoil.

Where appropriate, such as in steep slope areas, compaction of the soil may be used intentionally to prevent surface erosion and slope instability in the form of landslides, landslips, or surficial slumping. A detailed evaluation and selection of control measures, including tracking of disturbed slopes to improve compaction, will be implemented in areas of steep terrain in accordance with the BIC Program.

3.1.13.4 Revegetation

A *Restoration and Rehabilitation Plan* was prepared for the ACP and the associated Supply Header Project to address post-construction restoration and rehabilitation activities. Refer to the attached *Restoration and Rehabilitation Plan* (Appendix R) for seedbed preparation, seed mix selection, seeding methods, lime and fertilizer application, mulching, and supplemental planting. The *Restoration and Rehabilitation Plan* is a FERC document which contains the requirements of the Plan and Procedures. If there is a conflict between the *Restoration and Rehabilitation Plan* and Virginia regulatory requirements or, where applicable USFS requirements, then the contractor will adhere to the more stringent or protective of the requirements, unless otherwise agreed to in advance.

In accordance with Virginia Minimum Standards (MS-1), permanent or temporary soil stabilization will be applied to denuded areas within 7 days after final grade is reached on any portion of the site. Temporary soil stabilization will be applied within 7 days to denuded areas that may not be at final grade but will remain dormant for longer than 14 days. Permanent stabilization will be applied to areas that are to be left dormant for more than 1 year. A permanent vegetative cover will be established on denuded areas not otherwise permanently stabilized. Permanent vegetation will not be considered established until a ground cover is achieved that is uniform, is mature enough to survive and will inhibit erosion.

3.1.13.5 Wetland Restoration

DETI will employ clearing, construction, and restoration techniques designed to support regeneration of existing wetland vegetation as described in the *Restoration and Rehabilitation Plan* (Appendix R).

3.1.13.6 Vegetative Streambank Stabilization

Vegetative streambank stabilization will be used to protect streambanks from the erosive forces of flowing waters. Vegetative streambank stabilization will be implemented along banks in creeks, streams, and rivers subject to erosion from excess runoff. This practice is generally applicable where bankfull flow velocity does not exceed 5 feet per second and soils are erosion resistant. Above 5 feet per second, structural measures are generally required. This practice does not apply where tidal conditions exist. In accordance with VESCH **Std. & Spec. 3.22 (Vegetative Streambank Stabilization)**, DETI will adhere to the following design criteria:

- Ensure that channel bottoms are stable before stabilizing channel banks.
- Keep velocities at bankfull flow non-erosive for the site conditions.
- Provide mechanical protection such as rip-rap on the outside of channel bends if bankful stream velocities approach the maximum allowable for site conditions.
- Be sure that requirements of other Commonwealth or federal agencies are met in the design in the case that other approvals or permits are necessary.

DETI will employ clearing, construction, and restoration techniques designed to support regeneration of existing streambank vegetation as described in the *Restoration and Rehabilitation Plan* (Appendix R).

Streambanks are always vulnerable to new damage and repairs are periodically required. Banks should be checked after every high-water event is over. Gaps in the vegetative cover should be fixed at once with new plants, and mulched if necessary. Fresh cuttings from other plants on the bank can be used, or they can be taken from mother-stock plantings if they are available.

3.1.13.7 Structural Streambank Stabilization

Structural streambank stabilization is applicable to streambank sections that are subject to excessive erosion due to increased flows or disturbance during construction. This practice is generally applicable where flow velocities exceed 5 feet per second or where vegetative streambank protection is inappropriate. In accordance with VESCH **Std. & Spec. 3.23 (Structural Streambank Stabilization)**, DETI will adhere to the following general construction and maintenance specifications, where appropriate:

Streambank Protection Measures:

- Riprap – heavy angular stone placed or dumped onto the streambank to provide armor protection against erosion. Installation should be in accordance with **Std. & Spec. 3.19 (Riprap).**

- Gabions – Rectangular, rock-filled wire baskets are pervious, semi-flexible building blocks which can be used to armor the bed and/or banks of channels or to divert flow away from eroding channel sections. At a minimum, they should be constructed of a hexagonal triple twist mesh of heavily galvanized steel wire. The design water velocity for channels utilizing gabions should not exceed that given below in Table 3.1.13-2.

TABLE 3.1.13-2

Recommended Gabion Thickness

Gabion Thickness (feet)	Maximum Velocity (feet per second)
1/2	6
3/4	11
1	14

- Deflectors (groins or jetties) – Structural barriers which project into the stream to divert flow away from eroding streambank sections.

- Reinforced Concrete – may be used to armor eroding sections of the streambank by constructing retaining walls or bulk heads. Positive drainage behind these structures must be provided.

- Log Cribbing – a retaining structure built of logs to protect streambanks from erosion. Log cribbing is normally built on the outside of stream bends to protect the streambank from the impinging flow of the stream.

- Grid Pavers – modular concrete units with interspersed void areas which can be used to armor the streambank while maintaining porosity and allowing the establishment of vegetation. These structures may be obtained in pre-cast blocks or mats, or they may be formed and poured in place.

All structures should be maintained in an "as built" condition. Structural damage caused by storm events should be repaired as soon as possible to prevent further damage to the structure or erosion of the streambank.

3.1.13.8 Off Road Vehicle Control

To control unauthorized vehicle access to the ROW, the following measures can be used:

- Signs;
- Fences with locking gates;
- Slash and timber barriers, pipe barriers, or a line of boulders across the ROW; and
- Conifers or other appropriate trees or shrubs across the ROW.

3.2 ACCESS ROADS CONSTRUCTION

DETI has identified both private and public roads which will be used to provide access to the proposed ACP pipeline ROW and other facilities during construction and operation of the Project. DETI will utilize existing roads to the extent practicable; however, new roads will need to be built in remote areas. In some cases, existing roads will require improvement (such as grading, gravelling, replacing or installing culverts, minor widening, and/or clearing of overhead vegetation) to safely accommodate construction equipment and vehicles. The following conditions apply to the use of access roads:

- Access road upgrades requiring grading of earth, cleaning of roadside channels, widening or similar earth disturbance shall be shown within the Project LOD and have appropriate ESCs installed. Existing access roads requiring only the resurfacing with gravel are not required to be included within the LOD.

- Construction entrances will have stone access entrance and exit drives and parking areas to reduce the tracking of sediment onto public or private roads. In accordance with VESCH **Std. & Spec 3.02 (Stone Construction Entrance)**, a construction entrance will be constructed at any point where construction equipment leaves the ROW and enters a paved public road or other paved surface. Refer to Section 3.1.2 for further information.

- During construction and restoration activities, access to the ROW is limited to the use of new or existing access roads identified on the construction alignment sheets (Appendix A).

- To the extent possible, access through wetlands will be limited to the construction ROW and those existing roads requiring no modification or improvements, other than routine repair, and posing no impact on the wetland.

- The construction ROW may be used for access across wetlands when the wetland soil is firm enough to avoid rutting or the construction ROW has been appropriately stabilized to avoid rutting (e.g., timber matting). However, access is not allowed through wetlands that would not otherwise be impacted by the Project.

- In wetlands that cannot be appropriately stabilized, all construction equipment other than that needed to install the wetland crossing will use access roads located in upland areas. Where access roads in upland areas do not provide reasonable access, limit all other construction equipment to one pass through the wetland using the construction ROW.

- Maintain safe and accessible conditions at all road crossings and access points during construction and restoration. Access road maintenance through the construction sequence may include grading and the addition of gravel or stone when necessary.

- Maintain access roads in a stable manner to prevent off-ROW impacts, including impacts to adjacent and/or nearby sensitive resource areas, and implement all appropriate ESC measures for construction/improvement of access roads.
- Minimize the use of tracked equipment on public roadways and in accordance with requirements of the managing agency.
- Remove any soil or gravel spilled or tracked onto roadways daily or more frequent as necessary to maintain safe road conditions.
- Repair any damages to roadway surfaces, shoulders, and bar ditches.
- If crushed stone/rock access pads are used in residential or agricultural areas, stone will be placed on synthetic, nonwoven geotextile fabric to facilitate removal after construction.
- All access roads across a waterbody must use an equipment bridge.
- For access through a saturated wetland, use timber mats or an equivalent unless otherwise authorized by agency permits.
- Limit construction equipment operating in wetland areas to that needed to clear the ROW, dig the trench, fabricate and install the pipeline, backfill the trench, and restore the construction ROW. All other construction equipment will use access roads located in upland areas to the maximum extent practical.
- Locate new roads on the sides of ridges.
- Locate new roads above flood plains and out of the lowest part of the terrain where surface water drainage can be difficult, such as the center of dry drainages.
- Boundary line restrictions or other physical features, such as rock outcroppings, will have additional measures taken to prevent erosion and/or water quality degradation.
- Locate roads as far as practical from the stream channel and maintain an unbroken organic litter layer on the forest floor.
- Roads will be surfaced with gravel or another suitable material to provide a non-erodible running surface.
- Cut-banks and fill-slopes will be stabilized as soon as feasible to a non-erodible condition using vegetation, rock, geotextile material, or other suitable material.
- Silt fence or rip rap outlet protection will be constructed at outlets of drainage structures.
- Do not side-cast fill material if there is a chance that it will enter a stream, or if side slope exceeds 60 percent. Full bench construction with end hauling material to a suitable location is required when side slopes exceed 60 percent.

- When access roads intersect public highways, the contractor will use a combination of geotextile and gravel (temporary stone construction entrance) to help keep mud off highway entrances. In accordance with Virginia Minimum Standard 17, where sediment is transported onto a paved or public road surface, the road surface will be cleaned thoroughly at the end of each day. Sediment will be removed from the roads by shoveling or sweeping and transported to a sediment control disposal area. Street washing will be allowed only after sediment is removed in this manner.

- Will maintain road so that water can flow freely from the road surface.

Following construction, some roads will be maintained for permanent access to the pipeline ROW and others will be removed and restored to pre-existing conditions, as shown on the Construction Alignment Sheets in Appendix A. Additional ESC measures for Road Stabilization, Rock Check Dams and Temporary Vehicular Stream Crossing are further addressed in DETI's Standards and Specifications located in Appendix B. Temporary access road restoration is further addressed in DETI's Standards and Specifications, located in Appendix B. A *Restoration and Rehabilitation Plan* was prepared for the ACP to address post-construction restoration and rehabilitation activities. Refer to the attached *Restoration and Rehabilitation Plan* (Appendix R) for seedbed preparation, seed mix selection, seeding methods, lime and fertilizer application, mulching, and supplemental planting. The *Restoration and Rehabilitation Plan* is a FERC document which contains the requirements of the Plan and Procedures. If there is a conflict between the *Restoration and Rehabilitation Plan* and Virginia regulatory requirements or, where applicable USFS requirements, then the contractor will adhere to the more stringent or protective of the requirements, unless otherwise agreed to in advance.

3.2.1 Road Width and Stabilization

In accordance with VESCH **Std. & Spec. 3.03 (Road Stabilization)**, temporary access roads should be at least 14 feet wide for one-way traffic and 20 feet wide for two-way traffic. DETI is planning for access roadbeds to be at least 30 feet wide for two-way traffic, where practical. All cuts and fills will be 2:1 or flatter to the extent possible. A 6-inch course of VDOT #1 Course Aggregate will be applied immediately after grading.

3.2.2 Road Grade

In accordance with VESCH **Std. & Spec. 3.03 (Road Stabilization)**, temporary access roads will follow contour as much as possible with grades between 2 to 10 percent. Steep gradients that exceed these grades may be necessary when boundary lines or buffer areas require such a deviation. In these instances of steep terrain, additional BMPs will be necessary to mitigate the disturbance. Road grades will vary frequently to help reduce road surface erosion.

3.2.3 Ditchline Protection

Recommended ditch line protection can be based on the grade as follows:

- Less than 3 percent – grassed;
- 3 to 8 percent – grass with RECPs; and

- Greater than 9 percent – rock check dams, or equivalent, with geotextile filter.

3.2.3.1 Rock Check Dam

Small, temporary stone dams are constructed across a drainage ditch to reduce the velocity of concentrated flows, reducing erosion of the swale or ditch. This practice also traps sediment by temporarily ponding stormwater runoff; however, it is not a substitute for perimeter trapping measures such as a sediment trap or sediment basin. Check dams are limited to small open channels which drain 10 acres or less and should not be used in live streams. No formal design is required, but the following criteria should be used. In accordance with VESCH **Std. & Spec. 3.20 (Rock Check Dam)**, DETI will adhere to the following construction and maintenance specifications:

- Use VDOT #1 coarse aggregate alone when the drainage area of the ditch or swale is less than 2 acres. Use a combination of Class I riprap and VDOT #1 coarse aggregate when the drainage area is between 2 and 10 acres.

- Maximum height of the check dam will be 3 feet.

- The center of the check dam must be at least 6 inches lower than the outer edges to create a weir effect.

- Key the check dam into the soil approximately 6 inches for added stability.

- Filter cloth may be used under the stone to provide a stable foundation and to facility the removal of the stone.

- The maximum spacing between the dams should be such that the toe of the upstream dam is at the same elevation as the top of the downstream dam.

- Sediment should be removed from behind the check dams when it has accumulated half of the original height of the dam. Erosion caused by high flows around the edges of the dam should be corrected immediately.

- Unless incorporated into a permanent SWM control, check dams are to be removed when their useful life has been completed. In temporary ditches and swales, check dams should be removed and the ditches filled in when they are no longer needed. In permanent ditches and swales, check dams should be removed when the grass has matured sufficiently to protect the ditch or swale. The area beneath the check dam should be seeded and mulched immediately after removal.

3.2.3.2 Stormwater Conveyance Channel

A stormwater conveyance channel is a man-made channel, including roadside ditches and natural channels that are modified to accommodate increased flows generated by land development, designed to carry concentrated flows without erosion. This practice is not generally applicable to major, continuous-flowing natural streams.

Per VESCH **Std. & Spec. 3.17 (Stormwater Conveyance Channel)**, DETI will apply the following general specifications to the construction and maintenance of roadside ditches:

- Trees, stumps, roots, and obstruction will be removed and disposed properly.
- The channel will be excavated and graded to the proper grade and cross section.
- Fill will be well compacted.
- Excess soil will be removed and disposed of properly.
- The method used to establish grass in the ditch or channel will depend upon the severity of the conditions encountered. Methods available for grass establishment are set forth in VESCH **Std. & Spec. 3.32 (Permanent Seeding)**.
- During the initial establishment, grass-lined channels should be repaired immediately and grass re-established if necessary. After grass has become established, the channel should be checked periodically to determine if the grass is withstanding flow velocities without damage. If the channel is to be mowed, it should be done in a manner that will not damage the grass.
- For riprap-lined channels: riprap will be installed in accordance with VESCH **Std. & Spec. 3.19 (Riprap).** Riprap-lined channels should be inspected periodically to ensure that scour is not occurring beneath the fabric underlining of the riprap layer. The channel should also be checked to determine that the stones are not dislodged by large flows.

3.2.4 Stream Crossing

Per VESCH **Std. & Spec. 3.24 (Temporary Vehicular Stream Crossing)**, DETI will apply the following general specifications to the construction and maintenance of temporary vehicular stream crossings:

- The temporary waterway crossing will be at right angles to the stream. Where approach conditions dictate, the crossing may vary 15 degrees from a line drawn perpendicular to the center line of the stream at the intended crossing location.
- Equipment bridges may be installed and used where needed to allow equipment access across waterbodies. Equipment bridges will be able to withstand the anticipated loading of the construction traffic, have one traffic lane, and have the minimum width of 12 feet with a maximum width of 20 feet.
- Minimum Standard 1 states that permanent or temporary soil stabilization shall be applied to denuded areas within 7 days after final grade is reached on any portion of the site. The areas disturbed during installation will be stabilized within 7 days of that disturbance in accordance with Virginia Minimum Standard 1.

- Intermittent and perennial streams will be crossed using properly designed and constructed structures installed at right angles to the access road.

- Structures will not impede fish passage or stream flow.

- Approaches to stream crossings will be stabilized with gravel, mulch or other suitable material for a minimum distance of 50 feet on each side of the crossing, or to the top of the grade that is contributing sediment to the stream crossing.

- Until the equipment bridge is installed, only clearing equipment and equipment necessary for installation of equipment bridges may cross the waterbody, and the number of crossings will be limited to one crossing per piece of equipment, unless otherwise authorized by the appropriate permitting agency. EI approval is required prior to equipment crossing a waterbody without an equipment bridge.

- Construct and maintain equipment bridges that allow unrestricted flow and prevent sediment from entering the waterbody.

- Do not use soil to construct or stabilize equipment bridges.

- Design and maintain equipment bridges to prevent sediment from entering the waterbody.

- Remove temporary equipment bridges as soon as practicable after seeding.

- If there will be more than 1 month between final cleanup and the beginning of permanent seeding and reasonable alternative access to the ROW is available, remove temporary equipment bridges as soon as practicable after final cleanup.

3.2.5 Sediment Control

During construction of access roads, sediment control will consist of installing appropriate sediment control devices such as silt fencing, ditches, or culverts, as shown on the construction alignment sheets (Appendix A). Sediment Barriers will be provided on the downgradient side of the access roads where there is a waterbody within 200 feet of the LOD.

3.3 PIPE STORAGE AND CONTRACTOR YARDS

Yard preparation will be limited to a small amount of clearing, grading, leveling, and filling in upland areas. The contractor will perform the following measures in the pipe storage and contractor yards.

- Strip and segregate topsoil in agricultural lands.

- Install ESC structures as directed by the EI or identified on the construction alignment sheets, and as outlined in this ESC Plan and the SPCC Plan. Maintain controls throughout construction and restoration activities.

- ESC measures used in pipe storage and contractor yards will primarily consist of silt fencing and construction entrance stabilization. See Section 3.1 for a description of these control measures.

- Implement and comply with the SPCC Plan, including the completion of any required site-specific forms and attachments.

- Restore and revegetate all disturbed areas in accordance with the measures outlined in this ESC Plan, landowner agreements, and/or as directed by the EI. At a minimum, the area must be returned to pre-construction contours and stabilized prior to contractor demobilization.

3.4 ABOVEGROUND FACILITY CONSTRUCTION

There is one compressor station located within Buckingham County, Virginia (Compressor Station 2Buckingham Compressor Station), and there are 4 aboveground M&R stations within Virginia.

3.4.1 Compressor Station 2 (Buckingham Compressor Station) and Woods Corner M&R Station

An individual ESC and SWM Plan has been prepared for these aboveground facilities (Appendix E).

3.4.2 Elizabeth River M&R Station

An individual ESC and SWM Plan has been prepared for this aboveground facility (Appendix F).

3.4.3 Brunswick M&R Station

An individual ESC and SWM Plan has been prepared for this aboveground facility (Appendix G).

3.4.4 Greensville M&R Station

An individual ESC and SWM Plan has been prepared for this aboveground facility (Appendix H).

3.5 SPECIAL CONSTRUCTION PROCEDURES

Sensitive areas (e.g., wetland/waterbody crossings or residential developments) or areas requiring specialized construction measures (e.g., boring or directional drilling) will be treated as separate construction entities. Sensitive areas require additional ESC procedures. Specialized construction often combines several construction stages into one and reduces earth disturbance, reducing the amount of ESC measures. Sensitive areas may have incremental controls added, as needed, and are identified on the construction alignment sheets (Appendix A).

3.5.1 Horizontal Directional Drilling

The HDD method is a process that allows for trenchless construction by drilling a hole beneath a surface feature, such as a waterbody or other unique resource, and installing a prefabricated segment of pipeline through the hole. The method avoids disturbance to the surface of the ROW between the entry and exit points of the drill. The method is sometimes used to install pipelines underneath sensitive resources or areas that present difficulties associated with construction or access using typical installation methods. HDDs can provide certain advantages over typical construction methods, such as avoidance of surface disturbance, riparian tree clearing, or in-stream construction.

For each HDD crossing, electric grid guide wires will be laid by hand on the ground along the pipeline centerline to create an electromagnetic sensor grid. The grid will be used by the HDD operator to steer the drill head during drilling. No ground or surface disturbing activities will be required for installation of the guide wires. In thickly vegetated areas, however, a small pathway measuring approximately 2 to 3 feet in width may need to be cut with hand tools to create a path for the wires.

To complete each HDD, a drill rig will be placed on the entry side of the crossing and a small-diameter pilot hole will be drilled along a predetermined path beneath the waterbody using a powered drill bit. As drilling progresses, additional segments of drill pipe will be inserted into the pilot hole to extend the length of the drill. The drill bit will be steered and monitored throughout the process to maintain the designated path of the pilot hole. Once the pilot hole is complete, the electric sensor grid will be removed and the hole will be enlarged to accept the pipeline.

To enlarge the pilot hole, a larger reaming tool will be attached to the end of the drill on the exit side of the hole. The reamer will be drawn back through the pilot hole to the drill rig on the entry side of the hole. Drill pipe sections will be added to the rear of the reamer as it progresses toward the rig, allowing a string of drill pipe to remain in the hole at all times. Several passes with progressively larger reaming tools will be required to enlarge the hole to a sufficient diameter to accommodate the pipeline. The final hole will be approximately 12 inches larger than the pipeline to be installed.

