ATLANTIC COAST PIPELINE, LLC
ATLANTIC COAST PIPELINE

and

DOMINION TRANSMISSION, INC.
SUPPLY HEADER PROJECT

Supplemental Filing
January 27, 2017

APPENDIX C

Second Draft of the Construction, Operations, and Maintenance Plan

ATLANTIC COAST PIPELINE, LLC
ATLANTIC COAST PIPELINE
Docket Nos. CP15-554-000
CP15-554-001

Construction, Operations, and Maintenance Plan

DRAFT

Prepared by

ERM

Updated Rev 2
January 2017

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LIST OF ATTACHMENTS

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LIST OF ACRONYMS AND ABBREVIATIONS

ACP	Atlantic Coast Pipeline
ACRES	Assessment, Cleanup and Redevelopment Exchange System
ANST	Appalachian National Scenic Trail
AO	Authorized Officer
APE	Area of Potential Effect
Atlantic	Atlantic Coast Pipeline, LLC
ATV	all-terrain vehicle
ATWS	Additional Temporary Workspace
BA	biological assessment
BFM	bonded fiber matrix
BIC	Best in Class
Blocking Plan	OHV Blocking Plan
BMP	best management practice
BRP	Blue Ridge Parkway
BSRF	Belted Silt Retention Fence
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
CFR	Code of Federal Regulations
CM	Compliance Monitors
COM	Construction, Operation and Maintenance
CP	cathodic protection
CPCN	Certificate of Public Convenience and Necessity
DEQ	Department of Environmental Quality
Dominion	Dominion Resources, Inc.
DTI	Dominion Transmission, Inc.
E&S	Erosion and Sediment Control
EACG	Eastern Area Coordination Group
ECC	Environmental Construction Coordinator
EI	Environmental Inspector
EIS	Environmental Impact Statement
EPA	U.S. Environmental Protection Agency
ERP	Emergency Response Plan
ERS	electronic reporting system
ESCP	Erosion and Sedimentation Control Plan
FAO	Fire Authorized Officer
FERC PM	FERC Environmental Project Manager
FERC	Federal Energy Regulatory Commission
Fire Plan	Fire Prevention and Suppression Plan
FSO	Field Safety Officer
ft./sec.	feet per second
FWS	U.S. Fish and Wildlife Service
GAI	GAI Consultants, Inc.
GPS	global positioning system
GWNF	George Washington National Forest[1]
HCA	High Consequence Areas

[1] George Washington National Forest refers to the northern portion of the George Washington & Jefferson National Forests throughout this document. Originally two separate national forests, the GWNF and Jefferson National forest were administratively combined in 1995 and are administered as a single national forest unit.

HDD	horizontal directional drill
ICS	Incident Command System
LRMP	Land and Resource Management Plans
LUST	Leaking Underground Storage Tank
MNF	Monongahela National Forest
MP	Milepost
NEPA	National Environmental Policy Act
NFS	National Forest Service
NNIS	Non-Native Invasive Species
NPS	National Park Service
NTP	Notice to Proceed
NTU	Nephelometric Turbidity Units
OHV	Off-Highway Vehicle[2]
OPS	Office of Pipeline Safety
Plan	Upland Erosion Control, Revegetation, and Maintenance Plan
PPV	peak particle velocity
Procedures	Wetland and Waterbody Construction and Mitigation Procedures
Projects	Atlantic Coast Pipeline and Supply Header Project
RECP	Rolled Erosion Control Product
RQ	reportable quantities
SACG	Southern Area Multi-Agency Coordination Group
SPCC Plan	Spill Prevention, Control, and Countermeasure Plan
Survey	Soil Survey
SWPPP	Storm Water Pollution Prevention Plan
TMDL	Total Maximum Daily Load
Transportation Plan	Traffic and Transportation Plan
UDP	Unanticipated Discoveries Plan
USACE	U.S. Army Corps of Engineers
USDA	United States Department of Agriculture
USDOT	U.S. Department of Transportation
USFS	U.S. Forest Service
UTV	Utility Task Vehicle
VAC	Virginia Code
VDEQ	Virginia Department of Environmental Quality
VDOT	Virginia Department of Transportation
VESCH	Virginia Erosion and Sediment Control Handbook
WVDOT	West Virginia Department of Transportation

[2] Off-Highway Vehicle (OHV) in this document refers generally to all types of motorized off-highway vehicles, including both street-legal and non-street-legal full-sized vehicles, motorcycles, all-terrain vehicles (ATV), Utility Task Vehicles (UTV), etc.

1.0 INTRODUCTION

1.1 BACKGROUND

Atlantic Coast Pipeline, LLC (Atlantic) is a company formed by four major U.S. energy companies – Dominion Resources, Inc. (Dominion; NYSE: D), Duke Energy Corporation (Duke Energy; NYSE: DUK), Piedmont Natural Gas Co., Inc. (Piedmont; NYSE: PNY), and Southern Company Gas (NYSE: GAS).[3] The company was created to develop, own, and operate the proposed Atlantic Coast Pipeline (ACP), an approximately 600-mile-long, interstate natural gas transmission pipeline system designed to meet growing energy needs in Virginia and North Carolina. Atlantic has contracted with Dominion Transmission, Inc. (DTI), a subsidiary of Dominion, to permit, build, and operate the ACP on behalf of Atlantic.

The ACP will serve the growing energy needs of multiple public utilities and local distribution companies in Virginia and North Carolina. Based on current customer commitments, approximately 79.2 percent of the natural gas transported by the ACP will be used as a fuel to generate electricity for industrial, commercial, and residential uses. The remainder of the natural gas will be used directly for residential (9.1 percent), industrial (8.9 percent), and commercial and other uses such as vehicle fuel (2.8 percent). By providing access to low-cost natural gas supplies, the ACP will increase the reliability and security of natural gas supplies in Virginia and North Carolina.

An Environmental Impact Statement (EIS) is being prepared for the project by the Federal Energy Regulatory Commission (FERC), which has jurisdiction over the project under Section 7 of the Natural Gas Act. The FERC is responsible for the preparation of the Project's EIS in compliance with the Council on Environmental Quality regulations for implementing the National Environmental Policy Act (40 Code of Federal Regulations [CFR] Parts 1500-1508), and FERC's National Environmental Policy Act implementing regulations (18 CFR Part 380). The FERC will use the EIS to aid in deciding whether to issue the ACP a Certificate of Public Convenience and Necessity (CPCN). The U.S. Forest Service (USFS), along with several other Federal agencies, is cooperating with the FERC in preparing the EIS for the Project, and will use the EIS to aid in its own decision-making process, as discussed below. A complete list of federal, state/commonwealth, and local permits is included as Attachment N.

FERC, in consultation with the State Historic Preservation Officers, is also responsible for compliance with Section 106 of the National Historic Preservation Act (16 U.S. Code § 470f) and its implementing regulations (36 CFR Part 800) promulgated by the Advisory Council on Historic Preservation.

FERC, in consultation with the U.S. Fish and Wildlife Service (FWS), is also the lead federal agency responsible for compliance with Sections 7(a)(2) and 7(c) of the Endangered Species Act (16 U.S. Code. §§ 1536(a)(2), 1536(c)). FERC will prepare a biological assessment (BA) consistent with the requirements of 50 CFR § 402.12(f). The BA will identify conservation measures to avoid or minimize any adverse effects the Project may have on federally listed species and their critical habitat.

Portions of the Project would cross USFS lands administered by the Monongahela National Forest (MNF) and George Washington National Forest (GWNF)[4] (see Figure 1.1-1). Accordingly, Atlantic submitted an Application for Transportation and Utility Systems and Facilities on USFS Lands (Form SF-299) on November 12, 2015, and amended its application to incorporate various route changes on July 29, 2016.[5]

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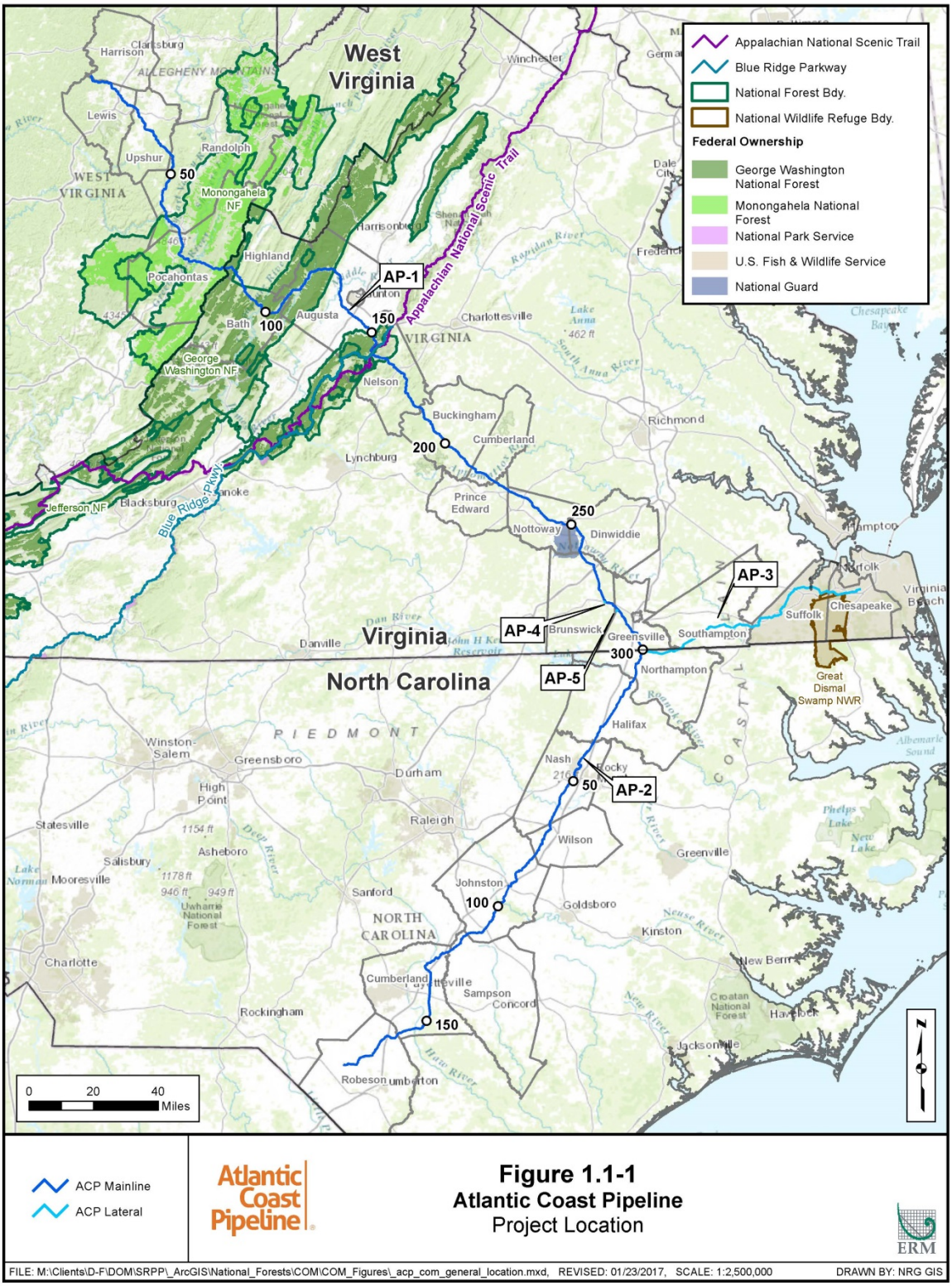
[3] On August 24, 2015, Southern Company and AGL Resources announced that the boards of directors of both companies approved a definitive merger agreement. Pursuant to the agreement, AGL Resources will become a new wholly owned subsidiary of Southern Company. The companies announced completion of this transaction on July 1, 2016.

[4] Since 1995, the GWNF in central western Virginia and the Jefferson National Forest in southwestern Virginia have been administratively combined as the single George Washington & Jefferson National Forests, managed by a single Forest Supervisor.

[5] Atlantic submitted a separate application to the National Park Service (NPS) for a right-of-way across NPS-administered Blue Ridge Parkway lands.


West Virginia
Virginia
North Carolina
Appalachian National Scenic Trail
Blue Ridge Parkway
National Forest Bdy.
National Wildlife Refuge Bdy.
Federal Ownership
George Washington National Forest
Monongahela National Forest
National Park Service
U.S. Fish & Wildlife Service
National Guard
AP-1
AP-2
AP-3
AP-4
AP-5
50
100
150
200
250
300
Appalachian National Scenic Trail
Blue Ridge Parkway
Monongahela NF
George Washington NF
Jefferson NF
Great Dismal Swamp NWR
Croatan National Forest
Uwharrie National Forest
PIEDMONT
COASTAL
NORTH CAROLINA
0 20 40 Miles
ACP Mainline
ACP Lateral
Atlantic Coast Pipeline
Figure 1.1-1
Atlantic Coast Pipeline
Project Location
ERM
FILE: M:\Clients\D-F\DOM\SRPP_ArcGIS\National_Forests\COM\COM_Figures_acp_com_general_location.mxd, REVISED: 01/23/2017, SCALE: 1:2,500,000
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The ACP's proposed route does not lie within a GWNF-designated utility corridor. The GWNF's Land and Resource Management Plan (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 will therefore determine whether to amend the LRMP to reallocate approximately 104.2 acres to the Designated Utility Corridors prescription area (Rx 5C) from the Dispersed Recreation Areas (Rx 7-E1) and Mosaics of Habitat (Rx 13) prescription areas. Several other project-specific amendments to LRMPs for both the MNF and the GWNF are being considered; these are noted in the relevant Construction, Operation, and Maintenance (COM) Plan section. The USFS must also decide whether to authorize granting a right-of-way/use permit to construct and operate the pipeline facilities on USFS lands. The COM Plan specifies the terms under which a right-of-way across USFS lands would be granted. The COM Plan is intended to be appended to the right-of-way grant.

The COM Plan consists of a number of individual topical plans and attachments applicable to construction and operation of the ACP on USFS lands. During the planning and building of the ACP, changes to the COM Plan may be warranted. The COM Plan is the repository and reference for new and amended permits, approvals, clearances, and plans that may be issued during the planning, construction and operation of the portion of the Project on USFS lands.

2.0 PROJECT DESCRIPTION

The following ACP project description encompasses the entire project (i.e. portions of the Project that lie on both USFS and non-USFS lands):

Mainline Pipeline Facilities:

- AP-1: approximately 333 miles of underground 42-inch outside diameter natural gas transmission pipeline in Harrison, Lewis, Upshur, Randolph, and Pocahontas Counties, West Virginia; Highland, Bath, Augusta, Nelson, Buckingham, Cumberland, Prince Edward, Nottoway, Dinwiddie, Brunswick, and Greensville Counties, Virginia; and Northampton County, North Carolina.

- AP-2: approximately 186 miles of underground 36-inch outside diameter natural gas transmission pipeline in Northampton, Halifax, Nash, Wilson, Johnston, Sampson, Cumberland, and Robeson Counties, North Carolina.

Lateral Pipeline Facilities:

- AP-3: approximately 83 miles of underground 20-inch outside diameter natural gas lateral pipeline in Northampton County, North Carolina; and 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 mile of underground 16-inch outside diameter natural gas lateral pipeline in Greensville County, Virginia.

Compressor Station Facilities:

- Compressor Station 1 (Marts Compressor Station): a new, natural gas-fired compressor station at approximately Milepost 6 (MP) 7.5 of the AP-1 mainline in Lewis County, West Virginia.

- Compressor Station 2 (Buckingham Compressor Station): a new, natural gas-fired compressor station at approximately MP 191.5 of the AP-1 mainline in Buckingham County, Virginia.

- Compressor Station 3 (Northampton Compressor Station): a new natural gas-fired compressor station at approximately MP 300.1 of the AP-1 mainline and MP 0.0 of the AP-2 mainline and 0.0 of the AP-3 lateral in Northampton County, North Carolina.

Other Aboveground Facilities:

- Nine new metering and regulating stations at receipt and/or delivery points along the new pipelines (including one at Compressor Station 1 and one at Compressor Station 2).

- Forty-one valve sites at select points along the new pipelines at intervals specified by U.S. Department of Transportation (USDOT) regulations at Title 49 CFR Part 192.

- Eleven sets of pig launcher and/or receiver sites at 11 sites along the new pipelines (including launcher/receiver sites at Compressor Stations 2 and 3).

2.1.1.1 Facilities on U.S. Forest Service Lands

This COM Plan applies only to USFS lands crossed by the ACP Project. On USFS lands, the ACP consists of a 42-inch, buried steel pipe across portions of the MNF and GWNF. The pipeline route crosses the MNF for a total of 5.2 miles, all within the Marlinton Ranger District. It crosses the GWNF for a total of 15.9 miles in the Warm Springs, North River, and Glenwood & Pedlar Ranger Districts, in Virginia. No compressor stations, meter and regulating stations, pig launcher/receivers, mainline valves or other major above-ground facilities are proposed on USFS lands. Minor appurtenant facilities on USFS lands include pipeline markers and cathodic protection (CP) test stations.

Pipeline markers will be installed at road and rail and trail crossings, and at other areas as deemed necessary to alert the public to the line's presence. Outside of USFS lands, larger aerial markers will be installed in the permanent right-of-way at periodic intervals to facilitate aerial surveillance during operation of the pipeline system. No aerial markers will be installed on USFS lands.

Installation of a CP system is necessary to protect the pipe from corrosion, and is required by USDOT pipeline safety regulations. The CP system for the ACP utilizes a number of anode beds installed perpendicular to the right-of-way; none of these will be located on USFS lands. The CP system also requires the installation of CP test stations, which consist of a small-diameter plastic stand-pipe

[6] The mileposts used in the initial 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. For these reasons, the straight-line distance between consecutive mileposts as indicated or depicted in tables and figures in this updated Resource Report may be greater than or less than 5,280 feet. The mileposts should be considered as reference points only.

holding wires attached to the pipe, at periodic intervals, usually at road crossings next to the pipeline marker. Some CP test stations will be installed on USFS lands.

Construction of the ACP requires the use of existing USFS roads for access to the right-of-way. Some of these roads will require improvements, ranging from light grading and graveling of existing road prisms, to widening at certain locations to accommodate pipe and log trucks. A number of new roads will also be required. Once the pipeline is installed, these same roads will be used to access the right-of-way for operations and maintenance purposes. Roads to be used for ACP purposes, including new and existing roads, and existing roads that will require improvements, are shown in Table 2.1.1-1.

2.1.1.2 Land Requirements

On USFS lands, Atlantic proposes to utilize a nominal 125-foot-wide construction right-of-way for installation of the 42-inch pipeline, with a 40-foot-wide spoil side and an 85-foot-wide working side. For most pipeline construction activities, this right-of-way width would accommodate large equipment, pipe stringing and set up, welding, the trench, and the temporary storage of topsoil and trench spoil.

Additional temporary workspace (ATWS) is proposed on USFS lands at certain locations, such as road crossings, and where additional spoil or topsoil storage, log landings or equipment staging is needed. Accordingly, the total width of the construction right-of-way will exceed the nominal 125 foot width in these areas. Conversely, the nominal 125-foot construction right-of-way width is proposed to be reduced to 75 feet in wetlands and certain other ecologically sensitive areas.

Typical right-of-way configurations are provided in Attachment A[7]. The alignment sheets (provided in Attachment B) give the exact dimensions of the proposed construction right-of-way, including ATWS, on USFS lands.

On USFS lands, Atlantic proposes to utilize a 53.5-foot-wide permanent right-of-way for operating purposes. The permanent right-of-way will be maintained in an herbaceous state to allow for maintenance access along the right-of-way, although no permanent access road will be established on or along the right-of-way. All temporary construction work areas outside the permanent right-of-way will be restored in accordance with the Restoration and Rehabilitation Plan.

The ACP will mostly use existing USFS roads to access the pipeline right-of-way. A number of new roads would be required. Several existing, unnumbered roads that will be used are not part of the USFS road system, and so are considered new roads in this COM Plan. Section 2.1.1.4 provides more details about access roads proposed to construct and operate the pipeline.

[7] Atlantic will add to Attachment A two drawings associated with steep slope design, at a later date.

TABLE 2.1.1-1

Atlantic Coast Pipeline Access Roads on USFS Lands

Forest Road No.	Project Access Road Name	Mile-post	County	State	New/ Existing	Improve-ments	National Forest	Area Affected by Construction and Operations (acres)	Length (miles)	Needed for O&M	Width of Road ROW (ft)[8]	Cultural/Bio Survey status
New road connecting MNF road 1026 and right-of-way	05-001-C009.AR2	71.7	Pocahontas	WV	New	N/A	MNF	0.0	0.1	Yes	30	Pending
MNF Road 1026 (Buzzard Ridge Road)	05-001-C009.AR1	71.7	Pocahontas	WV	Exist	Yes	MNF	13.9	3.8	Yes	30	Pending
MNF Road 1012 (Sugar Camp Road)	05-001-E064.AR1	81.8	Pocahontas	WV	Exist	Yes	MNF	4.8	1.3	Yes	30	Complete
New road connecting MNF Road 1012 (Sugar Camp Road) and right-of-way	05-001-E064.AR1	81.8	Pocahontas	WV	New	N/A	MNF	1.5	0.4	Yes	30	Complete
MNF Road 1017 (Shock Run Road)	05-001-E064.AR3	83.3	Pocahontas	WV	Exist	Yes	MNF	0.1	0.0	Yes	30	Complete
MNF Road 55 (Allegheny Road)	05-001-E064-AR2	83.3 to 83.8	Pocahontas	WV	Exist	Yes	MNF	10.2	2.8	Yes	30	Complete
New road along an existing un-numbered road between Highway 84 and right-of-way	06-001-B001.AR3	85.0	Highland	VA	New	N/A	GWNF	0.6	0.2	Yes	30	Complete
New Road	06-001-B001-AR7	85.3	Highland	VA	New	N/A	GWNF	1.8	0.5	Yes	30	Complete
New road along an existing un-numbered road between Highway 84 and right-of-way	06-001-B001.AR4	85.4	Highland	VA	New	N/A	GWNF	0.4	0.1	Yes	30	Pending
GWNF Road 124	36-014.AR2	93.6	Bath	VA	Exist	Yes	GWNF	19.1	5.3	Yes	30	Complete
GWNF Road 281 (Tower Mtn. Road)	36-016.AR1	96.3	Bath	VA	Exist	Yes	GWNF	10.1	2.8	Yes	30	Complete
GWNF Road 309	36-016.AR2	99.6	Bath	VA	Exist	Yes	GWNF	2.0	0.6	Yes	30	Complete
GWNF Roads 449 and 449A	07-001.AR1-AR 3	116.8	Augusta	VA	Exist	Yes	GWNF	9.2	3.0	Yes	30	Complete
New Road connecting GWNF Road 449 and right-of-way.	07-001.AR1-AR 4	117.2	Augusta	VA	New	Yes	GWNF	0.1	0.1	Yes	30	Complete

[8] Estimated. Final width subject to as-built surveys

TABLE 2.1.1-1

Atlantic Coast Pipeline Access Roads on USFS Lands

Forest Road No.	Project Access Road Name	Mile-post	County	State	New/ Existing	Improve-ments	National Forest	Area Affected by Construction and Operations (acres)	Length (miles)	Needed for O&M	Width of Road ROW (ft)[8]	Cultural/Bio Survey status
New road along an existing un-numbered road between GWNF Road 449A and right-of-way	07-001.AR1-AR 6	118.0	Augusta	VA	New	N/A	GWNF	0.9	0.8	Yes	30	Complete
GWNF Road 466A	07-001.AR1-AR 8	120.2	Augusta	VA	Exist	Yes	GWNF	1.1	0.3	No	30	Complete
GWNF Road 466	07-001.AR1-AR 9	120.4	Augusta	VA	Exist	Yes	GWNF	2.0	0.6	Yes	30	Complete
GWNF Road 1755	07-001.AR1-AR 7	121.1	Augusta	VA	New	Yes	GWNF	1.4	0.4	Yes	30	Complete

Some existing roads require minor grading and graveling and/or widening to accommodate construction vehicles. Most roads utilized for construction would also be used to access the permanent right-of-way for operation and maintenance purposes. Table 2.1.1-2 below shows the acreage directly affected on the MNF and GWNF for the construction right-of-way, the permanent right-of-way, and access roads.

TABLE 2.1.1-2

Summary of National Forest Lands Directly Affected by the Atlantic Coast Pipeline (acres)

National Forest	Permanent right-of-way (50' width)	Temporary Workspace, including Additional Temporary Workspace	Access Roads (as is or with improvements)	Access Roads (new)
Monongahela National Forest	33.1	47.0	29.06	1.5
George Washington National Forest	105.2	144.40	43.5	9.1
Total	**138.3**	**191.4**	**72.5**	**10.6**

2.1.1.3 Construction Schedule

Overall Construction Schedule

Subject to receipt of the required permits and regulatory approvals, initial construction activities (e.g., timber removal, preparation of contractor yards and access roads) are expected to begin in November, 2017. The ACP pipeline will be built along 17 spreads, five of which lie on USFS lands. 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 2.1.1-3.

Construction on the MNF will span two spreads. Spread 3 crosses the MNF for about 0.8 mile, north of Cloverlick Mountain. Initial site preparation on Spread 3 is scheduled to begin in September, 2018. Timber removal[9] is scheduled to begin in November, 2018, with pipeline construction to commence in April, 2019. Spread 3A crosses the MNF for about 4.3 miles between Michael Mountain and the Virginia border. Timber removal on Spread 3A is scheduled for November, 2017. Pipeline construction is scheduled to commence in April, 2018. Construction on the GWNF will span four spreads. Spread 3A, which also lies on the MNF, crosses the GWNF for about 4 miles just east of the West Virginia-Virginia border, where the GWNF abuts the MNF. As indicated above, timber removal on this spread is scheduled for November, 2017 and pipeline construction is scheduled to commence in April, 2018.

Spread 4 crosses the GWNF for about 3.9 miles in Highland and Bath counties, Virginia. Initial site preparation on Spread 4 is scheduled to begin in September, 2018. Timber removal is scheduled to begin in November, 2018, with pipeline construction to commence in April, 2019. Spread 4A crosses the GWNF for about 6.7 miles in Augusta County. Timber clearing is scheduled to begin in November, 2017. Pipeline construction is scheduled to start in April, 2018.

Spread 5 crosses the GWNF for about 1.2 miles in the vicinity of the Mt. Torrey Furnace and the Appalachian National Scenic Trail in Augusta County. The horizontal directional drill crossing of the Appalachian National Scenic Trail and Blue Ridge Parkway, which lies within Spread 5, is scheduled to be constructed from March to September, 2018. Timber may be cleared from the horizontal directional drilling (HDD) entry and exit sites in late 2017. For the rest of Spread 5, initial site preparation is scheduled to begin in September, 2018, with timber removal beginning in November, 2018, and pipeline construction commencing in February, 2019. Figure 2.1-1 shows the locations and scheduled start dates of construction spreads in and near the MNF and GWNF.