Throughout the drilling process, a fluid mixture consisting of water and bentonite clay (a naturally occurring mineral) will be pumped into the drill hole to lubricate the bit, transport cuttings to the surface, and maintain the integrity of the hole. Water for the mixture will be pumped from the waterbody to the drill site through a hose or temporary network of irrigation-type piping or trucked in from another source. The pump intake will be appropriately screened to prevent entrainment of aquatic species. Small pits will be dug at or near the entry and exit points for the HDD to temporarily store the drilling fluid and cuttings. The fluid and cuttings will be pumped from the pits to an on-site recycling unit where the fluid will be processed for reuse.

The pipeline segment (also called a pull section) to be installed beneath the surface feature will be fabricated on the ROW or in the ATWS on the exit side of the crossing while the drill hole is reamed to size. The pull section will be inspected and hydrostatically tested prior to installation.

As the pipeline is being installed, excess drilling fluid will be collected and incorporated into the soil in an upland area or disposed of at an appropriate facility. If water is left over from the drilling process, it will be discharged into a well-vegetated upland area or an energy dissipation/sediment filtration device, such as a geotextile filter bag, in a manner that does not affect flowing streams or off-site property.

If an HDD crossing is successful, there are little to no impacts on the surface feature being crossed. If a natural fracture or weak area in the ground is encountered during drilling, however, an inadvertent return of drilling fluid to the environment could occur. Substrate consisting of unconsolidated gravel, coarse sand, or fractured bedrock could present circumstances that increase the likelihood of an inadvertent return. Depending on the orientation of the natural fracture or substrate, the drilling fluid may move laterally or vertically from the drill hole. If the drilling fluid moves laterally, the release may not be evident on the ground. For an inadvertent return to be evident on the surface, there must be a preferential pathway extending vertically from the drill hole to the surface of the ground. The volume of fluid released in an inadvertent return is dependent on a number of factors, including the size of the pathway, the permeability of the geologic material, the viscosity of the fluid, and the pressure of the hydraulic drilling system.

DETI's *Horizontal Directional Drill Fluid Monitoring, Operations, and Contingency Plan* (HDD Plan, Appendix T), identifies typical contingency measures to be implemented in the event of a drill failure, such as drilling along a new path, abandoning and sealing the drill hole, and implementing an alternate crossing method, and describes the procedures to be followed in the event of an inadvertent return of drilling fluid. If a release occurs on land, including within a wetland, a small pit will be excavated at the release site to contain the spread of the fluid, and a pump will be used to transfer the fluid from the pit into a containment vessel. If an inadvertent return occurs in a waterbody, it will be more difficult to contain because the fluid will be dispersed into the water and carried downstream. In this situation, an attempt will be made to plug the flow path by adding thickening agents to the drilling fluid, such as additional bentonite, cottonseed hulls, or other non-hazardous materials. DETI will consult with and obtain permission from the appropriate Commonwealth regulatory agencies regarding the use of additives during the HDD (or conventional bore) process, and confirm that additives will not violate water quality standards.

The HDD method will not be used in areas with the potential to contain karst features due to the potential for drilling fluid to enter aquifers through pre-existing voids or conduits in limestone or dolomite bedrock. This will avoid the potential for drilling fluid to reach groundwater and wells in karst areas. In other areas, DETI will monitor source waters along and near the drill path, such as seeps and springs, for inadvertent returns. DETI will implement the measures identified in the HDD Plan to control and clean-up the inadvertent return, test the water for water quality, and provide an alternate supply of water to affected landowners until the inadvertent return is remediated. Additionally, DETI will conduct pre- and post-construction testing of wells and springs within 150 feet of construction areas (and within 500 feet of the proposed centerline in locations with karst terrain) for water quality and yield.

3.5.2 Agricultural Areas

Special construction procedures and best practices for activities within actively cultivated or rotated land used for the production of crops including but not limited to corn, grains, orchards, vineyards, and hayfields may be needed in agricultural areas. These activities will be implemented according to the FERC Plan.

In actively cultivated and rotated croplands, pastures, orchards, nurseries, and residential areas, topsoil will be removed and segregated in accordance with the FERC Plan. DETI will maintain water flow in crop irrigation systems unless shutoff is coordinated with affected parties. Typically, topsoil will be removed over the entire width of the construction ROW (with the exception of areas beneath topsoil stockpiles). Following pipeline installation, the subsoil will be returned to the ditch and the topsoil replaced in the area from which it was removed. As necessary, the working side of the ROW will be de-compacted prior to final grading and restoration.

Where livestock fences (including electric fences) need to be cut to access the construction ROW, DETI will brace and secure the fencing prior to construction and repair the fences to pre-construction condition or better during the restoration phase of the Project. Further, DETI will work with landowners to remove livestock to alternate fields during construction or maintain adequate temporary fencing in grazing areas. If cattle or other livestock are present during construction, DETI will install temporary fencing around the ROW in areas where the pipe trench is left open overnight. Additionally, DETI will confer with landowners regarding a potential grazing deferment to allow vegetation to establish within the ROW after construction of the Project is complete.

DETI will work with landowners to identify drain tile systems in advance of construction, and mark the locations of any tile broken during pipeline trenching operations. DETI will contact landowners and local soil conservation authorities to determine the locations of future drain tiles that are likely to be installed within 3 years of the ACP construction. DETI will implement temporary tile line repairs to maintain the functionality of tile drainage systems during construction. Prior to backfilling the trench, DETI will employ a qualified tile contractor for permanent tile repairs. DETI will probe all drainage tile systems within the area of disturbance to check for damage, and will repair damaged drain tiles to their original or better condition. DETI will not use filter-covered drain tiles unless the local soil conservation authorities and the landowner agree. Following completion of construction and restoration, DETI will work with landowners to repair or correct tile drainage problems due to construction of the Project.

In agricultural lands, the pipelines will be buried at depths sufficient to provide a minimum of 4 feet of cover to avoid potential impacts associated with typical agricultural activities, such as plowing. In consultation with landowners, the pipeline may be buried deeper in certain locations to facilitate the passage of heavy equipment, such as logging equipment.

3.5.3 Road Crossings

Construction across paved roads, highways, and railroads will be conducted in accordance with the FERC Plan and requirements identified in road and railroad crossing permits or approvals. Most paved roads, highways, and railroads will be crossed by conventional

subsurface boring beneath the roadbed or railroad, which will avoid surface disturbance of the roads and railroads. Boring activities will consist of the following: excavating a pit on each side of the road or railroad; placing boring equipment within the pits; boring a hole under the roadbed or railroad that is greater than or equal to the diameter of the pipe; and pulling a section of pipe through the hole. For long crossings, sections of pipe may be welded into a pipe string before being pulled through the borehole.

Typically, there is little or no disruption to traffic at road, highway, or railroad crossings during boring operations; however, brief traffic delays could occur when equipment required to complete a bore is brought onto or off of the construction rights-of-way. In these instances, DETI will use flaggers and signage to safely slow or direct traffic as appropriate.

Unpaved roads, two-tracks, trails, and driveways, as well as roads in areas with a high water table, will be crossed using the open-cut method and then restored to pre-construction condition. This method will require temporary closure of the road to traffic and establishment of detours. If no reasonable detour is feasible, at least one lane of the road being crossed will be kept open to traffic except during brief periods when it is essential to close the road to install the pipeline. Most open-cut road crossings will be completed and the road restored in a few days using the same type of sub-bed and surface material as the original construction. DETI will take measures such as posting signs at open-cut road crossings for safety and to minimize traffic disruptions.

If road closures are necessary, a road closure schedule will be arranged with the appropriate transportation authority, if applicable, prior to the closure. Landowners, land managing agencies, and local businesses that could be affected by the closure, as well as law enforcement agencies, will be notified in advance of the closure.

Where construction crosses roads necessary for access to private residences or businesses and no alternative entrance exists, DETI will implement measures (e.g., plating over the open portion of the trench or a temporary bridge) to maintain passage for landowners and emergency vehicles. DETI will place and maintain traffic control measures during construction, and use flaggers, warning signs, lights, and barriers, as appropriate, for safety and to minimize traffic congestion.

Once construction is complete, DETI's construction contractors will repair road damage that occurs as a result of construction, and roadways will be restored to their pre-construction condition. The road crossing methods are show in Appendix U.

3.5.4 Residential Areas

In residential areas, construction activities will be completed as expediently as practicable to minimize disturbance to residents. While constructing in these areas, DETI will maintain access to the residences for the duration of construction activities. Where the pipeline will cross roads necessary for access to residential properties and no alternative entrances exist, DETI will implement measures, such as plating over the open portion of the trench, to maintain passage for landowners and emergency vehicles.

In general, DETI will reduce the width of the construction ROW or adjust the pipeline centerline to avoid occupied structures. For any residences within 50 feet of a construction work area, DETI will implement the following mitigation measures during construction:

- Orange safety fence will be installed at a minimum of 15 feet from the residence and 100 feet along the construction corridor, each direction from the residence.
- Avoid the removal of mature trees and landscaping within the construction work area unless necessary for safe operation of equipment, or as specified in the landowner agreements.
- Restore all lawn areas and landscaping immediately following cleanup operations or as specified in landowner agreement.
- During landowner negotiations, identify location of septic system and avoid or develop a replacement plan with landowner during construction.
- For this project, the following notes will also be applied:
    a. Where the pipeline centerline is within 25 feet of a residence, the trench will not be excavated until the pipe is ready for installation.
    b. Landowner will be notified 1 week prior to construction on his/her property.
    c. No refueling or storage of hazardous materials will occur within 200 feet of a private well.
    d. Steel plating or other effective means will be provided to allow landowner access to his/her residence should construction or other ground disturbances occur at egress points, landowner driveways, or other private access ways.
    e. On public roads, DETI will follow the traffic management plans that are filed as part of the road-use permit.
    f. Construction will be limited to daylight hours.
    g. DETI will:
        i. Ensure piping is welded and installed as quickly as possible to minimize the amount of time a neighborhood is affected by construction;
        ii. Complete final cleanup, grading, and installation of permanent erosion control devices within 10 days after backfilling the trench, weather permitting. If seasonal or other weather conditions prevent compliance with this time frame, maintain temporary erosion controls (sediment barriers and mulch) until conditions allow completion of restoration; and

iii. During landowner negotiations, will work with landowner on restoration procedure. These procedures will include seeding mix, tree/shrub planting and hardscape replacement.

DETI has prepared site-specific construction plans for residences located within 50 feet of the construction work areas for the Project. The plans identify the mitigation measures DETI will implement at each residence to control erosion and sedimentation and to promote safe and efficient pipeline installation with minimal impact on residents (Appendix V).

3.5.5 Winter Construction

DETI has developed and filed a project-specific winter construction plan with the FERC application. The plan addresses:

- Winter construction procedures (e.g., snow handling and removal, access road construction and maintenance, soil handling under saturated or frozen conditions, topsoil stripping);
- Stabilization and monitoring procedures if ground conditions will delay restoration until the following spring (e.g., mulching and erosion controls, inspection and reporting, stormwater control during spring thaw conditions); and
- Final restoration procedures (e.g., subsidence and compaction repair, topsoil replacement, seeding).

3.5.6 Steep Terrain and Best-in-Class Program

DETI recognizes the increased risk of instability associated with pipeline construction particularly while traversing steep slopes. As a baseline, DETI developed a program for use on projects within steep terrain. The program outlines the following engineering design methods which will apply to slip prevention and correction during construction:

- Drainage improvement that may include providing subsurface drainage at seep locations through granular fill and outlet pipes, incorporating drainage into trench breakers using granular fill, and/or intercepting groundwater seeps and diverting them from the ROW;
- Buttressing slopes with Sakrete trench breakers;
- Changing slope geometry;
- Benching and re-grading with controlled backfill;
- Using alternative backfill;
- Chemical stabilization of backfill;
- Geogrid reinforced slope that consists of benching existing slope, installing subsurface drains, and incorporating Geogrid reinforcement into compacted backfill; and/or

- Retaining structures.

Selection of the most appropriate engineered prevention measure or combination is dependent on the individual site conditions and constraints.

For the ACP Project, DETI is also committed to identifying mitigation measures beyond standard practices through a BIC Program. The focus of the BIC Program is to proactively address steep slopes (defined as slopes with an inclination greater than 30 percent and greater than 100 feet in length) and landslide hazards related to pipeline construction, compressor station, and metering and regulation facilities that could potentially impact environmental resources, in particular streams, wetlands, and waterbodies. The BIC program is intended to incorporate the permit requirements from West Virginia, Virginia, and North Carolina, and then exceed these regulatory standards in order to mitigate for potential erosion and sediment discharges related to steep slope and landslide hazards.

The ultimate goal of the BIC Program is to develop project-specific engineering mitigation recommendations and thereby support preparation of steep slope control measures and site-specific ESC Plans (Appendix W) for the ACP Project. The BIC Program has achieved this by assembling a team of internal Dominion stakeholders, along with supporting external subject matter experts, to develop project- specific mitigation recommendations, by using a process-based approach that includes hazard identification and assessment (i.e., find and then understand the hazard), engineering mitigation design (i.e., targeted design measures that mitigate the hazard), monitoring (i.e., track performance to understand if additional mitigation is needed), and operational measures (i.e., monitor and maintain and operate the system, as needed).

The BIC Program Team convened in a series of design workshops to examine the identified hazards and supporting information along the pipeline alignment. The hazards were initially identified by studies such as the Geohazards Assessment or the karst study, and/or from other targeted studies such as the Order 1 Soil Survey. These studies identify and assess or support the review of the hazard, provide a basis to select the appropriate BIC mitigation response to minimize or eliminate the hazard, and then monitor the hazard through ongoing operations.

The conceptual work-flow process of the BIC Program is organized around four general steps, briefly described as follows:

- Hazard Identification – Geologic hazards are systematically identified during the Geohazards Analysis Program through desktop analysis and field reconnaissance as well as by supporting evaluations (e.g., karst studies and soil surveys). Refer to Figure 3.5.6-1 for the conceptual work-flow process diagram describing the general approach.

- Hazard Characterization, Assessment, and Threat Classification – As part of the Geohazards Analysis Program, the nature of the geohazards and their potential impacts on the pipeline and environmental resources are assessed. A semi-quantitative ranking of hazard threat level to the proposed pipeline from various geohazards is used to identify areas for further investigation to determine where appropriate mitigation and monitoring measures may need to be designed and

implemented during construction. Refer to Figure 3.5.6-1 for the conceptual work-flow process diagram describing the general approach.

- Hazard Mitigation – Areas for mitigation are selected based upon potential risk to the pipeline, environment, and operation and maintenance. Overall hazard reduction techniques may include BIC construction practices and/or BMPs.

- Site and hazard specific plans are being developed based on the recommendations of the Geohazards Analysis Program and mitigation techniques selected by a BIC team of experts. The site and hazard specific plans address the specific geologic hazard (e.g., slip, stream scour, ground displacement) with mitigation measures, as applicable, for construction and/or operation of the Project. DETI has incorporated these mitigation ESC Plans in Appendix W of this SWPPP. Site-specific design (SSD) drawings will be submitted at a later date once finalized. Refer to Figure 3.5.6-2 for the conceptual work-flow process diagram.

- Hazard Monitoring – DETI will monitor mitigation techniques to assess their effectiveness and the need for further mitigation, if appropriate. Refer to Figure 3.5.6-3 for a conceptual work flow process diagram.

Figure 3.5.6-1 Hazard Identification and Assessment

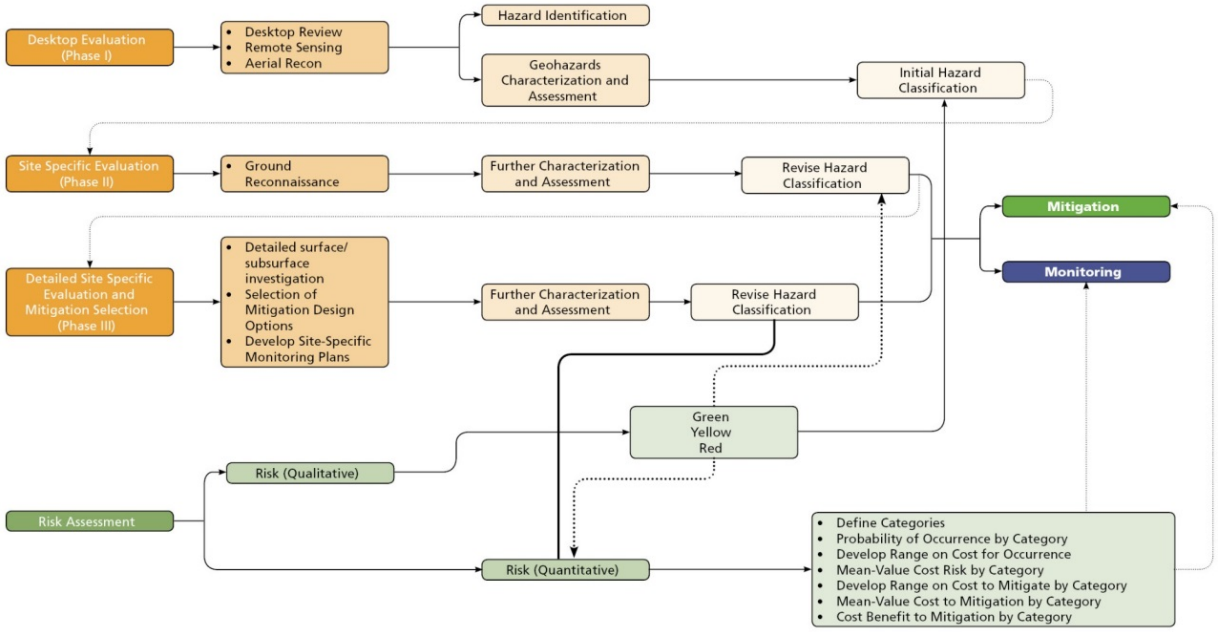


Figure 3.5.6-2 Hazard Mitigation

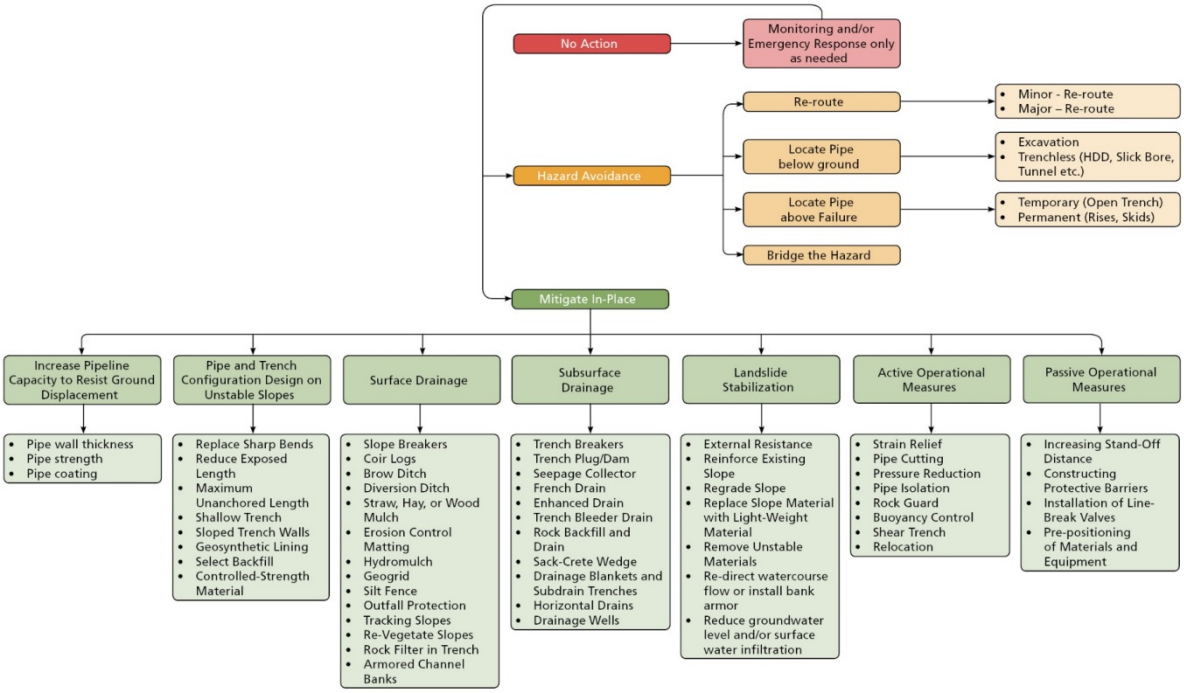
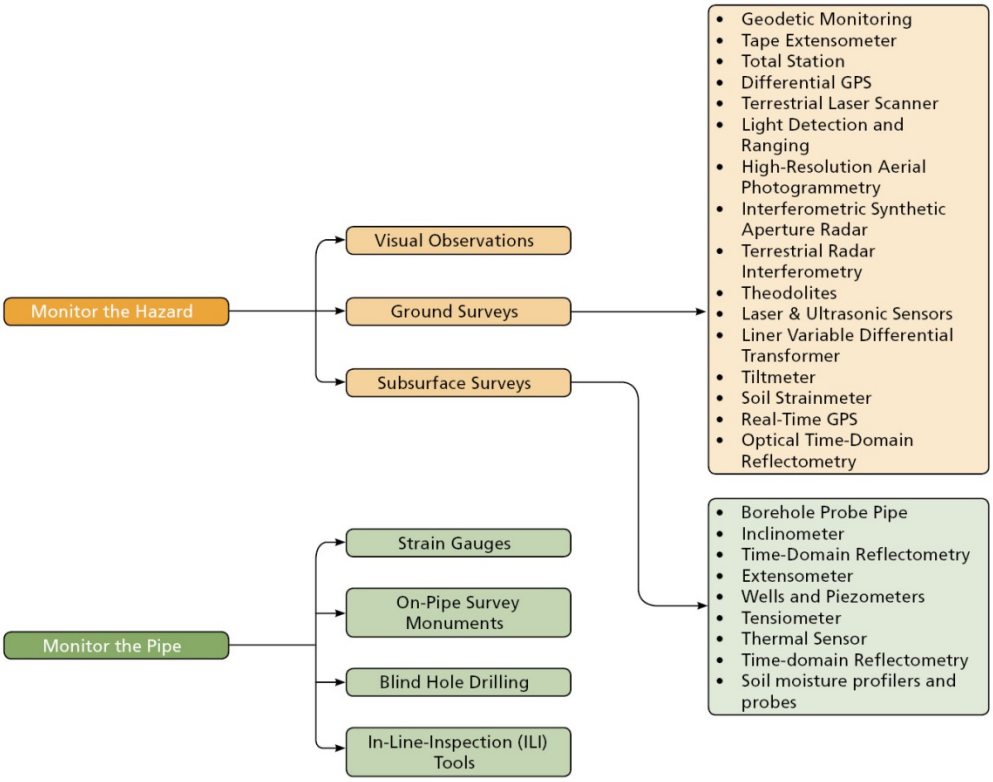


Figure 3.5.6-3 Hazard Monitoring



As one of the initial steps in the BIC Program, DETI implemented a comprehensive Geohazards Analysis Program to assess potential geohazards, including slope failures, along the proposed pipeline route. The study for slope failures included:

- A desktop analysis to prepare an inventory of and categorize potential slope hazards along the proposed routes;
- A field program to verify the locations and limits of slope hazards along the routes;
- A risk analysis of slope hazards along the routes; and
- Recommendations for landslide and landslip mitigation, if and where warranted.

DETI has completed the desktop portion of the Geohazards Analysis Program and the field reconnaissance portion and filed a report on the results of the Program to FERC. The final report provided recommendations on geological hazards and potential risks to be mitigated during construction and operation of the proposed ACP facilities. Through desktop study and field verification, the Geohazards Analysis Program identified six recurring typical steep slope hazard scenarios that collectively encompass the majority of the steep slopes identified along the ACP alignment. Some sites may have the characteristics of more than one typical scenario type,

particularly those that contain sensitive resources at the slope's toe or where previously modified by cutting and filling.

The six typical scenarios are identified by letters A through F, and each are generally described as follows:

Primary Scenarios

A. Steep slopes without evidence of previous movement;

B. Steep slopes with evidence of active movement;

C. Steep slopes with increased potential to become unstable after construction disturbance;

D. Steep slopes near narrow ridge tops;

Secondary Scenarios

E. Steep slopes with a sensitive resource at toe (e.g., streams, wetlands, roads); and

F. Steep slopes previously modified by cutting and filling.

Project-specific steep slope geohazard mitigation Typical Designs (TDs) for each of the six typical scenarios were developed as part of the BIC Program. Additionally SSDs are being developed for those locations with unique geohazard concerns and/or a greater potential for instability. Site-specific design (SSD) drawings will be submitted at a later date once finalized. The TD package is provided in Appendix W. The locations where the BIC Program will be implemented are identified on the construction alignment sheets in Appendix A and Appendix W.

Implementation of the BIC Steep Slope Hazard Mitigation Program in the field during construction will follow a detailed decision tree/work flow process provided in Appendix W. In summary, the TD packages are intended to provide a comprehensive and programmatic approach to address the hundreds of BIC locations along the pipeline alignment. TD packages include Incremental Control (IC) measures (i.e., Typical Details) that provide targeted mitigation for steep slope related hazards that are above and beyond the standard ESCs necessary to meet regulatory requirements. The TDs list BIC ICs that are available for use at a site. The host of ICs for each typical scenario provides options to the field team to respond to site-specific field conditions. These ICs will be selected using the decision tree/work flow process provided in Appendix W and will be implemented in addition to the standard ESC measures which are shown on the alignment sheets. Detailed drawings of the ICs are also provided in Appendix W.

SSD packages are site-specific steep slope mitigation plans that address specialized steep slope or related hazards and conditions at targeted sites, and require geotechnical, hydro-technical engineering, or geologic technical support to develop the design package. SSD packages typically include detailed engineering drawing sets, showing plan and profile and section views of the intended design, supported by details and specifications, and may require

specialized work plans. Incremental controls proposed for SSDs are the same as used for the TDs. There are currently 15 locations along the ACP pipeline (9 are located within Virginia), identified through the Geohazards Analysis Program, that were addressed with a SSD. Site-specific design (SSD) drawings will be submitted at a later date once finalized.

DETI will provide specific employee training that has been developed from the steep slope program. DETI personnel with responsibility for pipeline routing, construction, or operation must be trained in this procedure on an annual basis. The training may be completed by an online learning management system (LMS) module or may be conducted by Energy Infrastructure Environmental Services (EIES) personnel or DETI Engineering Management. At a minimum, the following personnel will be trained:

- Engineering Directors and Managers;
- Design and construction engineers;
- Operations Directors, Managers and Supervisors;
- Construction supervisors; and
- Construction and operations Environmental Construction Coordinators (ECC).

The training must include the following:

- Types and causes of slope failures;
- Routing avoidance and desktop methods;
- Field reconnaissance;
- Risk prioritization;
- Pipeline design and engineering to prevent slope failures;
- Addressing slope failures during construction;
- Addressing slope failures post-construction; and
- Reporting requirements.

3.5.7 Narrow Ridgetops

A narrow ridge is defined for ACP as any area where the ridge is narrower than that of the LOD. When these types of terrain are encountered, the ridge will be minimally graded to the least extent possible, but as necessary by equipment to create a relatively level workspace to accommodate safety concerns as well as construction crews/equipment that will install the pipeline. The material that is temporarily removed from the crest of the ridge is typically placed along the edge of the LOD on the travel side (sometimes ditch side) of the ROW to build up the lower topography areas to assist in creating the level working area and help reduce the amount of material that has to be removed. This cut and fill balance is then utilized as a travel lane for the construction equipment during pipeline installation. When conditions allow, pipe handling and welding operations will be performed within the ditch to accommodate for the reduction in useable workspace. Once the pipe has been installed and backfilled, previously graded material from the crest of the ridge is then returned to pre-existing contours to the best extent practicable to re-establish the natural drainage divide. Any natural swales and drainages along the slope are then re-established and permanent waterbar structures are installed to help reduce the potential for erosion until permanent vegetation is established.

3.5.8 Seeps

In the event that subsurface flow is encountered, a subsurface drain may be utilized to divert water outside of the LOD. If encountered, seeps can be mitigated by using seep collectors placed down-slope of areas showing seepage. Armored fill placed at the toe of the slope may be used in areas of steep slopes in addition to a perforated drain pipe to divert subsurface water away from the cut slope. The use of subsurface drains in steep slope areas is addressed by the BIC Program and the project-specific control recommendations provided in Appendix W.

3.5.9 Karst Geological Formations

This section discusses the BMPs to be utilized for mitigating, remediating, and minimizing impacts to karst features that may be encountered during construction activities. Included are features that are either within or receive drainage from the pipeline ROW, or that are intercepted during the excavation and trenching process. The format and manner in which the mitigation and remedial activities will be undertaken and reported are addressed in a *Karst Terrain Assessment, Construction, Monitoring and Mitigation Plan* (Appendix N). In accordance with this plan, buffer zones and incremental ESC controls will be implemented as shown on the construction alignment sheets (Appendix A).

3.5.10 Agricultural Cost Share Program

If Agricultural Cost Share Program BMPs are intersected by the ACP pipeline, the area will be restored to pre-existing conditions in accordance with landowner requirements. In the rare event that a riparian forest buffer is crossed, the area will not be restored to pre-existing land cover since the permanent ROW must be restored to open herbaceous cover for proper operation and maintenance of the pipeline. Additional details on the permanent ROW restoration procedures are located within Appendix R.

3.5.11 Waterbody Crossings

Pipeline construction across waterbody channels may result in short-term water quality impacts. At least one EI having knowledge of the wetland and waterbody conditions in the Project area is required for each construction spread. Additional ESC information is located in DETI's Standards and Specifications (Appendix B).

DETI has completed the following notification and permit applications:

- Applied to the U.S. Army Corps of Engineers (USACE), or its delegated agency, for the appropriate jurisdictional wetland and waterbody crossing permits.

- Provide written notification to authorities responsible for potable surface water supply intakes located within 3 miles downstream of the crossing at least 1 week before beginning work in the waterbody, or as otherwise specified by that authority.

- Applied for Commonwealth-issued waterbody crossing permits and obtained individual or generic Section 401 water quality certifications or waiver.

Additionally, the following general procedures are to be followed to minimize or avoid impacts at waterbody crossings:

- Notify appropriate federal and Commonwealth authorities, including the USFS, at least 48 hours before beginning trenching or blasting within the waterbody, or as specified in applicable permits. Crossings of waterbodies may proceed using standard upland construction techniques when they are dry or frozen and not flowing provided that the EI verifies that water is unlikely to flow between initial disturbance and final stabilization of the feature.

- Construct crossings as close to perpendicular to the axis of the waterbody channel as engineering and routing conditions permit.

- Perform mobilization of construction equipment, trench excavation, and backfilling in a manner that will minimize the potential for erosion and sedimentation within the waterbody channel.

- Locate extra work areas (such as staging areas and additional spoil storage areas) at least 50 feet away from the water's edge, except where the adjacent upland consists of cultivated or rotated cropland or other disturbed land, or as determined by coordinating agencies.

- Implement erosion control measures to confine water quality impacts within the immediate construction area and to minimize impacts to downstream areas.

- Place spoil from the waterbody within the construction ROW at least 10 feet from the water's edge or in the extra work areas shown on the construction alignment sheets.

- Maintain adequate flow rates to protect aquatic life and prevent the interruption of existing downstream uses.

- Implement temporary diversion dikes parallel to the ROW on upslope side in side-slope areas.

- Where the pipeline parallels a waterbody, maintain at least 15 feet of undisturbed vegetation between the waterbody (and any adjacent wetland) and the construction ROW, except where maintaining this offset will result in greater environmental impact.

- According to **VESCH Std. & Spec. 3.24 (Temporary Vehicular Stream Crossing)**, temporary culvert crossings will use VDOT #1 coarse aggregate or larger to form the crossing with a depth equal to one-half the diameter of the culvert or 12 inches, whichever is greater. If the structure will remain in place for longer than 14 days the culvert will be large enough to convey the flow from a 1-year frequency storm. If the application of the 1-year frequency storm culvert results in a culvert that is larger than the cross-section of the waterbody, the

selected culvert size will be based on that which can be accommodated without modification of the stream geometry.

3.5.11.1 Time Windows for In-stream Work

Unless expressly permitted or further restricted by the appropriate federal or Commonwealth agency in writing on a site-specific basis, in-stream work must not occur during the following time windows, per Virginia Department of Game and Inland Fisheries (VDGIF):

- Coldwater fisheries: June 1 through September 30;
- Coolwater Fisheries: March 1 through June 30;
- Warmwater Fisheries: April 15 through July 15;
- In-stream Long Term Brooder Mussels: April 15- June 15 and August 15-September 30
- Instream Short Term Brooder Mussels: May 15-July 31
- Natural Trout Streams:
    - Brown and Brook Trout: October 1 to March 31;
    - Rainbow Trout: March 15 to May 15; and
    - Roanoke Logperch: March 15 to June 30.

Installation or removal of equipment bridges above the top of bank is not subject to the aforementioned time windows.

3.5.11.2 Types of Waterbody Crossing Methods

Waterbody crossing techniques allowed for use on the project have been determined by agency consultations and permits. Construction at waterbodies will generally be conducted using a "dry" crossing method. The "dry" or "dry-ditch" crossing procedure is further divided into a flume crossing method and a dam-and-pump crossing methods. These methods are designed to maintain downstream flow at all times and to isolate the construction zone from the stream flow by channeling the water flow through a flume pipe or by damming the flow and pumping the water around the construction area. The overall objective is to minimize siltation of the waterbody and to facilitate trench excavation of saturated spoil. Waterbody crossing methods are identified in Appendix P. Site-specific construction plans for major waterbodies are located in Appendix Q.

Unless approved otherwise by the appropriate federal or Commonwealth agency, pipeline construction and installation must occur using one of the two "dry" crossing methods for waterbodies up to 30 feet wide (at the water's edge at the time of construction) that are Commonwealth-designated as either coldwater or significant coolwater or warmwater fisheries, or federally designated as critical habitat. The flume and dam-and-pump crossing methods are applicable to waterbodies up to 10 feet wide (possibly wider depending on flow volume and rate)

at the water's edge at the time of construction. Care must be taken to inspect any stream crossing area at the end of each day to make sure the construction materials are positioned securely.

Open-Cut

The open-cut or wet trench crossing method will involve trenching through the waterbody while water continues to flow through the trenching area. Prior to initiating construction across the waterbody, the crossing section of pipeline will be fabricated (i.e., bent, welded, and coated) in adjacent ATWS areas. Backhoe-type excavators will then be used to excavate a trench in the flowing waterbody from one or both banks of the waterbody. Where the waterbody is too wide to excavate the trench from the banks, equipment may operate from within the waterbody with approval from the appropriate regulatory agencies. Equipment operating within the waterbody will be limited to that needed to construct the crossing. During these operations, flow will be maintained at the crossing as specified in the FERC Procedures. Turbidity curtains will be installed downstream of the crossing as necessary to minimize suspended solids in the water.

According to **VESCH Std. & Spec. 3.27 (Turbidity Curtain)**, DETI will adhere to the following criteria. Refer to the VESCH for further detail:

- A Type I, II, or III curtain will be selected based on the flow condition. In most situations, turbidity curtains should not be installed across channel flows.
- Turbidity curtains will extend the entire depth of the watercourse when the watercourse is not subject to tidal action and/or significant wind and wave forces.
- In tidal and/or wind and wave action situations, the curtain will never touch the bottom. The curtain will have a minimum 1-foot gap between the weighted lower end of the skirt and the bottom at "mean" low water.
- In tidal and/or wind and wave action situations, the curtain depth will not be lower than 10 to12 feet below the surface.
- Turbidity curtains will be located parallel to the direction of flow of a moving waterbody.
- A minimum continuous span of 50 feet between joints and a maximum span of 100 feet between joints (anchor or stake locations) is a good rule of thumb.
- The ends of the curtain should extend well up to the shoreline and secured firmly to the shoreline, preferably to rigid bodies such as trees or piles.
- When there is specific need to extend the curtain to the bottom of the watercourse in tidal or moving water conditions, a heavy woven pervious filter fabric may be substituted for the normally recommended impervious geotextile.

- Barriers will be of bright colors to attract the attention of nearby boaters.
- Seams in the fabric will be either vulcanized welded or sewn and will develop the full strength of the fabric.
- The load lines will be fabricated into the bottom of all floating curtains. Type-II and III must have load lines also fabricated into the top of the fabric.
- External anchors may consist of wooden or metal stakes for Type I curtains; Type-II and III should use bottom anchors.
- Once the curtain is no longer required, as determined by the EI, the curtain and related components will be removed in such a manner as to minimize turbidity. Sediment may be removed and the original depth restored. Any spoils will be taken to an upland area and stabilized.

Spoil excavated from the trench will be placed on the bank above the high water mark (at least 10 feet from the edge of the water) or placed adjacent to the trench in the stream (major waterbodies only, in accordance with the FERC Procedures) for use as backfill. A prefabricated segment of pipeline will then be placed into the trench using side-boom tractors. Concrete coating (installed in uplands in project workspace) or pipeline weights will be utilized, as necessary, to provide negative buoyancy for the pipeline. Once the trench is backfilled, the banks will be restored as near as practicable to pre-construction contours and stabilized as described above.

Throughout the construction process, DETI will follow the FERC Procedures to avoid or minimize impacts on water quality. Construction activities will be scheduled so that the trench is not excavated across the waterbody until immediately prior to pipe laying activities. The duration of in-stream construction activities (excluding blasting, if required) will be limited to 24-hours across minor waterbodies (those 10 feet in width or less) and 48 hours across intermediate waterbodies (those between 10 and 100 feet in width). Site-specific crossing drawings have been developed for major waterbody crossings (Appendix Q).

Conventional Bore

In some cases, waterbodies may be crossed by conventional subsurface boring beneath the waterbody. Boring involves installing pipeline through a hole bored through the substrate. Where this method is implemented, equipment operating from pits excavated on either side of the crossing will bore through the substrate beneath the waterbody. If dewatering of the pits is necessary, it will be conducted in accordance with the FERC Plan and Procedures and applicable permits in a manner that will minimize erosion and prevent silt-laden water flowing into the waterbody or adjacent wetlands.

The pipeline will be pushed through the bore under the waterbody. The conventional bore can eliminate direct surface impacts on waterbodies; however, there are limitations to its use. This method cannot typically be used to cross waterbodies with unconsolidated soils in the substrate because it is not possible to maintain the integrity of the borehole in this condition.

Because conventional bores in general are installed straight along a horizontal plane, the bore pits must be excavated to a depth sufficient to allow installation of pipe at the appropriate depth beneath the streambed (i.e., 5 feet beneath the streambed) and to account for the height of the boring machinery. Where waterbodies are entrenched or adjacent slopes are steep, excavation to sufficient depths can require excessively large pits to address Occupational Safety and Health Administration (OSHA) shoring requirements, which creates the potential to sink the stream or flood the bore pits. These considerations limit the use of this crossing method for entrenched waterbodies or those with steep slopes.

Flume Crossing

The flume crossing method utilizes a flume pipe(s) to transport stream flow across the disturbed area and allows trenching to be done in drier conditions. The flume pipe(s) installed across the trench will be sized to accommodate anticipated stream flows. Flumes are generally not recommended for use on a waterbody with a broad unconfined channel, unstable banks, a permeable substrate, excessive stream flow, or where the installation and construction of the flume crossing will adversely affect the bed or banks of the stream.

DETI is requesting a review of a case by case basis with the DEQ for the ability to utilize the dry-ditch stream crossing method (Flume crossing) for streams that exceed the 10 feet width as outlined in VESCH **Std. & Spec. 3.25 (Utility Stream Crossing)**. Under certain field conditions, flume crossing procedures are preferred over dam and pump methods. The following scenarios typically encountered during construction make the flume method a better option and reduce the overall potential environmental impact to the stream itself: streams with high flow rates, and terrain constraints.

Streams with higher flow rates require more and larger pumps in order to maintain adequate upstream to downstream flow during construction. Due to limitations placed on pipeline construction "limits of disturbance" via FERC requirements, many times there is not adequate space in order to install multiple pumps and backup pumps in case of a potential primary pump failure. Additionally, when pumps are utilized, crews are required to maintain (fuel, monitor) day and night. By installing a flume, the construction crew is able to maintain adequate flow rates of the stream while conducting the crossing and eliminate the need to refuel and maintain pumps overnight.

Terrain can be a factor especially when the area leading into and going away from the stream channel is steep. Depending on the overall grade of the slope, installing pumps on sloped terrain should be avoided or may not be feasible. During these situations, the flume crossing method is preferred. A flume crossing typical is provided in Appendix A.

In accordance with VESCH **Std. & Spec. 3.25 (Utility Stream Crossing)**, the flume waterbody crossing will be installed as follows:

- Install flume pipe(s) after blasting and other rock breaking measures (if required), but before trenching. The flume pipe crossing will be made operational prior to the start of construction in the stream.

- Properly align flume pipe(s) to prevent bank erosion and streambed scour.

- The materials used (culvert(s), stone and filter fabric) must meet the physical constraints of those used in VESCH **Std. & Spec. 3.24 (Temporary Vehicular Steam Crossing)**.

- A large flume pipe (or culvert) of an adequate size to support normal water channel flow will then be installed in the stream bed across the proposed pipeline trench centerline.

- Sand bags, VDOT #1 Coarse Aggregate (minimum size), or riprap will be placed close to each end of the flume pipe so as to dam off the creek forcing the water to flow through the flume pipe (some modifications to the stream bottom may be required to achieve an effective seal).

- The entrapped water can then be pumped from the creek within the dammed-off area and in the proposed trench centerline into a dewatering structure (see Section 3.1.8). The trench can then be dug under the flume pipe. The pipe sections will then be installed to the proper depth under the flume pipe. After pipe sections are installed, the ditch will be backfilled and re-stabilization will then be carried out.

- The flume pipe will not be removed during trenching, pipe laying (thread pipe underneath the flume pipe. For each wetland crossed, DETI will install a trench breaker at the base of slopes near the boundary between the wetland and adjacent upland areas. It will install a permanent slope breaker across the construction ROW at the base of slopes greater than 5 percent where the base of the slope is less than 50 feet from the wetland, or as needed to prevent sediment transport into the wetland. In some areas, with the approval of the EI, an earthen berm maybe suitable as a sediment barrier adjacent to the wetland.