[9] Throughout the COM Plan "timber removal" is used to describe the entire merchantable timber logging process, from felling to removal of the logs from the right-of-way,

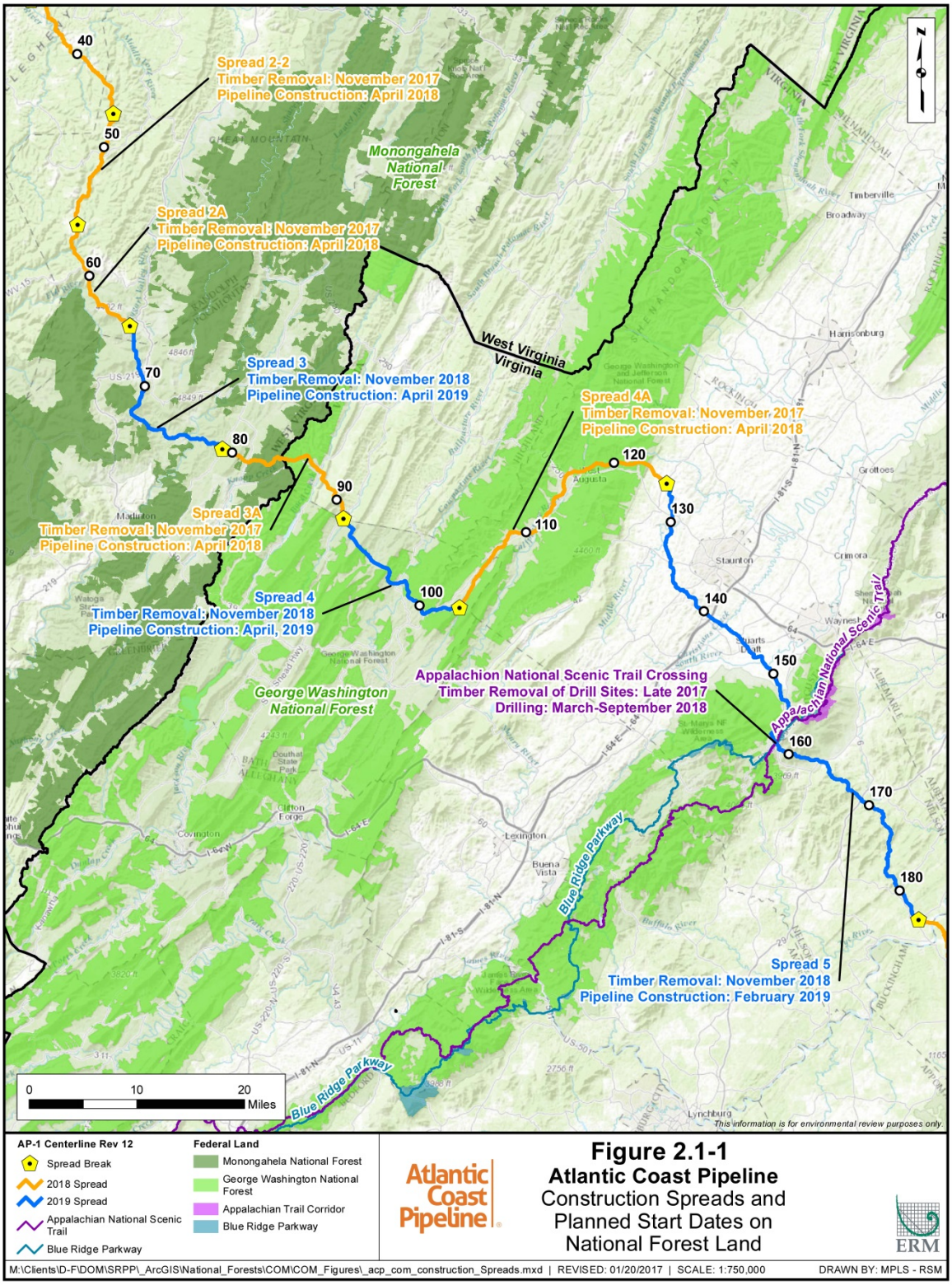
40
50
60
70
80
90
100
110
120
130
140
150
160
170
180
Spread 2-2
Timber Removal: November 2017
Pipeline Construction: April 2018
Spread 2A
Timber Removal: November 2017
Pipeline Construction: April 2018
Spread 3
Timber Removal: November 2018
Pipeline Construction: April 2019
Spread 3A
Timber Removal: November 2017
Pipeline Construction: April 2018
Spread 4
Timber Removal: November 2018
Pipeline Construction: April, 2019
Spread 4A
Timber Removal: November 2017
Pipeline Construction: April 2018
Spread 5
Timber Removal: November 2018
Pipeline Construction: February 2019
Appalachian National Scenic Trail Crossing
Timber Removal of Drill Sites: Late 2017
Drilling: March-September 2018
Monongahela National Forest
George Washington National Forest
West Virginia
Virginia
Appalachian National Scenic Trail
Blue Ridge Parkway
Blue Ridge Parkway
0
10
20
Miles
This information is for environmental review purposes only
AP-1 Centerline Rev 12
Spread Break
2018 Spread
2019 Spread
Appalachian National Scenic Trail
Blue Ridge Parkway
Federal Land
Monongahela National Forest
George Washington National Forest
Appalachian Trail Corridor
Blue Ridge Parkway
Atlantic Coast Pipeline
Figure 2.1-1
Atlantic Coast Pipeline
Construction Spreads and Planned Start Dates on National Forest Land
ERM
M:\Clients\D-F\DOM\SRPP_ArcGIS\National_Forests\COM\COM_Figures_acp_com_construction_Spreads.mxd | REVISED: 01/20/2017 | SCALE: 1:750,000
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TABLE 2.1.1-3

Construction Schedule by Spread for the Atlantic Coast Pipeline and Supply Header Project [a]

Spread	Approximate Mileposts	Counties/Cities and States/Commonwealths	Begin Construction	Finish Construction [d]
ATLANTIC COAST PIPELINE				
Initial Construction Activities				
Initial Site Preparation (2018 spreads)	By spread	See below	November 2017	1Q 2018
Tree Clearing (2018 spreads) [b, c]	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) [b, c]	By spread	See below	November 2018	1Q 2019
Construction of Pipeline				
Spread 1-1 (AP-1)	0.0–17.2	Harrison, and Lewis Counties, WV	April 2019	4Q 2019
Spread 1-2 (AP-1)	17.2–31.6	Lewis and Upshur Counties, WV	April 2019	4Q 2019
Spread 2-1 (AP-1) [f]	31.6–47.3	Upshur and Randolph Counties, WV	April 2018	4Q 2018
Spread 2-2 (AP-1) [f]	47.3–56.1	Randolph County, WV	April 2018	4Q 2018
Spread 2A (AP-1) [f]	56.1–65.4	Randolph County, WV	April 2018	4Q 2018
Spread 3 (AP-1)	65.4–79.2	Randolph and Pocahontas Counties, WV	April 2019	4Q 2019
Spread 3A (AP-1) [f]	79.2–91.3	Pocahontas County, WV and Highland County, VA	April 2018	4Q 2018
Spread 4 (AP-1)	91.3–103.1	Highland and Bath Counties, VA	April 2019	4Q 2019
Spread 4A (AP-1) [f]	103.1–125.9	Bath and Augusta Counties, VA	April 2018	4Q 2018
Spread 5 (AP-1) [g]	125.9–183.3	Augusta and Nelson Counties, VA	February 2019	4Q 2019
Spread 6 (AP-1) [g]	183.3–239.6	Nelson, Buckingham, Cumberland, Prince Edward, and Nottoway Counties, VA	February 2018	4Q 2018
Spread 7 (AP-1)	239.6–300	Nottoway, Dinwiddie, Brunswick, and Greensville Counties, VA, and Northampton County, NC	February 2019	4Q 2019
Spread 8 (AP-2)	0.0–61.6	Northampton, Halifax, and Nash Counties, NC	February 2018	4Q 2018
Spread 9 (AP-2)	61.6–125.0	Nash, Wilson, Johnston, Sampson, and Cumberland Counties, NC	February 2019	4Q 2019
Spread 10 (AP-2)	125.0–183.0	Cumberland and Robeson Counties, NC	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) [e]	0.0–0.4; 0.0–1.1	Brunswick County, VA; Greensville County, VA	February 2018	4Q 2018
Construction of Compressor Stations				
Compressor Station 1	7.6	Lewis County, WV	November 2017	4Q 2019
Compressor Station 2	191.5	Buckingham County, VA	November 2017	4Q 2019
Compressor Station 3	300.1	Northampton County, NC	November 2017	4Q 2019
Construction of Metering and Regulating Stations				
Kincheloe	7.6	Lewis County, WV	November 2017	4Q 2019
Long Run	47.2	Randolph County, WV	April 2018	4Q 2019
Woods Corner	191.5	Buckingham County, VA	November 2017	4Q 2019
Smithfield	92.7	Johnston County, NC	November 2017	3Q 2019
Fayetteville	132.9	Johnston County, NC	February 2018	3Q 2019
Pembroke	183.0	Robeson County, NC	March 2018	3Q 2019
Elizabeth River	83.0	City of Chesapeake, VA	April 2018	3Q 2019
Brunswick	0.4	Brunswick County, VA	January 2018	3Q 2019

TABLE 2.1.1-3

Construction Schedule by Spread for the Atlantic Coast Pipeline and Supply Header Project [a]

Spread	Approximate Mileposts	Counties/Cities and States/Commonwealths	Begin Construction	Finish Construction [d]
Greensville	1.1	Greensville County, VA	February 2018	3Q 2019
SUPPLY HEADER PROJECT				
Initial Construction Activities				
Initial Site Preparation (Spread 13)	By spread	See below	November 2017	1Q 2018
Tree Clearing (Spread 13) [b, c]	By spread	See below	November 2017	1Q 2018
Initial Site Preparation (Spread 14)	By spread	See below	November 2018	1Q 2019
Tree Clearing (Spread 14) [b, c]	By spread	See below	November 2018	1Q 2019
Construction of Pipeline Spreads				
Spread 13 (TL-635)	0.0–33.6	Wetzel, Doddridge, Tyler, and Harrison Counties, WV	April 2018	4Q 2019
Spread 14 (TL-636)	0.0–3.9	Westmoreland County, PA	January 2019	4Q 2019
Construction of Compressor Station Modifications				
JB Tonkin	0.0	Westmoreland County, PA	February 2018	3Q 2019
Crayne	NA	Greene County, PA	February 2018	3Q 2019
Burch Ridge	NA	Marshall County, WV	April 2019	4Q 2019
Mockingbird Hill	0.0	Wetzel County, WV	February 2018	3Q 2019
M&R Stations				
CNX	NA	Lewis County, WV	January 2019	4Q 2019
Abandonment of Gathering Compressor Units				
Hastings	NA	Wetzel County, WV	January 2019	4Q 2019

[a] The number and timing of the construction spreads are subject to change dependent upon construction and permit requirements.
[b] The start of tree clearing is dependent upon the results of the environmental surveys and agency consultations.
[c] 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.
[d] 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.
[e] Spread 12 will be completed with spread 11 and is counted as one spread.
[f] Hydrostatic test and remaining cleanup will be completed by the 3Q of 2019.
[g] Blue Ridge Parkway and James River HDDs will be constructed in 2018.

Seasonal Restrictions

Timber Removal/Clearing

Based on agency consultations to date, timing restrictions for tree clearing in West Virginia and Virginia are as follows:

- West Virginia:
  - migratory birds: restricted between April 1 through August 31
  - Indiana bat: restricted between April 1through November 15
- Virginia:
  - migratory birds: restricted between April 1 through August 15
  - Indiana bat: restricted between April 1 through November 15 (if hibernacula is within 5 miles of right-of-way); otherwise April 15 through September 15.

Timber removal on the MNF is scheduled to take place between November 1 and April 1 of both construction seasons. For any areas of the right-of-way within 5 miles of known Indiana bat hibernacula, no timber removal will occur before November 16.

Timber removal on the GWNF is scheduled to take place between November 1 and April 1 of both construction seasons. For any areas of the right-of-way within 5 miles of known Indiana bat hibernacula, no timber removal will occur before November 16.

Surveys for eagles were completed in 2016 via helicopter and no eagle nests were identified on USFS lands. Bald eagles are known to occur year round in areas with suitable habitat along the ACP route; bald eagles nest in late winter into the summer and roost in the winter. Golden eagles are not known to nest in this area, although they do winter roost. If additional bald eagle nests or occupied bald or golden eagle winter roosting habitat are identified ahead of or during construction, Atlantic will follow the National Bald Eagle Management Guidelines for work within 660 feet of bald eagle nests. For tree clearing that occurs during the winter roosting or nesting season, a qualified biological monitor will accompany the clearing crews for work conducted in areas where golden and bald eagles are believed to be present on USFS lands.

Stream and Wetland Crossings

At streams containing sensitive fisheries and other sensitive aquatic organisms, crossings utilizing dry crossing methods will be scheduled to occur during the least sensitive periods, determined in consultation with federal and state/commonwealth agencies, including the USFS. Streams on USFS lands where timing restrictions have been adopted are shown in Tables 2.1.1-1 and 2.1.1-2.

TABLE 2.1.1-1

Waterbodies Crossed and Crossing Methods for the Atlantic Coast Pipeline in the Monongahela National Forest

Waterbody			Crossing		Special Designations		
Feature ID	Waterbody Name	Flow Regime	Approximate Crossing Width (feet)	Construction Method[a]	State Water Quality Classification[a]	Fishery [b] Type	Time Restrictions[c]
AP-1 MAINLINE							
spoa402	UNT to Sugar Camp Run	Intermittent	4	1) Dam and Pump 2) Flume	UNT to B1	Coldwater; some segments designated as trout streams	April 1 to June 30
spoa400	UNT to Shock Run	Perennial	12	1) Dam and Pump 2) Flume	Unclassified	Coldwater	April 1 to June 30

[a] Abbreviations for West Virginia State Water Quality Classifications are listed below:
West Virginia Stream Water Use Categories:
Category A - Public Water; Category B - Propagation and Maintenance of Fish and Other Aquatic Life; Category B1 - Warm Water Fishery; Category B2 - Trout Waters; Category B4 – Wetlands; Category C - Water Contact Recreation (Category C); Category D - Agricultural and Wildlife Uses; Category D1 –Irrigation; Category D2 - Livestock; Category D3 - Wildlife; Category E - Water Supply Industrial, Water Transport, Cooling and Power ; Category E1 - Water Transport; Category E2 - Cooling Water; Category E3 -Power Production; Category E4 - Industrial (West Virginia CSR, 2014).
State Water Quality Classifications were determined using West Virginia Code of State Regulations, Title 47, Series 2 and communication with West Virginia Department of Environmental Protection (WVDEP) staff (Peterson, 2015). WVDEP considers all waters of the state Category A, B, and C waters. Waterbodies are assumed to be capable of supporting public water use. Those waterbodies listed in the table as Category A waters are waterbodies listed in appendices to West Virginia CSR, Title 47.
High Quality Streams (HQS) are based on the Sixth Edition of the West Virginia High Quality Streams prepared by the Wildlife Resources Section of the West Virginia Division of Natural Resources.
State regulations require the classification to extend into adjacent tributaries, indicated by UNT (unnamed tributary) to [Stream Class] to indicate connected tributaries to classified waters.

[b] Fisheries type is based on readily available data from agency consultation letters or online data. Additional consultation with state and federal agencies will be on-going to further refine these waterbody designations.

[c] Timing restrictions are based on readily available data from agency consultation letters or online data. Additional consultations with state and federal agencies, as well as field survey data for protected species will be necessary to further refine timing restrictions.

TABLE 2.1.1-2

Waterbodies Crossed and Crossing Methods for the Atlantic Coast Pipeline in the George Washington National Forest

State/ Facility/ Milepost	Waterbody				Crossing		Special Designations		
	Feature ID[a]	Waterbody Name	Flow Regime	Approximate Crossing Width (feet)[b]	FERC Classification[c]	Construction Method [d]	State Water Quality Classification[e]	Fishery Type[f]	Time Restrictions[g]
AP-1 MAINLINE									
85.0	shia407	UNT to Townsend Draft	Perennial	45	Intermediate	1) Dam and Pump 2) Flume	Unclassified	Unclassified	--
85.1	shia410	UNT to Townsend Draft	Perennial	10	Intermediate	1) Dam and Pump 2) Flume	Unclassified	Unclassified	--
85.4	shia409	UNT to Lick Draft	Perennial	10	Intermediate	1) Dam and Pump 2) Flume	Unclassified	Unclassified	--
85.5	shia408	Lick Draft	Perennial	8	Minor	1) Dam and Pump 2) Flume	Unclassified	Unclassified	--
94.1	nhd_va_e_024	Laurel Run	Perennial	5	Minor	Dam and Pump	Aquatic Life, I-IV	Wild Brook Trout	October 1 to March 31
98.3	nhd_va_j_007	UNT to Cowpasture River	Intermittent	5	Minor	Dam and Pump	UNT to Aquatic Life	Unclassified	--
115.8	saub108	Barn Lick Branch	Perennial	8		1) Dam and Pump 2) Flume	Unclassified	Unclassified	--
117.1	sauc002	Dowell's Draft	Perennial	10	Intermediate	1) Flume 2) Dam and Pump	Unclassified	Unclassified	--
117.2	sauc004	UNT to Dowell's Draft	Perennial	9	Minor	Dam and Pump	Unclassified	Unclassified	--
117.7	sauc005	UNT to Dowell's Draft	Intermittent	7	Minor	Dam and Pump	Unclassified	Unclassified	--
120.2	sauc007	UNT to White Oak Draft	Perennial	2		1) Dam and Pump 2) Flume	UNT to Aquatic Life, I-IV	UNT to Wild Brook Trout	October 1 to March 31
120.2	sauc006	White Oak Draft	Perennial	25	Intermediate	Dam and Pump	Aquatic Life, I-IV	Wild Brook Trout	October 1 to March 31
120.4	sauc008	White Oak Draft	Perennial	29	Intermediate	1) Flume 2) Dam and Pump	Aquatic Life, I-IV	Wild Brook Trout	October 1 to March 31
120.6	sauc009	UNT to White Oak Draft	Intermittent	3		1) Dam and Pump 2) Flume	UNT to Aquatic Life, I-IV	UNT to Wild Brook Trout	October 1 to March 31
121.1	nhd_va_030	Stoutameyer Branch	Perennial	1	Minor	1) Dam and Pump 2) Flume	Unclassified	Coldwater	--
122.5	sauc010	UNT to Jennings Branch	Intermittent	3	Minor	Dam and Pump	UNT to Aquatic Life, I-IV	UNT to Wild Brook Trout	October 1 to March 31
122.8	sauc011	UNT to Jennings Branch	Perennial	6	Minor	1) Dam and Pump 2) Flume	UNT to Aquatic Life, I-IV	UNT to Wild Brook Trout	October 1 to March 31
123.0	sauc012	UNT to Jennings Branch	Intermittent	3	Minor	1) Dam and Pump 2) Flume	UNT to Aquatic Life, I-IV	UNT to Wild Brook Trout	October 1 to March 31

TABLE 2.1.1-2

Waterbodies Crossed and Crossing Methods for the Atlantic Coast Pipeline in the George Washington National Forest

State/ Facility/ Milepost	Waterbody				Crossing		Special Designations		
	Feature ID[a]	Waterbody Name	Flow Regime	Approximate Crossing Width (feet)[b]	FERC Classification[c]	Construction Method [d]	State Water Quality Classification[e]	Fishery Type[f]	Time Restrictions[g]
AP-1 MAINLINE									
154.2	saua072	UNT to Back Creek	Intermittent	5	Minor	1) Flume 2) Dam and Pump	UNT to Aquatic Life, V-VIII	UNT to Stockable Trout Stream	--
154.4	sauc104	UNT to Back Creek	Intermittent	8	Minor	Dam and Pump	UNT to Aquatic Life, V-VIII	UNT to Stockable Trout Stream	--
154.5	saua071	UNT to Back Creek	Intermittent	4	Minor	1) Flume 2) Dam and Pump	UNT to Aquatic Life, V-VIII	UNT to Stockable Trout Stream	--
154.8	sauc103	UNT to Back Creek	Intermittent	10	Intermediate	Dam and Pump	UNT to Aquatic Life, V-VIII	UNT to Stockable Trout Stream	--
154.9	sauc102	UNT to Back Creek	Ephemeral	6.	Minor	Dam and Pump	UNT to Aquatic Life, V-VIII	UNT to Stockable Trout Stream	--
155.0	sauc101	UNT to Back Creek	Intermittent	Not Crossed By Centerline	N/A	Not Crossed by Centerline	UNT to Aquatic Life, V-VIII	UNT to Stockable Trout Stream	--
155.1	sauc100	UNT to Back Creek	Ephemeral	11	Intermediate	Dam and Pump	UNT to Aquatic Life, V-VIII	UNT to Stockable Trout Stream	--

TABLE 2.1.1-2

Waterbodies Crossed and Crossing Methods for the Atlantic Coast Pipeline in the George Washington National Forest

	Waterbody				Crossing		Special Designations		
State/ Facility/ Milepost	Feature ID[a]	Waterbody Name	Flow Regime	Approximate Crossing Width (feet)[b]	FERC Classification[c]	Construction Method [d]	State Water Quality Classification[e]	Fishery Type[f]	Time Restrictions[g]

a Atlantic utilized a project-specific nomenclature system that assigned a unique identifier (ID) to each waterbody encountered during field surveys. The breakdown of the unique waterbody ID includes the following abbreviations and descriptors, using shia407 as an example: s = stream, hi = Highland County (two letters used for each county), a = crew A collected the feature, and 407 is the unique number from 000 – 999 used to uniquely identify the waterbody. Where access to property was not available to field crews, National Hydrography Dataset (NHD) data were used to supplement field survey data. Unique IDs beginning with "NHD" represent waterbodies for which ground truth data have not yet been collected. This unique ID is consistently used for each waterbody to correlate to the geospatial data (GIS data), field data collected on datasheets, and waterbody impact tables used during project permitting.

b Waterbodies with a Feature ID starting with NHD represent waterbodies that are based on desktop data from the National Hydrography Dataset, and widths have been assumed as 10 feet wide for perennial and 5 feet wide for intermittent waterbodies in this dataset.

c Minor = <10 feet wide at time of crossing. Intermediate = 10 – 100 feet wide at time of crossing.

d Construction methods are provided for features that intersect the centerline. e Abbreviations for Virginia Water Quality Classifications are listed below:

Virginia Trout Waters Classes:

Classes I, II, III, IV are wild natural trout streams ranking from highest to lowest quality

Classes V, VI, VII, VIII are stockable trout streams ranking from highest to lowest quality

Water Quality Classifications were determined using Virginia Department of Environmental Quality GIS dataset, 2012 Integrated WQ Report Rivers, January 27, 2014 available for download from the Virginia Environmental Geographic Information System (VEGIS) website at: http://www.deq.virginia.gov/ConnectWithDEQ/VEGIS/VEGISDatasets.aspx. State regulations require the classification to extend into adjacent tributaries, indicated by UNT (unnamed tributary) to [Stream Class] to indicate connected tributaries to classified waters.

Unclassified – waters that do not have an assigned classification, or are not unnamed tributaries to classified waters.

f Fisheries type is based on readily available data from agency consultation letters or online data. Additional consultation with state and federal agencies will be on-going to further refine these waterbody designations.

g Timing restrictions are based on readily available data from agency consultation letters or online data. Additional consultations with state and federal agencies, as well as field survey data for protected species will be necessary to further refine timing restrictions.

2.1.1.4 Access

The ACP will mostly use existing USFS roads to access the pipeline right-of-way. A number of new roads will be required. Several existing, unnumbered roads that will be used are not part of the USFS road system, and so are considered new roads in this COM Plan (see Table 2.1.1-1). Maps showing locations of access road improvements on USFS lands are provided in Attachment F.

New Access Road 05-001-C009.AR2 would consist of about 100 feet of new road on the MNF between Forest Road 1026 (Buzzard Ridge Road) and the pipeline right-of-way near MP 71.7. The pipeline right-of-way itself does not lie on USFS lands at this location.

New Access Road 05-001-E064.AR1 would consist of about 0.4 mile of new road on the MNF between Forest Road1012 (Sugar Camp Road) and the right-of-way, at approximately MP 81.8.

New Access Road 06-001-B001.AR3 would consist of about 0.2 mile of new road on the GWNF, following the alignment of an unnamed road between Highway 84 and the right-of-way, at approximately MP 85.0.

New Access Road 06-001-B001.AR7 would consist of about 0.5 mile of new road on the GWNF, at approximately MP 85.3.

New Access Road 06-001-B001.AR4 would consist of about 0.1 mile of new road on the GWNF, following the alignment of an unnamed road between Highway 84 and the right-of-way, at approximately MP 85.4.New Access Road 07-001.AR1-AR4 is a short (approximately 200 feet) new road at approximately MP 117.2, connecting GWNF Forest Road 449 with the right-of-way.

New Access Road 07-001-AR1-AR-6 would consist of about 0.8 mile of new road on the GWNF, following the alignment of an unnamed road between Forest Road 449A and the right-of-way, at approximately MP 118.0.New Access Road 07-001.AR1-AR 7 would follow GWNF Forest Road 1755 for about 0.4 mile between Stover Shop Road and the pipeline right-of-way at about MP 121.1. Forest Road 1755 would require substantial improvements along its entire length to accommodate construction equipment, and so has been considered a new road for purposes of the COM Plan. This segment of Forest Road 1755 would be closed to the public during road construction.

Among the existing roads that will be utilized is GWNF Forest Road 281 (Project Access Road No. 36-016.AR1). A portion of this existing road lies within GWNF Management Prescription Area 2C3 (Eligible Recreation River Corridor). The GWNF LRMP includes a standard relevant to road construction or reconstruction within this Management Prescription, which GWNF is considering as potentially requiring a project-specific LRMP amendment:

> *Allow road construction or reconstruction to improve recreational access, improve soil and water, to salvage timber, or to protect property or public safety.* **(GWNF LRMP 2C3-015)**

ACP's plans for this access road include a widening of the entrance way, where GWNF Road 281 intersects Indian Draft Road, and graveling of the surface. Atlantic is not proposing construction or reconstruction of Forest Road 281.

Most of the existing USFS roads to be used for pipeline construction will require minor grading and graveling and/or widening to accommodate construction vehicles. Improvements to existing roads, as well as new road construction, will be done according to USFS specifications. New and existing improved roads will meet USFS requirements for all seasons, based on engineering standards that use information such as ASHTO and UNIFIED values for soils to be used as base material as well as the anticipated level of use (intensity, duration and type/weight of vehicles).

Dominion will provide the USFS proposed design details for access road construction and improvements after civil surveys have been completed. The roads and associated drainage structures will be designed and constructed in accordance with USFS requirements. Methods and locations for disposal of any excess fill created by road construction will also be identified.

All roads utilized for construction would also be used to access the permanent right-of-way for operation and maintenance purposes. Use of USFS access roads not identified in the COM Plan, or the undertaking of improvements to existing USFS roads not identified in the COM Plan, will not occur unless approved in writing by the USFS Authorized Officer (AO) and FERC.

2.1.1.5 General Pipeline Construction Procedures

Construction of the ACP will follow industry-standard practices and procedures as described below. In a typical scenario, construction involves a series of discrete activities conducted in a linear sequence. These include survey and staking; clearing and grading; trenching; pipe stringing, bending, and welding; lowering-in and backfilling; hydrostatic testing; final tie-in; commissioning; and right-of-way cleanup and restoration. Figure 2.1-2 illustrates each of the steps in a typical construction sequence. A description of each step in the process is provided below.