- The use of the flume pipe crossing method will last less than 72 hours. However, DETI is requesting a review of a case by case basis with the DEQ in areas where rock is encountered which requires blasting/rock hammering that could significantly increase the amount of time needed to complete the crossing or failure in crossing method requires additional time to either mitigate or change.

- Restore pre-construction wetland contours to maintain the wetland hydrology.

- Revegetation and permanent ROW maintenance procedures as well as the use of lime, mulch or fertilizer in wetland areas is addressed in the *Restoration and Rehabilitation Plan* provided in Appendix R.

- DETI will not use herbicides or pesticides in or within 100 feet of a wetland, except as allowed by the appropriate federal or Commonwealth agency.

- Remove project-related material used to support equipment on the construction ROW, including timber matting and prefabricated equipment mats, upon completion of construction.

- Remove temporary sediment barriers located at the boundary between wetland and adjacent upland areas after upland revegetation and stabilization of adjacent upland areas are successful.

- Within 3 years after construction, file a report with FERC identifying the status of the wetland revegetation efforts and documenting success.

Dam-and-Pump Crossing

The dam-and-pump crossing method is presented as an alternative dry crossing procedure to the flume crossing (in limited cases, it may be used in combination with a flume crossing). The dam-and-pump method is accomplished by utilizing pumps to transport stream flow across the disturbed area. This method involves placing sandbags or equivalent across the existing stream channel upstream from the proposed crossing to stop water flow and downstream from the crossing to isolate the work area. Pumps are used to pump the water across the disturbed area and back into the stream further downstream.

The dam-and-pump procedure allows for more space and flexibility during trenching and pipe installation, which shortens the duration of time spent at the waterbody. The dam-and-pump method may be used for crossings of waterbodies where pumps can adequately transfer stream flow volumes around the work area, and where there are no concerns about sensitive species passage.

The dam-and-pump crossing method will be installed as follows:

- Install and properly seal sandbags at the upstream and downstream location of the crossing.

- Create an in-stream sump using sandbags if a natural sump is unavailable for the intake hose.

- Initiate pumping of the stream around the work area prior to excavating the trench.

- Monitor dams and pumps at all times to ensure proper operation until the waterbody crossing is completed.

- Remove the sandbag dams, pumps, and hoses and return normal flow back to the waterbody following installation and restoration of the streambed.

Implementation of the dam-and-pump crossing method will meet the following performance criteria:

- Use sufficient pumps, including on-site backup pumps, to maintain downstream flows.
- Construct dams with materials that prevent sediment and other pollutants from entering the waterbody (e.g., sandbags or clean gravel with plastic liner).
- Screen all intake hoses to minimize the entrainment of fish and other aquatic life.
- Prevent streambed scour at pump discharge.
- Continuously monitor the dam and pumps to ensure proper operation throughout the waterbody crossing.

Cofferdam Crossing

The cofferdam crossing method is presented as an alternative dry crossing procedure when stream diversion is not practical and the stream is wide enough (10 feet or wider) to make cofferdam installation practical. Implementation of the cofferdam crossing method will meet the following performance criteria in accordance with VESCH **Std. & Spec. 3.25 (Utility Stream Crossing)**:

- Construction is to be performed in low flow periods.
- Crossing will be accomplished in a manner that will not prohibit the flow of the stream.
- Approach areas must be controlled with perimeter measures such as silt fences.
- Remove large rocks, wood vegetation, or other material from the streambed and banks that may get in the way of placing the riprap, sandbags, sheet metal, or wood planks or of installing the utility pipe or line.
- Form a cofferdam by placing the riprap (or other non-erodible materials) in a semicircle along the side of the stream in which the utility installation will begin. It must be surrounded and underlain with filter cloth. The height of an area within the dam will depend upon the size of the work area and the amount of stream flow. Stack materials as high as will be necessary to keep water from overtopping the dam and flooding the work area. When the stream flow is successfully diverted by the cofferdam, dewater the work area and stabilize it with aggregate (VDOT #57 or #68 Coarse Aggregate) or sand. Discharge the water into a dewatering structure (see Section 3.1.8).
- Install the utility pipe or line in half of the streambed. Remove riprap or other materials and begin placing them on the other side of the stream.

- Restoration will consist of vegetative or structural streambank stabilization as discussed in Section 3.1.13. Stabilization of streambed and banks and the approach areas should occur immediately following the attainment of final grade. See Section 3.5.11.5.

3.5.11.3 Temporary Erosion and Sediment Controls at Waterbodies

Install sediment barriers before initial disturbance of the waterbody or adjacent upland. Sediment barriers must be properly maintained throughout construction and repaired or reinstalled as necessary (such as after backfilling of the trench), until replacement by permanent erosion controls or restoration of adjacent upland areas is complete. The following specific measures must be implemented at stream crossings:

- Install sediment barriers across the entire construction ROW at all waterbody crossings where necessary to prevent the flow of sediments into the waterbody. For open-cut crossings, stabilize waterbody banks and install temporary sediment barriers within 24 hours of completing in-stream construction activities. For dry-ditch crossings, complete streambed and bank stabilization before returning flow to the waterbody channel.

- Install sediment barriers along the edge of the construction ROW as necessary to contain spoil within the construction ROW and prevent sediment flow into the waterbody where waterbodies are adjacent to the construction ROW or parallel to the construction ROW and the ROW slopes toward the waterbody.

- Removable or temporary sediment barriers, such as slope breakers or drivable berms, may be used in lieu of sediment barriers in front of equipment bridges or timber mats across the travel lane. Temporary slope breakers must be installed on slopes greater than 5 percent where the base of the slope is less than 50 feet from waterbody, wetland, and road crossings. Removable sediment barriers can be removed during the construction day, but must be reinstalled after construction has stopped for the day or whenever heavy precipitation is imminent.

- Use trench plugs at all waterbody crossings, as necessary, to prevent diversion of water into upland portions of the pipeline trench and to keep any accumulated trench water out of the waterbody. Trench plugs will be of sufficient size to withstand upslope water pressure.

3.5.11.4 FERC Waterbody Classification

In the FERC Procedures, a “waterbody” is defined to include any natural or artificial stream, river, or drainage with perceptible flow at the time of crossing, and other permanent waterbodies such as ponds and lakes. Waterbodies have been further divided into three classifications by FERC depending on the width of the feature, which dictate construction limitations or requirements.

Minor Waterbodies

FERC defines a "minor waterbody" as a waterbody less than or equal to 10 feet wide at the water's edge at the time of crossing. Minor waterbodies will be crossed in accordance with the following requirements:

- The spoil from minor waterbody crossings must be placed in the construction ROW at least 10 feet from the water's edge or in additional extra work areas. Use sediment barriers to prevent the flow of spoil or silt-laden water into any waterbody.

- Unless approved otherwise by the appropriate federal or Commonwealth agency, utilize a dry crossing construction technique to install crossings at minor waterbodies that are Commonwealth-designated fisheries or federally designated as critical habitat.

- Where a dry-ditch crossing is not required, minor waterbodies may be crossed using the open-cut crossing method, with the following restrictions:

    - Except for blasting and other rock breaking measures, complete in-stream construction activities (including trenching, pipe installation, backfill, and restoration of the streambed contours) within 24 hours. Streambanks and unconsolidated streambeds may require additional restoration after this period.

    - Limit use of equipment operating in the waterbody to that needed to construct the crossing.

Intermediate Waterbodies

FERC defines an "intermediate waterbody" as a waterbody greater than 10 feet wide but less than or equal to 100 feet wide at the water's edge at the time of crossing. Intermediate waterbodies will be crossed in accordance with the following requirements:

- The spoil from intermediate waterbody crossings must be placed in the construction ROW at least 10 feet from the water's edge or in additional extra work areas. Use sediment barriers to prevent the flow of spoil or silt-laden water into any waterbody.

- Unless approved otherwise by the appropriate federal or Commonwealth agency, install the pipeline using a dry crossing method for crossings of waterbodies up to 30 feet wide (at the water's edge at the time of construction) that are:

    - commonwealth-designated as either coldwater or significant coolwater or warmwater fisheries; or

    - federally designated as critical habitat.

Where a dry-ditch crossing is not required, intermediate waterbodies may be crossed using the open-cut crossing method, with the following restrictions:

- Complete in-stream construction activities (not including blasting and other rock breaking measures) within 48 hours, unless site-specific conditions make completion within 48 hours infeasible.

- Limit use of equipment operating in the waterbody to that needed to construct the crossing.

- All other construction equipment must cross on an equipment bridge as specific in Section 3.2.4.

Major Waterbodies

FERC defines a "major waterbody" as all waterbodies greater than 100 feet wide at the water's edge at the time of crossing. DETI submitted to FERC site-specific construction plans and scaled drawings identifying all areas to be disturbed by construction for each major waterbody crossing (Appendix Q). These plans were developed in consultation with the appropriate state and federal agencies and include extra work areas, spoil storage areas, sediment control structures, etc., as well as mitigation for navigational issues.

3.5.11.5 Waterbody Restoration

Restore and stabilize the waterbody banks and channels in accordance with this section.

- Return waterbody banks to pre-construction contours or to stable angle of repose as approved by the EI.

- Use clean gravel or native cobbles for the upper 12 inches of trench backfill in waterbodies identified as coldwater fisheries, unless otherwise specified by Commonwealth-specific agency recommendations or permit conditions.

- For dry crossings, complete bank stabilization before returning flow to the waterbody channel.

- Limit the use of rock riprap to areas where flow conditions preclude effective vegetation stabilization techniques such as seeding and erosion control fabric, unless otherwise specified by USACE and Commonwealth permits. Limit the placement of rock riprap to the slopes along the disturbed waterbody crossing. Application of riprap for bank stabilization must comply with the permit terms and conditions of the USACE, or its delegated agency.

- Disturbed banks and riparian work areas will be seeded as soon as possible after final grading, weather and soil conditions permitting and subject to the recommended seeding dates for the area. Seeding is intended to stabilize the soil, improve the appearance of the area disturbed by construction, and restore native

flora. DETI will determine appropriate seeding prescriptions based upon the vegetative community of the disturbed area.

- Restoration of forested riparian areas will include seeding as discussed above, and may include supplemental plantings of tree seedlings and shrubs. Clearing of riparian trees in forested areas will reduce shade near streams, and may allow for an increase in local water temperature. Large woody debris, where available and where appropriate habitat conditions exist, will be placed adjacent to waterbody crossings to add shade and fish habitat. Forested riparian areas will be restored and enhanced using plantings of native shrubs and trees, excluding the permanent easement, which will be retained in an herbaceous state. On a site-specific basis, DETI will design riparian revegetation with the use of fast growing native trees and shrubs placed closest to the bank top to provide canopy recovery as quickly as possible to shade and overhang the waterbodies.

- Install erosion control fabric or a functional equivalent on waterbody banks at the time of final bank contouring. Do not use synthetic monofilament mesh/netted erosion control materials in areas designated as sensitive wildlife habitat unless the product is specifically designed to minimize harm to wildlife.

- Revegetate disturbed riparian areas with native species of conservation grasses, legumes, and woody species similar in density to adjacent undisturbed lands.

- In the event that final cleanup is deferred more than 14 days after the trench is backfilled, all slopes within 100 feet of waterbodies will be mulched with 3-tons/acre of straw within 7 days.

- Remove all temporary sediment barriers when replaced by permanent erosion controls or when restoration of adjacent upland areas is successful.

- Stabilize the bed and banks of a watercourse immediately after any work within the waterway is completed.

- Install a permanent water bar and a trench plug at the base of slopes greater than 5-percent that are less than 50 feet from each waterbody crossed.

3.5.11.6 Post-Construction Maintenance

DETI will limit routine vegetation mowing or clearing adjacent to waterbodies to allow a riparian strip at least 25 feet wide, as measured from the waterbody's mean high water mark, to permanently revegetate with native plant species across the entire construction ROW. However, to facilitate periodic corrosion/leak surveys, a corridor centered on the pipeline and up to 10 feet wide may be cleared at a frequency necessary to maintain the 10-foot corridor in an herbaceous state.

In addition, trees that are located within 15 feet of the pipeline that have roots that could compromise the integrity of the pipeline coating may be cut and removed from the permanent

ROW. DETI will not conduct any routine vegetation mowing or clearing in riparian areas that are between HDD entry and exit points. DETI will not use herbicides or pesticides in or within 100 feet of a waterbody except as allowed by the appropriate land management or Commonwealth agency.

Time of year restrictions specified in section VII.A.5 of the FERC Plan (April 15 through August 1 of any year) apply to routine mowing and clearing of riparian areas.

3.5.12 Wetland Crossings

Crossing procedures are to comply with the permit terms and conditions of the USACE, or its delegated agency. The following general mitigation measures were implemented during project planning and pipeline routing:

- Route the pipeline to avoid wetland areas to the maximum extent possible.
- If a wetland cannot be avoided or crossed by following an existing ROW, route the new pipeline in a manner that minimizes disturbance to wetlands. Where looping an existing pipeline, overlap the existing pipeline ROW with the new construction ROW. In addition, locate the loop line no more than 25 feet away from the existing pipeline unless site-specific constraints would adversely affect the stability of the existing pipeline.
- Identify site-specific areas where excessively wide trenches could occur and/or where spoil piles could be difficult to maintain because existing soils lack adequate unconfined compressive strength.
- Limit construction activity and ground disturbance in wetland areas to a construction ROW width of 75 feet or as shown on the construction alignment sheets. Only with prior written approval from FERC, construction ROW width within the boundaries of federally delineated wetlands may be expanded beyond 75-feet if required by site-specific topographic conditions or soil limitations.
- Extra work areas must be located at least 50 feet away from wetland boundaries, except where the adjacent upland consists of cultivated or rotated cropland or other disturbed land. Only with prior written approval from FERC, DETI can locate extra work areas closer than 50 feet from the wetland if site-specific conditions justify a less than 50-foot setback.
- Following construction, a 50-foot-wide permanent easement will be maintained for operation of the pipeline.
- Aboveground facilities are not located in any wetland, except as permitted or where the location of such facilities outside of wetlands would prohibit compliance with USDOT regulations.

- In the event a waterbody crossing is located within or adjacent to a wetland crossing, DETI filed a site-specific crossing plan for review and obtained written approval by FERC before construction if all measures of Sections V. and VI. of the FERC Procedures could not be met.

3.5.12.1 Clearing and Grading at Wetlands

- Limit construction equipment operating in wetland areas to that needed to clear the ROW, dig the trench, fabricate and install the pipeline, backfill the trench, and restore the construction ROW. All other construction equipment will use access roads located in upland areas to the maximum extent practical.

- Wetland boundaries and buffers (e.g., extra work area setbacks, refueling restrictions) must be clearly marked in the field with signs and/or highly visible flagging until construction-related ground disturbing activities are complete.

- If standing water or saturated soils are present, or if construction equipment causes ruts or mixing of the topsoil and subsoil in wetlands, use low-ground-weight construction equipment or operate normal equipment on timber matting, prefabricated equipment mats, or terra mats on the working side of the ROW during clearing operations.

- Attempt to use no more than two layers of timber matting to stabilize the ROW. If approved by the USACE, woody debris can be burned in wetlands as long as it is in accordance with Commonwealth and local regulations, ensuring that all woody debris is removed for disposal.

- Cut vegetation just above ground level and grind stumps to ground level, leaving existing root systems in place and remove any excess vegetation (e.g., wood chips). Immediately remove all cut trees, limbs, and branches from the wetland and stockpile in an upland area on the ROW for disposal.

- Limit pulling of tree stumps and grading activities to directly over the trenchline. Do not grade or remove stumps or root systems from the rest of the construction ROW in wetlands unless the ECC and EI determine that safety-related construction constraints require grading or the removal of tree stumps from under the working side of the construction ROW.

- Do not cut trees outside of the construction ROW to obtain timber for equipment mats.

- Cleared materials, such as slash, logs, brush, and wood chips, will not be permanently placed within wetland areas.

3.5.12.2 Temporary Erosion and Sediment Control at Wetlands

Install sediment barriers before initial ground disturbance at the following locations:

- Within the ROW at the edge of the boundary between wetland and upland;
- At the base of slopes greater than 5 percent where the base of the slope is less than 50 feet from a wetland;
- Across the entire ROW immediately upslope of the wetland boundary to contain spoil within the construction ROW and prevent sediment flow into the wetland;
- Along the edge of the ROW, where the ROW slopes toward the wetland, to protect adjacent, off-ROW wetlands; and
- Along the edge of the ROW as necessary to contain spoil and prevent sediment from migrating outside the construction ROW in areas where a wetland is both within and adjacent to the construction ROW.

Maintain sediment barriers throughout construction and re-install as necessary (such as after backfilling of the trench) until replaced by permanent erosion controls or restoration of adjacent upland areas is complete.

3.5.12.3 Wetland Crossing Procedure

Procedures used to install a pipeline across wetlands vary depending on the level of soil stability and saturation encountered during construction. DETI will comply with USACE permit terms and conditions. It will assemble the pipeline in an upland area unless the wetland is dry enough to adequately support skids and pipe. DETI will use "push-pull" or "float" techniques to place the pipe in the trench where water and other site conditions allow. Wetland crossing methods are identified in Appendix O.

The following BMPs are to be employed during standard wetland crossings:

- Assemble the pipeline in an upland area unless the wetland is dry enough to adequately support skids and pipe.
- Do not use rock, soil imported from outside the wetland, tree stumps, or brush riprap to stabilize the ROW.
- Perform topsoil segregation in accordance with Section 3.1.6.1, including segregating the surficial 12 inches of topsoil from the area disturbed by trenching, except in areas where standing water is present or soils are saturated. Immediately after backfilling is complete, restore the segregated topsoil to its original location.
- If required, dewatering should be conducted as described in Section 3.1.8.

- Minimize the length of time that topsoil is segregated and the trench is open. Do not trench the wetland until the pipeline is assembled and ready for lowering-in.

- Install permanent trench breakers at the wetland boundaries and/or seal the trench bottom as necessary to maintain the original wetland hydrology at locations where the pipeline trench may drain a wetland.

- Install a permanent slope breaker and a trench breaker at the base of slopes near the boundary between the wetland and adjacent upland areas for each wetland crossed.

- Install a permanent slope breaker across the construction ROW at the base of slopes greater than 5 percent where the base of the slope is less than 50 feet from the wetland, or as needed to prevent sediment transport into the wetland. In some areas, with the approval of the EI, an earthen berm may be suitable as a sediment barrier adjacent to the wetland.

- When required, additional fill material imported from off the ROW must be approved by the EI.

- Pre-construction wetland contours and flow regimes will be restored to the extent practical.

3.5.12.4 Wetland Cleanup and Restoration

- For each wetland crossed, DETI will install a trench breaker at the base of slopes near the boundary between the wetland and adjacent upland areas. It will install a permanent slope breaker across the construction ROW at the base of slopes greater than 5 percent where the base of the slope is less than 50 feet from the wetland, or as needed to prevent sediment transport into the wetland. In some areas, with the approval of the EI, an earthen berm may be suitable as a sediment barrier adjacent to the wetland.

- Restore pre-construction wetland contours to maintain the wetland hydrology.

- Revegetation and permanent ROW maintenance procedures as well as the use of lime, mulch, or fertilizer in wetland areas is addressed in the *Restoration and Rehabilitation Plan* provided in Appendix R.

- DETI will not use herbicides or pesticides in or within 100 feet of a wetland, except as allowed by the appropriate federal or Commonwealth agency.

- Remove project-related material used to support equipment on the construction ROW, including timber matting and prefabricated equipment mats, upon completion of construction.

- Remove temporary sediment barriers located at the boundary between wetland and adjacent upland areas after upland revegetation and stabilization of adjacent upland areas are successful.

- Within 3 years after construction, file a report with FERC identifying the status of the wetland revegetation efforts and documenting success.

3.5.13 Threatened and Endangered Species

In select locations with the potential for impacts to threatened and endangered species, habitat incremental ESC measures have been identified and are depicted on the construction alignment sheets.

3.5.14 Historic Preservation

Survey results to date revealed that archeological and cultural resource sites and aboveground historic resources occur within the Virginia study area. Copies of the survey reports have been provided to the Virginia Department of Historical Resources for review and have been filed with FERC. If applicable, avoidance measures will be addressed as part of DETI's consultations with the Virginia Department of Historical Resources.

3.5.15 Acid Rock and Soil Management

Based on a review of available mapping and agency consultations, several of the geologic formations underlying the proposed ACP Project are known to contain acid-producing sulfide materials (Orndorff and Daniels, 2004). These formations include consolidated bedrock (e.g., shale and slate) along the inland portions of the Projects and unconsolidated marine sediments in the Coastal Plain. The milepost ranges for crossings of these formations by the proposed ACP pipeline facilities in Virginia are provided in Table 3.5.15-1.

TABLE 3.5.15-1
Geologic Units Crossed by the Proposed Atlantic Coast Pipeline Containing Potentially Significant Acid-Producing Sulfide Minerals

Milepost		Physiographic	Physiographic		Predominant	Secondary	
From	To	Province	Section	Unit Name	Rock Type	Rock Type	Unit Age
ATLANTIC COAST PIPELINE							
AP-1 Mainline							
87.13	87.37	Valley and Ridge	Middle	Millboro Shale and Needmore Formation	black shale	shale	Devonian
90.94	91.61	Valley and Ridge	Middle	Millboro Shale and Needmore Formation	black shale	shale	Devonian
91.61	92.02	Valley and Ridge	Middle	Millboro Shale and Needmore Formation	black shale	shale	Devonian
97.25	97.75	Valley and Ridge	Middle	Millboro Shale and Needmore Formation	black shale	shale	Devonian
101.76	102.17	Valley and Ridge	Middle	Millboro Shale and Needmore Formation	black shale	shale	Devonian
103.65	105.16	Valley and Ridge	Middle	Millboro Shale and Needmore Formation	black shale	shale	Devonian

TABLE 3.5.15-1
Geologic Units Crossed by the Proposed Atlantic Coast Pipeline Containing Potentially Significant Acid-Producing Sulfide Minerals

Milepost		Physiographic	Physiographic		Predominant	Secondary	
From	To	Province	Section	Unit Name	Rock Type	Rock Type	Unit Age
108.37	108.86	Valley and Ridge	Middle	Millboro Shale and Needmore Formation	black shale	shale	Devonian
109.09	110.49	Valley and Ridge	Middle	Millboro Shale and Needmore Formation	black shale	shale	Devonian
114.92	115.00	Valley and Ridge	Middle	Millboro Shale and Needmore Formation	black shale	shale	Devonian
115.03	115.34	Valley and Ridge	Middle	Millboro Shale and Needmore Formation	black shale	shale	Devonian
122.64	122.80	Valley and Ridge	Middle	Millboro Shale and Needmore Formation	black shale	shale	Devonian
177.09	179.20	Piedmont	Piedmont Upland	Ashe Formation - Biotite gneiss	biotite gneiss		Proterozoic Z
AP-3 Lateral							
34.37	38.01	Coastal Plain	Embayed	Tabb Formation; Sedgefield Member	sand		Quaternary
38.54	38.58	Coastal Plain	Embayed	Tabb Formation; Sedgefield Member	sand		Quaternary
38.58	39.24	Coastal Plain	Embayed	Tabb Formation; Sedgefield Member	sand		Quaternary
55.26	55.52	Coastal Plain	Embayed	Chesapeake Group	sand	silt	Tertiary
55.84	56.44	Coastal Plain	Embayed	Chesapeake Group	sand	silt	Tertiary
57.43	58.06	Coastal Plain	Embayed	Chesapeake Group	sand	silt	Tertiary
60.57	61.27	Coastal Plain	Embayed	Chesapeake Group	sand	silt	Tertiary
61.94	62.26	Coastal Plain	Embayed	Chesapeake Group	sand	silt	Tertiary
62.37	62.67	Coastal Plain	Embayed	Chesapeake Group	sand	silt	Tertiary
65.08	65.23	Coastal Plain	Embayed	Tabb Formation; Sedgefield Member	sand		Quaternary
65.50	66.47	Coastal Plain	Embayed	Tabb Formation; Sedgefield Member	sand		Quaternary
69.90	71.40	Coastal Plain	Embayed	Tabb Formation; Sedgefield Member	sand		Quaternary
71.40	71.40	Coastal Plain	Embayed	Tabb Formation; Sedgefield Member	sand		Quaternary
72.59	73.45	Coastal Plain	Embayed	Tabb Formation; Sedgefield Member	sand		Quaternary
76.33	81.70	Coastal Plain	Embayed	Tabb Formation; Lynnhaven Member	sand	silt	Quaternary
81.82	82.70	Coastal Plain	Embayed	Tabb Formation; Lynnhaven Member	sand	silt	Quaternary

Sources: Orndorff and Daniels, 2004

The exposure of acid-producing rock or soils during excavation can result in the oxidation of iron sulfide minerals in the subsoil or bedrock, thereby producing sulfuric acid. Introduction of sulfuric acid to an adjacent wetland or waterbody could potentially increase the acidity of the water and have negative impacts on aquatic or terrestrial vegetation and

wildlife. In addition, incorporation of these materials into the surface could affect revegetation in areas disturbed during construction.

As part of the environmental training, which will be conducted prior to the start of construction, field personnel will be provided the descriptions and potential locations of the geologic formations that could contain significant acid-producing sulfide minerals (e.g., dark subsoils in the Coastal Plain with a sulfurous odor).

The EIs will survey work areas prior to construction for signs of acid-producing materials including sparse vegetation and/or red iron discharges or staining on side slopes. During construction, the EIs will monitor excavation activities and open trenches to identify potential acid-producing formations. The EIs will also monitor stockpiled materials for signs of oxidation and acid drainage.

DETI will implement a number of measures to avoid or minimize potential impacts resulting from construction activities in areas containing acid-producing rocks or soils. These include the following:

- Segregating the top 12 inches of topsoil or all of the soil to the top of an acid producing layer in the trench, whichever is reached first;
- Segregating rock or soil from the top of the acid-producing layer to the bottom of the acid-producing layer or to the bottom of the trench, whichever is reached first;
- Segregating rock or soil below the acid-producing layer to the bottom of the trench;
- Backfilling the trench with acid-producing materials first to a maximum of 12-inches below the surface;
- Placing a cover of sand or other clean material around and over the pipe to avoid corrosion; and/or
- Applying lime to the topsoil or replacing a minimum of 12 inches of acid-free topsoil.

DETI will attempt to limit the duration of stockpiled materials to 30 days or less in areas that contain acid-producing rock or soils. This will reduce the likelihood that these materials are oxidized and acidic drainage is produced. In addition, implementation of the measures outlined in the Plan and Procedures, such as erosion and sediment controls, will prevent tracking of acid-producing materials along the ROW and minimize or avoid impacts on sensitive resources in these areas.

Acidic fill materials in the pipeline trench could accelerate corrosion of steel pipe. DETI will install cathodic protection systems at various points along the proposed pipelines to inhibit external corrosion of the underground facilities. The outside of the steel pipe will also be coated with fusion-bonded epoxy that protects the surface of the pipe against corrosion. During operations, DETI will conduct routine inspections and cathodic protection surveys along the

pipelines to confirm proper operating conditions consistent with federal requirements for corrosion mitigation.

3.6 GEORGE WASHINGTON NATIONAL FOREST

A 14.7-mile portion of the ACP's proposed route crosses the GWNF managed by the USFS. The ACP's proposed route does not lie within a GWNF-designated utility corridor. The GWNF's LRMP requires that decisions for new authorizations outside designated utility corridors include an amendment to the LRMP to change the management prescription of the corridor area. The GWNF must therefore decide whether to amend its LRMP, and the USFS must decide whether to authorize granting a ROW/use permit to construct and operate the pipeline facilities on National Forest Service (NFS) lands. A COM Plan was submitted to the USFS that specifies the terms under which a ROW across NFS lands would be granted. The COM Plan is intended to be appended to the ROW grant.

The COM Plan consists of a number of individual topical plans and appendices applicable to construction and operation of the ACP on NFS lands. An Upland Erosion Control Plan included within the COM Plan was prepared to be consistent with federal FERC and Commonwealth of Virginia requirements as well as on-going consultations with the USFS. The COM Plan meets the requirements of the Virginia Stormwater Management Act, the Virginia Erosion and Sediment Control Law, and associated regulations, where applicable.; the FERC Plan and Procedures; and the GWNF LRMP, where applicable. If there is a conflict between the requirements listed above, then the COM Plan reflects the more stringent of those requirements, unless otherwise agreed to in advance. DETI is currently coordinating with the USFS to refine the ESC measures and engineering controls to be implemented within the GWNF and will revise the COM Plan accordingly. Prior to land disturbing activities, DETI will submit to the VDEQ the final drawings and plans for the GWNF for review and approval.

During construction and operation of the ACP within the GWNF, the COM Plan will serve as the reference document for implementing ESC control measures. As changes to the COM Plan may be warranted during construction of the Project, the COM Plan will be the repository and reference for new and amended permits, approvals, clearances, and plans that may be issued during that time frame.

4.0 EROSION AND SEDIMENT CONTROL MINIMUM STANDARDS

The Virginia ESC regulations specify minimum standards that must be followed for all regulated land-disturbing activities, where applicable to a specific project. Modifying or waiving any of the ESC regulations, including the 19 minimum standards, on a project-specific basis, requires a written variance request to VDEQ for review and approval. DETI will construct the ACP Project in accordance with the following criteria, techniques and methods per minimum standards set forth in 9 VAC 25-840-40, except for project-specific variances in the general notes on the construction alignment sheets (Attachment A).

Minimum Standard 1 – Permanent or temporary soil stabilization shall be applied to denuded areas within 7 days after final grade is reached on any portion of the site. Temporary soil stabilization shall be applied within 7 days to denuded areas that may not be at final grade but will remain dormant for longer than 14 days. Permanent stabilization shall be applied to areas that are to be left dormant for more than 1 year.

Minimum Standard 2 – During construction of the project, soil stock piles and borrow areas shall be stabilized or protected with sediment trapping measures. The applicant is responsible for the temporary protection and permanent stabilization of all soil stockpiles on site as well as borrow areas and soil intentionally transported from the project site.

Minimum Standard 3 – A permanent vegetative cover shall be established on denuded areas not otherwise permanently stabilized. Permanent vegetation shall not be considered established until a ground cover is achieved that is uniform, is mature enough to survive, and will inhibit erosion.

Minimum Standard 4 – Sediment basins and traps, perimeter dikes, sediment barriers, and other measures intended to trap sediment shall be constructed as a first step in any land-disturbing activity and shall be made functional before upslope land disturbance takes place.

Minimum Standard 5 – Stabilization measures shall be applied to earthen structures such as dams, dikes, and diversions immediately after installation.

Minimum Standard 6 – Sediment traps and sediment basins shall be designed and constructed based upon the total drainage area to be served by the trap or basin.

6.a. The minimum storage capacity of a sediment trap shall be 134 cubic yards per acre of drainage area and the trap shall only control drainage areas less than three acres.

6.b. Surface runoff from disturbed areas that is comprised of flow from drainage areas greater than or equal to 3 acres shall be controlled by a sediment basin. The minimum storage capacity of a sediment basin shall be 134 cubic yards per acre of drainage area. The outfall system shall, at a minimum, maintain the structural integrity of the basin during a 25-year storm of 24-hour duration. Runoff coefficients used in runoff calculations shall correspond to a bare earth condition or those conditions expected to exist while the sediment basin is utilized.

Minimum Standard 7 – Cut and fill slopes shall be designed and constructed in a manner that will minimize erosion. Slopes that are found to be eroding excessively within 1 year of permanent stabilization shall be provided with additional slope stabilizing measures until the problem is corrected.

Minimum Standard 8 – Concentrated runoff shall not flow down cut or fill slopes unless contained within an adequate temporary or permanent channel, flume, or slope drain structure.

Minimum Standard 9 – Whenever water seeps from a slope face, adequate drainage or other protection shall be provided.

Minimum Standard 10 – All storm sewer inlets that are made operable during construction shall be protected so that sediment-laden water cannot enter the conveyance system without first being filtered or otherwise treated to remove sediment.

Minimum Standard 11 – Before newly constructed stormwater conveyance channels or pipes are made operational, adequate outlet protection and any required temporary or permanent channel lining shall be installed in both the conveyance channel and receiving channel.

Minimum Standard 12 – When work in a live watercourse is performed, precautions shall be taken to minimize encroachment, control sediment transport, and stabilize the work area to the greatest extent possible during construction. Nonerodible material shall be used for the construction of causeways and cofferdams. Earthen fill may be used for these structures if armored by nonerodible cover materials.

Minimum Standard 13 – When a live watercourse must be crossed by construction vehicles more than twice in any 6-month period, a temporary vehicular stream crossing constructed of nonerodible material shall be provided.

Minimum Standard 14 – All applicable federal, state, and local requirements pertaining to working in or crossing live watercourses shall be met.

Minimum Standard 15 – The bed and banks of a watercourse shall be stabilized immediately after work in the watercourse is completed.

Minimum Standard 16 – Underground utility lines shall be installed in accordance with the following standards in addition to other applicable criteria:

16.a. No more than 500 linear feet of trench may be opened at one time.

16.b. Excavated material shall be placed on the uphill side of trenches.

16.c. Effluent from dewatering operations shall be filtered or passed through an approved sediment trapping device, or both, and discharged in a manner that does not adversely affect flowing streams or off-site property.

16.d. Material used for backfilling trenches shall be properly compacted in order to minimize erosion and promote stabilization.

16.e. Restabilization shall be accomplished in accordance with this chapter.

16.f. Applicable safety requirements shall be complied with.

Minimum Standard 17 – Where construction vehicle access routes intersect paved or public roads, provisions shall be made to minimize the transport of sediment by vehicular tracking onto the paved surface. Where sediment is transported onto a paved or public road surface, the road surface shall be cleaned thoroughly at the end of each day. Sediment shall be removed from the roads by shoveling or sweeping and transported to a sediment control disposal area. Street washing shall be allowed only after sediment is removed in this manner. This provision shall apply to individual development lots as well as to larger land-disturbing activities.

Minimum Standard 18 – All temporary ESC measures shall be removed within 30 days after final site stabilization or after the temporary measures are no longer needed, unless otherwise authorized by the Virginia Erosion and Sedimentation Control Program (VESCP) authority. Trapped sediment and the disturbed soil areas resulting from the disposition of temporary measures shall be permanently stabilized to prevent further erosion and sedimentation.

Minimum Standard 19 – Properties and waterways downstream from development sites shall be protected from sediment deposition, erosion, and damage due to increases in volume, velocity, and peak flow rate of stormwater runoff for the stated frequency storm of 24-hour duration in accordance with the following standards and criteria. Stream restoration and relocation projects that incorporate natural channel design concepts are not man-made channels and shall be exempt from any flow rate capacity and velocity requirements for natural or man-made channels:

19.a. Concentrated stormwater runoff leaving a development site shall be discharged directly into an adequate natural or man-made receiving channel, pipe, or storm sewer system. For those sites where runoff is discharged into a pipe or pipe system, downstream stability analyses at the outfall of the pipe or pipe system shall be performed.

19.b. Adequacy of all channels and pipes shall be verified in the following manner:

19.b.(1) The applicant shall demonstrate that the total drainage area to the point of analysis within the channel is one hundred times greater than the contributing drainage area of the project in question; or

19.b.(2)(a) Natural channels shall be analyzed by the use of a 2-year storm to verify that stormwater will not overtop channel banks nor cause erosion of channel bed or banks.

19.b.(2)(b) All previously constructed man-made channels shall be analyzed by the use of a 10-year storm to verify that stormwater will not overtop its

banks and by the use of a 2-year storm to demonstrate that stormwater will not cause erosion of channel bed or banks; and

19.b.(2)(c) Pipes and storm sewer systems shall be analyzed by the use of a 10-year storm to verify that stormwater will be contained within the pipe or system.

19.c. If existing natural receiving channels or previously constructed man-made channels or pipes are not adequate, the applicant shall:

19.c.(1) Improve the channels to a condition where a 10-year storm will not overtop the banks and a 2-year storm will not cause erosion to the channel, the bed, or the banks; or

19.c.(2) Improve the pipe or pipe system to a condition where the 10-year storm is contained within the appurtenances;

19.c.(3) Develop a site design that will not cause the pre-development peak runoff rate from a 2-year storm to increase when runoff outfalls into a natural channel or will not cause the pre-development peak runoff rate from a 10-year storm to increase when runoff outfalls into a man-made channel; or

19.c.(4) Provide a combination of channel improvement, stormwater detention or other measures that is satisfactory to the VESCP authority to prevent downstream erosion.

19.d. The applicant shall provide evidence of permission to make the improvements.

19.e. All hydrologic analyses shall be based on the existing watershed characteristics and the ultimate development condition of the subject project.

19.f. If the applicant chooses an option that includes stormwater detention, he shall obtain approval from the VESCP of a plan for maintenance of the detention facilities. The plan shall set forth the maintenance requirements of the facility and the person responsible for performing the maintenance.

19.g. Outfall from a detention facility shall be discharged to a receiving channel, and energy dissipators shall be placed at the outfall of all detention facilities as necessary to provide a stabilized transition from the facility to the receiving channel.

19.h. All on-site channels must be verified to be adequate.

19.i. Increased volumes of sheet flows that may cause erosion or sedimentation on adjacent property shall be diverted to a stable outlet, adequate channel, pipe or pipe system, or to a detention facility.

19.j. In applying these SWM criteria, individual lots or parcels in a residential, commercial, or industrial development shall not be considered to be separate development projects. Instead, the development, as a whole, shall be considered to be a single development project. Hydrologic parameters that reflect the ultimate development condition shall be used in all engineering calculations.

19.k. All measures used to protect properties and waterways shall be employed in a manner that minimizes impacts on the physical, chemical, and biological integrity of rivers, streams and other waters of the state.

19.l. Any plan approved prior to July 1, 2014, that provides for SWM that addresses any flow rate capacity and velocity requirements for natural or man-made channels shall satisfy the flow rate capacity and velocity requirements for natural or man-made channels if the practices are designed to (i) detain the water quality volume and to release it over 48 hours; (ii) detain and release over a 24-hour period the expected rainfall resulting from the 1-year, 24-hour storm; and (iii) reduce the allowable peak flow rate resulting from the 1.5-, 2-, and 10-year, 24-hour storms to a level that is less than or equal to the peak flow rate from the site assuming it was in a good forested condition, achieved through multiplication of the forested peak flow rate by a reduction factor that is equal to the runoff volume from the site when it was in a good forested condition divided by the runoff volume from the site in its proposed condition, and shall be exempt from any flow rate capacity and velocity requirements for natural or man-made channels as defined in any regulations promulgated pursuant to §62.1-44.15:54 or 62.1-44.15:65 of the Act.

19.m. For plans approved on and after July 1, 2014, the flow rate capacity and velocity requirements of §62.1-44.15:52 A of the Act and this subsection shall be satisfied by compliance with water quantity requirements in the Stormwater Management Act (§62.1-44.15:24 et seq. of the Code of Virginia) and attendant regulations, unless such land-disturbing activities are in accordance with 9 VAC 25-870-48 of the VSMP Regulation or are exempt pursuant to subdivision C 7 of §62.1-44.15:34 of the Act.

19.n. Compliance with the water quantity minimum standards set out in 9 VAC 25-870-66 of the VSMP Regulation shall be deemed to satisfy the requirements of this subdivision 19.

5.0 STORMWATER MANAGEMENT PLAN

Where pre-development land cover conditions are changed significantly triggering post-construction stormwater quality and quantity requirements, post-construction BMPs may be required to comply with water quality and water quantity criteria of the Stormwater Management Regulations and Minimum Standard 19 of the Erosion and Sediment Control Regulations.

Successful management of post-construction runoff from the ROW will include the following non-structural BMPs: proper grading to minimize concentrated flow and restore pre-construction flow patterns; mitigation of soil compaction to improve infiltration and decrease runoff volume; and establishment of permanent vegetation. Annual maintenance and inspection programs for the ROW will be implemented to provide long-term vegetation management and runoff control. Through the implementation of these non-structural BMPs, post-construction runoff characteristics of the land surface after the completion of construction and final stabilization will be equivalent to pre-construction conditions. Additional details for each of the non-structural BMPs are presented in Section 5.1.

The VDEQ recognizes that construction of aboveground and underground linear utilities may not result in changes to the post-development runoff characteristics of the land surface after completion of construction and final stabilization. The installation of the ACP pipeline ROW is an example of such a project where the areas disturbed will be returned to their pre-development condition. Likewise, the pipe storage and contractor yards will be restored to pre-development conditions.

Access roads surfaced with gravel and designated to remain post-construction represent impervious surface, and therefore potentially result in increases in nutrient loading and runoff volume and peak flow rate. The stormwater quality and quantity evaluation for ACP, demonstrating compliance with Virginia's water quality and quantity criteria as set forth in 9 VAC 25-870-63 and 9 VAC 25-870-66, respectively, and related VDEQ guidance, is presented in Appendix X.

ESC and SWM Plans for each of the M&R Stations covered by this SWPPP are provided in Appendices E, F, G, and H.

5.1 NON-STRUCTURAL STORMWATER BMPS

5.1.1 Grading

Restoration of the ROW will begin after pipeline construction activities have been completed. Restoration measures include the re-establishment of final grades and drainage patterns as well as the installation of permanent erosion and sediment control measures to minimize post-construction erosion and to control post-construction stormwater runoff. Grading will be conducted prior to construction where necessary to provide a reasonably level work surface. Upon completion of construction, Dominion will:

- Restore the ground surface as closely as practicable to original contours to restore natural overland water flow patterns, aquifer recharge, and drainage patterns;

- Re-contour disturbed areas in a fashion designed to stabilize slopes, remove ruts and scars, and support successful revegetation; and

- Restore, to original or better condition, drainage ditches and culverts that are diverted or damaged during construction.