2.1.2 Survey and Staking

Atlantic's surveyors will stake the pipeline centerlines and limits of the construction right-of-way and ATWS areas. Wetland boundaries and other environmentally sensitive areas will also be marked at this time.

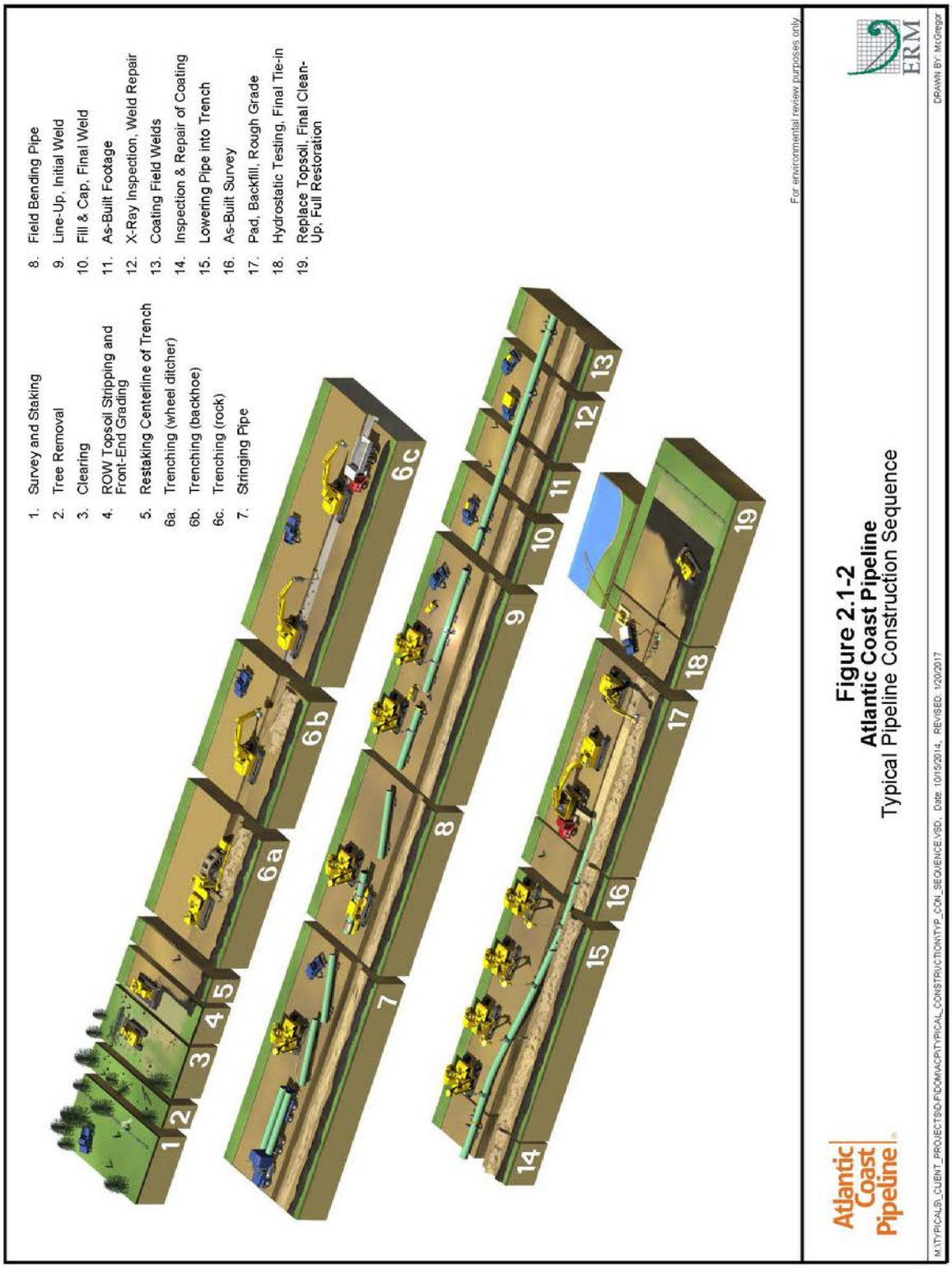
Atlantic's surveyors will record existing USFS property corner monuments and their accessories, including any property boundary markers and survey markers that may be disturbed during construction, so they may be re-established after construction, in accordance with the USFS Land Surveying Guide.

2.1.3 Clearing and Grading

Prior to beginning ground-disturbing activities, Atlantic's construction contractors will coordinate with the One-Call systems in West Virginia and Virginia to have existing underground utilities (e.g., cables, conduits, and pipelines) identified and flagged. Merchantable timber will be felled, decked and hauled to mills in accordance with the Timber Removal Plan.

After merchantable timber has been cleared from the construction right-of-way, clearing crews will mobilize to the construction areas. Fences along the right-of-way will be cut and braced, and temporary gates and fences will be installed to contain livestock, if present. The clearing crew will then clear the work area of vegetation and other obstacles, including trees, stumps that lie within the trenchline, logs, brush, and rocks.

Cleared vegetation and stumps will either be chipped (except in wetlands) burned (if permitted), or hauled offsite to a commercial disposal facility or for beneficial reuse, as specified in the Restoration and Rehabilitation Plan or otherwise directed by the AO. No chips, mulch, or mechanically cut woody debris will be stockpiled in wetlands, and no upland woody debris will be disposed of in wetlands.


1. Survey and Staking
2. Tree Removal
3. Clearing
4. ROW Topsoil Stripping and Front-End Grading
5. Restaking Centerline of Trench
6a. Trenching (wheel ditcher)
6b. Trenching (backhoe)
6c. Trenching (rock)
7. Stringing Pipe
8. Field Bending Pipe
9. Line-Up, Initial Weld
10. Fill & Cap, Final Weld
11. As-Built Footage
12. X-Ray Inspection, Weld Repair
13. Coating Field Welds
14. Inspection & Repair of Coating
15. Lowering Pipe into Trench
16. As-Built Survey
17. Pad, Backfill, Rough Grade
18. Hydrostatic Testing, Final Tie-in
19. Replace Topsoil, Final Clean-Up, Full Restoration
For environmental review purposes only
Atlantic Coast Pipeline
ERM
Figure 2.1-2
Atlantic Coast Pipeline
Typical Pipeline Construction Sequence
M:\TYPICALS_CLIENT_PROJECTS\DOMINION\TYPICAL_CONSTRUCTION\TYP_CON_SEQUENCE.VSD; Date: 10/15/2014; REVISED: 1/20/2017
DRAWN BY: McGregor

Burning of slash, stumps, or non-merchantable wood is not currently anticipated. If burning is deemed necessary, it will be done only after Atlantic has acquired all applicable permits and approvals, including specific authorization from the AO. In West Virginia, such burning would require an Approval to Conduct Open Burning for Land Clearing Debris from the West Virginia Department of Environmental Protection. In Virginia, burning on Federal lands would not be subject to the Virginia Department of Forestry's Burn Law. Virginia counties may enact bans on outdoor burning, but such ordinances do not apply to Federal lands Any burning on USFS lands will be done in accordance with standards contained in USFS' Management Direction for Fire Management, and with the *Fire Prevention and Suppression Plan* (Fire Plan). This would entail preparation of a project-specific Burn Plan for USFS approval.

Following clearing, the construction right-of-way and ATWS will be graded where necessary to provide a level work surface to allow safe passage of construction equipment and emergency vehicles. More extensive grading will be required in steep side slope or vertical areas and where necessary to prevent excessive bending of the pipelines. Topsoil will be segregated in accordance with the Upland Erosion Control Plan.

In accordance with the Upland Erosion Control Plan, in areas where topsoil segregation is required Atlantic will segregate at least 12 inches of topsoil in deep soils (more than 12 inches of topsoil) and the entire topsoil layer in shallow soils (less than 12 inches of topsoil). Excavated topsoil will be placed on the edge or edges of the construction right-of-way as shown in the typical drawings provided in Attachment A.

In areas disturbed by grading, and as required by the Upland Erosion Control Plan, temporary erosion and sediment controls will be installed immediately after initial disturbance within the right-of-way to minimize erosion. All materials used for erosion and sediment control will be certified as weed free. The erosion and sediment control materials will be inspected and maintained throughout the construction and restoration phases of the Project, as appropriate, and as required by the Upland Erosion Control Plan, described in Section 8.

2.1.4 Trenching

Pipe trench will be excavated by rotary trenching machines, track-mounted backhoes, or other similar equipment. Trench spoil will be deposited adjacent to the trench within the construction right-of-way. The trench for each pipeline will be excavated to a depth that provides sufficient cover over the pipeline after backfilling. The typical dimensions of each pipeline trench will vary depending on a number of factors, such as the substrate in the vicinity of the trench (see Table 2.1.4-1). The bottom width of the trench will accommodate the diameter of the pipeline and sufficient pad material around it (typically approximately one foot on either side of the pipeline). The top width will vary to allow the sides of the trench to be adapted to local soil conditions at the time of construction. If trench dewatering is required, it will be conducted in accordance with the Upland Erosion Control Plan and applicable permits in a manner that will not cause additional erosion or result in heavily silt-laden water flowing into a wetland or waterbody.

Atlantic will conduct topsoil segregation in accordance with the FERC Upland Erosion Control, Revegetation and Maintenance Plan. In areas where topsoil segregation is conducted, subsoil from trench excavations will be placed adjacent to the topsoil in a separate pile to allow for proper restoration of the soil during backfilling and restoration. Gaps will be left between the topsoil and subsoil piles to prevent stormwater runoff from backing up or flooding. Mixing of topsoil and subsoil piles will be prevented by separating them physically or with a mulch or silt fence barrier, where necessary and dictated by site conditions, to accommodate reduced workspace.

When rock or rocky formations are encountered, hydraulic hammers, tractor-mounted mechanical rippers or rock trenchers will be used for breaking up the rock prior to excavation. In areas where mechanical equipment or other means cannot be used to break up or loosen boulders or shallow bedrock, blasting will be required. Locations where blasting may be required on USFS lands are identified in the Blasting Plan.

2.1.5 Pipe Stringing, Bending, and Welding

Individual joints of pipe (up to approximately 80 feet long) will be transported to the construction right-of-way and strung along the trenchline in a single, continuous line. Individual sections of pipe will be bent, where necessary, to allow for a uniform fit with the contours at the bottom of the trench and horizontal points of inflection. Typically, a track-mounted, hydraulic pipe-bending machine will tailor the shape of the pipe to conform to the contours of the trench. After the pipe sections are bent, they will be welded together into long sections and placed on temporary supports along the trench.

TABLE 2.1.4-1

Typical Trench Dimensions for the Atlantic Coast Pipeline

Pipeline	Outside Diameter	Cover	Top Width (feet)	Depth (feet)	Typical Depth of Cover (feet)
ATLANTIC COAST PIPELINE					
AP-1	42-inch	Non-agricultural upland	10–15	7.5	3
		Agricultural	10–15	8.5	4
		Wetland	15–20	7.5	3
		Road, railroad, and waterbody crossings	15–20	9.5	5

Welding is a crucial phase of pipeline construction because the integrity of the pipeline depends on this process. Each weld must exhibit the same structural integrity with respect to strength and ductility. Welding will be conducted in compliance with 49 CFR 192 and API Standard 1104, Welding of Pipelines and Related Facilities. Completed welds will be visually and radiographically inspected. Welds that do not meet established specifications will be repaired or removed. Following welding and after inspection, pipe weld joints will be coated with an epoxy coating in accordance with required specifications. If the coating is sprayed on, it will be contained within semi-automatic application rings that ensure little or no overspray of coating into the environment. The coating will be inspected for defects, and repaired, if necessary, prior to lowering the pipe into the trench.

2.1.6 Lowering-in and Backfilling

Prior to lowering-in, the trench will be inspected for rocks and other debris that could damage the pipe or its protective coating, and where necessary, the pipe will be protected with rock-shield, a thick, plastic-based protective mesh wrapped around the pipe to protect it from rock damage. Dewatering may be necessary to inspect the bottom of the trench in areas where water has accumulated. If dewatering is required, it will be conducted in accordance with the Upland Erosion Control Plan and applicable permits in a manner that will not cause erosion or result in silt-laden water flowing into a wetland or waterbody.

The pipe will be lifted from the temporary supports and lowered into the trench using side-boom tractors. Sand bags or sifted spoil (not topsoil) will be placed in the bottom of the ditch to support the pipe. As necessary, trench breakers (stacked sand bags, bags of ready mix concrete or foam) will be installed in the trench around the pipe where necessary to prevent movement of subsurface water along the pipeline.

After lowering-in, the pipe will be padded and the trench will be backfilled with previously excavated materials using bladed equipment or backhoes. If the material excavated from the trench is rocky, the pipeline will be protected with a rock shield or covered with other suitable fill (i.e., crushed limestone rock or screened sand). Additionally, excavated rock may be buried within the limits of the construction right-of-way, crushed with a rock pulverizer and incorporated into fill, or used as gravel to upgrade access roads. Excavated material not required for backfill will be removed and disposed of at approved upland disposal sites. Atlantic will not remove excess soil or rock material from USFS lands without authorization from the AO.

If soils containing hazardous materials are encountered during excavation, Atlantic will implement the procedures identified in the Contaminated Media Plan to isolate and contain the suspected soil contamination, collect and test samples of the soil to identify the contaminants, and develop a response plan for crossing or avoiding the site. With the exception of soils classified as hazardous material, all native soils can be used as backfill without affecting the pipe, regardless of soil chemistry or texture.

2.1.7 Hydrostatic Testing

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, terrain conditions and class location. No water will be withdrawn from sources on either the MNF or the GWNF. As practicable, water will be transferred from one test section to another to reduce the amount of water that is required for testing. No hydrostatic discharge locations are anticipated to be required on either the MNF or the GWNF.

During hydrostatic testing, internal pressures and durations will be in accordance with 49 CFR 192 and applicable permit conditions. If leaks are found during testing, the leaks will be repaired and the section of pipe retested until the required specifications are met.

Water Impoundment Structures

No water impoundment structures are proposed to be located on USFS lands.

Final Tie-in and Commissioning

After hydrostatic testing, the pipeline will first be cleaned and dried utilizing compressed air and dry foam pig(s). The pig(s) will be continuously run through the pipeline, at designated controlled launching and receiving points located within the construction limits of disturbance, until a desired moisture content is achieved. After the pipeline has been dried and verified through Atlantic inspection, in-line inspection tools (telemetry pigs) are utilized to detect anomalies within the pipe that may have been introduced during construction. In the event that any anomalies are identified, they will first be located and excavated for field verification, and then cut out and replaced with pre-tested pipe, in accordance with all project environmental permits and guidelines. Once all anomaly repairs (if any are identified) have been completed, then final-tie(s) will be completed and commissioning of the line will begin. During the commissioning of the line, operational equipment associated with the pipeline (ex. mainline valves) are inspected and verified for proper installment and functionally working controls, including communication systems, and the initial start-up of compressor facilities begin. The line and associated facilities are slowly purged and loaded with natural gas until brought into actual operation.

2.1.8 Clean-Up and Restoration

Final cleanup will begin after backfilling and as soon as weather and site conditions permit. Final cleanup (including final grading and installation of permanent erosion control devices) will be completed within timeframes specified in the Upland Erosion Control Plan (Section 8) and the Restoration and Rehabilitation Plan (Section 10). Construction debris will be collected and taken to an approved disposal facility. Preconstruction contours will be restored as closely as practicable. Segregated topsoil will be spread over the surface of the right-of-way, and permanent erosion controls will be installed.

Revegetation measures will be implemented in accordance with the Restoration and Rehabilitation Plan. Work areas will be stabilized and seeded as soon as possible after final grading, weather and soil conditions permitting, subject to the recommended seeding dates for the seed mixes used to revegetate different areas along the pipelines. Seeding will stabilize the soil, improve the appearance of the area disturbed by construction, and restore native flora.

If seasonality or timing prevent the use of vegetative erosion control measures, physical measures such as matting, silt fences, etc. will be used in the short term and inspected and maintained regularly to ensure proper functioning until seeding occurs and revegetation becomes effective.

As-built drawings of the pipeline segments crossing USFS lands will be provided to the USFS following construction. Upon completion of construction, Atlantic will re-establish all disturbed USFS property corner monuments and their accessories, including any property boundary markers, in conformance with the USFS Land Surveying Guide.

Markers showing the location of the pipeline will be installed intermittently along the pipeline right-of-way according to ACP specifications, on both sides of all road, rail and trail crossings, and at fencelines. The markers will convey emergency information in accordance with applicable government regulations, including USDOT safety requirements

The pipeline “line-of-sight” markers will be flat fiberglass stakes with markings on both sides of the marker. The pipeline markers at road and railroad crossings will be round posts (3 inches in diameter and 5 feet in height) with wording on at least one side facing the roadway. The markers will contain markings required by law, including the following:

- the marker must state the word “Warning”;
- the marker must identify what product is being carried in the pipeline;
- the marker must identify the pipeline operator;
- the marker must include a telephone number that can be reached 24 hours per day, 365 days per year in case of an emergency; and
- the marker must include “call before you dig” labeling and the telephone of the state/commonwealth One-Call system.

No aerial markers will be installed on USFS lands.

2.1.9 Specialized Pipeline Construction Procedures

In addition to standard pipeline construction methods, Atlantic will use special construction techniques where warranted by site-specific conditions, e.g., when constructing across waterbodies, wetlands, roads, highways, railroads, steep terrain, karst areas, agricultural areas, and residential areas; when blasting through rock; or when working in winter conditions. Each of these specialized measures is described below. Illustrations of select crossing methods are provided in Attachment A.

2.1.9.1 Waterbody Crossings

Atlantic will cross all waterbodies on USFS lands using open cut construction methods. Specifically, Atlantic will employ the "dry" open cut methods discussed below. Other stream crossing methods, including the open cut wet crossing method, coffer dam method, conventional bore method, or HDD method, are therefore not discussed. It should be noted that while HDD will not be employed to cross waterbodies on the USFS, a single HDD will be utilized to cross both the Appalachian National Scenic Trail, which lies on the GWNF, and Blue Ridge Parkway (BRP), which lies on NPS land.

Atlantic will adhere to the measures specified in the Stream and Wetland Crossing Procedures described in Section 9, and any additional requirements contained in federal or state/commonwealth waterbody crossing permits, including applicable permits and approvals from the U.S. Army Corps of Engineers and various state/commonwealth agencies. Complete lists of the waterbodies crossed on USFS lands and the construction method proposed for each crossing are provided in Tables 2.1.1-4 and 2.1.1-5.

During the clearing and grading phase of construction, temporary bridges will be installed across waterbodies on USFS lands in accordance with the Procedures to allow construction equipment and personnel to cross. The bridges may include clean rock fill over culverts, timber mats supported by flumes, railcar flatbeds, flexi-float apparatuses, or other types of spans. Construction equipment will be required to use the bridges, except that the clearing and bridge installation crews will be allowed one pass through waterbodies before bridges are installed (this one-time pass through to install temporary bridges will be included in any applicable state/commonwealth permit applications pertaining to stream crossing construction). The temporary bridges will be removed when construction and restoration activities are complete.

ATWS will be required on both sides of waterbody crossings to stage construction equipment, fabricate the pipeline, and store construction materials. Except as authorized by the FERC and the AO, the ATWS will be located at least 100 feet away from the water's edge at each waterbody on USFS lands. ATWS locations are shown on the alignment sheets provided in Attachment B. These locations are subject to the same environmental field surveys and analyses as any project construction work area.

Clearing adjacent to waterbodies will involve the removal of trees and brush from the construction right-of-way and ATWS areas. Woody vegetation within the construction right-of-way will be cleared to the edge of each waterbody. Sediment barriers will be installed at the top of the bank if no herbaceous strip exists. Initial grading of the herbaceous strip will be limited to the extent needed to create a safe approach to the waterbody and to install temporary bridges.

Following clearing, sediment barriers will be installed and maintained across the right-of-way adjacent to waterbodies and within ATWS to minimize the potential for sediment runoff. Silt fence, coir logs and/or weed-free straw bales[10] located across the working side of the right-of-way will be removed during periods of active construction when vehicle traffic is present, and will be replaced each night.

[10] While straw bales are not allowed by the State of West Virginia for a primary form of erosion control, Atlantic proposes to use them in West Virginia as a secondary form of erosion control, in some instances or as directed by the MNF.

Alternatively, drivable berms may be installed and maintained across the right-of-way in lieu of silt fences and/or weed-free straw bales.

Vehicle and equipment refueling and lubricating at waterbodies will take place in upland areas that are 100 feet or more from the edge of the waterbody and adjacent wetlands. Stationary equipment such as water pumps for use during stream crossing construction may need to be operated continuously on the banks of waterbodies and may require refueling in place. All such stationary equipment will be enclosed within impermeable secondary containment structures. The Spill Prevention, Control and Countermeasure (SPCC) Plan addresses the handling of fuel and other materials associated with the Projects. The SPCC Plan will be available on each construction spread.

After the pipeline is installed across a waterbody using one of the methods described below, the trench will be backfilled with native material excavated from the trench. If present and moved prior to construction, larger rocks or boulders will be replaced in the stream channel within the construction area following backfill of the trench. The streambed profile will be restored to pre-existing contours and grade conditions to prevent scouring. The stream banks will then be restored as near as practicable to pre-existing conditions and stabilized. Typical stabilization measures include seeding, plantings, and installation of erosion control blankets. Jute thatching or bonded fiber blankets will be installed on banks of waterbodies or road crossings to stabilize seeded areas. Temporary erosion controls will be installed immediately following bank restoration. Any non-biodegradable fabric used for bank stabilization will be removed when vegetation is re-established. Rip-rap is not anticipated to be necessary to stabilize streambanks; in the event that rip-rap is deemed an appropriate stabilization measure, Atlantic will consult with the USFS and seek the AO's approval and other permits as necessary. The waterbody crossing area will be inspected and maintained until restoration of vegetation is complete.

2.1.9.2 Flume Method Dry Crossing

The flume crossing method consists of isolating and temporarily diverting the flow of water across the trenching area through one or more large-diameter, smooth steel flume pipes placed in the waterbody. This method allows for trenching activities to occur within a relatively dry stream or riverbed (i.e., beneath the flume pipes containing the water flow) thereby avoiding sedimentation and turbidity in the waterbody. The flume method is typically used to cross small to intermediate flowing waterbodies that support coldwater or other significant fisheries.

For each waterbody where the flume method is implemented, a sufficient number of adequately sized flume pipes will be installed in the waterbody to accommodate the highest anticipated flows during construction. Atlantic will use stream gauge data from the U.S. Geological Survey to determine the highest anticipated flows during the time the flume crossing is in effect. As noted above, the duration of in-stream construction activities (excluding blasting, if required) will be limited to as short a duration as possible. In the absence of stream gauge data, Atlantic's engineers and Environmental Inspectors (EI) will estimate the highest anticipated flows based on the width of the waterbody at the ordinary high water mark, the depth of the waterbody, existing flows at the time of the crossing, and the weather forecast at the time of the crossing. As a contingency, Atlantic will stage additional flume pipes at the crossing in the event that the volume of flow increases due to a precipitation event.

Prior to installation, EIs will visually verify the flume pipes are free of dirt, grease, oil, or other pollutants. After placing the pipes in the waterbody, sand- or pea gravel-filled bags, water bladders, or metal wing deflectors will be placed in the waterbody around the flume pipes upstream and downstream of the proposed trench. These devices will serve to dam the stream and divert the water flow through the flume pipes thereby isolating the water flow from the construction work area between the dams.

After installation of the flume pipes, the remaining standing water between the dams will be pumped out. Pump intakes will be appropriately screened to prevent entrainment of aquatic species. Additionally, fish trapped in the dewatered area will be removed and returned to the flowing waterbody. Leakage from the dams or subsurface flow from below the waterbody bed may cause water to accumulate in the trench once trenching has begun. If water accumulates in this area, it may be periodically pumped through piping into energy dissipation/sediment filtration devices as required by the Procedures. Such devices include geotextile filter bags or straw bale (weed-free) structures. Alternatively, the water will be discharged into areas away from the edge of the waterbody and determined by the EI to be sufficiently level and well-vegetated to avoid erosion and prevent heavily silt-laden water from entering the waterbody.

Backhoe-type excavators located on the banks of the waterbody will be used to excavate a trench under the flume pipe across the dewatered streambed. Spoil excavated from the waterbody trench will be placed and stored on the bank above the high water mark and a minimum of 10 feet from the edge of the waterbody. Temporary erosion control devices such as silt fences will be installed around the perimeter of the spoil piles. Once the trench is excavated, a prefabricated segment of pipe will be installed beneath the flume pipes. The trench will then be backfilled with the native material excavated from the trench across the waterbody bed. The banks will be protected with temporary erosion control devices before removing the dams and flume pipes and returning flow to the waterbody channel.

The flume method has proven to be an effective technique for constructing pipelines across sensitive waterbodies. The potential for the introduction of turbidity or suspended sediments is limited because sediment generated during trench excavation and backfilling operations is isolated to the dewatered area between dams. When flumes are installed properly, the operation of the flume is generally stable and can be left in place for periods prior to and following the installation of the waterbody pipeline crossing. The flume method also provides for continued fish passage through the construction work area via the flume pipes during the crossing.

2.1.9.3 Dam-and-Pump Dry Crossing Method

The dam-and-pump method may be used as an alternative to the flume method. It generally is preferred for waterbodies where hard bedrock occurs and in-stream blasting is required. The dam-and-pump method is similar to the flume method except that pumps and hoses are used instead of flume pipes to isolate and transport the stream flow around the construction work area. Similar to the flume method, the objective of the dam-and-pump method is to create a relatively dry work area to avoid or minimize the transportation of sediment and turbidity downstream of the crossing during in-stream work.

As the first step in implementing the dam-and-pump method, one or more pumps and hoses of sufficient size to transport anticipated flows around the construction work area will be installed in the waterbody. Additional back-up pumps will be on site at all times in case of pump failure. Once the pumps are operational, the waterbody upstream and downstream of the construction area will be dammed with sandbags and/or steel plates. Prior to dewatering the streambed, a fish relocation procedure will be implemented to remove fish from the section of the waterbody to be dewatered. As the dams are installed, the pumps will be started to maintain continuous flow in the waterbody.

Following the installation of the dams, the pumps will be run continuously until the pipeline is installed across the waterbody and the streambed and banks are restored. Pump intakes above the upstream dam will be appropriately screened to prevent entrainment of aquatic species. Energy-dissipation devices will be used to prevent scouring of the streambed at the discharge location. Water flow will be maintained through all but a short reach of the waterbody at the actual crossing location.

Backhoe-type excavators located on the banks of the waterbody will be used to excavate a trench across the waterbody. Spoil removed from the trench will be placed and stored on the bank above the high water mark at a minimum of 10 feet from the edge of the waterbody. Trench plugs will be maintained between the upland trench and the waterbody crossing. After backfilling, the dams will be removed and the banks restored and stabilized as described above.

2.1.9.4 Wetland Crossings

No wetlands are crossed by the pipeline in the MNF and two are crossed in the GWNF. The crossed wetlands are located at MPs 117.0 and 85.4 and are categorized as palustrine forested. The combined length of the crossing of both wetlands is 61 feet, comprising approximately 0.1 acre of temporary impacts and 0.06 acres of permanent potential wetland conversion, as these areas will no longer consist of forest vegetation. Construction across wetlands will be conducted in accordance with the Procedures and additional requirements identified in Federal or state/commonwealth wetland crossing permits. Typical methods for construction across wetlands are described below.