Additionally, in areas with slope inclinations equivalent to or greater than 30 percent and a slope length greater than 100 feet, restoration of steep terrain may include:

- Grading to the natural conditions;

- Installation of permanent erosion control devices (i.e., slope breakers) designed to reduce runoff velocity, divert water from the surface of the ROW, and encourage retention of soils;

- The use of additional structural materials (e.g., rock or woody debris) to provide an anchor for revegetation and deposition of soil; and

- The use of grading practices such as stair-stepping or grooving slopes or leaving slopes in a roughened condition by not fine-grading in accordance with VESCH **Std & Spec 3.29 (Surface Roughening)** on slopes with an inclination exceeding 3 horizontal to 1 vertical (3:1) or that have received final grading but will not be stabilized immediately.

In addition to these general measures, Dominion will develop and implement other additional site-specific measures, where warranted, to address land movement, surface erosion, backfill erosion, general soil stability when backfilling the trench, and restoring of the ROW in steep slope areas. Specifically, Dominion is committed to employing Best-in-Class (BIC) measures to protect the environment in steep slope areas. BIC is defined as the most efficient and/or protective design or configuration with the least environmental impact while providing reliable construction and operations.

The following special design and construction mitigation measures will be implemented during construction in steep slope areas:

- Targeted management and diversion of surface water around landslide sites, including the use of ditches, berms, slope breakers, and/or grading;

- Mitigation of surface erosion by armoring or otherwise stabilizing surface soils using riprap, coir cloth, hydroseeding, mulching, and/or tracking;

- Targeted management of water sources along the trench, including the use of trench breakers and/or added drainage piping in the trench;

- Targeted mitigation of seeps, springs, or other subsurface water encountered along the ROW using subsurface drains or other special drainage measures;

- Engineering of the backfill around or within steep slope areas to dry the backfill, facilitate compaction, improve backfill soil strength, and reduce saturation;

- Installation of targeted structures to stabilize backfill using engineered fill, retaining walls, sack-crete placements, key trenches, and/or shear trenches; and

- Reduction in surcharge on steep slope areas by reducing excess or saturated backfill.

5.1.2 Soil Compaction Mitigation

Soil compaction resulting from construction activities may reduce the potential for successful revegetation as well as decrease infiltration capability thereby increasing runoff potential. Fine-textured soils with poor internal drainage that are moist or saturated during construction are the most susceptible to compaction and rutting. Dominion will minimize impacts by implementing the mitigation measures for compaction and rutting as described in FERC's Plan and summarized below.

Compaction impacts will be mitigated through the use of tillage equipment during restoration activities such as a paraplow or similar implement. In areas where topsoil segregation occurs, plowing with a paraplow or other deep tillage implement to alleviate subsoil compaction will be conducted before replacement of the topsoil. In rocky or heavily rooted soils, compaction may be impossible to measure and rectify without additional damage. If compaction testing is impeded by rock or roots, Dominion may conclude that there is a suitable amount of large material in the soil to rectify potential compaction. Soil compaction will be remediated prior to re-spreading of salvaged topsoil.

Dominion will test for soil compaction using penetrometers or other appropriate devices:

- In residential and agricultural areas (e.g., active croplands, pastures, nurseries, and orchards) disturbed by construction activities;

- In other areas requested by the land managing agency or landowner;

- In undisturbed areas adjacent to the construction workspace with the same soil type under similar moisture conditions to approximate pre-construction conditions; and

- In areas identified by the EIs, who will be responsible for conducting subsoil and topsoil compaction testing and determining the need for corrective measures.

Where appropriate, such as in steep slope areas, compaction of the soil may be used intentionally to prevent surface erosion and slope instability in the form of landslides, landslips, or surficial slumping. A detailed evaluation and selection of control measures, including mechanical compaction of disturbed slopes, will be implemented in areas of steep terrain in accordance with the BIC Program.

5.1.3 Revegetation

A Restoration and Rehabilitation Plan (Attachment R) was prepared for the ACP to address post-construction restoration and rehabilitation activities. The Restoration and Rehabilitation Plan describes seedbed preparation, seed mix selection, seeding methods, lime and fertilizer application, mulching, and supplemental planting.

In accordance with Virginia Minimum Standards (MS-1), permanent or temporary soil stabilization will be applied to denuded areas within seven (7) days after final grade is reached on any portion of the site. Temporary soil stabilization will be applied within seven (7) days to denuded areas that may not be at final grade but will remain dormant for longer than 14 days. Permanent stabilization will be applied to areas that are to be left dormant for more than one (1) year. A permanent vegetative cover will be established on denuded areas not otherwise permanently stabilized. Per Virginia Minimum Standards (MS-3), permanent stabilization is achieved when vegetation is established that is uniform, mature enough to survive and will inhibit erosion.

5.1.4 Maintenance and Inspection

Post-construction maintenance and inspections will be used to monitor the success of the ROW restoration and control of stormwater runoff. Dominion will inspect disturbed areas after the first and second growing seasons to determine the success of revegetation. In agricultural areas, revegetation will be considered successful when the area has been revegetated and is similar to adjacent undisturbed areas of the same field. In all other non-forested areas, revegetation will be considered successful when the density and cover of non-nuisance vegetation is similar to adjacent areas that were not disturbed by construction activities. In Federal and Commonwealth forested areas, monitoring activities will be performed until reforestation is determined successful based on pre-defined success criteria, as determined through consultations with Federal and Commonwealth land managing agencies. In addition, routine operations inspections include visually inspecting the ROW once a year.

Property will be restored as close to its pre-construction condition as practical, unless otherwise specified by the landowner. In accordance with the FERC Plan, in non-cultivated uplands, a 10-foot-wide herbaceous corridor will be established and may be maintained annually, as needed. In addition, trees and brush will be cleared over the entire width of the permanent ROW on an as-needed basis not to exceed once every three years. In wetlands and riparian areas, the FERC Procedures allow a 10-foot-wide corridor centered over pipelines to be permanently maintained in an herbaceous state. The FERC Procedures also allow for cutting and removing trees greater than 15 feet in height within 15 feet of pipelines in wetlands.

5.2 PERMANENT SLOPE BREAKERS

In addition to non-structural BMPs, Dominion will construct permanent slope breakers during the construction phase of the Project. The slope breakers, installed primarily as an erosion control measure, also provide incremental benefit to stormwater management in the near-term post-construction period.

Permanent slope breakers will be installed during final grading, except in cultivated areas and lawns (unless requested by the landowner), using spacing as shown on the construction alignment sheets. Spacing for permanent slope breakers will be congruent with the FERC Plan requirements and are outlined in Table 5.2-1 below:

Table 5.2-1
Recommended Spacing for Permanent Slope Breakers (FERC V.B.2)

Trench Slope	Distance (feet)
5-15	300
>15-30	200
>30	100

NOTE: Slope breaker spacing in areas of steep terrain may be decreased as a result of the steep slopes BIC Program. Accordingly, this table may be revised to reflect more stringent spacing requirements.

The use of permanent slope breakers will shorten the drainage path, reduce runoff velocity, and direct water off the ROW to a stable well-vegetated area as sheet flow. In the absence of a stable well-vegetated area, an energy dissipating device, such as riprap outlet protection, will be installed at the end of the slope breaker. Analysis has been performed to confirm that the flow leaving the permanent waterbars is sheet flow and therefore can be discharged to a well-vegetated area. Further discussion is located in Appendix X.

6.0 POLLUTION PREVENTION PRACTICES AND PROCEDURES

The pollution prevention plan addresses potential pollutant-generating activities that may reasonably be expected to affect the quality of stormwater discharges from construction activities. Contractors will minimize the potential for a spill during construction activities by implementing appropriate measures to prevent and contain spills. Equipment and materials will be located on site to meet the provisions of this plan. The Contractors will comply with applicable environmental and safety laws and regulations and will ensure that a copy of this plan is available on site to Construction Work Crew members. Cleanup and other construction-related spill activities will be completed by the appropriate Contractors.

6.1 POLLUTION PREVENTION PLAN

Construction for the project will require the use of lubricating oils, aerosol spray lubricants, paint, gasoline/diesel fuels, and solvents. DETI's contractors will provide DETI with a written SPCC Plan, as necessary, that meets federal regulatory requirements. The SPCC Plan will be made available in the field on each construction spread.

DETI personnel have been instructed in established procedures include the implementation of precautionary steps to control and or eliminate spill or leaks that could potentially result in a discharge. Third party contractors are also trained on and required to comply with these procedures.

6.1.1 Spill Reporting Procedures

All spills will be reported immediately to DETI. DETI's contractor will report all spills to the Lead EI. The Lead EI will contact the DETI's Section Lead ECC. DETI's environmental team will report the spill to the applicable regulatory agencies if the spill meets or exceeds a reportable threshold. Reports will include the following information:

- Date, time, and location of the spill.
- Type of material spilled.
- Amount of material spilled.
- Extent of spill area.
- Whether the material has reached or has the potential to reach a wetland, waterbody, or karst feature.
- Status of spill containment and cleanup.
- Circumstances leading up to the spill.

Table 6.1.1-1 lists the federal and Commonwealth agencies that would be contacted, as appropriate, if a spill meets or exceeds a reportable threshold.

TABLE 6.1.1-1

Agency Notification List

Agency	Program	Contact Information	Hours of Operation	Applicable Areas Served
Federal				
Environmental Protection Agency	National Response Center	800-424-8802	24-hour hotline	All Areas
USFWS	Virginia Field Office	804-693-6694	Monday – Friday 8:30 am – 4:30 pm	All Areas
US Coast Guard	National Pollution Funds Center	1-800-280-7118	Monday – Friday 7:00 am – 4:00 pm	All Areas
Virginia				
Department of Environmental Quality (VDEQ)	Pollution Response Program-Valley Regional Office	540-574-7800	Monday – Friday 8:30 am – 4:30 pm	Augusta, Highland, and Nelson Counties
VDEQ	Pollution Response Program-Blue Ridge Regional Office	540-562-6700	Monday – Friday 8:30 am – 4:30 pm	Buckingham, Cumberland, Prince Edward, and Nottoway Counties
VDEQ	Pollution Response Program-Piedmont Regional Office	804-527-5020	Monday – Friday 8:30 am – 4:30 pm	Dinwiddie, Brunswick, and Greensville Counties
VDEQ	Pollution Response Program-Tidewater Regional Office	757-518-2000	Monday – Friday 8:30 am – 4:30 pm	Southampton County and Cities of Suffolk and Chesapeake
VDEQ	Pollution Response Program – Online Reporting System	Online form at: http://www.deq.virginia.gov/Programs/PollutionResponsePreparedness/PollutionReportingForm.aspx	24-hour online reporting option	Entire Commonwealth
Department of Emergency Management	Virginia Emergency Response Team	800-468-8892 or 804-674-2400	24-hour hotline	Entire Commonwealth
Department of Game and Inland Fisheries	Virginia Office	804-367-1000	Monday – Friday 8:30 am – 4:30 pm	All Areas

6.2 POTENTIAL POLLUTION SOURCES AND LOCATIONS

Stormwater at the site may come into contact with sediments, oils, and greases resulting from construction and maintenance operations. Typical material storage at pipeline construction sites includes diesel fuel, hydraulic oil, and welding gases (oxygen and acetylene). Table 6.2-1 outlines potential pollutants and their associated BMPs. Site-specific descriptions and maps depicting locations of fixed material storage containers and type of material located within the containers will be provided by the contractor prior to construction.

TABLE 6.2-1

Potential Pollutants and Associated Best Management Practices for the Atlantic Coast Pipeline Within Virginia

Pollutant Name	Source	Associated BMP(s)
Sediment	Erosion	Site-specific ESCs; BIC Steep Slopes controls; FERC Plan and Procedures.
Oil	Hydraulic oil, lubrication oil, greases, etc. associated with equipment & vehicle	Proper application, following manufacturer recommendations. Store minimum quantities necessary in tightly sealed containers, away from stormwater where possible, or within secondary containment. Dispose of used containers and excess material in accordance with manufacturer recommendations and local, state, and federal regulations. Vehicles and equipment will be inspected routinely for leaks, and will be repaired promptly to minimize or avoid drips.
Gasoline & diesel fuel	Fueling areas, mobile fueling truck, equipment & vehicles	Proper fueling practices, including personnel monitoring while fueling, routine inspections of fueling equipment, and use of secondary containment. Fuels stored on site will be within secondary containment subject to routine inspection, in accordance with SPCC Plan. Vehicles and equipment will be inspected routinely for leaks, and will be repaired promptly to minimize or avoid drips.
Paint	Construction & maintenance activities	Proper application, following manufacturer recommendations. Store minimum quantities necessary in tightly sealed containers, away from stormwater where possible, or within secondary containment. Dispose of used containers and excess material in accordance with manufacturer recommendations and local, state, and federal regulations.
Solvents	Construction, maintenance & cleaning activities	Proper application, following manufacturer recommendations. Store minimum quantities necessary in tightly sealed containers, away from stormwater where possible, or within secondary containment. Dispose of used containers and excess material in accordance with manufacturer recommendations and local, state, and federal regulations.
Antifreeze and coolants	Equipment & vehicles	Proper application, following manufacturer and equipment specifications. Store minimum quantities necessary in tightly sealed containers, away from stormwater where possible, or within secondary containment. Dispose of used containers and excess material in accordance with manufacturer recommendations and local, state, and federal regulations. Vehicles and equipment will be inspected routinely for leaks, and will be repaired promptly to minimize or avoid drips.
Welding gases	Construction & maintenance activities	Proper use, following manufacturer specifications. Store minimum quantities necessary in tightly sealed containers, away from stormwater where possible, or within secondary containment. Dispose of used containers and excess material in accordance with manufacturer recommendations and local, state, and federal regulations.
Drilling mud & fluids	Drilling & construction activities	Proper use of structures to divert and contain material, using secondary containment where applicable, in conjunction with designated storage areas and containers prior to off-site disposal in accordance with local, state, and federal regulations.
Bentonite	Drilling & construction activities	Proper use, following manufacturer specifications. Store minimum quantities necessary in tightly sealed containers, away from stormwater where possible, or within secondary containment. Dispose of used containers and excess material in accordance with manufacturer recommendations and local, state, and federal regulations.
Concrete	Construction & maintenance activities	Proper use, following manufacturer specifications. Store minimum quantities necessary in tightly sealed containers, away from stormwater where possible, or within secondary containment. Dispose of used containers and excess material in accordance with manufacturer recommendations and local, state, and federal regulations.
Adhesives, epoxy, etc.	Construction & maintenance activities	Proper use, following manufacturer specifications. Store minimum quantities necessary in tightly sealed containers, away from stormwater where possible, or within secondary containment. Dispose of used containers and excess material in accordance with manufacturer recommendations and local, state, and federal regulations.

TABLE 6.2-1 (cont'd)

Potential Pollutants and Associated Best Management Practices for the Atlantic Coast Pipeline within Virginia

Pollutant Name	Source	Associated BMP(s)
Wood preservatives	Construction & maintenance Erosion	Proper use, following manufacturer specifications. Store minimum quantities necessary in tightly sealed containers, away from stormwater where possible, or within secondary containment. Dispose of used containers and excess material in accordance with manufacturer recommendations and local, state, and federal regulations.
Fertilizers	Erosion	Site-specific ESCs; BIC Steep Slopes controls; FERC Plans & Procedures
Pesticides	Construction & maintenance	Site-specific ESCs; BIC Steep Slopes controls; FERC Plans & Procedures
Soap/detergents	Equipment & vehicles	Proper application, following manufacturer and equipment specifications. Store minimum quantities necessary in tightly sealed containers, away from stormwater where possible, or within secondary containment. Dispose of used containers and excess material in accordance with manufacturer recommendations and local, state, and federal regulations. Vehicles and equipment will be inspected routinely for leaks, and will be repaired promptly to minimize or avoid drips.
Sand Blast Media	Construction	Spent blast media will be stored in closed containers and disposed in accordance with manufacturer recommendations and local, state, and federal regulations

A mobile fueling truck will be used to transport gasoline/diesel fuels. Aboveground storage tanks located inside secondary containment will be used for fuel storage at contractor yards. All other oils and/or chemicals are expected to be delivered in 5-gallon steel containers or 55-gallon drums which will be on pallets, and located inside one or more secondary containment areas, such as mobile trailers or fixed containers, as needed.

As new materials are used on site, their pollution potential will be evaluated. Safety Data Sheets (SDSs) from the manufacturer will be maintained on site and staff will be trained on new materials applications and spill response actions necessary. It is the responsibility of the stormwater inspector to continually update and monitor the inventory list within this SWPPP, and to ensure that each potential pollutant listed above has a BMP installed to prevent discharges.

6.3 PREVENTION AND RESPONSE TO LEAKS AND SPILLS

At all times, DETI personnel or their third-party contractors will reduce and/or eliminate the potential for any spills or leaks. The first priorities after discovering a spill or leak are to protect the safety of personnel and the public and to minimize damage to the environment. Spills of non-hazardous materials on pavement or ground soil must be absorbed with sawdust, kitty litter, or other absorbent materials and disposed of with the trash at a licensed sanitary landfill. Spills of hazardous or industrial materials such as most solvents, gasoline, oil-based paints, and cement curing compounds on to pavement or ground soil require special handling by trained personnel. The contractor will contact the Environment Construction Coordinator for instructions regarding clean-up and disposal. Further discussion of spill prevention and response, including spill kit location and contents, will be located within DETI's contractors SPCC Plans, provided to DETI prior to any ground disturbance activities.

6.4 DISCHARGE PREVENTION

Contractors will minimize the potential for a spill during construction activities by implementing appropriate measures to prevent and contain spills. Equipment and materials will

be located on site. The Contractors will comply with applicable environmental and safety laws and regulations and will ensure that a copy of the Contractor's SPCC Plan is available on site to Construction Work Crew members, as needed. Cleanup and other construction-related spill activities will be completed by the appropriate Contractors.

Minimize Discharge of Soaps and Detergents:

- Soaps and detergents used will be restricted to off site as much as is practicable. In those instances when a soap or detergent is used, potential discharges/spills will be collected and disposed of as appropriate across the project areas.

Minimize Discharge of Pollutants and Equipment Washing:

- Vehicles and equipment should be washed prior to initial arrival at contractor yards and staging areas. DETI will install intermediate cleaning stations at additional locations based on non-native invasive plant species survey results, which will be identified and provided prior to construction. The washout areas are shown on the Construction Alignment Sheets located in Appendix A.

- A wash rack may be used to make washing more convenient and effective. Wash water must be carried away from the entrance to a settling area to remove sediment before discharge. The water may be allowed to infiltrate into upland soils within the work area, if necessary. Contractors and EIs will maintain logs documenting the cleaning history of each piece of equipment. The EI will use stickers or other visual marking to identify that equipment has been cleaned and inspection has been completed.

- Concrete washout areas may be located within the ROW, contractor yards, and aboveground facilities and will follow procedures in Section 6.6.5.

- Project activities having the potential to be discharges will be performed in a restricted area having water/discharge collection containers/structures. Such containers will be either temporary or permanent and properly managed including labeling for transport and disposal.

6.5 ALLOWABLE NON-STORMWATER DISCHARGES

Allowable non-stormwater discharges will be limited to the following list:

- Discharges from firefighting activities;

- Fire hydrant flushing;

- Waters used to wash vehicles or equipment where soaps, solvents, or detergents have not been used and the wash water has been filtered, settled, or similarly treated prior to discharge;

- Water used to control dust that has been filtered, settled, or similarly treated prior to discharge;
- Potable water sources, including uncontaminated waterline flushings;
- Routine external building wash down where soaps, solvents, or detergents have not been used and the wash water has been filtered, settled, or similarly treated prior to discharge;
- Pavement wash waters where spills or leaks of toxic or hazardous materials have not occurred (or where all spilled or leaked material has been removed prior to washing); where soaps, solvents, or detergents have not been used; and where the wash water has been filtered, settled, or similarly treated prior to discharge;
- Uncontaminated ground water or spring water;
- Foundation or footing drains where flows are not contaminated with process materials such as solvents;
- Uncontaminated excavation dewatering, including dewatering of trenches and excavations that have been filtered, settled, or similarly treated prior to discharge; and
- Landscape irrigation.

DETI will discharge hydrostatic test waters in accordance with the General Virginia Pollutant Discharge Elimination System (VPDES) Permit for Discharges from Petroleum Contaminated Sites, Groundwater Remediation, and Hydrostatic Tests (VAG 83).

6.6 GOOD HOUSEKEEPING

Housekeeping will consist of neat and orderly storage of materials and containerized fluids. Construction wastes may include, but are not limited to, excess soil materials, building materials, vehicle wash water, and sanitary wastes. The contractor will inspect the project area weekly and properly dispose of construction wastes. Wastes will be temporarily stored in sealed containers and regularly collected and disposed of at off-site, suitable facilities. If spills occur, prompt cleanup is required to minimize any comingling of waste materials with stormwater runoff.

Cleanup of trash and discarded materials will be conducted at the end of each workday. Cleanup will consist of patrolling the roadway, access areas, and other work areas to pick up trash, scrap debris, and other discarded materials. These materials will be placed in roll-off bins for trash/waste collection. Deposited sediment will be removed from paved surfaces using loaders, hand shovels, and/or brooms within 24 hours of tracking the sediment.

In addition, DETI will develop and maintain inspection schedules; correct deficiencies noted during these inspections; clean and maintain stormwater management system components; perform routine trash collection and disposal and grounds maintenance along the ROW; dispose

of trash generated by project activities; and familiarize employees with good housekeeping procedures, tips, reminders, and pollution prevention concepts.

6.6.1 Material and Waste Management

- Measures will be implemented for housekeeping materials management and litter control. Wherever possible, re-usable wastes will be segregated from other waste and stored separately for recycling. Manufacturer's recommendations for proper use and disposal will be followed. Whenever possible, all of the product in a container will be used before proper disposal of the container.

- Recyclable materials and general construction waste will be collected and stored in separate containers (e.g., dumpsters) at staging areas. The containers will have a lid to minimize windblown trash and accumulation of water. The container will be in an area that stormwater does not collect or drain to, and meet federal, Commonwealth, and municipal regulations. The containers will be emptied once they near capacity. Containers will not be allowed to overflow.

- DETI and third-party contract personnel will exercise practices that reduce or eliminate any spill or discharge of fluids or wastes.

- Petroleum products, which may be present at the construction site, include gasoline, diesel fuel, lubricant oils, hydraulic oils, used oils, and solvents.

- Incidents such as spills, leaks and improper dumping, along with other information describing the quantity and quality of the stormwater discharges should be included in DETI's records. Record keeping of quality and quantity of stormwater discharges may be accomplished through documentation of visual observations of stormwater discharges and BMP installation. Inspection and maintenance records must be kept on site for review by the VDEQ Director or designed representative.

- A hazardous substance release in any amount that enters or threatens to enter waters of the Commonwealth will be reported to the National Response Center and to VDEQ.

- Material stored on site will be stored in a neat, orderly manner in appropriate containers and, if reasonably possible, under a roof or other enclosure. Products will be kept in their original containers with the original manufacturer's label, unless the containers are not re-sealable.

- Original labels and SDSs will be retained for the period of time that the product is being utilized on site in accordance with applicable OSHA regulations.

- Substances will not be mixed unless necessary for the construction activity and as recommended by the manufacturer.

6.6.2 Vehicle Fueling and Maintenance Areas

Equipment will be refueled with extreme care under continual surveillance and away from wetland and associated waterbodies. A combination of fixed storage tanks and mobile fuel tanker trucks will be used to store and deliver fuel to on-site equipment.

Equipment will be maintained in good operating condition and inspected regularly for leaks. Routine scheduled maintenance and identified necessary maintenance will only take place within the staging areas unless equipment is not able to be moved to staging areas for unplanned, emergency repairs. In the event of planned major maintenance, the vehicle should be transported off site for service. Any liquids leaked during maintenance will be cleaned up and disposed of properly.

Repairs will only be made outside of the staging area if equipment requires emergency repairs on site (e.g., unexpected hydraulic hose rupture or similar) and cannot be moved to the staging area. As soon as equipment can be safely moved, the equipment will be moved to staging areas for continued maintenance. The EI will be notified of all necessary emergency repairs prior to them occurring. Proper containers and/or disposable sorbent materials will be placed under the equipment to collect drips and leaked liquids. Impacted soils and spilled material will be properly cleaned up, contained, and disposed of properly.

6.6.3 Sanitary Waste Facilities

Portable toilets should be provided in the staging areas, generally located at road crossings, during the entire length of the construction activities. The portable toilets will be in an area away from heavy traffic flow and concentrated stormwater flows or stormwater collection areas. The portable toilets should be routinely serviced to maintain sanitary conditions. Portable toilets will be placed in an area at a reasonable distance from any waterbody or wetland.

6.6.4 Staging Areas

Staging areas should be maintained on site throughout the construction activities. The staging areas should be used as a place to store equipment, construction materials, waste, and additional construction related material. The staging areas will be in an area away from concentrated stormwater drainage paths. The contractor is responsible for storing and securing all tools, materials, and waste.

6.6.5 Washout Areas

A washout area for excess concrete and cleaning of concrete delivery vehicles will be constructed near areas where concrete pours will occur. Concrete wash water or green concrete will be managed to minimize the potential for this material to reach identified water and wetland resources.

The washout area will be installed in an upland area away from potential wetlands and streams. It will be above grade, with a minimum width of 10 feet. The base and sides of the washout area will be covered with a plastic sheeting at least 10 mils thick without any holes or tears. The wash area will be inspected for any leaks, holes, and tears in the plastic on a daily basis. If the washout area gets to 75 percent capacity, the area should be cleaned out. Once

concrete mixing activities are completed, the concrete waste area should be allowed to harden, be broken up, and then disposed of properly.

Concrete coating activities and washout activities will not be performed within 100 feet of wetlands, waterbodies, or springs, or with 300 feet of karst features unless the location is an existing industrial site designated for such use.

7.0 ROLES AND RESPONSIBILITIES

7.1 QUALIFIED PERSONNEL

DETI has established the following qualified personnel for the Project:

The **Construction Site Supervisor** will have direct oversight of all personnel that prepare, construct, maintain, and rehabilitate a given project. The Supervisor also has control over site-specific construction plans, including the ability to make modifications to those plans. This person must ensure compliance with ESC, SWPPP, and VSMP requirements as well as compliance with DETI's Standards and Specifications. The Construction Site Supervisor is authorized to direct workers at a site to carry out activities in accordance with DETI's Standards and Specifications and other permit conditions. The Construction Site Supervisor must be certified as a Responsible Land Disturber by VDEQ. The Construction Site Supervisor has primary responsibility for implementing the SWPPP and will be responsible for ensuring that construction activities are performed in accordance with contract specifications and will be responsible for the following:

- Ensuring that Project construction activities, environmental mitigation measures, and operations are conducted in strict compliance with federal, Commonwealth, and local environmental health and safety regulations and environmental permits;

- Coordinating on-site inspections to confirm the continued proper use, storage, and disposal of on-site construction materials and containers and to ensure that procedures are in place to minimize the potential for pollutants to escape into the environment;

- Providing pollution prevention briefings to the construction contractors prior to the commencement of construction to ensure adequate understanding of the proper management practices as documented in this plan; and

- Handling emergency situations such as employee accidents, fires, and releases of hazardous substances stored at the Project site during construction. The Construction Site Supervisor will coordinate with local fire officials regarding on site fire safety and emergency response procedures, as required.

The **Construction Site Supervisor** (Primary) is responsible for notifying the ECC and Station operating personnel of a reportable release incident resulting from construction activities. SWPPP key personnel contact information will be provided once finalized.

The Program Administrator will be responsible for the management and coordination of DETI's Standards and Specifications for ESC and SWM. The Program Administrator must be certified as a Combined Administrator by VDEQ or provisionally certified. This role may be conducted by a third party as directed by DETI.

Spill Coordinator – Each Contractor will appoint a Response Coordinator who will be responsible for coordinating Contractor Work Crews for response spill cleanup, conducting site

investigations, and completing the required reports and notifications. The Response Spill Coordinator will report spills to an EI, who will initiate the spill reporting process. The Spill Coordinator will be responsible for completing a Spill Report Form within 24 hours of the occurrence of a spill, regardless of the size of the spill. A spill report form will be provided within the Contractor's SPCC Plan.

Contractor Work Crews – Contractor Work Crews will comply with this SWPPP and the Contractor's SPCC Plan and will notify the crew foreman or Spill Coordinator immediately of a spill of fuel or other hazardous material, regardless of the volume of the spill.

Environmental Inspectors (EI) – The EI must be certified as an ESC (and SWM, when applicable) Inspector by VDEQ or provisionally certified. At least one EI is required for each construction spread during construction and restoration. The EI will serve as the primary point of contact for on-site environmental compliance. The EI has the authority to stop activities that violate the environmental conditions of the FERC's orders, stipulations of other environmental permits or approvals, or landowner easement agreements; and to order appropriate corrective action. The EI will provide expert technical support on a wide range of environmental issues and is responsible for:

- ESC Plan, FERC Plan and Procedures, and environmental conditions of FERC's Orders compliance;
- Verifying that the LOD and locations of access roads are visibly marked before clearing and are maintained throughout construction;
- Proper maintenance of environmental records on site;
- Advising the ECC on site-specific environmental concerns and making it advisable to restrict or delay construction activities to avoid topsoil mixing or excessive compaction;
- Educating company inspectors and personnel on site-specific environmental concerns and requirements;
- Reporting any non-compliance and problem areas;
- Monitoring the Contractors' compliance with the provisions of the Contractor's SPCC Plan to ensure that spill resources are allocated and cleanup is accomplished in accordance with this plan and applicable regulatory requirements;
- Working in conjunction with DETI's environmental team to promptly report spills to appropriate federal, Commonwealth, and local agencies, as required, and to coordinate with these agencies regarding contacting additional parties or agencies as may be required;

- Identifying, documenting, and overseeing corrective actions, as necessary to bring an activity back into compliance;

- Verifying the location of signs and highly visible flagging marking the boundaries of sensitive resource areas, waterbodies, wetlands, or areas with special requirements along the construction ROW;

- Ensuring that the design of slope breakers will not cause erosion or direct water into sensitive environmental resource areas, including cultural resource sites, wetlands, waterbodies, and sensitive species habitats;

- Verifying that the soils imported for agricultural or residential use are certified as free of noxious weeds and soil pests, unless otherwise approved by the landowner;

- Ensuring that erosion control devices are properly installed to prevent sediment flow into sensitive environmental resource areas (e.g., wetlands, waterbodies, cultural resource sites, and sensitive species habitats) and onto roads, and determining the need for additional erosion control devices;

- Ensuring the repair of ineffective temporary erosion control measures within 24 hours of identification, or as soon as conditions allow if compliance with this time frame would result in greater environmental impacts;

- Identifying areas that should be given special attention to ensure stabilization and restoration after the construction phase; and

- Verifying that locations for any disposal of excess construction materials for beneficial reuse comply with FERC specifications.

The **Environmental Construction Coordinator** (ECC) will serve as part of the environmental team relative to environmental compliance within DETI. The ECC has the responsibility of ensuring full compliance with applicable laws, environmental rules, regulations, permits, and company policies that pertain to their projects. The ECC's roles and responsibilities may include:

- Ensure compliance with applicable federal, Commonwealth, and local environmental regulations, permits, company standards, and procedures, and facility procedures at assigned projects;

- Promote environmental stewardship;

- Coordinate with the EIs and contractors to ensure site environmental compliance;

- Serve as primary site coordinator with Dominion Energy Environmental Services, internal departments, and external agencies regarding environmental issues;

- Serve as contact with community or local public to resolve environmental emergencies, complaints, or problems;
- Maintain environmental permits, plans, and various compliance records; and
- Assist with environmental emergency response activities.

Erosion and Sediment Control and Stormwater Inspector will be responsible for the inspection and compliance with ESC and SWM/SWPPP practices, as applicable, as well as those practices outlined in DETI's Standards and Specifications. These responsibilities will typically be shared between the EI and the ESC/SWM Inspector. The Inspector must be certified as an ESC (and SWM when applicable) Inspector by VDEQ or provisionally certified. This role may be conducted by a third party firm preparing the plans as directed by DETI. DETI must ensure that inspection staff is suitable for the size and scope of the project. The ESC Inspector is the individual recognized by the VDEQ as training in the best practices and responsibilities of a stormwater inspection during and after construction. The individual must successfully complete a 2-day course offered by the VDEQ.

The list of individuals conducting inspections and their qualifications are listed in Table 7.1-1.

TABLE 7.1-1

Qualified Erosion and Sediment Control Inspectors

Name	Qualifications	Phone Number
Robert S. Prescott	Completed 2-day Inspector for ESC Training course	804-273-2550

This table will be updated with additional ESC Inspectors once DETI has obtained necessary qualified personnel prior to any ground disturbance activities.

The **Plan Reviewer** will be responsible for the review of ESC and SWM portions of project plans for compliance with DETI's Standards and Specifications and applicable laws and regulations. The Plan Reviewer must be certified as an ESC (and SWM when applicable) Plan Reviewer by VDEQ or provisionally certified. This role may be conducted by a third party firm preparing the plans as directed by DETI.

7.2 RESPONSIBLE LAND DISTURBER

A Responsible Land Disturber is an individual from the project or development team, who will be in charge of and responsible for carrying out a land-disturbing activity covered by an approved plan, who (i) holds a Responsible Land Disturber certificate of competence, (ii) holds a current certificate of competence from the VDEQ in the areas of Combined Administration, Program Administration, Inspection, or Plan Review, (iii) holds a current Contractor certificate of competence for erosion and sediment control, or (iv) is licensed in Virginia as a professional engineer, architect, certified landscape architect, or land surveyor.

The identified person designated as the Responsible Land Disturber who will be in charge of and responsible for carrying out the land-disturbing activity and inspections of the ESC controls will be provided prior to land disturbance activities.

8.0 INSPECTION AND MAINTENANCE

8.1 INSPECTION FREQUENCY

8.1.1 Spring, Summer, and Fall

Routine inspections will be conducted by DETI or designated personnel, trained in stormwater controls and BMPs. Inspection frequency requirements are stipulated by both the FERC Plan and the Commonwealth of Virginia Stormwater Management Act, the Virginia Erosion and Sediment Control Law and associated regulations, where applicable.

Virginia Inspection Frequency

The Commonwealth of Virginia inspection frequency depends on whether the area of land disturbance discharges to exceptional waters or waters impaired for sediment, sediment-related parameter, or nutrients. DETI has elected to apply the most stringent inspection frequency to the entire ACP Project, regardless of location within an exceptional or impaired waterbody watershed. Therefore, SWPPP inspections will be conducted at a frequency of at least once every 4 business days.

FERC Inspection Frequency:

- On a daily basis in areas of active construction or equipment operation;
- On a weekly basis in areas with no construction or equipment operation; and
- Within 24 hours of each stormwater event (runoff from precipitation, snowmelt, and surface runoff and drainage, including rainfall events resulting in 0.5-inch or more).

EIs will perform inspections of all temporary ESC measures in accordance with FERC requirements and will record the results of the inspections on a Daily Report. In addition, inspections will be performed in accordance with Virginia Stormwater Management Act, the Virginia Erosion and Sediment Control Law, and associated regulations, where applicable and the requirements listed below in Section 8.3. These inspections will be conducted every 4 business days as indicated above and will be recorded on the DETI ECS/VPDES Inspection Report provided in Appendix Y.

8.1.2 Winter

According to Virginia Stormwater Management Act, the Virginia Erosion and Sediment Control Law, and associated regulations, where applicable, where areas have been temporarily stabilized or land-disturbing activities will be suspended due to continuous frozen ground conditions and stormwater discharges are unlikely:

- The inspection frequency may be reduced to **once per month**. If weather conditions (such as above-freezing temperatures or rain or snow events) make

discharges likely, the operator will immediately resume the regular inspection frequency [CGP Part II.F.2.b].

DETI will also follow additional inspection protocol as outline in the *Winter Construction Plan* submitted to FERC:

- Following pipeline construction activities and prior to the resumption of restoration activities the following Spring, DETI will inspect the condition of erosion control devices **within 48 hours of a significant rain or snow melt event,** if accessible and weather permitting, to ensure that the devices remain in place and are effective in controlling snow melt and Spring runoff.

8.2 REPRESENTATIVE INSPECTION LOCATIONS

Representative inspections may be utilized for utility line installation, pipeline construction, or other similar linear construction activities provided that:

- Temporary or permanent soil stabilization has been installed and vehicle access may compromise the temporary or permanent soil stabilization and potentially cause additional land disturbance increasing the potential for erosion.

- Inspections occur on the same frequency as other construction activities.

- Control measures are inspected along the construction site 0.25 mile above and below each access point (i.e., where a roadway, undisturbed ROW, or other similar feature intersects the construction activity and access does not compromise temporary or permanent soil stabilization).

- Inspection locations are provided in the inspection report.

- Representative inspections will include all outfalls discharging to surface waters.

8.3 INSPECTION REQUIREMENTS

As part of the inspection, DETI personnel or its contractor will at a minimum include the following as set forth in the Virginia Stormwater Management Act, the Virginia Erosion and Sediment Control Law, and associated regulations, where applicable:

- Record the date and time of the inspection and, when applicable, the date and rainfall amount of the last measurable storm event.

- Record the information and a description of any discharges occurring at the time of the inspection.

- Record any land-disturbing activities that have occurred outside of the approved ESC Plan.

- Inspect the following for installation in accordance with the approved ESC Plan, identification of any maintenance needs, and evaluation of effectiveness in minimizing sediment discharge, including whether the control has been inappropriately or incorrectly used:

    a. All perimeter ESCs, such as silt fence;

    b. Soil stockpiles, when applicable, and borrow areas for stabilization or sediment trapping measures;

    c. Completed earthen structures, such as dams, dikes, ditches, and diversions for stabilization;

    d. Cut and fill slopes;

    e. Sediment basins and traps, sediment barriers, and other measures installed to control sediment discharge from stormwater;

    f. Temporary or permanent channel, flume, or other slope drain structures installed to convey concentrated runoff down cut and fill slopes;

    g. Storm inlets that have been made operational to ensure that sediment laden stormwater does not enter without first being filtered or similarly treated; and

    h. Construction vehicle access routes that intersect or access paved roads for minimizing sediment tracking.

- Inspect areas that have reached final grade or that will remain dormant for more than 14 days for initiation of stabilization activities.

- Inspect areas that have reached final grade or that will remain dormant for more than 14 days for completion of stabilization activities within 7 days of reaching grade or stopping work.

- Inspect for evidence that the approved ESC Plan prepared in accordance with VDEQ-approved standards and specifications has not been properly implemented. This includes but is not limited to:

    a. concentrated flows of stormwater in conveyances such as rills, rivulets, or channels that have not been filtered, settled, or similarly treated prior to discharge, or evidence thereof;

    b. sediment laden or turbid flows of stormwater that have not been filtered or settled to remove sediments prior to discharge;

    c. sediment deposition in areas that drain to unprotected stormwater inlets or catch basins that discharge to surface waters. Inlets and catch basins with

failing sediment controls due to improper installation, lack of maintenance, or inadequate design are considered unprotected;

d. sediment deposition on any property (including public and private streets) outside of the construction activity;

e. required stabilization has not been initiated or completed on portions of the site;

f. sediment basins without adequate wet or dry storage volume or sediment basins that allow the discharge of stormwater from below the surface of the wet storage portion of the basin;

g. sediment traps without adequate wet or dry storage or sediment traps that allow the discharge of stormwater from below the surface of the wet storage portion of the trap; and

h. land disturbance outside of the approved area to be disturbed.

- Inspect pollutant generating activities identified in the pollution prevention plan for the proper implementation, maintenance, and effectiveness of the procedures and practices.

- Identify any pollutant generating activities not identified in the pollution prevention plan.

- Identify and document the presence of any evidence of the discharge of pollutants prohibited by the Virginia Stormwater Management Act, the Virginia Erosion and Sediment Control Law, and associated regulations, where applicable.

8.4 INSPECTION REPORT

Each inspection will be documented in an inspection report to include at a minimum:

- The date and time of the inspection and, when applicable, the date and rainfall amount of the last measurable storm event;

- Summarized findings of the inspection (see inspection requirements in Section 8.3);

- Representative inspection locations which are used when temporary or permanent soil stabilization has been installed and vehicle access may compromise the temporary or permanent soil stabilization and potentially cause additional land disturbance (see Section 8.2);

- The location(s) of prohibited discharges;

- The location(s) of control measures that require maintenance;

- The location(s) of control measures that failed to operate as designed or proved inadequate or inappropriate for a particular location;

- The location(s) where there is evidence that the approved ESC Plan prepared in accordance with VDEQ-approved standards and specifications has not been properly implemented (see Section 8.3, number 7);

- The location(s) where any additional control measure is needed that did not exist at the time of inspection;

- A list of corrective actions required (including any changes to the SWPPP that are necessary) as a result of the inspection or to maintain permit compliance;

- Documentation of any corrective actions required from a previous inspection that have not been implemented; and

- The name, date, signature, and qualifications of the qualified personnel and the operator or its duly authorized representative.

The inspection report and any corrective actions taken will be retained by DETI as part of the SWPPP for at least three years. The inspection reports will identify any incidents of noncompliance. Where an inspection report does not identify any incidents of noncompliance, the report will contain a certification that the construction activity is in compliance with the SWPPP and the Virginia Stormwater Management Act, the Virginia Erosion and Sediment Control Law, and associated regulations, where applicable. The report will be signed and certified by a responsible corporate officer or a duly authorized representative of that person (see Sections 10.11 and 10.12).

Copies of general field inspection forms are included in Appendix Y and will be maintained by DETI or DETI representatives. The results of the inspections will be used to update and revise the list of potential pollutant sources.

8.5 CORRECTIVE ACTION

DETI will implement the corrective action(s) identified as a result of an inspection as soon as practicable but no later than 7 days after discovery or a longer period as approved by the VSMP authority. If approval of a corrective action by a regulatory authority (e.g., the VDEQ) is necessary, additional control measures will be implemented to minimize pollutants in stormwater discharges until such approvals can be obtained.

If site inspections identify an existing control measure that needs to be modified or if an additional control measure is necessary for any reason, implementation will be completed prior to the next anticipated measurable storm event. If implementation prior to the next anticipated measurable storm event is impracticable, then alternative control measures will be implemented as soon as practicable, but no later than 7 days after discovery or a longer period as established by the VSMP authority.

DETI may be required to remove accumulated sediment deposits located outside of the construction activity as soon as practicable in order to minimize environmental impacts. DETI will notify the VDEQ as well as obtain all applicable federal, Commonwealth, and local authorizations, approvals and permits prior to the removal of sediments accumulated in surface waters, including wetlands.