In accordance with the Procedures, the width of the construction right-of-way will be limited to 75 feet through wetlands, with ATWS on both sides of wetland crossings to stage construction equipment and materials, fabricate the pipeline, and store materials and excavated spoil. ATWS will be located in upland areas a minimum of 50 feet from the wetland edge (with the exception of site-specific modifications as approved by the FERC and the AO).

Wetland boundaries will be clearly marked in the field prior to the start of construction with signs and flagging. Construction equipment working in wetlands will be limited to what is essential for right-of-way clearing, excavating the trench, fabricating and installing the pipeline, backfilling the trench, and restoring the right-of-way. In areas where there is no reasonable access to the right-of-way except through wetlands, non-essential equipment will be allowed to travel through wetlands once, unless the ground is firm enough or has been stabilized to avoid rutting.

Clearing of vegetation in wetlands will be limited to trees and shrubs, which will be cut flush with the surface of the ground and removed from the wetland. To avoid excessive disruption of wetland soils and the native seed and rootstock within the topsoil, stump removal, grading, topsoil segregation, and excavation will be limited to the area immediately over the trenchline, except a limited amount of stump removal and grading may be conducted in other areas if required by safety-related issues. Topsoil segregation over the trenchline will only occur if the wetland soils are not saturated at the time of construction.

Following clearing, sediment barriers, such as silt fences, straw bales (weed-free), or other approved sediment barriers, will be installed and maintained adjacent to wetlands and within ATWS areas as necessary to minimize the potential for sediment runoff. Sediment barriers will be installed across the full width of the construction right-of-way at the base of slopes adjacent to wetland boundaries. Silt fences, coir logs and/or straw bales (weed-free) installed across the working side of the right-of-way will be removed during active construction when vehicle traffic is present, and will be replaced each night. Alternatively, drivable berms may be installed and maintained across the right-of-way in lieu of silt fences or weed-free straw bales. Sediment barriers will also be installed adjacent to or within wetlands along the edge of the right-of-way, where necessary, to minimize the potential for sediment to run off the construction right-of-way and into wetlands outside the work area. If trench dewatering is necessary, it will be conducted in accordance with the Procedures and applicable permits. Silt-laden trench water will be discharged into an energy dissipation/sediment filtration device, such as a geotextile filter bag or straw bale (weed-free) structure or a well-vegetated upland area, to minimize the potential for erosion and sedimentation.

The method of pipeline construction used in wetlands will depend on site-specific weather conditions, soil saturation, and soil stability at the time of construction. If wetland soils are not excessively saturated at the time of construction and can support construction equipment on equipment mats, they will be crossed using conventional open-trench construction. This will occur in a manner similar to conventional upland cross-country construction techniques. In unsaturated wetlands, topsoil from the trenchline will be stripped and stored separately from subsoil.

Because little or no grading will occur in wetlands, restoration of contours will be accomplished during backfilling. Prior to backfilling, trench breakers will be installed, where necessary, to prevent subsurface drainage of water from wetlands. Where topsoil is segregated, the subsoil will be backfilled first followed by the topsoil. Topsoil will be replaced to the original ground level leaving no crown over the trenchline. In areas where wetlands overlie rocky soils, the pipe will be padded with rock-free soil or sand before backfilling with native bedrock and soil. Equipment mats, gravel fill, and/or geotextile fabric will be removed from wetlands following backfilling.

Where wetlands are located at the base of slopes, permanent slope breakers will be constructed across the right-of-way in upland areas adjacent to the wetland boundary. Temporary sediment barriers will be installed where necessary until revegetation of adjacent upland areas is successful. Once revegetation is successful, sediment barriers will be removed from the right-of-way and disposed of at an approved disposal facility.

Road and Trail Crossings

The *Traffic and Transportation Plan* (Transportation Plan) identifies USFS roads crossed by the ACP Project on FS lands, with crossing methods[11].

All roads crossed by the ACP on the MNF and GWNF will be crossed using the open-cut method and then restored to preconstruction condition. This method could require temporary closure of the road, two-track, or trail 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 in the trench. 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. Atlantic will take measures such as posting signs and implementing necessary traffic control measures at open-cut road crossings for safety and to minimize traffic disruptions. Specific measures associated with the timing of any road closures, detours to avoid active construction areas, and mitigation measures for maintaining access across the road, such plating across the road, are provided in the Transportation Plan. Debris from road construction (e.g., remnants of concrete) will be recycled or disposed of at an approved disposal facility.

Details regarding construction across designated USFS trails, including the timing of any closures, detours to avoid active construction areas, and measures for maintaining access across trails, are discussed in Section 17, Public Access Plan. For certain high-use trails, Atlantic will install the pipeline using construction methods to be determined in consultation with the USFS, to ensure that trail access across the right-of-way can continue until the trail crossing segment is ready to be excavated, installed, and backfilled, and to limit the trail closure time to two days or less in most instances. At all trail crossings crossed by the open-cut method, the trail will be restored to its preconstruction condition. Section 2.1.9.11 discusses the crossing of the Appalachian National Scenic Trail (ANST).

[11] The ACP Project does not cross any state highways or railroads on USFS lands.

2.1.9.5 Steep Terrain

Steep slope hazards are one of numerous geologic hazards and processes that could adversely impact environmental resources; or affect the routing, design, construction, and operation or the integrity of the Projects. In accordance with Atlantic's commitment to safety and the environment, Atlantic developed and implemented for all new construction projects, the Slope Stability Policy and Procedure (updated in September, 2016)to avoid, minimize, and mitigate potential landslide issues in slip prone areas prior to, during, and after construction (see Attachment C). The Slope Stability Policy and Procedure applies to both West Virginia and Virginia. It includes considerations for slips associated with pipeline construction during routing, engineering design, preconstruction planning, construction, and post construction. It exceeds FERC or other regulatory requirements regarding slope stability design.

In addition, Atlantic is committed to identifying mitigation measures beyond standard practices targeted to prevent slips on steep slopes through a Best in Class (BIC) Program. The focus of the BIC Program is to proactively address steep slopes (defined as slopes greater than 30 percent) 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 and Virginia, and then go above and beyond all 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 targeting un-authorized discharges to water bodies resulting from steep slope, landslide and erosion hazards; and thereby support preparation of the project-specific Erosion & Sediment Control Plan and corresponding Storm Water Pollution Prevention Plans (SWPPP) that will be used to secure the construction stormwater permits for the project. The BIC Program achieves this by pulling together 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 know if additional mitigation is needed), and operational measures (i.e. monitor and maintain and operate the system, as needed).

The BIC Program Team will convene in a series of design workshops to examine the identified hazards and supporting information along the pipeline alignment. The hazards will be initially identified by studies such as the "Geohazards Assessment" (which may include geotechnical or hydrotechnical investigations) or the karst study, and/or by other targeted studies such as the soil survey. These studies identify and assess or support the review of the hazard, and provide a basis to select the most applicable and robust BIC mitigation response to minimize or eliminate the hazard, and then monitor the hazard through ongoing operations. Atlantic intends to submit to the USFS supplemental drawings associated with steep slope design and will include these drawings in Attachment A.

2.1.9.6 Karst Areas

Based on review of maps from the U.S. Geological Survey, West Virginia Department of Environmental Protection, and Virginia Department of Mines, Minerals, and Energy, portions of the AP-1 mainline route across USFS lands have the potential to contain karst features (Dicken et al., 2005; Hubbard, 1983; Nicholson et al., 2005; West Virginia Department of Environmental Protection, 1998). A detailed desktop assessment and field survey was conducted by a geotechnical expert to identify sinkholes and other karst features (e.g., cave entrances, closed depressions, and sinking streams) along the proposed pipeline route in these areas. The Karst Monitoring and Mitigation Plan (Attachment H) identifies

construction and restoration practices in karst areas. In accordance with this plan, erosion and sediment controls will be installed prior to construction along the edge of the right-of-way and in other work areas upslope of known sinkholes or other karst features with a direct connection to the phreatic zone of the karst (i.e., groundwater). Refueling activities and the handling of fuel and other materials in the vicinity of these features will be conducted in accordance with the SPCC Plan. Additionally, Atlantic will monitor clearing, grading, and trenching activities to identify potential karst features that may have been unidentifiable on the surface during the preconstruction survey. If features are uncovered, they will be evaluated by a geotechnical contractor, in conjunction with the construction/environmental team members, to determine the need for mitigation measures, such as stabilization. Additionally, Atlantic will monitor karst features as described in the Karst Monitoring and Mitigation Plan.

2.1.9.7 Blasting

It is anticipated that blasting will be required in areas where hard shallow bedrock or boulders are encountered that cannot be removed by conventional excavation with a backhoe trencher, by ripping with a bulldozer followed by backhoe excavation, or by hammering with a backhoe-attached device followed by backhoe excavation. The Blasting Plan identifies areas on USFS lands where hard shallow bedrock is anticipated and blasting could be necessary. The Blasting Plan also provides blasting procedures, including safety, use, storage, and transportation of explosives, consistent with safety requirements as defined by Federal and state/commonwealth regulations.

2.1.9.8 Winter Construction/Snow Removal

Atlantic does not expect that construction activities will occur in frozen ground conditions, although such a scenario is possible depending on weather conditions, particularly if construction extends into the late 4th Quarter of the year. It is also quite possible that construction could occur during times of snowfall in West Virginia and Virginia, particularly at higher elevations. Atlantic filed a Winter Construction Plan with the FERC (Attachment D), which identifies best management practices (BMP) for winter construction activities. As necessary, snow will be removed from construction work areas to expose soils for grading and excavation. Snow removal will be limited to active construction areas and areas needed to maintain access to the construction right-of-way. Snow will be bladed or pushed to the edges of the right-of-way with a motor-grader, snowplow, or bulldozer fitted with a “shoe” to minimize impacts on underlying soils and vegetation, and stockpiled within the right-of-way or in approved ATWS areas. Snow will not be bladed off the right-of-way. Alternatively, in the event of extreme snow events or significant snowdrifts, snow may be blown off the right-of-way using industrial blowers mounted to construction vehicles. Snow that is blown off the construction right-of-way will be directed away from existing roads and driveways, parking areas, residences, and other landowner structures. Regardless of the method used, snow removal equipment will access the ACP Project area from approved access roads, and will operate from within the construction right-of-way or approved ATWS areas.

Snow will be removed from both the working and spoil sides of the construction right-of-way prior to topsoil segregation and grading to prevent mixing of snow with excavated spoil. Snow which accumulates on the right-of-way during construction will be removed and stockpiled along the edges of the construction right-of-way or in approved ATWS areas, or blown off the right-of-way, as described above. Large accumulations of snow on excavated spoil piles will be removed as practicable prior to backfilling. Snow will not be mixed with spoil during backfilling to the extent practicable.

Snow also will be removed, as necessary, from approved access roads by plowing to the edges of the road or blowing off the road to allow safe access to the construction right-of-way. The access roads will be maintained in accordance with applicable permit requirements and landowner agreements.

Gaps will be left in stockpiled snow piles based on an assessment of drainage patterns to allow water to drain off of the right-of-way during thaw. Gaps will also be left in stockpiled snow at drainage crossings. Atlantic's EIs will assess potential volumes and velocities of snow melt, considering temperature variations and rain amounts, and will work with the construction contractors to determine how best to stockpile snow, and where to create gaps in the event of a significant snow melt, to avoid situations where large accumulations of melting snow could flow away from the right-of-way causing erosion. Erosion control devices and diversion berms will be installed in these areas, as appropriate, in accordance with the Upland Erosion Control Plan. During winter or spring thaw conditions, Atlantic will determine when construction activities may be required, and will ensure they are implemented in accordance with the Winter Construction Plan. These construction activities could include any or all of the following:

- Surveying and staking the access roads, right of way, temporary work space and additional temporary work space
- Opening, upgrading, preparing and maintaining access roads
- Loading and offloading of construction equipment
- Felling, hauling and removing of timber
- Installing and maintaining erosion and sediment control materials and devices
- Chipping, grinding and burning (if permitted) of timber, slash and stumps
- Stripping, salvaging and stabilizing topsoil
- Grading of the right of way, temporary work space and additional temporary work space
- Hammering, drilling, blasting, excavating, storing, hauling and removing rock
- Hauling, stringing and bending of the pipe
- Excavating the ditch
- Welding the pipe and non-destructive examination of the welds
- Sandblasting and coating the welds
- Hauling and stockpiling padding material and installing it in the ditch
- Lowering the pipe into the ditch and backfilling
- Boring under roads, railroads and other infrastructure
- Horizontal directional drilling and associated support activities
- Installing, filling, maintaining, emptying and removing water impoundment structures
- Hauling and trucking of water

- Filling, testing, dewatering, drying, cleaning and internally inspecting the pipeline
- Removing, hauling and disposing of construction debris, trash and waste
- Maintaining and refueling equipment
- Monitoring, maintaining, stabilizing and securing the right of way, temporary work space, additional temporary work space and access roads
- Restoring areas disturbed by construction

2.1.9.9 Concrete Coating

As noted above, concrete coating or bag weights will be used to provide negative buoyancy for the pipelines where they are installed across wetlands and waterbodies. Concrete coating, where required, will be applied to pipe joints at the contractor yards or on the construction right-of-way. The pipe will either be coated at contractor yards, in the construction right-of-way or in approved ATWS areas. All applications of concrete coating will be conducted in accordance with the SPCC Plan and other applicable environmental requirements. Concrete coating activities will not be conducted within 100 feet of wetlands, waterbodies, or springs, or within 300 feet of karst features, unless the location is an existing industrial site designated for such use.

2.1.9.10 Appalachian National Scenic Trail/Blue Ridge Parkway Crossing

Atlantic proposes to cross beneath the ANST and BRP with a single HDD. This method will avoid direct impacts to these features and surrounding federal lands, and will significantly mitigate visual impacts of the pipeline right-of-way from both features. Plan and profile drawings for the proposed HDD are included as Attachment O.

At the proposed pipeline crossing location, the ANST lies on GWNF land, while the nearby BRP lies on NPS lands. The GWNF is considering a project-specific LRMP amendment that would allow the ACP to cross the ANST at this location. **GWNF LRMP Standard 4A-025** states:

> *Locate new public utilities and rights-of-way in areas of [the ANST Management Prescription Area] where major impacts already exist. Limit linear utilities and rights-of-way to a single crossing of the [ANST Management Prescription Area] per project.*

The HDD method is a process that allows for trenchless construction by drilling a hole beneath a surface feature, such as in this case the BRP and the ANST, and installing a prefabricated segment of pipeline through the hole. Use of this method will completely avoid disturbance to the surface of the right-of-way between the entry and exit points of the drill. The distance of the HDD from entry to exit point is approximately 4,600 feet. When installed, the pipe will lie more than 600 feet below the ANST and the BRP.

Tree clearing and site preparation associated with the HDD to cross the ANST and BRP is anticipated to begin in fall of 2017 at the HDD entry and exit sites. Neither of these sites lies on USFS land. This work will be limited to tree clearing, processing timber, and site grading at the entry and exit workspaces. Drilling operations would begin in early spring of 2018. Drilling and installation of the pull section and cleanup and regrading of the construction site, as needed, is conservatively estimated to continue for 12 months.

To complete the HDD, a drill rig will be placed on the entry side of the crossing and a small-diameter pilot hole (i.e., about 4 inches) will be drilled along a predetermined path within the approved and granted right-of-way underneath the BRP, other Federal lands and the ANST 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 under the mountain. 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 pilot hole will be enlarged through a process of back-reaming using progressively larger reaming tools until the bore hole is wide enough to accept the permanent pipeline. Several passes 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 42-inch-diameter pipeline to be installed, or approximately 54 inches.

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 rock cuttings to the surface, and maintain the integrity of the hole. Small pits will be dug at or near the entry and exit points for the HDD and will be located completely within the limits of the construction right-of-way. These pits will be used to temporarily store and manage 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 (rock cuttings removed) and cleaned for reuse. Water for the drilling operation and hydrostatic testing of the HDD pipe section will be trucked to the site from the James River. The drilling operation will conform to all relevant sections of this COM Plan.

The pipeline segment (also called a pull section) to be installed beneath the surface feature will be fabricated on the right-of-way or in the approved additional temporary workspace 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. A steel bullhead will be welded onto the front end of the pull section to aid in pulling the pipe through the drill hole. After the hole is completed, the pull section will be attached to the drill string on the exit side of the hole and pulled back through the hole toward the drill rig. As the pipeline is being installed, excess drilling fluid that is displaced from the hole by the pipeline will be collected and disposed of at an appropriate and approved off-site facility.

Temporary storage of material removed from either the proposed or contingency drill path will occur on the workspace associated with the entry or exit locations, which are not located on USFS land. Cuttings will be hauled away and deposited at approved landfills and will not result in any significant temporary accumulation. Any temporary storage of cuttings will be in accordance with project requirements (e.g., erosion and sedimentation controls, setbacks from water bodies, site clean-up).

Once installation of the HDD pipeline is completed, the pulled segment will be welded into the cross country sections of pipeline on either side of the HDD and the construction site will be cleaned up, regraded as necessary, and reseeded/replanted. Trees will be allowed to regrow in all temporary workspace outside of the permanent right-of-way.

If Atlantic is unable to complete the HDD after multiple adjustments and attempts, a contingency crossing plan employing a “direct drill” approach will be employed. If this crossing method begins, it would continue for approximately 12 to 16 weeks. The ANST crossing contingency plan is described in detail in Attachment P.

2.1.9.11 Construction Safety & Security

Day-to-day security of the work sites (contractor yards, material yards, work sites, etc.) will be the responsibility of the respective contractors assigned to the site. Contractors will likely use private security contractors and/or local off-duty police officers to maintain security. Contractors’ security

personnel will coordinate with Atlantic corporate security and will provide briefings on known or potential security risks as necessary. Atlantic will coordinate all security and safety activities at work sites on USFS lands with the designated USFS staff.

Each contractor will have a full-time safety representative assigned to each active construction site. This representative will work closely with Atlantic safety personnel, both field and managerial, to maintain and enforce project safety guidelines. Each contractor will develop site-specific safety plans that will address the safety concerns associated with each work site (steep terrain, urban work areas, etc.).

The contractors' safety plans will be submitted to Atlantic for approval and will address a broad range of project safety guidelines and procedures, including but not limited to:

- Accident investigation
- Substance abuse policy
- Emergency action plans (fire reporting, site evacuation procedures, etc.)
- Local emergency contacts (police, fire, hospitals, etc.)
- Safety training requirements and procedures
- Safe operation of equipment
- Traffic control procedures

General security and safety plans will be reviewed daily, during morning meetings with all construction personnel, prior to leaving the yard. Once on the right-of-way or associated job site, specific safety and security risks associated with the day's work will be addressed with job hazard analysis conducted by crew foremen. The job hazard analysis will be narrower in scope and will address specific hazards associated with the work to be completed that day.

Atlantic will, in close coordination with the USFS, post signs at various strategic locations informing the public about the pipeline construction, any road closures or detours, restricted areas, etc. Along portions of the construction right-of-way between road and trail crossings, ACP will post signs at or near the edge of the work area at spacings of about 200 feet or as dictated by terrain and visibility, warning the public that the construction right of way is closed to public entry. Measures to ensure the safety of the public are discussed in more detail in Section 17, Public Access Plan.

2.2 OPERATIONS AND MAINTENANCE

2.2.1 Routine Maintenance

DTI will operate and maintain the ACP facilities in accordance with all applicable federal and state/commonwealth requirements, including the minimum federal safety standards identified in Transportation of Natural and Other Gas by Pipeline, 49 CFR 192. Operations and maintenance of the ACP facilities will be performed by or at the direction of DTI in its capacity as operator of the ACP pursuant to a Construction, Operations, and Maintenance Agreement with Atlantic.

The USDOT's Pipeline and Hazardous Materials Safety Administration regulates the operations and maintenance of natural gas pipeline facilities. The regulations found at 49 CFR 192.613, 192.703, 192.705, and 192.709 address aerial and ground patrols of pipeline facilities. DTI will conduct regular aerial and ground patrols of the pipeline facilities in accordance with these regulations. The frequency of patrols is determined by class location unit (i.e., population density) and the location of the pipeline. DTI has Standard Operating Procedures for its facilities that define patrol frequency and methods and identify reporting requirements for abnormal or unusual conditions. All patrols are documented in an Inspection Monitoring System Compliance Database.

The pipeline facilities will be inspected by qualified personnel from the air (quarterly) and on foot (yearly) in accordance with the applicable regulations. This will allow for adequate viewing of the right-of-way and use of forward looking infrared technology for leak detection. Foot patrols are conducted by staff trained to identify potential issues such as erosion, slips, and leaks. These surveillance activities will provide information on possible encroachments and nearby construction activities, exposed pipe, and other potential concerns that may affect the safety and operation of the pipelines. Field personnel will advise the appropriate operations personnel of new construction along or near the pipeline system. Line patrol of highway and railroad crossings will be completed as required by the USDOT. Valves will be inspected annually and the results documented.

USFS staff will be notified of any planned foot patrols and will be provided with any resulting reports or photographs concerning the condition of the right-of-way or integrity of the pipeline system.

Pipeline markers and signs will be inspected to assure that pipeline locations are clearly identified. The condition of pipeline markers will be noted during line patrols as well as during road crossing, One-Call, and other inspections. Damaged or missing line markers will be noted and repaired or replaced as necessary.

In order to maintain accessibility of the right-of-way and accommodate pipeline integrity surveys, vegetation along the right-of-way will be cleared periodically, and as necessary, in accordance with the Upland Erosion Control Plan and Stream and Wetland Crossing Procedures (except in the ANST area crossed by HDD where vegetation maintenance will not be required). Clearing equipment will be pre-approved by the USFS, and clearing schedules will meet USFS requirements with respect to sensitive species timing restrictions.

The permanent pipeline right-of-way will be maintained in an herbaceous state. Woody vegetation within the permanent right-of-way will be cleared periodically, in order to maintain accessibility of the right-of-way for maintenance and to accommodate pipeline integrity surveys, In uplands, trees and brush will be cleared over the entire width of the permanent right-of-way on an as-needed basis not to exceed once every 3 years. In wetlands and riparian areas, a 10-foot-wide corridor centered over the pipeline will be cleared at a frequency necessary for the corridor to be permanently maintained in an herbaceous state, as allowed by the Procedures. In addition, trees within 15 feet of the pipeline with roots that could compromise the integrity of the pipeline coating may be selectively cut and removed from the permanent right-of-way.

Where necessary and when required, DTI will use mechanical mowing or cutting along the right-of-way for normal vegetation maintenance. On steep slopes (>40 percent) depending on bank stability the clearing would be completed via motorized equipment and/or hand clearing. No herbicides will be utilized for normal vegetation maintenance.

DTI will monitor the right-of-way for infestations of non-native invasive species that may have been created or exacerbated by its construction activities, and may utilize USFS-approved herbicides to treat such infestations, in accordance with the Non-Native Invasive Plant Species Management Plan.

Operations and maintenance procedures, including record keeping, will be performed in accordance with USDOT requirements.

Pipeline integrity surveys and vegetation maintenance may identify areas along the right-of-way where permanent erosion control devices need to be repaired or additional erosion control devices may be needed. If problem areas are evident, erosion control devices will be repaired or installed, as necessary,

and the right-of-way will be stabilized to prevent future degradation. USFS staff will be advised of planned erosion control repairs, re-installations, or additions.

2.2.2 Major Maintenance Work

During the operating life of the pipeline, it may be necessary on occasion to excavate the pipe for inspection, repair or replacement purposes. Atlantic will notify the appropriate Forest in advance of such work to review the work plan, to ensure the work is carried out in compliance with the terms of the right-of-way grant, and to address any other issues regarding the work. In many cases the work would be able to be performed within the permanent right-of-way boundaries. However, in some instances additional workspace may be needed outside the permanent right-of-way, depending on terrain, the extent of the excavation or repairs, etc. In such instances, Atlantic anticipates that the work would be able to be carried out within the ACP construction footprint.

2.2.3 Emergency Repairs

49 CFR Part 192 describes the minimum standards for operating and maintaining pipeline facilities, including the requirement to establish a written plan governing these activities. Under Section 192.615, each pipeline operator must establish an emergency plan that provides written procedures to minimize the hazards from a gas pipeline emergency. Key elements of the plan include procedures for:

- receiving, identifying, and classifying emergency events, such as gas leaks, fires, explosions, and natural disasters;
- establishing and maintaining communications with local fire, police, and public officials, and coordinating emergency response;
- making personnel, equipment, tools, and materials available at the scene of an emergency;
- protecting people first and then property, and making safe from actual or potential hazards; and
- emergency shutdown of systems and safe restoration of service.

DTI has an Emergency Response Plan (ERP) for its existing pipeline system in accordance with the USDOT regulations. DTI will update the ERP to incorporate the proposed Project based on feedback from local emergency service providers (e.g., police, fire, medical, and emergency response). The updates to the ERP will identify the appropriate contacts for emergency service providers (including names and telephone numbers) in the event of an emergency during operation of the Project. The updated ERP will be available prior to construction.

The USDOT requires that pipeline operators establish and maintain liaisons with local fire, police, and other emergency responders to plan for and coordinate emergency response efforts in the event of an incident during construction or operation of the proposed facilities. Additionally, each operator must establish a continuing education program to enable customers, the public, government officials, and those engaged in excavation activities to recognize a natural gas pipeline emergency and report it to the appropriate public officials. Accordingly, DTI will establish and maintain liaisons with local public officials and emergency responders, and provide appropriate training to responders before the proposed ACP is placed in service.

Regular meetings[12] will be held with emergency response agencies (including USFS wildland fire and law enforcement personnel and local fire departments) where the role of the agencies with regard to pipeline fires will be discussed, along with issues related to potential compressor station incidents. The information exchanged between DTI and the emergency response agencies that participate in these meetings will familiarize each organization with the resources, including personnel and equipment, that can be utilized in the unlikely event that an incident occurs. Police and fire departments will also receive emergency telephone numbers that can be used to contact DTI 24 hours a day.

In the unlikely event of an incident, DTI will work with emergency response agencies to maintain access to and from residences and businesses during potential emergency situations. DTI will implement its ERP to bring the incident under control, and work with local responders to maintain access to residences and businesses via existing roads. If a road is damaged by an incident, or access to residences and business is otherwise restricted, DTI responders will cut a new road for access or make an old road passable, to reach the affected residences and businesses. Additionally, in an emergency situation, DTI could use air lift services to reach affected residences and businesses.

2.2.4 Pipeline Operations/Safety and Security

The USDOT is the Federal agency responsible for pipeline safety under Title 49, United States Code Chapter 601. Within the USDOT, the Pipeline and Hazardous Materials Safety Administration's Office of Pipeline Safety (OPS) administers a national regulatory program to facilitate the safe transportation of natural gas and other hazardous materials by pipeline. The OPS has developed safety regulations and other approaches to risk management that promote safety in the design, construction, testing, operation, maintenance, and emergency response of pipeline facilities. Many of the regulations are written as performance standards that set the level of safety to be attained and allow the pipeline operator to use various technologies to achieve the required safety standards.