8.6 POST CONSTRUCTION INSPECTION

Post-construction maintenance and inspections will be used to monitor the success of the ROW restoration and management of stormwater runoff. DETI will inspect disturbed areas after the first and second growing seasons to determine the success of revegetation. Initial monitoring activities may be extended beyond the first and second growing seasons as a result of consultations with federal and Commonwealth land managing agencies, including the VDEQ. In addition, routine operations inspections include visually inspecting the ROW once a year.

A long-term maintenance plan will be developed and reviewed by the VDEQ prior to the completion of project construction activities. The long-term maintenance plan will be implemented once construction has been comleted across all LOD areas.

9.0 EMPLOYEE TRAINING

Prior to the start of construction, DETI will conduct environmental and field training for company and contractor personnel. The training program will be focused on this SWPPP; the VDEQ VESCH; the FERC Plan and Procedures; DETI's *Best-in-Class Steep Slopes Program;* other construction, restoration, and mitigation plans, including the USFS COM Plan; and applicable permit conditions. In addition, DETI will provide large-group training sessions before each work crew commences construction with follow-up training for groups of newly assigned personnel. Following initial training, the training will be conducted on a quarterly basis until construction activities are completed.

Experienced, well-trained personnel are essential for the successful implementation of the SWPPP. Contractors will provide pollution prevention, spill prevention and response training to their work crews as well as educate work crews on how to conduct daily inspections of ESC mechanisms. The training program will be designed to assure adequate understanding of the proper management practices, improve awareness of potential hazards, pollution control laws, and proper operation and maintenance of equipment. Contractors will train all employees who handle fuels and other regulated substances to prevent spills and to quickly and effectively contain and cleanup spills that may occur in accordance with applicable regulations. In addition the program will address preventative maintenance, inspection and monitoring, housekeeping practices, types and causes of slope failures, materials needed on site to prevent and address a slope failure, etc. Contractors will also train all employees on the methods by which to inspect, properly install, and repair ESC structures; and on the response procedures in the event an ESC structure fails. Training records will be included in personnel files. Copies of blank training records are included as Appendix Z.

10.0 NOTIFICATION, RECORDKEEPING, AND REPORTING

10.1 PLAN AVAILABILITY

Operators with day-to-day operational control over SWPPP implementation will have a copy of the SWPPP available at a central location on site for use by those identified as having responsibilities under the SWPPP whenever they are on the construction site.

DETI will make the SWPPP and all amendments, modifications, and updates available upon request to the VDEQ, the EPA, local government officials, or the operator of a municipal MS4 receiving discharges from the construction activity. If an on-site location is unavailable to store the SWPPP when no personnel are present, notice of the SWPPP's location must be posted near the main entrance of the construction site.

DETI will make the SWPPP available for public review in an electronic format or in hard copy. If not provided electronically, public access to the SWPPP may be arranged upon request at a time and at a publicly accessible location convenient to DETI or his/her designee but will be no less than once per month and will be during normal business hours. Information not required to be contained within the SWPPP by Virginia Stormwater Management Act, the Virginia Erosion and Sediment Control Law, and associated regulations, where applicable, is not required to be released.

10.2 FERC VARIANCE PROCESS

During construction, unforeseen or unavoidable site conditions can result in the need for changes from approved mitigation measures and construction procedures. Additionally, the need for route realignments, extra workspaces, or access roads outside of the previously approved construction work area may arise. These changes will be handled in the form of variance requests to be submitted by DETI and reviewed and approved or denied by FERC. The three variance levels, review and distribution process, and decision-making authority proposed for use for the project are discussed below.

Level 1 variances are site-specific, minor, performance-based changes to project specifications or mitigation measures that provide equal or better protection to environmental resources. These minor variance requests can be reviewed and either approved or denied by the FERC Third-Party Compliance Monitor (Compliance Monitor) in the field during normal construction operations.

To initiate a Level 1 variance request, the Lead EI or other designated DETI representative will fill out a variance request form and obtain the appropriate signatures. The Lead EI will then contact the Compliance Monitor to review the proposed change. The Lead EI and the Compliance Monitor will work together to evaluate the site-specific situation and determine if the request is appropriate. The Compliance Monitor may approve a Level 1 variance request if the results of implementing the change will provide equal or better protection for the resource than the original mitigation measure or if the original mitigation measure is not applicable to that specific site. If a Level 1 variance request is approved in the field, the Compliance Monitor will sign the variance request form. A Level 1 variance request can be implemented in the field as soon as it is approved by the Compliance Monitor. The Compliance

Monitor will document the variance approval in his/her daily monitoring report and transmit the approved form to the FERC Third-Party Compliance Manager (Compliance Manager). If the variance exceeds the Compliance Monitor's authority level, the Compliance Monitor will inform the Lead EI that a Level 2 or Level 3 variance request is required.

A Level 2 variance request exceeds the field decision authority of the Compliance Monitor and requires processing by the Compliance Manager. Level 2 variance requests generally involve project changes that would affect an area outside of the previously approved work area, but within the corridor previously surveyed for cultural resources and sensitive species. Level 2 variance requests typically require the review of supplemental documents, correspondence, and records. Level 2 variance requests may also be submitted for changes that would extend beyond the corridor previously surveyed for sensitive resources if additional cultural and biological resource surveys are conducted and documentation of the surveys and any applicable agency correspondence are submitted with the variance request. In this case, the survey results must indicate a "no effect" determination, and the Compliance Manager must consult with the FERC Environmental Project Manager before authorizing the variance. Depending on the sensitivity of the affected resource and the additional approvals that are necessary, the FERC Environmental Project Manager may determine that the request must be submitted as a Level 3 variance request.

To initiate a Level 2 variance request, the Lead EI or other designated DETI representative will fill out a variance request form, prepare the appropriate supporting documentation, and obtain the required signatures. The designated DETI representative will complete and submit the variance request form and supporting documentation by e-mail (scanned copy) or fax to the Compliance Manager. The Compliance Manager will review the request and supporting documentation and consult with the FERC Environmental Project Manager as necessary. The Compliance Manager may also discuss the request with the Compliance Monitor. If the Level 2 variance request is approved, the Compliance Manager will sign the variance request and e-mail the approved form (scanned copy) to the designated DETI representatives, the Compliance Monitor, and the FERC Environmental Project Manager. The variance may be implemented in the field as soon as the approved variance is received. If the variance exceeds the Compliance Manager's authority level, the Compliance Manager will inform the Lead EI or other designated DETI representative that a Level 3 variance request is required.

A Level 3 variance request exceeds the decision authority of the Compliance Manager. The designated DETI representative will file a formal written request with FERC and include supporting documentation as necessary. The FERC Environmental Project Manager will review the variance request and then issue a formal approval or denial letter.

10.3 AMENDMENT AND NOTIFICATION REQUIREMENTS

DETI will amend the SWPPP whenever there is a change in the design, construction, operation, or maintenance that has a significant effect on the discharge of pollutants to surface waters and that has not been previously addressed in the SWPPP. Revisions may include additional or modified control measures identified in the field during construction. These minor, field-approved changes will be documented on the construction alignment sheets, site plans,

and/or inspection reports. Likewise, in the event that a FERC variance is necessary, the FERC variance request forms and approvals will be adopted and incorporated by reference into the SWPPP. Amendments, modifications, or updates to the SWPPP will be signed in accordance with Virginia Stormwater Management Act, the Virginia Erosion and Sediment Control Law and associated regulations, where applicable.

DETI will amend the SWPPP whenever there is a change in the design, construction, operation, or maintenance that has a significant effect on the discharge of pollutants to surface waters and that has not been previously addressed in the SWPPP.

The SWPPP must be amended if, during inspections or investigations by DETI's qualified personnel, or by local, Commonwealth, or federal officials, it is determined that the existing control measures are ineffective in minimizing pollutants in discharges from the construction activity. Revisions to the SWPPP will include additional or modified control measures designed and implemented to correct problems identified. If approval by the VDEQ is necessary for the control measure, revisions to the SWPPP will be completed no later than 7 calendar days following approval.

Amendments, modifications, or updates to the SWPPP will be signed in accordance with Virginia Stormwater Management Act, the Virginia Erosion and Sediment Control Law and associated regulations, where applicable.

The SWPPP must clearly identify the contractor(s) that will implement and maintain each control measure identified in the SWPPP. The SWPPP will be amended to identify any new contractor that will implement and maintain a control measure.

10.4 PRE-CONSTRUCTION NOTIFICATION

DETI is responsible for providing project tracking and e-notification to VDEQ of all regulated land-disturbing activities subject to DETI's Standards and Specifications to comply with applicable ESC requirements pursuant to 9 VAC 25-840-65 and applicable SWM requirements pursuant to 9 VAC 25-870-170.

The DETI project team must electronically notify the VDEQ of any project that DETI intends to construct in Virginia to start the project permitting process. The following information is required to be included in the e-notification 2 weeks prior to initiating the regulated land-disturbing activity:

- Project name or project number;
- Project location (including nearest intersection, latitude, and longitude);
- On-site project manager name and contact information;
- Responsible Land Disturber name and contact information;
- Project description;
- Acreage of disturbance for the project; and
- Project start and finish date.

Notification must be made electronically to Linearprojects@deq.virginia.gov. Other questions should be directed to Larry Gavan (804-698-4040) and Hannah Zegler (804-698-4206).

10.5 NOTIFICATION SCHEDULE

In accordance with DETI's Standards and Specifications, the plan approving authority (i.e., VDEQ) must be notified one week prior to the pre-construction conference, one week prior to the commencement of the land disturbing activity, and one week prior to the final inspection.

10.6 RECORDKEEPING

10.6.1 Stormwater Pollution Prevention Plan

The SWPPP (including all amendments, modifications, and updates) will be maintained for a period of three years after completion of the Project or Commonwealth permit termination. This period of retention will be extended automatically during the course of any unresolved litigation regarding the regulated activity or regarding control standards applicable to DETI, or as requested by the State Water Control Board.

10.6.2 Erosion and Sediment Control Inspection and Corrective Action Records

Inspections of land-disturbing activities will be recorded on an inspection form (Appendix Y). The inspection reports and any corrective actions taken must be retained as part of the SWPPP for at least three years. The inspection reports will identify any incidents of noncompliance. Documentation will include replaced or modified controls where periodic inspections or other information have indicated that the controls have been used inappropriately or incorrectly. Where an inspection report does not identify any incidents of noncompliance, the report will contain a certification that the construction activity is in compliance with the SWPPP and the Virginia Stormwater Management Act, the Virginia Erosion and Sediment Control Law and associated regulations, where applicable.

10.6.3 Grading and Stabilization Activity Records

A record of dates when the following occurs will be maintained for the duration of the Project:

- Major grading activities;
- Construction activities temporarily or permanently cease on a portion of the site;
- Stabilization measures are initiated;
- Areas have reached final stabilization and no further SWPPP or inspection requirements apply; and
- Properties are no longer under the legal control of DETI.

The grading and stabilization records will be signed and certified in accordance with Virginia Stormwater Management Act, the Virginia Erosion and Sediment Control Law and associated regulations, where applicable.

10.6.4 Prohibited Discharge Records

Reports of unauthorized discharges including the discharge volume released, what actions were taken to minimize the impact of the release, and measures taken to prevent reoccurrence of a prohibited discharge will be retained with the SWPPP. Prohibited discharge records will be signed in accordance with 9 VAC 25-880-70 Part III K.

10.6.5 Construction Drawings

A construction record drawing for all permanent, structural SWM facilities ("as-built") with seal and signature of a Virginia-licensed Professional Engineer must be maintained by DETI in perpetuity, or until the stormwater facility is removed.

10.7 REPORTS OF UNAUTHORIZED DISCHARGES

Pursuant to § 62.1-44.5 of the Code of Virginia, except in compliance with a permit issued by the VDEQ, it will be unlawful to cause a stormwater discharge from a construction activity.

Any operator who discharges or causes or allows a discharge of sewage, industrial waste, other wastes, any noxious or deleterious substance or a hazardous substance or oil in an amount equal to or in excess of a reportable quantity established under either 40 CFR Part 110, 40 CFR Part 117, 40 CFR Part 302, or § 62.1-44.34:19 of the Code of Virginia that occurs during a 24-hour period into or upon surface waters, or who discharges or causes or allows a discharge that may reasonably be expected to enter surface waters, will notify the Department of Environmental Quality of the discharge immediately upon discovery of the discharge, but in no case later than within 24 hours after said discovery. A written report of the unauthorized discharge will be submitted to the VDEQ within 5 days of discovery of the discharge. The written report will contain:

- A description of the nature and location of the discharge;
- The cause of the discharge;
- The date on which the discharge occurred;
- The length of time that the discharge continued;
- The volume of the discharge;
- If the discharge is continuing, how long it is expected to continue;
- If the discharge is continuing, what the expected total volume of the discharge will be; and

- Any steps planned or taken to reduce, eliminate and prevent a recurrence of the present discharge or any future discharges not authorized by the Virginia Stormwater Management Act, the Virginia Erosion and Sediment Control Law, and associated regulations, where applicable.

Discharges reportable to the VDEQ under the immediate reporting requirements of other regulations are exempted from this requirement.

10.8 REPORTS OF EXTRAORDINARY DISCHARGES

If any unusual or extraordinary discharge including a "bypass" or "upset," as defined by the Virginia Stormwater Management Act, the Virginia Erosion and Sediment Control Law, and associated regulations, where applicable, should occur from a facility and the discharge enters or could be expected to enter surface waters, DETI will promptly notify, in no case later than within 24 hours, the VDEQ by telephone after the discovery of the discharge. This notification will provide all available details of the incident, including any adverse effects on aquatic life and the known number of fish killed. DETI will reduce the report to writing and will submit it to the VDEQ within 5 days of discovery of the discharge.

Unusual and extraordinary discharges include but are not limited to any discharge resulting from:

- Unusual spillage of materials resulting directly or indirectly from processing operations;
- Breakdown of processing or accessory equipment;
- Failure or taking out of service of some or all of the facilities; and
- Flooding or other acts of nature.

If the operator knows in advance of the need for a bypass, the operator will submit prior notice to the department, if possible, at least 10 days before the date of the bypass.

10.9 REPORTS OF NON-COMPLIANCE

DETI will report any noncompliance that may adversely affect surface waters or endanger public health.

- An oral report to the VDEQ will be provided within 24 hours from the time DETI becomes aware of the circumstances. The following will be included as information that will be reported within 24 hours:
  a. any unanticipated bypass; and
  b. any upset that causes a discharge to surface waters.

- A written report will be submitted within 5 days and will contain:

    a. a description of the noncompliance and its cause;

    b. the period of noncompliance, including exact dates and times, and, if the noncompliance has not been corrected, the anticipated time it is expected to continue; and

    c. steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.

The VDEQ may waive the written report on a case-by-case basis for reports of noncompliance if the oral report has been received within 24 hours and no adverse impact on surface waters has been reported.

DETI will report all instances of noncompliance not reported under the above in writing as part of the SWPPP. The reports will contain the information listed in item above.

The reports of unauthorized discharges, extraordinary discharges, and noncompliance will be made to the VDEQ. Reports may be made by telephone, email, or by fax. For reports outside normal working hours, leaving a recorded message will fulfill the immediate reporting requirement. For emergencies, the Virginia Department of Emergency Management maintains a 24-hour telephone service at 1-800-468-8892.

Where DETI becomes aware of a failure to submit any relevant facts, or submittal of incorrect information in any report to the VDEQ, DETI will promptly submit such facts or correct information.

10.10 NOTICE OF PLANNED CHANGES

DETI will give notice to the VDEQ as soon as possible of any planned physical alterations or additions to the permitted facility or activity. Notice is required only when:

- DETI plans an alteration or addition to any building, structure, facility, or installation that may meet one of the criteria for determining whether a facility is a new source in 9 VAC 25-870-420; and/or

- DETI plans an alteration or addition that would significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants that are not subject to effluent limitations in the Virginia Stormwater Management Act, the Virginia Erosion and Sediment Control Law, and associated regulations, where applicable.

DETI will give advance notice to the VDEQ of any planned changes in the permitted facility or activity, that may result in noncompliance with Commonwealth permit requirements.

10.11 SIGNATORY REQUIREMENTS

As stipulated in the Virginia Stormwater Management Act, the Virginia Erosion and Sediment Control Law, and associated regulations, where applicable. all reports, including SWPPPs, and other information requested by the board or the VDEQ will be signed by the following person or by a duly authorized representative of that person:

For a corporation: by a responsible corporate officer. For the purpose of this chapter, a responsible corporate officer means: (i) a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy-making or decision-making functions for the corporation; or (ii) the manager of one or more manufacturing, production, or operating facilities, provided the manager is authorized to make management decisions that govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long-term compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for Commonwealth permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.

A person is a duly authorized representative only if:

- The authorization is made in writing by a responsible corporate officer;
- The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for DETI (a duly authorized representative may thus be either a named individual or any individual occupying a named position); and
- The signed and dated written authorization is included in the SWPPP. A copy must be provided to the VDEQ, if requested.

Changes to authorization: If a duly authorized person is no longer accurate because a different individual or position has responsibility for the overall operation of the construction activity, a new authorization satisfying the duly authorized person requirements will be submitted to the VDEQ prior to or together with any reports or information to be signed by an authorized representative.

Certification: Any person signing a document will make the following certification:

"I certify under penalty of law that I have read and understand this document and that this document and all attachments were prepared in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and

belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

10.12 DELEGATION OF AUTHORITY

All reports required by the Virginia Stormwater Management Act, the Virginia Erosion and Sediment Control Law, and associated regulations, where applicable, including SWPPPs, and other information requested by the board or the VDEQ will be signed by a responsible corporate officer or by a duly authorized representative of that person. A person is a duly authorized representative only if:

- The authorization is made in writing by the responsible corporate officer;
- The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the operator. (A duly authorized representative may thus be either a named individual or any individual occupying a named position); and
- The signed and dated written authorization is included in the SWPPP.

Delegated authority authorization letters will be provided at a later date once finalized and will be located in Appendix AA.

If a duly authorized representative is no longer accurate because a different individual or position has responsibility for the overall operation of the construction activity, a new authorization satisfying the above requirements will be submitted to the VSMP authority as the administering entity for the board as the administering entity for the board prior to or together with any reports or information to be signed by an authorized representative.

11.0 REFERENCES

Dominion Energy Transmission, Inc. 2017. Standards and Specification for Erosion and Sediment Control and Stormwater Management for Construction and Maintenance of Gas Transmission Projects in Virginia. June 2017.

LandScope America. 2014. *Mid-Atlantic Coastal Plain.* Available online at http://www.landcope.org/explore/natural_geographies/ecoregions/Mid-Atlantic%20Coastal%20Plain/. Accessed November 2016.

Orndorff, Z. W. and W. L. Daniels. 2004. Evaluation of acid-producing sulfidic materials in Virginia highway corridors. Environmental Geology 46:209-216.

Soil Survey Staff. 2015a. Web Soil Survey. Natural Resources Conservation Service, U.S. Department of Agriculture. Available online at http://websoilsurvey.nrcs.usda.gov/. Accessed November 2016.

Soil Survey Staff. 2015b. Official Soil Series Descriptions. Natural Resources Conservation Service, U.S. Department of Agriculture. Available online at https://soilseries.sc.egov.usda.gov/. Accessed November 2016.

South Carolina Department of Natural Resources. 2014. *Piedmont Ecoregion Terrestrial Habitats.* Available online at https://www.dnr.sc.gov/cwcs/pdf/habitat/PiedmontHabitat.pdf. Accessed October 2014.

U.S. Forest Service. 2014. U.S. Forest Service, Region 8, *Revised Land and Resource Management Plan: George Washington National Forest*, R8-MB 143A, November 2014.

U.S. Geological Survey. 1994. Hydrological Units Maps: United States Geological Survey Water-Supply Paper 2294. Available online at http://pubs.usgs.gov/wsp/wsp2294/pdf/wsp_2294.pdf. Accessed November 2016.

U.S. Geological Survey. 2014. *NLCD 92 Land Cover Class Definitions*. Available online at http://landcover.usgs.gov. Accessed November 2016.

Virginia Department of Environmental Quality. 2013. Virginia Stormwater BMP Clearinghouse Stormwater Design Specification No. 2. Available online at http://www.vwrrc.vt.edu/swc/documents/2013/DEQ%20BMP%20Spec%20No%202_SHEET%20FLOW_Final%20Draft_v1-9_03012011.pdf. Accessed October 2016.

Virginia Department of Environmental Quality. 2015. Final 2012 305(b)/303(d) Water Quality Assessment Integrated Report; GIS Data. Available online at http://www.deq.virginia.gov/Programs/Water/WaterQualityInformationTMDLs/WaterQualityAssessments/2014305(b)303(d)IntegratedReport.aspx. Accessed February 2015.

Virginia Department of Transportation. 2017. 2016 Road and Bridge Specifications: Division VI- Roadside Development. Available online at

http://www.virginiadot.org/business/resources/const/VDOT2016_6Specs.pdf. Accessed August 2017.

World Wildlife. 2014. Appalachian-Blue Ridge forests. Available at https://www.worldwildlife.org/ecoregions/na0403. Accessed November 2016.