The pipeline facilities associated with the ACP will be designed, constructed, operated, and maintained to meet or exceed the USDOT Minimum Federal Safety Standards in Title 49 CFR Part 192. These regulations, which are intended to protect the public and to prevent natural gas facility accidents and failures, include specifications for material selection and qualification; minimum design requirements; and protection of the pipeline from internal, external, and atmospheric corrosion.

2.2.5 Integrity Management Plan

The Gas Transmission Integrity Management Rule (49 CFR Part 192, Subpart O) specifies how pipeline operators must identify, prioritize, assess, evaluate, repair, and validate the integrity of gas transmission pipelines that could, in the event of a leak or failure, affect High Consequence Areas (HCA). This rule requires that operators develop a written integrity management plan that includes:

- identification of all covered segments;
- development of a Baseline Assessment Plan to assure the integrity of all covered segments;
- a framework that contains all required elements of the Integrity Management Program;
- a process to assure continual improvement to the program;

[12] PHMSA Code requires ACP to hold annual meetings with emergency response agencies. This will be facilitated via regional and/or individual municipality meetings.

- provisions to implement industry standards invoked by reference; and
- a process to document changes to the program (and notify OPS as required).

DTI has implemented a comprehensive Integrity Management Program that meets or exceeds these regulations. DTI's Integrity Management Program addresses the following:

- HCAs – see Section 11.2.2.
- Threat Identification/Risk Assessment – DTI has adopted a threat-based methodology for managing pipeline risk.
- Baseline/Continuous Assessment Plans – Risk assessment provides a rational and consistent method to assess the integrity of a pipeline segment. This method allows for prioritization, which more effectively uses resources in identifying and mitigating threats.
- Remediation/Prevention – Remediation is defined as action taken by the operator to mitigate the danger of a potential integrity concern. Remediation includes pressure reduction and/or timely repair and preventive measures that halt a potential integrity problem so it does not proceed to failure.
- Record-Keeping Provisions – DTI maintains a complete history of all major integrity components within integrated databases.
- Performance and Quality Assurance – DTI's Integrity Management Program is evaluated to confirm that the program effectively assesses integrity and protects HCAs. A Quality Assurance Plan provides documented proof that the operator meets all requirements of its Integrity Management Plan.
- Management of Change – Management of change procedures identify changes to pipeline systems and consider the impact of those changes on the integrity of the pipeline system.
- Communications – DTI has developed and implemented a communications plan to inform company personnel, jurisdictional authorities, and the public about its integrity management efforts and the results of its integrity management activities.

2.2.6 Facilities Security

DTI maintains a Critical Gas Facilities Security Plan that addresses the assessment of risks to DTI facilities. DTI will update this plan to incorporate the proposed Project. The risk assessment process includes sabotage, terrorism, theft and diversion, cyber threats, security breaches, and security incidents. DTI Corporate Security, working with DTI Management, conducts ongoing risk assessment of DTI facilities utilizing the continual risk management methodology. This methodology assesses historical and projected risks.

The security plan implements a strategy that includes the development of close working relationships with the local, state/commonwealth, and federal law enforcement agencies that are responsible for DTI sites throughout the DTI footprint. These relationships include the sharing of risk/threat information pertaining to DTI facilities. The security strategy also includes an ongoing training program for DTI personnel on the security topics of the signs of terrorism, sabotage, and

suspicious incidents, to include the reporting of such incidents to DTI Management, DTI Corporate Security, law enforcement, and the appropriate state/commonwealth and federal regulatory agencies.

2.2.7 Abandonment

While Atlantic has no plans for abandonment of its pipeline facilities, if abandonment is necessary, Atlantic will either remove its pipeline facilities from USFS lands or abandon them in place as authorized or directed by the AO, and restore the right-of-way and associated work areas, in consultation with the USFS.

2.3 KEY CONTACTS

Key contacts during the period of ACP construction are as follows:

Names of person(s) to contact:

Dominion Transmission, Inc.: _____

U.S. Forest Service Authorized Officer: _____

Key Contacts

U.S. Forest Service:

- Authorized Officer(s): _____
- Forest Supervisor, Monongahela National Forest _____
- Forest Supervisor, George Washington National Forest _____

Dominion Transmission, Inc.

- Title: _____
- Field Compliance/Monitoring Officers _____

Federal Energy Regulatory Commission (FERC)

- FERC Environmental Project Manager _____
- Third-Party Monitors _____

Dominion Transmission, Inc. (Grant/Permit Holder)

- Project Manager _____
- Construction Site Supervisor _____
- Environmental Construction Coordinator _____
- Environmental Inspectors/Environmental Monitors _____

3.0 ENVIRONMENTAL COMPLIANCE

3.1 PURPOSE

The purpose of this Environmental Compliance Plan is to identify processes to ensure compliance with conditions attached to ACP authorizations, for the portion of the Project that lies on USFS lands only. However, it is designed to be consistent with, and will be referenced in, the broader *Implementation Plan*, which is required by the FERC to address environmental compliance across the entire Project. The Environmental Compliance Plan establishes processes and procedures for environmental training, environmental inspection and monitoring, and reporting on USFS lands. It also identifies the roles and responsibilities of Project and agency staff or their representatives, in assuring environmental compliance. This Environmental Compliance Plan extends to all subject areas covered by the COM Plan, for purposes of training, compliance and reporting.

3.2 FERC IMPLEMENTATION PLAN

Among the standard conditions included by the FERC in any issuance of a CPCN, is that the certificate holder submit an *Implementation Plan*. The *Implementation Plan* will describe how Atlantic will comply with the construction procedures and mitigation measures described in their application, supplemental filings (including responses to staff data requests), the final EIS, and conditions required by the CPCN. The *Implementation Plan* will demonstrate to the FERC, regulatory agencies, and federal/state land management agencies that Atlantic has considered all environmental requirements related to the project, and has a plan to ensure they are implemented during construction. The *Implementation Plan* will include, among other items, the following:

- updated alignment sheets;
- any changes, route realignments, facility relocations and staging area changes or additions shown on alignment sheets along with a written description of the change, existing land use/cover type, documentation of landowner or land management agency approval, and a statement of any cultural or federally listed threatened or endangered species that will be affected;
- a statement that Atlantic will inform contractor personnel of the EIs authority and commitment to provide environmental training to contractor personnel;
- a description of how Atlantic will implement the construction procedures and mitigation measures described in its application, supplemental filings (including responses to staff data requests), the final EIS, and required by the CPCN; and how Atlantic will incorporate these requirements into the contract bid documents, construction contracts and construction drawings so that the mitigation required at each site is clear to onsite construction and inspection personnel;
- a schedule or Gantt Chart that includes dates for the completion of all required surveys and reports; the environmental training of construction personnel; the start of construction; and the start and completion of restoration;
- the number of EIs assigned per construction spread, and how Atlantic will ensure that sufficient personnel are available to implement the environmental mitigation measures; company personnel, including EIs and contractors; who will receive copies of the appropriate material; the location and dates of the environmental compliance training; the

procedures (including use of contract penalties) Atlantic will follow if noncompliance occurs;

- a discussion of the EI's roles and responsibilities;
- a commitment by Atlantic to file weekly or biweekly construction status reports;
- a description of Atlantics environmental complaint resolution procedure that provides landowners with clear and simple directions for identifying and resolving their environmental mitigation problems/concerns during construction and restoration of the ACP Project.

Atlantic's *Implementation Plan* will need to be filed within 60 days of acceptance of the CPCN.

3.3 CONTRACTOR BID DOCUMENTS

Atlantic will include copies of all approved environmental construction and mitigation plans and permits for incorporation into the construction contracts. The construction contracts will include penalties for noncompliance with the project's environmental requirements.

3.4 PREPARATION OF REQUEST FOR PROPOSAL FOR THIRD-PARTY COMPLIANCE CONTRACTOR

Following receipt of the CPCN from the FERC, Atlantic will prepare a request for proposal to provide third-party compliance oversight on behalf of the FERC and other agencies, including, pending their concurrence, the MNF and GWNF. The request for proposal will be sent to multiple environmental firms with a demonstrated track record of providing these services to the FERC. The environmental contractor assisting FERC with the Environmental Impact Statement is typically included on the list assuming they are qualified to provide these services. Atlantic will choose its preferred proposals (typically three) and submit them to FERC. The FERC will choose its preferred provider from the proposals submitted by Atlantic.

3.5 NOTICES TO PROCEED

Atlantic will not commence construction anywhere on the Project until the FERC has issued the Project a Notice to Proceed (NTP). FERC's NTP is typically issued once the certificate holder has satisfactorily demonstrated compliance with pre-construction conditions contained in the CPCN. Similarly, Atlantic will not commence construction (including timber removal) on USFS lands unless and until the USFS AO has issued the Project an NTP.

Due to the two-season construction schedule, as well as the need to complete certain surveys, conduct treatment at cultural resource sites, etc., Atlantic anticipates requesting from both the FERC and the USFS partial NTPs covering those segments of the Project that are ready to commence construction and for which pre-construction conditions have been satisfied. Any such requests will document the reasons for the request of a partial NTP, as well as documentation that pre-construction conditions have been satisfied for the requested segment(s).

3.6 ENVIRONMENTAL COMPLIANCE ROLES AND RESPONSIBILITIES

3.6.1 US Forest Service

The USFS has authority over all activities that occur on USFS lands.

3.6.2 USFS Authorized Officer

The USFS AO will have environmental compliance oversight over the portion of the project on USFS lands, and is responsible for determining overall environmental compliance with the COM Plan, Record of Decision, and terms of the right-of-way grant. The AO has stop work authority on all USFS lands. The AO manages the Field Compliance/Monitoring Officers. The AO is responsible for issuing NTPs on USFS lands and for approving requested project changes on USFS lands using the variance request process described in Section 3.9 below.

3.6.3 Field Compliance/Monitoring Officers

The Field Compliance/Monitoring Officers will conduct compliance oversight inspections on all USFS lands. The Field Compliance/Monitoring Officers will be responsible to the AO to verify and document Atlantic's compliance with the COM Plan, the Record of Decision, and terms of the right-of-way grant. The Field Compliance/Monitoring Officers will not interact directly with the contractor but will coordinate and communicate with Atlantic's EIs. The Field Compliance/Monitoring Officers will conduct field review of potential project changes and report findings to the AO to support approval or denial of variance requests. The Field Compliance/Monitoring Officers will have Stop Work authority for discrete activities on USFS lands that pose an immediate threat to a sensitive environmental resource. The Field Compliance/Monitoring Officers will also have the authority to approve that specific goals or objectives have been met.

3.6.4 Federal Energy Regulatory Commission

3.6.5 FERC Environmental Project Manager

The FERC Environmental Project Manager (FERC PM) will have environmental compliance oversight over the entire Project. The FERC PM will direct the activities of the Third-Party Compliance Monitoring Team. The FERC PM will have Stop Work authority for all project-related activities.

3.6.6 Third-Party Compliance Monitoring Team

The FERC Third-Party Compliance Monitoring Team will consist of an office-based Compliance Manager and multiple field-based Compliance Monitors (CM). The Third-Party Compliance Manager will manage the Third-Party Compliance Monitoring Program and be responsible for directing the day to day activities of the Third-Party CMs, reporting compliance results to FERC, and managing the FERC variance approval process. The Third-Party Compliance Manager will be responsible to ensure that corrective actions are documented in relation to all noncompliance activities. The Third-Party Compliance Manager will be responsible to approve or deny Level 2 variance requests. The Compliance Manager will coordinate with Atlantic, the AO, and the FERC PM to ensure compliance.

The CMs will conduct daily inspections of all construction activities and document their observations and levels of compliance in daily reports. The CM will assist in the review of variance requests and be responsible to approve or deny Level 1 variance requests. The CMs' primary responsibilities will be monitoring environmental compliance on all non-USFS lands; however, because the FERC has responsibility for environmental compliance over the entire Project, the CMs will conduct

limited monitoring on USFS lands and will coordinate with the Field Compliance/Monitoring Officers. The CMs will not interact directly with the contractor but will coordinate and communicate with Atlantic's EIs and the USFS' Field Compliance/Monitoring Officers. The CMs will have Stop Work authority for discrete activities that pose an immediate threat to a sensitive environmental resource.

3.6.7 Project Manager

Atlantic's Project Manager will be responsible to Atlantic and is responsible for overall management of construction activities.

3.6.8 Construction Site Supervisor

The Construction Site Supervisor will have direct oversight of all personnel that prepare, construct, maintain and rehabilitate the Project. The Supervisor also has control over site-specific construction plans, including the ability to make modifications to those plans, pending any necessary USFS approvals. In addition to USFS requirements, this person must ensure compliance with the FERC Order, COM Plan, the Erosion and Sediment Control Plan (ESCP), Storm Water Pollution Prevention Plan (SWPPP), and West Virginia and Virginia Stormwater Management Program requirements. The Construction Site Supervisor is authorized to direct workers at a site to carry out activities in accordance with these and other permit conditions. The Supervisor will ensure compliance with all applicable safety requirements.

3.6.9 Environmental Construction Coordinator

The Environmental Construction Coordinator (ECC) will serve as part of the environmental team relative to environmental compliance within Atlantic. The ECC has the responsibility of ensuring full compliance with applicable laws, environmental rules, regulations, permits, and company policies that pertain to their Project. The ECC's roles and responsibilities may include:

- Ensure compliance with applicable federal, state, and local environmental regulations, permits, company standards, and procedures, and facility procedures at the Project;
- Promote environmental stewardship;
- Coordinate with EI's and contractors to ensure site environmental compliance;
- Serve as primary site coordinator with Dominion 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.

3.6.10 Environmental Inspector

EIs will have the authority to stop activities that violate the environmental conditions of the FERC Order, the COM Plan, stipulations of other environmental permits or approvals, or landowner easement agreements, as well as order appropriate corrective action.

The EI will have peer status with all other activity inspectors and will report directly to the ECC who has overall authority on the construction spread or Project.

The number and experience of EIs assigned to each construction spread shall be appropriate for the length of the construction spread and the number/significance of resources affected. The person designated as the EI will typically be a dedicated role for each construction spread.

At a minimum, the EI shall be responsible for:

- Inspecting construction activities for compliance with the requirements of this COM Plan, the ESCP, the Construction Alignment Sheets, the environmental conditions of the FERC Order, proposed mitigation measures, other federal or state and local environmental permits and approvals, and environmental requirements in landowner easement agreements;

- Identifying, documenting, and overseeing corrective actions, as necessary to bring an activity back into compliance;

- Verifying that the limits of authorized construction work areas and locations of access roads are visibly marked before clearing, and maintained throughout construction;

- Verifying the location of signs and highly visible flagging marking the boundaries of sensitive resource areas, including waterbodies and wetlands, or areas with special requirements along the construction work area;

- Identifying erosion/sediment control and soil stabilization needs in all areas;

- Ensuring that the design of slope breakers will not cause erosion or direct water into sensitive resource areas, including cultural resource sites, wetlands, waterbodies and sensitive species habitats;

- Verifying that dewatering activities are properly monitored and do not result in the deposition of sand, silt, and/or sediment into sensitive resource areas, including wetlands, waterbodies, cultural resource sites, and sensitive species habitat; stopping dewatering activities if such deposition is occurring and ensuring the design of the discharge is changed to prevent reoccurrence; and verifying that dewatering structures are removed after completion of dewatering activities;

- Ensuring that subsoil and topsoil are tested on USFS lands to measure compaction and determine the need for corrective action;

- Advising the Construction Site Supervisor when environmental conditions (such as wet weather, severe storm events or frozen soils) make it advisable to restrict or delay construction activities to avoid topsoil mixing or excessive compaction;

- Ensuring restoration of contours and topsoil;

- Verifying that any imported soils have been certified as free of noxious weeds and soil pests, unless otherwise approved by the landowner, and is considered clean and free of hazardous materials;

- Ensuring that the appropriate erosion/sediment control and stabilization needs are implemented in all areas, including ensuring that erosion and sediment controls are properly installed and maintained daily to prevent sediment flow into sensitive 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;

- Inspecting and ensuring the maintenance of temporary erosion and sediment control measures at least:

    - On a daily basis in areas of active construction or equipment operation;

    - On a twice-weekly basis in areas with no construction or equipment operation;

    - Within 24 hours of each stormwater event (runoff from precipitation, snowmelt, surface runoff and drainage, including rainfall events resulting in 0.5 inches or more);

- Ensuring the repair of all ineffective temporary erosion and sediment 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;

- Ensuring proper seed mixes, rates and restoration methods are used, and obtaining documentation;

- Ensuring that the Contractor implements and complies with Atlantic's internal environmental standards and related operating procedures;

- Verifying that locations for any disposal of excess construction materials for beneficial reuse comply with this COM Plan, the ESCP and any applicable permits / clearances; and;

- Keeping records of compliance with the environmental conditions of the FERC Order and the mitigation measures proposed by Atlantic in the application submitted to the FERC, the COM Plan, and other federal or state environmental permits during active construction and restoration. Records should include photo documentation.

3.6.11 Environmental Monitors

In addition to EIs, Environmental Monitors will be deployed as required. Environmental Monitors are resource specialists and include for example cultural and biological resource monitors. Depending on the Project requirements, the biological monitors may be general biological monitors, avian or fisheries monitors, or other species-specific monitors with certifications for handling sensitive species. These monitors will be provided on an as-needed basis in compliance with construction monitoring plans and permit conditions. For example, certain monitors may only be required when construction activities are in the vicinity of a specific site (e.g., a known cultural resource site or habitat for a threatened endangered species). Depending on the timing of construction, avian monitors may be required during tree clearing operations.

3.7 ENVIRONMENTAL TRAINING

Environmental training will be given to both Atlantic personnel and contractor personnel whose activities have the potential to impact the environment during pipeline construction. All construction personnel from the ECC, EI, ESCP/Stormwater Management inspectors, craft inspectors, contractor job superintendent to loggers, welders, equipment operators, and laborers will be given some form of environmental training. The level of training will be commensurate with the type of duties of the personnel. At the discretion of Atlantic, environmental training for personnel may also be required on the Project where it is not required by FERC.

Training will be given prior to the start of construction and throughout the construction process, as needed, and will cover the following issues:

- Specifics of this COM Plan, the ESCP and other Atlantic plans;
- General environmental regulatory permit requirements;
- Job or activity specific permit requirements;
- Atlantic policies and commitments;
- Cultural resource procedures and restrictions;
- Threatened and endangered species procedures and restrictions; and
- Any other pertinent information related to the job.

In addition to the EI, all other construction personnel are expected to play an important role in maintaining strict compliance with all permit conditions, and to promptly report any conditions that are perceived as having the potential to threaten environmental protection to the appropriate inspector during construction.

3.8 REPORTING

All EIs and Environmental Monitors will document their daily inspection activities in a daily report using an electronic reporting system. All information for the daily inspection reports will be entered into an electronic daily report template that transfers the information to a Project-specific database. The daily report will have required reporting fields such as date, location information, and compliance level and will be capable of handling photographic documentation. The electronic reporting system will be used to generate information for the Atlantic's weekly report to be submitted to FERC.

Section 8.11 discusses reporting requirements specific to the ESCP.

3.9 VARIANCE PROCEDURES

Project changes will require approval through the variance request process. A dedicated Variance Coordinator may be required to coordinate variance requests from the contractor, ensure approvals are received from Atlantic, ensure any necessary landowner approvals are in place, appropriate documentation is provided (e.g., photos, maps, biological/ cultural survey), and other agency approval as necessary. Levels of variance approvals are as follows:

- Level 1 variance requests include the approval of like-use roads (assuming the Project has received blanket concurrences from the FWS and State Historic Preservation Officer for like-use roads); shifting extra workspace along the construction right-of-way for a short distance within the previously surveyed corridor (without increasing land use disturbance in type or acreage or impacting cultural or environmental resources); and performance-based changes to mitigation measures. On USFS lands, Level 1 variances

must be approved in writing by the USFS Field Compliance/Monitoring Officer, unless the USFS delegates this authority to the FERC Compliance Monitor. Any such approvals will be documented by the FERC Compliance Monitor.

- Level 2 variance requests typically include additional workspace within the area surveyed for cultural and biological resources. On USFS lands, Level 2 variance requests must be approved in writing by the USFS Field Compliance/Monitoring Officer. Any such approvals will be documented by the FERC Compliance Monitor.

- Level 3 variance requests typically include additional workspace for which cultural and biological survey and associated agency consultation is required. They may include changes to permanent facility locations or Project-wide changes. On USFS lands, Level 3 variance requests must be approved in writing by the AO. Level 3 variance request must also be formally filed with the FERC for review and approval by the FERC PM.

4.0 TIMBER REMOVAL PLAN

4.1 PURPOSE

The purpose of this plan is to describe how timber removal activities will be conducted on USFS lands, and identify measures for reducing impacts and stabilizing areas where timber is removed. For purposes of this plan, timber removal is defined as removing merchantable timber logs, disposal of non-merchantable timber, and the decking/removal of logs at the edge of the right-of-way or landings. This plan augments the other construction, restoration, and mitigation plans prepared for the Projects. All applicable provisions of other plans apply to timber removal activities (e.g., the equipment refueling procedures described in the SPCC Plan).

The MNF and GWNF each have standards and guidelines applicable to timber removal practices within the National Forests. This Timber Removal Plan has been written to conform to the standards and guidelines contained within the LRMPs of both National Forests.

The ACP will cross USFS lands administered by the GWNF at the ANST. Atlantic is planning to cross the ANST, as well as the nearby Blue Ridge Parkway corridor on NPS land, with a single HDD, eliminating the need to clear trees at these sensitive crossing locations.

4.2 TRAINING

Prior to the start of timber removal, Atlantic will conduct environmental and safety training for Atlantic and Contractor personnel. The training program will focus on this *Timber Removal Plan,* the FERC Plan and Procedures, and other applicable elements of the COM Plan and permit conditions. In addition, Atlantic will provide large-group training sessions before each work crew commences construction with periodic follow-up training for groups of newly assigned personnel.

4.3 COMPENSATION

Timber located on National Forest Service (NFS) lands will be paid for and disposed of at the discretion of the Timber Sale Contracting Officer's. The volume of merchantable timber to be removed for pipeline construction will be determined by a timber cruise complying with a cruise plan provided by the Forest Service. The cruise will evaluate forests within the Project's footprint and provide a volume estimate for merchantable timber. The Forest Service will perform a timber appraisal based upon this cruise to determine the value of the merchantable timber to be removed. Atlantic will reimburse the Federal government based on that valuation, prior to any cutting taking place.

4.4 TIMBER CRUISE AND EXTRACTION PLANS

Timber cruises will be conducted prior to construction to determine timber volumes, values, and species composition. Atlantic will employ timber specialists to cruise, mark and appraise timber in accordance with Cruise Plans provided by the MNF and GWNF (see Attachment Q). For areas containing merchantable timber, the Project will prepare Timber Extraction Plans (a.k.a. Logging Plans) in consultation with the MNF and GWNF after timber cruises are complete. These Plans will be appended to the COM Plan and will identify:

- the timber volume to be cleared;
- tree sizes;
- log grades;
- the dollar value of the timber;

- the logging system(s) to be used for each harvest segment;
- yarding methods and landing locations and decks;
- the volume of timber that will be yarded at each landing;
- the locations of any landings and decks not previously identified; and
- the roads that will be used to haul logs.

4.5 TIMBER REMOVAL METHODS

The Project is considering two timber-clearing methods for the Projects: mechanical harvesting and high line yarder logging. Helicopter logging is not currently being considered, but could be used in steep areas All three methods are described below.

4.5.1 Mechanical Harvesting

Wherever possible, mechanical harvesting will be employed. "Feller bunchers," which are mechanized tree harvesters that can cut and gather several trees at once, can be used to cut trees on slopes with up to 50 percent grade. The feller bunchers will pile the felled trees, allowing them to be transported (yarded) to larger collection areas (landings) by "skidders" or "forwarders," which are other specialized machines for moving trees. Skidders drag logs, while forwarders carry logs clear of the ground. Log cranes and logging shovels will load trucks, feed grinders, handle stumps, place environmental mats, build bridges, and aid in the overall safe handling of materials and rigging on the landing and in the woods.

Skidders will be limited to slopes of 35 percent or less. Forwarders, skyline, or other advanced harvesting system may be utilized on slopes from 35-50 percent as approved by the USFS on a case-by-case basis. Skyline systems or helicopters may be used on slopes steeper than 50 percent.

4.5.2 Yarder Logging

Cable yarding systems remove felled timber with the use of cables and blocks using a tower (the "yarder") and an anchor line. Yarding systems may drag logs up or down hill, or in the case of skyline systems, partially or entirely lift the logs above the ground. Skyline logging will be implemented in some areas because of steep terrain, limited access, and the alignment of the route. Alignment is critical in all cable systems. Where there are slight changes in alignment, skyline yarder logging can be effectively used. Where cable systems are utilized, only skyline systems will be used. Partial or full suspension is necessary on steep slopes. Atlantic will not "drag logs up or downhill" without at least partial suspension.

Yarder work using a skyline system could be used in some places on the right-of-way. This system requires a tailhold, which is the point of anchorage of the skyline. In many cases, a right-of-way alignment does not lend itself to be "in line" for a good tailhold. Loggers typically seek permission to place their tailhold outside the cutting area to create better alignment. Consequently, the tailhold is typically placed off the construction area and on an opposing slope. The tailhold could also be a tree that is rigged off the main cutting area. The Project will seek extra workspace authorization, if necessary to locate any tailholds beyond the construction right-of-way.

Yarders will be used to assist excavators, skidders, stump grinders, and dozers to remove brush and stumps on the right-of-way. With long cable capabilities and good rigging, many machines can be aided by a yarder using stump holds, blocks, and "dead men" as a safety anchor on a steep slope.

A yoder is a combination yarder/loader that can accomplish many of the same tasks as a yarding system on a smaller scale. Yoders can fill the gap for log removal in areas where alignment problems

pose major inefficiencies to big yarders. These smaller yarding machines can effectively remove logs in tight, steep areas, such as those encountered in parts of the Appalachian Range.

4.5.3 Helicopter Logging

Helicopter logging is typically employed in remote areas with rough terrain. Timber is generally felled by hand cutters with chain saws. One advantage of helicopter logging is the ability to safely remove timber on remote slopes where no roads exist. Helicopters are also used to safely remove timber on steep slopes and protect terrestrial and aquatic resources. Flying logs to existing roadway systems creates less soil disturbance and requires fewer man-hours on the hills. Logs are flown to the nearest timber landing for truck transport to a mill.

During log transportation, helicopter flight paths typically will be along the pipeline right-of-way. The helicopter can also provide ambulatory service, if needed, as well as help with fire patrol and the delivery of equipment and crew to the field.

4.6 PLANNED TIMBER REMOVAL OPERATIONS

4.6.1 General Requirements

The schedule for timber removal is provided in Section 2.1.1.3. Timber removal on the MNF and the GWNF is scheduled to take place between November 1 and April 1 of both construction seasons, which will minimize the potential to take nesting migratory birds. For any areas of the right-of-way within 5 miles of known Indiana bat hibernacula, no timber removal will occur before November 16.

Surveys for eagles were completed in 2016 via helicopter and no eagle nests were identified on USFS lands. Bald eagles are known to occur year round in areas with suitable habitat along the ACP route; bald eagles nest in late winter into the summer and roost in the winter. Golden eagles are not known to nest in this area, although they do winter roost.

If additional bald eagle nests or occupied bald or golden eagle winter roosting habitat are identified ahead of or during construction, Atlantic will follow the National Bald Eagle Management Guidelines for work within 660 feet of bald eagle nests. For tree clearing that occurs during the winter roosting or nesting season, a qualified biological monitor will accompany the clearing crews for work conducted in areas where golden and bald eagles are believed to be present on USFS lands.

Before initiating timber removal activities, Atlantic and DTI will conduct environmental training for company and contractor personnel. The training program will focus on the FERC *Upland Erosion Control, Revegetation, and Maintenance Plan* (Plan) and *Wetland and Waterbody Construction and Mitigation Procedures* (Procedures), other Project-specific construction, restoration, and mitigation plans; and applicable permit conditions. In addition, the Project will provide large-group training sessions before each crew commences construction with periodic follow-up training for groups of newly assigned personnel.

A detailed civil survey will be conducted before timber removal activities begin to delineate the limits of approved work areas (i.e., the construction right-of-way, temporary and ATWS, aboveground facility sites and associated workspace, staging areas, and contractor yards). The locations of approved access roads will be flagged and marked with signs.

Riparian and wetland areas will be clearly labeled in the field. Other areas/sensitive features will be flagged prior to clearing (e.g., existing snags or large diameter trees on the edge of the construction right-of-way to be saved/protected as green recruitment or habitat/shade trees). Applicable erosion and

sediment control measures will be installed in accordance with the Plan and Procedures to prevent unnecessary disturbance associated with initial clearing. Additionally, temporary bridges will be installed at waterbody crossings along the right-of-way in accordance with the Plan and Procedures.

Prior to felling, the boundaries of the construction areas will be painted with paint furnished by the Forest Service. Timber will be felled from construction areas using the method best suited to terrain and topography. Merchantable timber will be skidded or carried to landings for loading onto trucks and hauling off site. Non-merchantable timber will be burned, chipped, stacked along the edge of the right-of-way, hauled off-site, or salvaged for use during restoration activities (e.g., habitat construction, off-highway vehicle [OHV] blocking). 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 right-of-way or at the nearest staging area.

Slash will not be windrowed or left in a manner that creates an obstruction. Slash may be chipped and blown off the right-of-way outside wetlands or stream channels. If approved by the CO, slash may be burned. Stumps will be cut as close to the ground as possible and left in place, except over the trench line, or where grading is necessary to create a safe and level work surface. The top of the stumps will be ground flush to grade within the majority of the right-of-way. All stumps excavated from the trench line that cannot be ground to mulch onsite will be placed along the edge of the construction right-of-way or in temporary extra workspaces. Stumps will be hauled from the extra workspaces to a pulp mill, a permitted disposal facility, used on the right-of-way for restoration purposes, burned (if permitted), or disposed of according to land managing agency or landowner specifications.

During construction, the Project will monitor compliance with the environmental requirements and permit conditions for the Project. The EIs will be responsible for monitoring contractor compliance with this *Timber Removal Plan*.

4.6.2 Access Roads and Storage Areas

Approved access roads and storage areas for timber removal activities will be depicted on Project alignment sheets and flagged or otherwise marked in the field.

4.7 MITIGATION MEASURES

4.7.1 General Mitigation Measures

The Project will implement several additional measures to reduce or minimize impacts associated with timber removal activities, including the following:

- During timber removal, temporary erosion control devices will be installed, inspected, and maintained in accordance with the Plan and Procedures. Erosion control and all other timber removal activities taking place during the winter season will be conducted in accordance with the Winter Construction Plan.

- Any debris entering a waterbody as a result of felling and yarding of timber will be removed as soon as practical and will be placed outside the 100-year floodplain where feasible.

- Logs and slash will not be yarded across perennial streams unless fully suspended.

- During logging/clearing operations, the direction of log or slash movement will be conducted to minimize the potential for sediment reaching waterbodies.

- Logs firmly embedded in the bed or bank of waterbodies that are in place prior to felling and yarding of timber will not be disturbed unless they prevent trenching or fluming operations or operation of equipment.

- Any existing logs that are removed from waterbodies to construct the pipeline crossing will be returned to the waterbody after the pipeline has been installed, backfilling is complete, and while stream banks are being restored.

- Landings for clearing operations will not be located in wetlands or riparian areas, and, where feasible, logs yarded out of wetlands or riparian areas will be skidded with at least one end suspended from the ground to minimize soil disturbance.

- Any timber cleared from the pipeline right-of-way or other work areas that will be used for in-stream or upland wildlife habitat diversity structures will be stored in approved temporary workspace areas for use during restoration.

- Prior to clearing operations, EIs will flag existing snags on the edges of the construction right-of-way or ATWS, where feasible, to save from clearing. These snags will be saved as mitigation to benefit primary and secondary cavity nesting birds, mammals, reptiles, and amphibians.

- Selected large diameter trees on the edge of the construction right-of-way and ATWS areas will be flagged by EIs to save/protect as green recruitment or habitat/shade trees, where feasible.

- Implement the Visual Resources Plan (Section 20), which will reduce visual impacts by employing “feathering” of the right-of-way edge in certain locations, and replanting woody vegetation in the construction right-of-way .

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. Proper supportive surfacing material will be operated on during timber removal. Soil quality standards will be maintained and detrimental soil disturbance will be avoided. Proper skid roads will be constructed if needed to ensure safe operations and protection of resources on site. Use of skid roads will not cause soil movement resulting in erosion and sedimentation. Since skid roads will lie within the limits of the pipeline construction work area, such areas will be restored as part of the pipeline construction restoration effort.

- Designed skid trails will be used to restrict detrimental soil disturbance (e.g., compaction and displacement) to a smaller area of the right-of-way over the pipeline trenching area. Detrimental soil disturbance will be defined by FSH 2550. Class 2 and Class 3 disturbances will be mitigated to return proper function to the soil resource. All skid trails

will be identified in the logging plan to be submitted for the review and approval of the USFS, and must be in compliance with the respective Forest's LRMP.

4.7.2 Additional Mitigation Measures for Forest Service Lands

On USFS lands, additional measures will be implemented, in conformance with LRMP standards and guidelines. If a general mitigation measure is more stringent than its counterpart Forest mitigation measure below, the more stringent measure will be applied.

4.7.2.1 Monongahela National Forest

- Whole trees will not be yarded without approval from the CO (MNF LRMP TR05).
- Slash will be removed from permanent roads and recreation trails. Slash may be retained in wildlife openings in brush piles if approved by the CO (MNF LRMP TR08). Slash will not be windrowed or left in a manner that creates an obstruction. Slash may be chipped and blown off the right-of-way outside wetlands or stream channels.
- USFS roads will not be used for skidding (MNF LRMP TR09).
- USFS roads will not be used as log landings unless approved by the CO. Any wildlife openings used as log landings will be restored similarly to all pipeline construction work areas upon completion of construction (MNF LRMP TR10).
- Log landings and other concentrated timber removal activities will be located outside channel buffers (MNF LRMP TR11).
- Skid trails will be kept to the minimum necessary to yard the logs (MNF LRMP TR13).
- Right-of-way edges will be "feathered" in irregular patterns to blend in with the landscape in the immediate foreground, foreground or midground of visually sensitive areas (MNF LRMP TR20).
- Access roads identified for pipeline access will be used for timber removal activities as well (see Table 2.1.1-1). To the extent possible, landings will be sited at locations where extra workspace for pipeline construction is needed, to avoid disturbing more area than is necessary.
- No timber removal activities will take place outside work areas authorized by the USFS; this will avoid impacts to any threatened and endangered plant populations outside the workspace.

4.7.2.2 George Washington National Forest

- Inventory any stands proposed for timber harvest for existing old growth conditions using the criteria in Appendix B (Guidance for Conserving and Restoring Old Growth Forest Communities on National Forests in the Southern Region (Forestry Report R8-FR62, June, 1997)). Any stands in Old Growth Forests Type 1 (Northern Hardwood), 2a (Hemlock-Northern Hardwood), 2b (White Pine-Northern Hardwood), 2c (Spruce-Northern Hardwood), 5 (Mixed Mesophytic), 10 (Hardwood Wetland Forests), 22 (Dry and Xeric Oak Forest), 24 (Xeric Pine and Pine-Oak Forest and Woodland), 28 (Eastern

Riverfront) that meet the age criteria for old growth will be unsuitable for timber production, regardless of whether they meet the other criteria for existing old growth. Stands in Old Growth Forest Types 21 (Dry Mesic Oak), or 25 (Dry and Dry-Mesic Oak Pine) may be suitable for timber harvest. Decisions to harvest these stands would be made after consideration of the contribution of identified patches to the distribution and abundance of the old growth community type and to the desired condition of the appropriate prescription during project analysis. **(GWNF LRMP FW-85).** Note: GWNF has identified this standard as potentially requiring a project-specific LRMP amendment, depending upon the results of old growth forest surveys.

- Advanced harvesting methods (such as cable or helicopter) will be used on sustained slopes greater than 35 percent (**GWNF LRMP FW-125).**

- Log landings will be located outside of riparian corridors. **(GWNF LRMP FW-139).**

- All equipment used for harvesting and hauling operations will be serviced outside of riparian corridors **(GWNF LRMP FW-140).**

- Unless otherwise authorized by the Forest CO, log landings will be ripped to a depth of 6-8 inches to break up compaction, and to ensure soil productivity and the successful reestablishment of vegetation. **(GWNF LRMP FW-141).**

- Skid trails will cross riparian corridors only at Forest-designated crossings. If crossing a perennial or intermittent stream is unavoidable, temporary bridges will be used. All streams will be crossed as close to a right angle as possible. Stabilization of skid trails will occur as soon as possible after use, to minimize soil movement downslope. **(GWNF LRMP FW-142).**

- Skidding of trees will be directed in a manner that prevents creation of channels or gullies that concentrate water flow to adjacent streams. **(GWNF LRMP FW-143).**

- Temporary stream crossings associated with timber harvest operations will be removed and rehabilitated. **(GWNF LRMP FW-144).**

- Dips or waterbars or other dispersal methods will be constructed and maintained to direct stormwater off skid trails and reduce potential sediment flow to streams. **(GWNF LRMP FW-145).**

- Designated trails will not be used as skid trails. Crossing of designated trails will occur at right angles to the extent feasible. Designated trail treads and profiles will be restored upon completion of pipeline construction. **(GWNF LRMP FW-146).**

- Right-of-way edges will be shaped or "feathered" in irregular patterns to blend in with the existing landscape in High and Moderate SIO areas. At the direction of the Forest CO, some edges may not need feathering to meet the Scenic Integrity Objectives. Geometric shapes will not be utilized. **(GWNF LRMP FW-184).**

- If visible within a 100-foot zone of Concern from Level 1 & 2 travelways and use areas, slash will be removed, burned, chipped or lopped. These treatments result in an average slash height of 2 feet off the ground. **(GWNF LRMP FW-186).** Slash will not be

windrowed or left in a manner that creates an obstruction. Slash may be chipped and blown off the right-of-way outside wetlands or stream channels.

- To the extent practical, log landings, access roads and bladed skid trails will be located out of view to avoid bare mineral soil observation from Concern Level 1 travel routes and viewing platforms. **(GWNF LRMP FW-190).**

- Access roads identified for pipeline access (see Table 2.1.1-1) will be used for timber removal activities as well. To the extent possible, landings will be sited at locations where extra workspace for pipeline construction is needed, to avoid disturbing more area than is necessary.

- No timber machinery shall cross the ANST nor operate between the HDD entry and exit points or, if the contingency direct drill approach is employed, between the direct drill entry and exit points.

- All woody material will be moved, lopped, and/or scattered so as not to be visible from the ANST or its associated features.

5.0 FIRE PREVENTION AND SUPPRESSION PLAN

5.1 PURPOSE

The purpose of this Fire Plan is to identify BMPs for preventing fires on USFS lands and responding to inadvertent fires that occur during construction of the ACP on or near USFS lands. It is based upon the Fire Plan prepared in connection with Atlantic's application to the FERC for the entire Project. This Fire Plan focuses on USFS lands. It incorporates elements that are applicable across the Project as well as elements specific to either or both National Forests crossed by the ACP (the MNF and the GWNF). It incorporates by reference both Forests' standards and guidelines pertaining to fire prevention and suppression (Attachment E).

The Fire Plan identifies responsibilities and procedures for suppressing fire ignitions, responding to and reporting fire emergencies, and working with emergency response agencies in the event of fire, regardless of cause. The Fire Plan is designed to be consistent with applicable Federal and state/commonwealth laws, regulations, plans, and policies, including Chapter 14 of the 2003 International Fire Code (Combustible Dust-Producing Operations) and Section A104 of the International Wildland-Urban Interface Code (Ignition Source Control).

The Fire Plan provides an implementation strategy to ensure immediate and aggressive action to suppress inadvertent fires that occur during construction of the Project and establishes protocols and lines of communication for reporting fires that occur. Implementation of the Fire Plan will ensure that proper types and quantities of safety and fire extinguishing equipment are available in construction areas to suppress fires, and that construction workers are adequately trained for response to fires. The Plan will be used to familiarize ACP personnel with basic fire emergency planning, response, and evacuation procedures, and their individual roles in fire prevention and suppression. Planning and training will help ACP personnel respond effectively in the event of a fire, thereby avoiding or minimizing injuries and/or damage to property or the environment.

5.2 TRAINING

Prior to the start of construction, Atlantic will conduct environmental and safety training for Company and Contractor personnel. The training program will focus on the FERC Plan and Procedures, other construction, restoration, and mitigation plans, including this Fire Plan; and applicable permit conditions. In addition, Atlantic and DTI will provide large-group training sessions before each work crew begins construction with periodic follow-up training for groups of newly assigned personnel.

Training for fire suppression and response will include:

- the chain of command and fire reporting process;
- emergency contacts and numbers;
- basic fire prevention behavior controls;
- basic uses of hand tools, water backpacks, and other fire suppression equipment;
- fire suppression procedures and precautions; and
- emergency response and evacuation procedures.

5.3 RESPONSIBILITIES

Atlantic will be responsible for fire prevention during construction of the Project. Atlantic along with the appropriate emergency response or jurisdictional agencies will be responsible for fire suppression and investigation. All ACP personnel, including contractors, will be responsible for

complying with applicable laws and regulations for fire prevention and suppression as well as the measures described in this Fire Plan.

5.3.1 Interagency Coordination

Interagency coordination of wildfire management in the southeastern United States is overseen by the Southern Area Multi-Agency Coordination Group (SACG), which includes representation from Federal land managing agencies and state/commonwealth forestry agencies. The SACG and an adjunct organization, the Southern Area Coordination Center, encompass Virginia and North Carolina. Virginia and North Carolina also have their own centers for coordination of wildfire management.

Interagency coordination of wildfire management in the northeastern United States is overseen by the Eastern Area Coordination Group (EACG), which includes representation from Federal land managing agencies and state/commonwealth forestry agencies. The EACG and an adjunct organization, the EACC, encompasses West Virginia. The EACC and an adjunct organization, the Central Appalachian Dispatch Center, provides interagency coordination for wildfire management on the Monongahela National Forest.

Each of the states/commonwealths crossed by the Project has fire prevention and suppression laws, regulations, and programs. Responsible agencies include the West Virginia Division of Forestry and the Virginia Department of Forestry. Each of these agencies participates in the appropriate SACG and EACG for coordination of wildfire management.

When a fire is initially reported, local and partner firefighting agencies initially respond to the emergency. A local agency can ask for support from the appropriate state/commonwealth or a regional coordination center if a fire could or does exceed the response capabilities of the local agency. The state/commonwealth or regional coordination center may in turn request support from the National Interagency Coordination Center if a regional center exhausts its fire suppression resources.

During a fire emergency, coordination is implemented through the Incident Command System (ICS), which is part of the National Incident Management System. ICS is a standard incident management system used by firefighters and emergency medical teams to establish an organizational structure for management. A chain of command initially is established by the local response agencies to direct the response. As an incident progresses, personnel with higher authority and training assume responsibility for directing the response. ICS and National Incident Management System provide a framework that assists agencies, non-governmental organizations, and the private sector in preventing, responding to, and mitigating the effects of incidents and ensuring an appropriate response based on the capabilities of response agencies.

5.3.2 ACP Project Responsibilities

The construction contractors working on the Project will be required to implement the provisions of this Fire Plan. Additionally, each contractor will be required to prepare and implement an individual fire control plan, which will identify responsibilities and describe actions to be implemented by the contractor in the event of an inadvertent fire. Copies of each fire control plan will be appended to this Fire Plan.

The key persons responsible for fire prevention and suppression during construction of the Project are the Construction Site Supervisor, Spread Superintendents, Field Safety Officers (FSO), EIs, Fire Authorized Officers (FAO), and Station Managers. Contact information for these persons will be appended to the "issued-for-construction" Fire Plan prior to the start of construction. At a minimum, each construction spread for the pipelines and each aboveground facility site will have one FSO trained in

accordance with National Fire Protection Standards 1521, Chapter 4, Responsibilities for a Health and Safety Officer.

Construction Site Supervisor

The Construction Site Supervisor will be responsible for oversight of all activities along the pipeline, including fire prevention and suppression.

Spread Superintendents

Spread Superintendents will be responsible for general construction operations associated with their individual spreads including compliance with this Fire Plan. Spread Superintendents will be in communication with Construction Site Supervisors, FSOs, EIs, FAOs, and local emergency response, as necessary, to ensure that construction personnel are aware of fire hazards and prevention methods. Spread Superintendents will coordinate with Federal, state/commonwealth, and local emergency responders during periods of high or severe fire conditions to ensure that appropriate preventive measures are in place during construction. Spread Superintendents also will be responsible for:

- monitoring construction areas to identify fire hazards and risks;
- developing and implementing fire protection strategies;
- ensuring adequate firefighting equipment is deployed to high risk areas and that equipment is visible and accessible; and
- ensuring that all firefighting equipment is inspected on a regular basis and maintained in good condition.

Field Safety Officers

The FSOs will be responsible for managing on-site fire suppression documentation, ensuring that fire suppression equipment is available and maintained, ensuring that construction personnel are trained to use equipment properly, and communicating fire hazards and threat levels to construction personnel. Additional responsibilities of the FSOs include:

- reporting all uncontrolled fires within or in the vicinity of the construction area, regardless of source, to the Spread Superintendent, emergency responders, and nearest fire dispatch;
- conducting weekly inspection of tools, equipment, personal protective equipment, and first aid kits;
- developing and maintaining a register of emergency equipment;
- conducting weekly inspections of flammable materials;
- posting “No Smoking” and “Designated Smoking Area” signs and fire rules at appropriate locations within the construction area;
- providing initial response support in the event of a fire and supervising fire suppression activities until relieved;

- providing and gaining approval of site-specific burn and smoke management plans for pre-planned controlled fires that will be implemented in accordance with Federal, state/commonwealth, and Local requirements;
- providing written burning and blasting schedules, as required, to the appropriate Federal, state/commonwealth, and Local fire control jurisdiction;
- monitoring construction areas where activities may present for safety issues, such as blasting;
- complying with regulatory requirements in the storage and handling of flammable substances and maintaining a registry of flammable substances;
- establishing facilities for on-site chemical management and maintaining Safety Data Sheets (formerly known as Material Safety Data Sheets) for flammable materials;
- establishing controls that minimize exposure to flammable materials;
- ensuring that flammable substances are removed from the construction area when not in use or when the location is unattended;
- training and instructing workers in the use, handling, and storage of flammable materials;
- ensuring that construction personnel have been trained in the requirements of this Fire Plan; and
- monitoring compliance with applicable Federal, state/commonwealth, and Local laws, ordinances, and regulations regarding fire prevention and suppression.

Environmental Inspectors

EIs provide environmental regulatory guidance and oversight. This oversight includes fire prevention and suppression within and in the vicinity of construction areas. EIs will be familiar with Federal, state/commonwealth, and Local rules and regulations pertaining to fire prevention and response. In the event of a fire emergency, EIs will assist with fire suppression.

Fire Authorized Officer (FAO)

The FAO may include Interagency Dispatch Centers or staff from land managing agencies. FAO will provide information on current fire danger ratings, the presence of other fires in the vicinity of construction areas, natural disaster warnings, and temporary restrictions on construction activities due to fire or other emergencies. If extreme fire danger is identified by a land managing agency, the FAO may direct the Construction Site Supervisor or Spread Superintendents to increase the level of fire monitoring, install additional fire prevention or suppression equipment, or stop work, if necessary.

The Construction Site Supervisor , Spread Superintendents, FSOs, EIs, FAOs, and local fire authorities have the authority to stop or reduce construction activities or operations that pose a fire hazard until appropriate measures are implemented to minimize risk. The FSOs will accompany Spread Superintendents, FAOs, or third-party CMs on fire inspections and take corrective action when observing or having been notified that fire protection measures have not been properly installed or maintained.

5.4 EMERGENCY NOTIFICATION

In the event of a fire or other emergency, construction personnel on the scene will notify the appropriate Spread Superintendent and FSO immediately. The Spread Superintendent will be responsible for immediately notifying the appropriate fire dispatch center and FAO or land managing agency, where appropriate. In the case of a serious injury, first aid treatment will be provided onsite. The FSO or another supervisor will coordinate with local emergency responders if additional support is required. In the event of a fire emergency, personnel will contact 911 or the nearest emergency response center. Contact information for emergency responders will be appended to the "issued-for-construction" version of this Fire Plan.

A fire emergency is defined as an incident requiring a coordinated response from one or more agencies. When a response is required, the Spread Superintendent or person in charge will communicate the location and extent of the fire and steps underway to control or suppress the fire.

5.5 FIRE DANGER RATINGS

Fire danger ratings based on standard vegetation fuel models will be used by the USFS to determine required fire prevention, control, and monitoring efforts. Based on the fire danger ratings, certain activities such as blasting, welding, or grinding may be restricted at the discretion of the USFS. Additionally, the land managing agency or local fire authority may modify or change requirements based on changes in fire restriction notices or localized hazards or risks.

On USFS Lands, fire danger ratings and associated precautions relevant to the Project include:

- No Fire Restrictions – normal fire precautions.
- Planning Levels 1 or 2 Fire Restrictions – normal fire precautions, except that designated smoking areas and permits for burning are required.
- Planning Levels 3 or 4 Red Flag Warning – special fire precautions including:
- Extra precautions such as designating a fire watch, using a spark shield, or wetting work areas down prior to active construction.
- Machine treatment of slash, skidding, yarding, blasting, welding, metal cutting, and offloading are subject to land managing agency requirements.
- No slash burning is allowed.
- Power saws must be shut down from 1:00 p.m. to 8:00 p.m. local time.
- Hauling trucking must stay on the right-of-way or surfaced roads after 6:00 p.m. local time.
- Additional personnel, equipment, and prevention measures are required.
- Stage 3 Fire Restrictions – special fire precautions including:
- All restrictions listed above.

- Shutdown of all construction activities except operations on soil or graded areas, watering, grading, trench excavation, padding, backfilling, and clean-up.

- Activities such as blasting and welding require an exemption from the FAO unless these activities are completed on the graded portions of the right-of-way.

The FSOs will contact the USFS Duty Officer(s) through the Dispatch Center(s) for each Forest as appropriate to obtain information on fire danger ratings. Contacts will be daily when conditions are favorable for fires and weekly at other times. The FSOs will communicate the fire danger ratings to the Construction Site Supervisor, Spread Superintendents, Station Managers, EIs, and construction crews. The FSOs will contact the USFS Fire Dispatch Center(s) to continue consultation with the USFS.

5.6 FIRE PREVENTION

5.6.1 Blasting

Procedures for blasting are discussed in Atlantic's and DTI's *Blasting Plan*. Additional measures to be implemented in blasting areas are described below.

When fire danger is high, a two-person fire watch will patrol the blast area for a period of one hour after the completion of blasting.

If blasting occurs when the fire danger rating is Planning Levels 2 or 3, an FSO will be on site during the operation and remain on site for one hour after the completion of blasting. At least one Size 0 or larger shovel and one water-filled backpack pump or fire extinguisher will be on site. In addition, a fire watch will be assigned to each crew utilizing blasting equipment.

When the fire danger rating is Planning Levels 3 or 4, blasting will be prohibited unless an exemption is granted by the local fire authority. If an exemption is granted, additional fire prevention equipment and personnel will be on site prior to blasting. Equipment may include water trucks, fire tankers, shovels, backpack pumps, bulldozers, etc. A fire watch will remain on site for at least two hours after the completion of blasting activities.

5.6.2 Welding

During fire season, welding, cutting, or drilling of metal components of the ACP will require the approval of the Spread Superintendent and the Construction Site Supervisor. In areas where approval has been granted, vegetation will be cleared at a minimum diameter of 30 feet around the center of the work area unless the area has been watered to eliminate the fire danger. Each welding crew will be outfitted with at least one Size 0 or larger shovel, one water-filled backpack pump, and one five-pound dry powder ABC fire extinguisher.

When the fire danger rating is Planning Levels 2 or 3, a fire watch will be assigned to each crew utilizing cutting and welding equipment. The fire watch will remain on site for one hour after the completion of welding activities.

When the fire danger rating is Planning Levels 3 or 4, an exemption by the FAO will be required prior to welding activities unless the activities are performed within the graded portions of the right-of-way or other work areas. If an exemption is granted, all Planning Levels 2 or 3 measures will be implemented. In addition, a water tanker and bulldozer will be required to be on site during welding operations, and a fire watch will remain on site for at least two hours after the completion of welding activities.

When the fire danger rating is Stage 3, welding activities will require approval from the FAO. If an approval is granted, all Planning Levels 2, 3 and 4 measures will be implemented.

Fire restriction measures also apply to welding operations performed for equipment maintenance. All welding activities require a permit from the jurisdictional agency as per 29 CFR 1910 Subpart Q (welding) and 29 CFR 1910 Subpart I (personal protective equipment).

5.6.3 Equipment

The construction contractor will develop a list of equipment to be used during construction. All equipment will be subject to inspection by USFS personnel. The equipment may be used only while in good operating order.

5.6.3.1 Fire Extinguishers

The FSAs will inspect fire extinguishers on a monthly basis to verify that:

- each extinguisher is in its designated place, clearly visible, and not blocked by equipment or other objects that could interfere with access to the fire extinguisher during an emergency;
- the nameplate with operating instructions is legible and facing outwards;
- the pressure gauge is showing that the extinguisher is fully charged;
- the pin and tamper seal are intact; and
- the extinguisher is in good condition, showing no signs of physical damage, corrosion or leakage.

The FSO performing the monthly inspection will initial and date each extinguisher inspection tag. Defective units will be taken out of service and replaced immediately.

Fire extinguishers will be used in accordance with 29 CFR 1910.157. Use of fire extinguishers by construction personnel to suppress fires will only be undertaken if:

- the fire is small and is not spreading to other areas;
- escaping the area is possible;
- the fire extinguisher is in working condition and the individual understands how to use it; and
- the fire extinguisher has been professionally inspected and tagged annually;

5.6.4 Spark Arrestors

Spark arresters used for portable equipment, such as chainsaws, will be in good working condition. Light trucks and cars with factory installed or equivalent mufflers, in good condition, may be used on roads where the roadway is cleared of vegetation.

Vehicles equipped with catalytic converters and modern diesel engines with “regeneration systems” or diesel particulate filters are potential fire hazards. These vehicles will be inspected and cleaned, as necessary, and parked on areas cleared of vegetation.

All vehicles operating in vegetation-covered areas will maintain clean and clear undercarriage and exhaust systems, with no chaff, grass, or brush lodged in the exhaust system and skid plates. Cross-country driving outside designated work areas will be prohibited.

5.6.5 Equipment Parking and Storage

Equipment parking areas and small stationary engine sites will be cleared of all extraneous flammable materials. Gas and oil storage areas will be cleared of extraneous flammable material and "No Smoking" signs will be posted within these areas.

All used and discarded oil, oil filters, oily rags, or other waste will be disposed of in approved and marked containers. Containers will be stored in approved locations and removed from the site by licensed contractors or approved personnel and disposed of or recycled at approved facilities. Glass containers will not be used to hold gasoline or other flammable materials.

5.6.6 Power Saws

All gasoline-powered saws will be provided with approved spark arresters/mufflers and maintained in good operating condition. Chainsaw operation will comply with the following:

- the arrester/muffler will contain a 0.023-inch mesh, stainless steel screen;
- a fire extinguisher or water backpack and shovel will be available during chainsaw operations;
- chainsaws will be moved at least 10 feet from the place of fueling before starting; and
- chainsaw fuel and oil will be carried in safety cans designed for that purpose.

5.6.7 Warning Devices

Highway flares or other devices with open flames will not be allowed in the construction area because of the danger for fire. Contractors will only use electric or battery-operated warning devices within the construction area.

5.6.8 Warming and Cooking Fires

Warming and cooking fires will be prohibited on the right-of-way.

5.6.9 Smoking

Smoking is allowed only in areas designated by the FSO. Smoking signs visible to all personnel will be posted at designated areas. The supervisory personnel will be responsible for enforcing smoking restrictions. "No Smoking" signs will be posted in all refueling areas and in areas where flammable materials are used, stored, or discarded.

5.6.10 Refueling

All fuel trucks will be equipped with a 35-pound minimum ABC fire extinguisher. If used, helicopter refueling trucks will be electrically grounded to the helicopter during refueling. Storage areas will be cleared of all extraneous flammable materials. All discarded oil, oil filters, oily rags, or other potentially flammable wastes will be disposed of or as described in Section 5.6.5 above. Only

Department of Transportation-approved and properly maintained containers will be used to store or transport flammable liquids.

5.7 BURNING

Burning of slash or non-merchantable wood is not currently anticipated. If burning is deemed necessary, it will be done only after Atlantic has acquired all applicable permits and approvals, including specific authorization from the FAO. In West Virginia, such burning would require an Approval to Conduct Open Burning for Land Clearing Debris from the West Virginia Department of Environmental Protection. In Virginia, burning on Federal lands would not be subject to the Virginia Department of Forestry's Burn Law. Virginia counties may enact bans on outdoor burning, but such ordinances do not apply to Federal lands Any burning on USFS lands will be done in accordance with standards contained in USFS' Management Direction for Fire Management, and with the Fire Plan. This would entail preparation of a project-specific Burn Plan for USFS approval. If the burn is approved, ACP will notify the West Virginia Department of Forestry and or Virginia Department of Forestry, the Monongahela National Forest and/or George Washington Duty Officer, the appropriate county 911 center, and the local fire department at least 24 hours prior to ignition.

5.8 FUEL LOADING

The USFS has identified fire-related concerns associated with potential increased fuel loadings on the proposed right-of-way if un-utilized woody material is left on the right-of-way. Atlantic will work with the MNF and GWNF to determine the proper balance between the increased fuel loading risks that this may represent and the beneficial uses of some of this material for wildlife habitat, OHV blocking, reduction of visual impacts, and erosion control/restoration purposes. Measures such as lopping and scattering tops and/or burning some of the material on site will be evaluated.

5.9 FIRE AND EMERGENCY RESPONSE EQUIPMENT

5.9.1 Construction Vehicles

All foreman vehicles and crew buses assigned to the construction area will be equipped with one 10-pound ABC fire extinguisher, one shovel, and an operable backpack water pump of four-gallon capacity.

During blasting "red flag warnings" and a fire danger rating of Planning Levels 3 or 4, one water truck per construction spread will be outfitted with a pressure pump, adjustable nozzle, threaded rubber-lined hose with a minimum of 300 feet of 1½-inch cotton jacket, and have a minimum water storage capacity of 1,500 gallons. Water trucks on the right-of-way will be able to help with wildfire fighting in the vicinity of the Project.

The construction companies use water trucks that typically have a 4,000-gallon capacity and 150 feet of 1½-inch water hose that would support fire suppression activities. Many of these vehicles have water cannons mounted on the roof. All vehicles and auxiliary equipment will be equipped with properly functioning and baffled exhaust systems.

5.9.2 Fire Fighting Tools

At least three 10-person tool caches will be maintained per spread. One cache will be placed in an EI's vehicle. The second cache will be located with the Spread Superintendent, or Station Manager. The third cache will be assigned to the FSO. Tool boxes will be red in color, sealed with metal box-car-type seals, and labeled "For Fire Fighting Only." The tool caches will contain the following:

- ten electric headlamps with batteries;
- one first aid kit, 10-person unit;
- two knapsacks;
- five pulaskis with sheaths;
- five long-handled, round-point, Size 0 shovels;
- five fire rakes; and
- ten one-gallon canteens, filled with water.

The Spread Superintendent will expedite delivery of the tool caches upon request of the FSO or FAO or when alerted to an emergency requiring the tools.

In case a tool cache or first aid kit has been used, it will be immediately replenished. All replenished tool caches or first aid boxes will be inspected by the FSO. These will then be resealed before being returned to the construction site.

5.9.3 Field Safety Officer

The FSO vehicle will maintain the following required equipment at all times, although suitable substitutions may be made as necessary:

Item	Description	Quantity
1	Pickup Truck	1
2	Two-Way Mobile Radio Operating (Administrative Unit) Frequency	1
3	Fire-Fighting Tool Cache (see above)	1
4	Axe, Double Bit, Cruiser Type	1
5	Sheath for Axe	1
6	Round-Point Shovel Size 0	2
7	Hard Hat	2
8	Backpack Pump, Complete (filled with water)	2
9	Hoses: Cotton Jacket, 1-1/2 inches (NS Thread) Cotton Jacket, 1 inch (IP Thread) High Pressure, 1 inch (IP Thread) Suction, 1-1/2 inch	 200 feet 400 feet 250 feet 24 feet
10	Hose Fittings: R-F Forester Nozzles R-S Nozzle, Tips (a) Fog (b) Straight Stream Reducer, 1-1/2-inch NS to 1-inch IP Strainer, Suction, 1-1/2 inch Siamese, 1-1/2-inch NS Thread, both Male and Female	 2 6 6 4 1 1 1
11	Tools: Spanner-Wrench, Large, 1-1/2-inch Hose Spanner-Wrench, Small, 1-inch Hose Carpenter Hammer Pliers, Slip Joint	 1 1 1 1
12	Fire Extinguishers ABC, 35-pound minimum	 1

5.10 EVACUATION

During an emergency evacuation, the Project will depend upon response teams, consisting of trained personnel, to attend to injured and/or trapped victims. Construction workers providing medical attention will not help beyond their capability.

Atlantic will establish an emergency communications system utilizing cell phones, hand-held radios, and/or satellite phones to notify workers of emergencies and contact local law enforcement and fire departments. If an immediate evacuation of a construction work area is required, the Construction Site Supervisor, Spread Supervisor, FSO, EI, or other supervisor will direct the evacuation via the nearest escape route to a "safe area." Otherwise, evacuations will be directed by local emergency responders. Designated evacuation wardens will be assigned to each spread or station to account for all personnel present before, during, and after the evacuation. Construction workers will not return to an evacuated work area until emergency responders have deemed it safe and the Construction Site Supervisor, Spread Supervisor, or Station Manager has given an "all-clear" signal.

5.11 PIPELINE OPERATIONS AND FIRES

Most prescribed fire and wildfire management activities undertaken on USFS lands will not be affected by operation of the proposed ACP. The principal concerns for these activities with respect to pipeline safety have to do with: 1) excavation or removal of cover on the right-of-way, and 2) excessive loadings over the pipeline. While the amount of cover over the pipeline would be sufficient to protect the line from fire, grading or excavation on the right-of-way that might be associated with fire management or firefighting activities would not be allowed, other than planned activities coordinated with and supervised by the pipeline operator. Such activities, for example, may require the addition of extra cover over the pipeline at selected crossing locations. Fire management activities not directly affecting the pipeline right-of-way would not be restricted, unless the activity may indirectly cause or contribute to undermining or erosion of the right-of-way.

Any issues associated with planned or unplanned fire management activities that may affect the pipeline right-of-way should be referred to **[Contact Number to be Inserted in Final Document]**

6.0 BLASTING PLAN

6.1 PURPOSE

Based on an analysis of the Natural Resource Conservation Service's Soil Survey Geographic Database, approximately 5.0 miles of the proposed ACP pipeline route on the MNF and 12.8 miles on the GWNF will cross areas with bedrock at depths of less than 60 inches. Some of this bedrock is considered paralithic (soft) and may not require blasting during construction. About 3.6 miles on the MNF and 7.9 miles on the GWNF cross soils with a lithic contact (hard bedrock) within 60 inches of the surface that may require blasting or other special construction techniques during installation of the proposed pipelines.

This *Blasting Plan* is based on the blasting plan prepared in connection with Atlantic's application to the FERC for the entire ACP. The plan outlines the procedures and safety measures that Atlantic will adhere to while conducting blasting activities required for the construction of the ACP. Before blasting, a site-specific Blasting Specification Plan, which is consistent with the provisions in this *Blasting Plan*, will be submitted by the Contractor to Atlantic for approval. Approval of a site-specific Blasting Specification Plan does not relieve the Contractor from responsibility or liability.

6.2 TRAINING

Prior to the start of construction, Atlantic will conduct environmental and safety training for Company and Contractor personnel. The training program will focus on the FERC Plan and Procedures, other construction, restoration, and mitigation plans, including this *Blasting Plan*; and applicable permit conditions. In addition, Atlantic will provide large-group training sessions before each work crew commences construction with periodic follow-up training for groups of newly assigned personnel.

6.3 GENERAL REQUIREMENTS

Blasting for grade or trench excavation will be used where deemed necessary by the Contractor, and approved by an Atlantic representative, after examination of the site. Blasting operations will be conducted by or under the direct and constant supervision of personnel legally licensed and certified to perform such activity in the jurisdiction where blasting occurs. Prior to any blasting activities, the Contractor will provide Atlantic with appropriate information documenting the experience, licenses, and permits associated with blasting personnel. Atlantic will provide such information to the USFS.

Blasting-related operations will comply with applicable federal and/or state/commonwealth, and local regulations, permit conditions, and the construction contract. These operations include:

- obtaining, transporting, storing, handling, loading, detonating, and disposing of blasting material;
- drilling; and
- ground-motion monitoring.

6.4 PRE-BLASTING REQUIREMENTS

Prior to the initiation of blasting operations, the Contractor will comply with the following:

- The Contractor will obtain all required federal, state/commonwealth, and local permits relating to the transportation, storage, handling, loading, and detonation of explosives.
- The Contractor will be responsible for the protection of existing underground facilities.
- Before performing any work on, or accessing the construction right-of-way within either Forest, the Contractor will verify with an Atlantic representative that the USFS, specifically the MNF and/or the GWNF have been notified of the upcoming construction activities. The Contractor will notify all such parties at least 48 hours prior to blasting.
- Atlantic will submit the Contractor's site-specific Blasting Specification Plan to the USFS prior to the execution of blasting.

6.5 SITE-SPECIFIC BLASTING PLANS

For each area determined to require blasting, a site-specific Blasting Specification Plan will be prepared by the Contractor. This plan will include, at a minimum, the following information:

- blaster's name, company, copy of license, and statement of qualifications;
- seismograph company, names, equipment and sensor location;
- site location (milepost and stationing), applicable alignment sheet numbers, and associated rock type and geological structure (solid, layered, or fractured);
- copies of all required federal, state/commonwealth, and local permits;
- methods and materials, including explosive type, product name and size, weight per unit, and density; stemming material; tamping method; blasting sequence; use of non-electrical initiation systems for all blasting operations; and magazine type and locations for storage of explosives and detonating caps;
- site dimensions, including explosive depth, distribution, and maximum charge and weight per delay; and hole depth, diameter, pattern, and number of holes per delay;
- global positioning system (GPS) coordinates of blasting location(s), distance and orientation to nearest aboveground and underground structures, and dates and hours blasting will be conducted;
- blasting procedures for:
    - storing, handling, transporting, loading, and firing explosives;
    - prevention of misfires, fly-rock, fire prevention, noise, and stray current accidental-detonation;
    - signs, flagmen, and warning signals prior to each blast;

- locations where the pipeline route:
  - parallels or crosses an electrical transmission corridor, cable, or pipeline;
  - parallels or crosses a highway or road;
  - approaches within 500 feet of a water well or within 150 feet of an oil and gas well; or
  - approaches within 1,000 feet of any residence, building, or occupied structure;
- local notification;
- inspections after each blast;
- disposal of waste blasting material; and
- blasting considerations of steep slopes.

6.6 MONITORING

During blasting operations, the Contractor will be required to monitor operations in the following manner:

- The Contractor will provide seismographic equipment to measure the peak particle velocity (PPV) of all blasts in the vertical, horizontal, and longitudinal directions.
- The Contractor will measure the PPV at any existing pipelines, domestic structures, water supply wells, oil and gas wells, electrical transmission tower footings, and other utilities within 150 feet of the blasting. If none of these structures/facilities are present, the Contractor will measure the PPV at the edge of the construction right-of-way.
- The Contractor will complete a Blasting Log Record immediately after each blast and submit a copy to an Atlantic representative upon completion of blasting activities at each blasting site.

6.7 SAFETY

6.7.1 Protection of Aboveground and Underground Structures

Where blasting is determined to be required, Atlantic will identify any municipal water mains proposed for crossing, and will consult the local water authority. Reports of identified crossings will include location by milepost, owner, and status and results of contacts with the water authority.

The Contractor will exercise control to prevent damage to aboveground and underground structures including pipelines, domestic structures, water supply wells, oil and gas wells, electrical transmission tower footings, and other utilities. The Contractor will implement the following procedures:

- If blasting occurs within 500 feet of an identified water well, water flow performance and water quality testing will be conducted before blasting. If the water well is damaged as a

result of ACP blasting, and upon confirmation through a damage claim investigation, the well will be repaired or otherwise restored or the well owner will be compensated for damages. Atlantic will provide an alternative potable water supply to the landowner until repairs occur

- If blasting occurs within 150 feet of aboveground structures, the Contractor and an Atlantic representative will inspect and photograph the structures before blasting. In the event that blasting damage to the aboveground structure is confirmed, the owner will be compensated.

- Blasting will not be allowed within 15 feet of an existing pipeline, unless specifically authorized by an Atlantic representative.

- Holes that have contained explosive material will not be re-drilled. Holes will not be drilled where danger exists of intersecting another hole containing explosive material.

- Blasting mats or padding will be used on all shots where necessary to prevent scattering of loose rock onto adjacent property and to prevent damage to nearby structures and overhead utilities.

- Blasting will not begin until occupants of nearby buildings, stores, residences, places of business, places of public gathering, and farmers have been notified by the Contractor in advance to protect personnel, property, and livestock. The Contractor will notify all such parties at least 48 hours prior to blasting.

- Blasting in or near environmentally sensitive areas, such as streams and wildlife areas, may include additional restrictions. Blasting in streams will only take place after any surface flow has been diverted around the work area. When blasting in streams, the following protocol will be used. These protocols may include fish alert tactics, such as:

    - Prior to the initiation of the designed blast and following audible warning signals, a single cap will be initiated in the stream to alert fish to move away from blasting area.

    - Removing fish from blasting area and relocating them downstream (will only be used in smaller streams).

    - In larger streams a boat can be used both up and down stream to alert fish to move away from the blasting area. This tactic can be used only if the operators of the boat can retreat a safe distance from the blast zone as determined by the Blaster in Charge.

- When blasting on steep slopes the following measures will be taken to minimize blasting impacts:

    - A safety berm may be created at the base of each shot to minimize the shot material movement down the slope after initiation if practical.

    - A catch berm may be created at the base of the hill to stop material from leaving the right-of-way, if practical.

  - Berms may be constructed on the right-of-way to direct any rolling material away for the offside boundaries.
  - Shots will be initiated from the lowest elevation of the trench.
  - The blaster will conduct test blasts on areas without slope with a reduction of powder factor that will fracture the material while keeping it in place. Tight digging and higher vibrations may be associated with this adjustment.
  - Decking the holes may be considered to lower the pounds per delay.
  - Where multiple trench shots are to be initiated, the shot material will stay in place and remain muck bound. This will hold the following shots in place.

- All blasting will be subject to the following limitations:
  - Maximum PPV of 12.0 inches per second, or the maximum PPV in accordance with state/commonwealth or local regulations, in any of three mutually perpendicular axes measured at the lesser distance of the nearest facility or the edge of the permanent easement.
  - Maximum drill size will be 2.5 inches unless otherwise approved by an Atlantic representative.
  - Maximum quantity of explosive per delay will be governed by the recorded measurements as influenced by the test blast program or a scaled distance formula.
  - Explosive agents and ignition methods will be approved by an Atlantic representative. Ammonium nitrate/fuel oil and other free flowing explosives and blasting agents are not acceptable and will not be used.
  - Drill holes will not be left loaded overnight.
  - Approved stemming material will be used in all holes.

- The drilling pattern will be set in a manner to achieve smaller rock fragmentation (maximum 1 foot in diameter) to use as much as possible of the blasted rock as backfill material after the pipe has been padded in accordance with the specifications. The Contractor will submit the proposed drilling pattern to an Atlantic representative for approval.

- Under pipeline crossings and all other areas where drilling and blasting is required within 15 feet of existing facilities:
  - Drill holes will be reduced to a maximum of 2 inches or less in diameter.
  - The number of holes shot at one time will be limited to three unless otherwise approved by an Atlantic representative.
  - Appropriate delay between charges will be used to attain desired fragmentation.

6.7.2 Protection of Personnel

The Contractor will include in its procedures all Federal, state/commonwealth, and local safety requirements for blasting. The Contractor's procedures will address, at a minimum, the following requirements:

- Blasting will be performed during daylight hours only.
- Only authorized, qualified, and experienced personnel will handle explosives.
- No explosive materials will be located where they may be exposed to flame, excessive heat, sparks, or impact. Smoking, firearms, matches, open flames, and heat- and spark-producing devices will be prohibited in or near explosive magazines or while explosives are being handled, transported, or used.
- A code of blasting signals will be established, posted in conspicuous places, and utilized during blasting operations. Employee training will be conducted on the use and implementation of the code.
- The Contractor will use every reasonable precaution including, but not limited to, visual and audible warning signals, warning signs, flag persons, and barricades to ensure personnel safety.
- Warning signs, with lettering a minimum of 4 inches in height on a contrasting background, will be erected and maintained at all approaches to the blast area.
- Flaggers will be stationed on all roadways and trails passing within 1,000 feet of the blast area to stop all traffic during blasting operations.
- Both workers involved in the detonation and personnel not involved in the detonation will stand back at a distances determined by the person in charge from the time the blast signal is given until the "ALL CLEAR" is sounded.
- No loaded holes will be left unattended or unprotected. No explosives or blasting agent will be abandoned.
- In the case of a misfire, the blaster will provide proper safeguards for personnel until the misfire has been re-blasted or safely removed.
- The exposed areas of the blast will be matted wherever practicable. In cases where such a procedure is not deemed to be feasible, the Contractor will submit an alternative procedure for review by an Atlantic representative and the site in question will be visited and examined by the consultant before any approval is granted.
- Atlantic may employ two-way radios for communication between vehicles and office facilities. The Contractor will advise Atlantic and other Contractors of any need to cease use of such equipment during blasting activities.
- All loading and blasting activity will cease and personnel in and around the blast area will retreat to a position of safety during the approach and progress of an electrical storm irrespective of the type of explosives or initiation system used. This is a major safety

precaution and will always be observed. All explosive materials, all electrical initiation systems, and all non-electric initiation systems are susceptible to premature initiation by lightning.

- Previous blast areas must be inspected to verify the absence of misfires. No drilling may commence until such inspection occurs. If a misfire occurs adjacent to a hole to be drilled, the misfire will be cleared by the blaster using reasonable techniques required for the situation prior to commencement of drilling. If a misfire occurs at some distance from the drilling area, drilling may be stopped while clearing preparations are underway. When the misfire is to be cleared by re-shooting, drilling will be shut down and personnel evacuated to a place of safety prior to detonation.

- All transportation of explosives will be in accordance with applicable Federal, state/commonwealth, and local laws and regulations. Vehicles used to transport explosives will be in good working condition and equipped with tight wooden or non-sparking metal floor and sides. If explosives are carried in an open-bodied truck, they will be covered with a waterproof and flame-resistant tarp. Wiring will be fully insulated to prevent short-circuiting and at least two fire extinguishers will be carried. The vehicle will be plainly marked to identify its cargo so that the public may be adequately warned. Metal, flammable, or corrosive substances will not be transported in the same vehicle with explosives. There will be no smoking, and unauthorized or unnecessary personnel will not be allowed in the vehicle. Competent, qualified personnel will load and unload explosives into or from the vehicle.

- No sparking metal tools will be used to open kegs or wooden cases of explosives. Metallic slitters will be used to open fiberboard cases, provided the metallic slitter does not come in contact with the metallic fasteners of the case. There will be no smoking, no matches, no open lights, or other fire or flame nearby while handling or using explosives. Explosives will not be placed where they are subject to flame, excessive heat, sparks, or impact. Partial cases or packages of explosives will be re-closed after use. No explosives will be carried in the pockets or clothing of personnel. The wires of an electric blasting cap will not be tampered with in any way. Wires will not be uncoiled. The use of electric blasting caps will not be permitted during dust storms or near any other source of large charges of static electricity. Uncoiling of the wires or use of electric caps will not be permitted near radio-frequency transmitters. The firing circuit will be completely insulated from the ground or other conductors.

- No blast will be fired without a positive signal from the person in charge. This person will have made certain that all surplus explosives are in a safe place; all persons, vehicles, and/or boats are at a safe distance; and adequate warning has been given. Adequate warning of a blast will consist of, but not be limited to, the following:

  - notifying nearby homeowners and local agencies, if necessary;

  - stopping vehicular and/or pedestrian traffic near the blast site; and

  - signaling with an air horn, whistle, or similar device using standard warning signals.

- Only authorized and necessary personnel will be present where explosives are being handled or used.

- The condition of the hole will be checked with a wooden tamping pole prior to loading. Surplus explosives will not be stacked near working areas during loading. Detonating fans will be cut from spool before loading the balance of charge into the hole. No explosives will be forced into a bore hole past an obstruction. Loading will be done by a blaster holding a valid license or by personnel under his direct supervision.

- Fly-rock leaving the right-of-way will be collected immediately and disposed of at disposal sites approved by Atlantic. This work will not be left to the cleanup crew.

- If any blasting is necessary within 2,000 feet of the Appalachian National Scenic Trail, flaggers will be stationed on the Trail to stop traffic during the blasting operations. Hikers could be delayed a maximum of 15 minutes.

6.7.3 Lightning Hazard

A risk of accidental detonation caused by lightning strikes exists at any time the workplace is experiencing an electrical storm and there are loaded holes on site. If this hazard is judged to exist by an Atlantic representative, work will discontinue at all operations and workers will be moved to secure positions away from the loaded holes. Furthermore, workers will not return to the work site until the storm has passed and an Atlantic representative has indicated it is clear to return.

The Contractor will have on site an approved lightning instrument capable of measuring the degree of electrical activity as a storm approaches, and the distance to the storm front from the instrument on the right-of-way.

6.8 KARST

In accordance with Atlantic's *Karst Terrain Assessment, Construction, Monitoring and Mitigation Plan* (Attachment H), and in addition to the measures described above, the following procedures will be implemented in areas of karst terrain:

- Blasting will be conducted in a manner that will not compromise the structural integrity or alter the karst hydrology of known or presumed habitat for federally listed threatened and endangered species in the subterranean karst environment (e.g. Madison cave isopod). Blasting will not occur within areas in close proximity to known threatened, endangered, sensitive, or locally rare species habitat unless pre-approved by the USFW and the USFS AO.

- Excavations will be inspected for voids, openings or other tell-tale signs of solution (karst) activity.

- If rock removal intercepts an open void, channel, or cave, construction activities will cease in the vicinity of the void, channel, or cave until a remedial assessment is performed by a qualified geologist or engineer with experience in karst terrain.

- Use of explosives will be limited to low-force charges designed to transfer the explosive force only to the rock which is designated for removal (e.g., maximum charge of 2 inches per second ground acceleration).

- If the track drill used to prepare drill holes for explosive charges encounters a subsurface void larger than 6 inches within the first 10 feet of bedrock, or a group of voids totaling

more than 6 inches within the first 10 feet of bedrock, then explosives will not be used until a subsurface exploration is conducted to determine if the voids have connectivity to a deeper karst structure. The subsurface exploration will be carried out with track drill probes, coring drill, electrical resistivity, or other techniques capable of resolving open voids in the underlying bedrock. If a track drill or coring rig is used, then all open holes will be grouted shut after the completion of the investigation.

- It is not expected that the limestone found within USFS lands along the pipeline route will fracture in such a way as to cause ground displacement. Following each blast, the area will be examined for signs of ground cracking. Any indication of "overbreak" (i.e.. cracks greater than half the distance to the edge of the construction right-of-way) will be brought to the attention of the blaster and noted on the blast report. The shot pattern and/or loading will be adjusted to minimize or eliminate overbreak. Signature hole analysis will be performed to determine optimum timing for the specific geology. The signature hole data will be interpreted by the Blasting company engineers who will specify timing to the blasters for in field detonator programming. Ongoing signature hole analysis will be necessary to adapt to the changing geology. How often this is completed will depend on site specific conditions.

- Site specific erosion and sediment control plans will be submitted to USFS prior to any drilling activities in karst topography.

6.9 BLASTING ON STEEP SLOPES

Blasting on steep slopes and landslide-prone slopes will be accomplished using conventional trench blasting methods. Blasting may also be required during the right-of-way grading operation.

A drill will be lowered down the slope using conventional winching techniques. The drilling program will be based on 2 or 3 rows of 2-1/2" to 3 1/2" inch diameter holes drilled with a grid spacing of approximately 4-5 feet by 4-5 feet along the ditch line. The drill pattern will be established using a powder factor of about 3.0-4.0 pounds per cubic yard to achieve the desired explosive energy ratio needed to break the rock and pull the ditch. This shot pattern may be adjusted on a site-specific basis to compensate for different geology, nearby structures, utilities or other sensitive areas. A signature hole analysis will be performed to determine optimum timing for the specific geology. The signature hole data will be interpreted by the blasting company engineers who will specify timing to the blasters for in field detonator programming. Ongoing signature hole analysis will be necessary to adapt to the changing geology. How often this is completed will depend on the site specific conditions. The amount of cartridge type explosives per borehole will be limited by the proximity of existing structures and utilities.

All shots will be carefully designed by the licensed blaster to control flyrock. All hole loading activity will be supervised by the licensed blaster. The licensed blaster will communicate with the drillers to obtain geological information for each shot. Matting and or padding may be utilized at the discretion of the licensed blaster.

Several methods will be taken to minimize blasting impacts on these slopes.

1. Trench

    a. Decking the holes may be considered to lower the pounds per delay.

b. The blaster will calculate the average powder factor currently used on the project. By increasing the stemming height the blast may achieve a reduction of 5 percent to 25 percent in powder which will minimize vertical and horizontal movement.

c. Where multiple trench shots are to be initiated, the shot material will stay in place and remain muck bound. This will hold the following shots in place.

2. Right-of-way

a. Decking the holes may be considered to lower the pounds per delay.

b. The blaster will calculate the average powder factor currently used on the project. By increasing the stemming height the blast may achieve a reduction of 5 to 30 percent in explosives which will minimize vertical and horizontal movement.

c. Where multiple Right-of-ways shots are to be initiated, the area will remain muck bound. This will hold the following shots in place.

- A safety berm may be created at the base of each shot to minimize the shot material movement down the slope after initiation if practical.
- A catch berm may be created at the base of the hill to stop material from leaving the right-of way, if practical.
- Berms may be constructed on the right-of-way to direct any rolling material away for the offside boundaries.
- Shots will be initiated from the lowest elevation of the trench.
- The blaster will conduct test blasts on areas without slope with a reduction of powder factor that will fracture the material while keeping it in place. Tight digging and higher vibrations may be associated with this adjustment.
- Decking the holes may be considered to lower the pounds per delay.
- Where multiple trench shots are to be initiated, the shot material will stay in place and remain muck bound. This will hold the following shots in place.

6.10 STORAGE REQUIREMENTS

All explosives, blasting agents, and initiation devices will be stored in locked magazines that have been located, constructed, approved, and licensed in accordance with Federal, state/commonwealth, and local regulations. Magazines will be dry, well ventilated, reasonably cool (painting of the exterior with a reflective color), bullet and fire resistant, and kept clean and in good condition.

Initiation devices will not be stored in the same box, container, or magazine with other explosives. Explosives, blasting agents, or initiation devices will not be stored in wet or damp areas; near oil, gasoline, or cleaning solvents; or near sources of heat radiators, steam pipes, stoves, etc. No metal or

metal tools will be stored in the magazine. There will be no smoking, matches, open lights, or other fire or flame inside or within 50 feet of storage magazines or explosive materials.

Magazines will be constructed and located in accordance with Federal, state/commonwealth, and local regulations. Magazines will be marked in minimum 3-inch-high letters with the words "DANGER – EXPLOSIVES" prominently displayed on all sides and roof, and be kept locked at all times unless explosives are being delivered or removed by authorized personnel. Admittance will be restricted to the magazine keeper, blasting supervisor, or licensed blaster.

Accurate and current records will be kept of the explosive material inventory to ensure that oldest stocks are utilized first, satisfy regulatory requirements, and for immediate notification of any loss or theft. Magazine records will reflect the quantity of explosions removed, the amount returned, and the net quantity used at the blasting site.

When explosive materials are taken from the storage magazine, they will be kept in the original containers until used. Small quantities of explosive materials may be placed in day boxes, powder chests, or detonator boxes. Any explosive material not used at the blast site will be returned to the storage magazine and replaced in the original container as soon as possible.

6.11 SPECIFIC USFS GUIDELINES

The MNF's LRMP includes several standards regarding the use of explosives in the Forest. In addition to aforementioned blasting procedures citied in this document, Atlantic will also adhere to the following standards:

- Explosives shall not be used within 200 feet of hibernacula, maternity colonies, or bachelor colonies unless analysis can demonstrate that this activity will not have an adverse effect on bat populations or habitat. Explosives outside of this area shall not be used when such use has potential to damage the cave or disturb the bat. **(MNF LRMP TE20).**

- Explosives may be allowed within the primary range if it can be demonstrated that this activity will not have an adverse effect on bat populations or habitat. **(MNF LRMP TE39).**

- Explosives shall not be used within 200 feet of hibernacula, within key areas, or within 2.5 miles of active maternity sites, unless analysis can demonstrate that this activity will not have an adverse effect on bat populations or habitat. Explosives outside of these areas shall not be used when such use has potential to damage the cave or disturb the bat. **(MNF LRMP TE50).**

The GWNF's LRMP does not offer specific standards, goals, or guidelines that addressed blasting or the use of explosives.

7.0 TRAFFIC AND TRANSPORTATION MANAGEMENT PLAN

7.1 PURPOSE

The purpose of the Transportation Plan is to identify BMPs that Atlantic will implement during construction of the Project to minimize impacts on roadways and traffic. This plan is based on the Transportation Plan prepared in connection with Atlantic's application to the FERC for the entire ACP. This Transportation Plan incorporates elements that are applicable to construction across roads and highways, commuting of the construction workforce, maintenance of traffic, movement of construction vehicles and delivery of equipment and materials within both National Forests crossed by the ACP.

Operation and maintenance of the proposed facilities will not affect traffic flow on roads and highways on USFS lands. Periodic maintenance and inspection procedures along the pipeline will involve a low frequency of light vehicle movement on and off roadways. Therefore, no impacts on roads or traffic are expected during operation of the Project.

7.2 TRAINING

Prior to the start of construction, Atlantic will conduct environmental and safety training for Atlantic and Contractor personnel. The training program will focus on the FERC Plan and Procedures , other construction, restoration, and mitigation plans, including this *Traffic and Transportation Management Plan*; and applicable permit conditions. In addition, Atlantic will provide large-group training sessions before each work crew commences construction with periodic follow-up training for groups of newly assigned personnel.

In developing the project environmental and safety training programs, Atlantic will review all traffic and transportation requirements relevant to the work of the Contractors or Atlantic personnel, and determine content and delivery strategies aimed at ensuring all project staff and Contractors understand how the requirements intersect with their functions. USFS staff's input will be invited in preparing the training programs, and USFS staff participation in the actual training sessions is encouraged. With respect to traffic and transportation issues, it is likely that special emphasis will be given to the following:

1. The importance of using only approved and posted project access roads.
2. Avoiding driving or parking outside the limits of approved access roads.
3. Obeying posted speed limits.
4. Use of flaggers where construction traffic is likely to encounter public traffic.
5. Other road safety-related requirements.

Atlantic conducts company-wide driver safety programs for its field operations personnel. When the project has been put into service and is ready to be turned over to Operations, requirements relevant to operating the pipeline system on USFS lands, such as this COM Plan, will be transitioned to DTI Operational staff. The hand-off to Operations will entail meetings and training sessions to ensure Operations staff understands all relevant requirements.

7.2.1 General Requirements

Prior to construction, Atlantic will obtain applicable Federal, state/commonwealth, and local road use and crossing permits. ACP personnel will comply with all permit requirements and conditions to provide for public safety and minimize impacts on public roads. West Virginia or Virginia guidelines will be utilized on USFS properties where there are no specific federal guidelines regarding maintenance of traffic, flagging protocol and signage. Copies of this *Traffic and Transportation Management Plan* as

well as applicable state/commonwealth guideline documents will be provided to the appropriate personnel and maintained at each Contractor's field office.

Atlantic will consult with the MNF and GWNF, the West Virginia Department of Transportation (WVDOT) and the Virginia Department of Transportation (VDOT) regarding detour routes, speed/load limits, and other use limitations, conditions, or restrictions on the roads that will be utilized during construction. Before the start of construction, Atlantic will refer to the WVDOT's Manual on Temporary Traffic Control for Streets and Highways, the Virginia Work Area Protection Manual, the MNF and GWNF LRMPs and the United States Department of Agriculture (USDA) Guidelines for Road Maintenance Levels to develop maintenance of traffic plans that are acceptable to the USFS.

As discussed further in the following sections, Atlantic will place and maintain traffic control measures, such as flag persons, warning signs, lights, and/or barriers, as appropriate, to safeguard construction workers and the public and to minimize traffic congestion. The aforementioned measures will be in accordance with the WVDOT's Manual on Temporary Traffic Control for Streets and Highways, the Virginia Work Area Protection Manual, and specific temporary traffic control measures adopted by the MNF or the GWNF.

Atlantic will maintain traffic flow and emergency vehicle access on roadways and the Appalachian National Scenic Trail and will work with local law enforcement, fire departments, and emergency medical services to coordinate access for effective emergency response during construction.

The USDA Guidelines for Road Maintenance Levels, prepared for the USFS, provides guidelines for road types, and maintenance within USFS property. Atlantic will provide protective measures to avoid damage to Forest road surfaces crossed by construction equipment. Atlantic will comply with weight limitations for and restrictions pursuant to prescription guidelines on designated USFS roads.

All Forest roads crossed by the pipeline are unpaved, and will be crossed with open cut construction methods (see Section 7.5). Once construction is complete, Atlantic will repair road damage that occurs as a result of construction, and roadways will be restored to their preconstruction condition. Sediment barriers will be installed at the base of slopes adjacent to roads to prevent sediment from the construction right-of-way from being washed onto roads during rain events.

7.3 ACCESS TO THE RIGHT-OF-WAY

Atlantic has endeavored to utilize existing roads to the extent practicable to provide access to the construction right-of-way on USFS lands. Construction traffic will be limited to access roads approved by the FERC and the USFS. Prior to and throughout construction, signs will be posted to identify approved access roads for construction traffic. If additional roads are identified as necessary for construction, they will not be used without authorization of both the FERC and the USFS. A table listing the access roads planned on USFS lands is included in Table 2.1.1-1 of this COM Plan.

Some of the existing USFS roads identified for access to the pipeline right-of-way may require improvement (such as grading, widening, the addition of gravel, or removal of obstructions) to provide for proper drainage or to safely accommodate construction equipment and vehicles. Roads requiring improvements are identified in Table 2.1.1-1 of this COM Plan. Such improvements will be consistent with the USDA Guidelines for Road Maintenance Levels as well as the LRMP for the applicable National Forest.

The erosion control and restoration measures approved by the USFS, the West Virginia Division of Environmental Protection and the Virginia Department of Environmental Quality (DEQ), will be utilized for improving, using, and restoring access roads or when constructing new access roads. If culverts are required to improve an access road at stream crossings, the culverts will be adequately sized to accommodate stormwater runoff as required by federal, state, or local permits, and will be of sufficient strength to support construction and maintenance equipment.

Atlantic will perform maintenance activities during construction, including blading or filling activities, to ensure the safety and proper functioning of all access roads. Dust emissions along unpaved access roads will be controlled by applying water, as needed, and by restricting vehicle speeds. If excessive rutting takes place on access roads, Atlantic will perform maintenance activities on the road prior to continued use. Road maintenance will conform to the USDA Guidelines of Road Maintenance Levels, as well as to any standard contained in the LRMP of the MNF or the GWNF, as applicable.

Atlantic's construction contractors will be responsible for removing obstructions affecting access roads, if present, within the boundaries of the roadway (up to a width of approximately 30 feet centered on the road centerline). Such obstructions will be cleared using the following methods, as appropriate.

- The removal of trees, limbs, brush, and other obstructions will be limited to those obstructing the driver's sight distance or within 15 feet of vertical clearance above the roadway.

- Limbing will be accomplished by the use of pruning saws, power saws, nippers, bow saws, or crosscuts. Limbs will be pruned flush with the trunk of the tree, except for portions of overhanging limbs. Use of axes for limbing will be prohibited.

- Material removed will be disposed of in approved areas or at the direction of the landowner or land managing agency.

During winter, snow will be removed, as necessary, from approved access roads to allow safe access to the construction right-of-way. Plowing of access roads will continue as necessary through the end of active construction. See Atlantic's *Winter Construction Plan* (Attachment D) for additional information regarding plowing.

If existing Forest roads are damaged during construction, Atlantic will restore the roads to their maintence prescription guideline as described in the USDA Guidelines for Road Maintenance Levels. All construction access roads will also be used for pipeline operation and maintenance purposes. Further information regarding planned improvements to access roads are included in Attachment F.

7.4 ROAD CROSSINGS

Construction across state maintained roads will be conducted in accordance with permits received from the WVDOT and the VDOT. Temporary traffic measures, such as flagging and maintenance of traffic flow, will be conducted in a manner consistent with the WVDOT Manual on Temporary Traffic Control for Streets and Highways and the Virginia Work Area Protection Manual. Construction planned across Forest roads will adhere to USFS standards. Table 7.4-1 lists Forest roads crossed by the ACP. Some roads, such as MNF Road 55, must be crossed more than once, due to terrain conditions where the road lies; avoidance of road crossings at these locations would typically require sidehill cuts and correspondingly greater ground disturbance.

As shown in Table 7.4-1, Forest roads will be crossed by open cut methods, will require temporary closure of the road to traffic and establishment of detours. Pre-construction conditions of the road will be photo-documented, as an aid to restoration. Most open-cut road crossings will be completed and the road restored in one or two days, depending on the nature of any rock that may be encountered or other unforeseen difficulties. The same type of sub-bed and surface material as the original construction, or flowable fill material, will be used to backfill the pipe and restore the road surface. Additional gravel will be brought in if necessary to ensure to safe, firm surface for passage. Atlantic will follow the appropriate signage protocol and maintenance of traffic planning pursuant to the posting signs at open-cut road crossings for safety and to minimize traffic disruptions. If the USFS does not have specific protocols for one-lane operation, Atlantic will utilize the applicable state Department of Transportation standards.

If road closures are necessary, a road closure schedule will be arranged with the USFS 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.

TABLE 7.4-1

U.S. Forest Service Roads Crossed by the Atlantic Coast Pipeline

U.S. Forest Road No.	Approximate Milepost	Road Crossing Method
MNF Road 1014 (Shock Run)	83.2	Open Cut
MNF Road 1017 (Upper Shock Run)	83.3	Open Cut
MNF Road 55 (Allegheny Road)	83.7	Open Cut
MNF Road 55 (Allegheny Road)	83.8	Open Cut
MNF Road 55 (Allegheny Road)	83.8	Open Cut
GWNF Road 281C	96.3	Open Cut
GWNF Road 281 (Tower Mt. Road)	96.3	Open Cut
GWNF Road 1748	97.1	Open Cut
GWNF Road 1748	97.2	Open Cut
GWNF Road 348.1	116.5	Open Cut
GWNF Road 449	117.0	Open Cut
GWNF Road 449	117.1	Open Cut
GWNF Road 449A	118.7	Open Cut
GWNF Road 449A	118.8	Open Cut
GWNF Road 449B	119.1	Open Cut
GWNF Road 466A	120.2	Open Cut
GWNF Road 466	120.4	Open Cut
GWNF Road 1755	121.2	Open Cut
GWNF Road 1755	121.5	Open Cut
GWNF Road 1755	121.7	Open Cut

Where construction crosses roads necessary for access to private residences or businesses and no alternative entrance exists, Atlantic 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. Atlantic 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.

Within USFS lands, Atlantic will adhere to applicable federal traffic control standards, however, in the absence of specific federal standards, Atlantic will defer to the applicable sections of the WVDOT's Manual on Temporary Traffic Control for Streets and Highways or the Virginia Work Area Protection Manual for flagging, signage, road closures, and maintenance of traffic.

Once construction is complete, Atlantic will repair road damage that occurs as a result of construction, and roadways will be restored to their preconstruction condition.

7.5 MOVEMENT OF PERSONNEL, EQUIPMENT, AND MATERIALS

The movement of construction equipment, materials, and personnel will cause a temporary increase in traffic volumes along USFS maintained roadways. Impacts are expected to be minor and short term because construction spreads and personnel will be geographically dispersed and personnel will commute to and from work areas in early mornings and late evenings during non-peak traffic hours.

Contractor yards will be used to stage construction, store materials, and park equipment when not on-site. Construction equipment will be moved from the contractor yard and delivered to the construction right-of-way. Once on the right-of-way, construction equipment will move in a linear manner along the right-of-way as work progresses, minimizing traffic on local roads. The amount of equipment moved by hauling from site to site will be reduced due to the accessibility created by the construction right-of-way. Traffic control measures consistent with the WVDOT/VDOT and the USFS will be implemented to further minimize impacts to traffic on roadways and park service roads, to assist with transportation of construction equipment and materials, and to provide for public safety. The construction contractors will post caution signs on roads, where appropriate, to alert motorists of pipeline construction and warn them of slow traffic caused by construction across roadways. Flaggers, signs, barricades, guardrails, safety fence, and/or signals will be placed and maintained at road crossings as required by federal, state, or local permits. Flaggers will be equipped with high visibility green/yellow safety vests and stop/slow signs pursuant to WVDOT or VDOT standards will be used on each side of the road when equipment is working on or crossing over the road. Posted speed limits will be observed on all roads or as specified by the USFS.

7.6 SPECIFIC FEDERAL GUIDELINES

7.6.1 U.S. Forest Service

The ACP will cross roads and utilize access roads on USFS lands in the MNF in West Virginia and the GWNF in Virginia. Traffic and transportation management and maintenance activities on these lands will conform to the standards and guidelines contained within the USDA Guidelines for Road Maintenance Levels and the LRMPs of the MNF and GWNF for road use, maintenance, and construction as well as WVDOT and VDOT standards where applicable. Potentially applicable federal standards and guidelines are listed below.

7.6.1.1 Monongahela National Forest Land and Resource Management Plan

- Roads shall be constructed to the standard appropriate to their intended use, considering safety and other resource concerns. **(MNF LRMP RF04).**

- Cooperators or permittees may be allowed to locate, design, and build special purpose roads on USFS lands. The USFS shall review all such locations and designs, and approve them where appropriate. Location and standards shall be coordinated with the needs for management and for protection of other resources. **(MNF LRMP RF05).**

- New road construction shall avoid wetlands where feasible. If a wetland cannot be avoided, road construction may be allowed as long as the subsurface drainage patterns can be preserved and maintained. Any road that would cross a wetland shall cross in a way that minimizes disturbance to the wetland. **(MNF LRMP RF06).**

- Where new roads cross streams or high-risk areas, disturbed soils shall be stabilized and designed drainage structures shall be installed as soon as practical. High-risk areas include landslide prone areas, steep slopes, and highly erosive soils (**MNF LRMP RF07).**

- The process to determine road maintenance levels should evaluate the purpose of the road, the type of vehicles expected, the duration and frequency of use, and necessary environmental protection measures. **(MNF LRMP RF11)**

- Temporary roads may be constructed and used to provide for short-term management access needs. **(MNF LRMP RF14)**

- Temporary roads shall be rehabilitated and returned to productivity following their use. (**MNF LRMP RF15).**

- Vehicle use on closed roads by permittees, contractors, or other cooperators may be authorized to conduct official business or to perform resource management activities. **(MNF LRMP RF20)**

7.6.1.2 George Washington National Forest

- Roads shall be designed and constructed to the standard necessary to provide access and manage resources according to management prescription desired conditions and public safety. **(GWNF LRMP FW-230).**

- All new and reconstructed roads will blend into the landscape to the extent practical. **(GWNF LRMP FW-232).**

- Apply the level of maintenance needed to protect the investment, facilitate resource management, and provide for user safety. **(GWNF LRMP FW-234).**

- Closed system roads are planted with native or desirable non-native wildflowers, forbs, shrubs, and/or grasses. **(GWNF LRMP FW-235).**

- Specify management requirements for permittee access roads in the designated use permit, where roads are included in the authorization. **(GWNF LRMP FW-248).**

7.6.2 United States Department of Agriculture Guidelines for Road Maintenance Levels

- Maintenance prescription guidelines for roads level 1 through level 5
- Road Management Strategies

8.0 UPLAND EROSION CONTROL PLAN

8.1 PURPOSE

This ESCP has been prepared for use by Atlantic and its contractors as a guidance manual for minimizing erosion of disturbed soils and transportation of sediments off the construction right-of-way and into sensitive resource and residential areas during natural gas pipeline construction. The procedures developed in this plan, which represent Atlantic's BMPs, are designed to accommodate varying field conditions while achieving compliance with regulatory requirements and protecting environmentally sensitive areas.

This ESCP is designed to provide guidelines, BMPs, and typical techniques for the installation and implementation of soil erosion and sediment control measures while permitting adequate flexibility to use the most appropriate BMP measures based on site-specific conditions. The intent of the ESCP is to provide general information on the pipeline construction process and sequence, and to describe specific measures that will be employed during and following construction to minimize impacts to the environment.

The goal of the ESCP is to preserve the integrity of the construction area and environmentally sensitive areas and to maintain existing water quality by:

- Minimizing the extent and duration of disturbance;
- Diverting runoff to stabilized areas;
- Installing temporary and permanent erosion control measures; and
- Establishing an effective inspection and maintenance program.

All land-disturbing activities will conform, at a minimum, to the FERC Plan and Procedures. Atlantic will also prepare and comply with SWPPPs that meet each state's requirements. The SWPPPs are currently being prepared. Atlantic will also prepare Construction Alignment Sheets depicting the locations of erosion and sediment controls in construction work areas, consistent with the FERC Plan and Procedures, as well as the West Virginia Department of Environmental Protection, Division of Water and Waste Management, *Erosion and Sediment Control Best Management Practice Manual*[13] (2006), the Virginia Department of Environmental Quality's *Virginia Erosion and Sediment Control Handbook* (VESCH) [14] (1992), Virginia's *Forestry Best Management Practices for Water Quality Technical Manual*, DTI's 2016 *Annual Standards and Specifications for Erosion and Sediment Control and Stormwater Management for Construction and Maintenance of Linear Gas Transmission Pipeline* (Standards and Specifications), and Dominion's Slope Stability Policy and Procedure (Attachment C).

In addition, the MNF and GWNF are managed under LRMPs issued in 2011 and 2014, respectively. The LRMPs are comprehensive planning documents designed to guide land management decisions within the National Forest boundaries. The LRMPs describe desired conditions and outline Management Prescriptions to be pursued to achieve those conditions.

The Virginia Department of Forestry's *Virginia's Forestry Best Management Practices for Water Quality, Technical Manual*, 2011 was also consulted during selection of erosion and sediment control measures.

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[13] An online copy is available on the West Virginia Department of Environmental Protection website at: https://apps.dep.wv.gov/dwwm/stormwater/BMP/index.html

[14] Hardcopy 1992 editions identify this as a Virginia Department of Conservation and Recreation document; the online version identifies this as a Virginia Department of Environmental Quality document.

Atlantic selected the more stringent or protective of the erosion and sediment control requirements set forth by FERC, West Virginia, Virginia, and the USFS to include in this ESCP. Consultation with USFS staff regarding specific control and restoration measures to be used in the MNF and GWNF is ongoing.

8.2 SOILS

An Order 1 Soil Survey (Survey) was performed between May 9 and June 22, 2016 along the available sections of the approximately 21.4-mile portion the route between MP 47 and MP 115. The Survey included approximately 5.2 miles of the route within the Marlinton Ranger District in the MNF, and 15 miles in the Warm Springs and North River Districts in the GWNF.

The Survey activities were conducted in a manner compliant with the requirements outlined in special use permit #GBR205003for surveys in the MNF, and special use permit #GWP433201T for surveys in the GWNF.

8.2.1 Soil Survey

The Survey was conducted in four phases: (1) Desktop Study, (2) Preliminary Field Reconnaissance, (3) Team Training, and (4) Field Investigation. Background information was obtained during the desktop study to help identify the prevalent soil-landscape relationships across the proposed pipeline route within the Project area. The background information was also used by the soil scientist team to identify preliminary test pit locations and develop strategies for conducting the Survey. Preliminary GIS-generated maps were prepared for planning and field use. This section outlines the objectives and accomplishments of each phase. The Survey Report and results are found in Attachment G.

8.3 CONSTRUCTION WORK AREAS

Construction work areas include the construction right-of way, additional temporary work space, access roads, temporary pipe storage and contractor yards, and aboveground facilities.

8.3.1 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), 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 right-of-way will be reduced to 75 feet, with 25 feet on the spoil side and 50 feet on the working side. Over short distances and where topography allows, it may be possible to reduce the width of the corridor to a minimum of 75 feet in ecologically sensitive areas to minimize impacts. Atlantic will work with the USFS to determine where the width of the construction right-of-way can be reduced, and where the additional corresponding ATWS on each side of the narrowed section will be located. Following construction, a 53.5 foot-wide permanent easement will be maintained for operation of the pipeline.

During construction of the pipeline, the top width of the excavated pipe trench in most areas will typically range from 10 to 15 feet. This assumes that construction personnel will not be required to work in the trench, which is typical for most installations. In areas with steep terrain, construction personnel will be required to work in the trench to weld the pipeline. In these areas, the top of the trench will typically be 30 feet wide to provide sufficient space for construction personnel to work in the trench

safely. The additional spoil from excavation of a wider trench will be stockpiled in the temporary construction right-of-way and ATWS.

Refer to Attachment A for typical construction right-of-way diagrams showing general land-disturbing boundaries and construction techniques.

8.3.2 Additional Temporary Workspace

In addition to the construction right-of-way, ATWS will be required to stage construction activities and store equipment, materials, spoil and topsoil where required 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.

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. Consistent with the LRMPs, ATWS will be set back 100 feet from in-stream waterbody crossings on USFS lands. Locations of ATWS are shown on the alignment sheets (Attachment B).

8.3.3 Access Roads

Atlantic has identified roads to be used to provide access to the right-of-way during construction and operation of the Project. Atlantic will mostly utilize existing roads, but eight new roads are proposed to be constructed on USFS lands (see Section 2.1.1.4). Some 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.

8.4 CRITICAL AREAS

Atlantic developed and implemented the Slope Stability Policy And Procedure (updated in September, 2016) to avoid, minimize, and mitigate potential landslide issues in slip prone areas prior to, during, and after construction. The Slope Stability Policy And Procedure (Attachment C) applies to both Virginia and West Virginia. It includes considerations for slips associated with pipeline construction during routing, engineering design, preconstruction planning, construction, and post construction.

8.4.1 Steep Terrain

Atlantic recognizes the increased risk in slips associated with pipeline construction particularly while traversing steep slopes. Special construction procedures and erosion and sediment control measures will be used in steep terrain areas, as described in Section 8.7.2. Additionally, Atlantic has developed and implemented a BIC Program to proactively manage construction and operation in steep slope areas, as described in Section 8.7.2.

Atlantic will:

- ensure that the erosion and sediment control measures in West Virginia are in compliance with an approved SWPPP or the *West Virginia Erosion and Sediment Control Best Management Practice Manual*;

- ensure that the erosion and sediment control measures in the Commonwealth of Virginia are in compliance with an approved SWPPP or the following regulations:
- Virginia Erosion and Sediment Control Regulations, (9 Virginia Code [VAC] VAC 25-840 et seq., as amended);
- Virginia Erosion and Sediment Control Certification Regulations (9 VAC25-850 et seq. as amended);
- Virginia Department of Environmental Quality (VDEQ), VESCH, Third Ed., 1992, as amended;
- VDEQ, Virginia Stormwater BMP Clearinghouse Stormwater Design Specifications, 2013, as amended;
- Virginia Stormwater Management Program Regulations (9 VAC 25-870 et seq., as amended);
- VDEQ, *Virginia Stormwater Management Handbook*, First Edition, 1999, as amended;
- conduct monthly inspections to assess potential concerns and document and remediate identified slope failures;
- complete a geotechnical analysis to evaluate the causes of past slope failures along its pipeline right-of-way;
- identify procedures and measures to identify, prevent, contain, and remediate slope failures; and
- develop and implement policy and procedures to address slip prone areas.

8.4.2 Karst Geological Formations

A Karst Monitoring and Mitigation plan was developed for the proposed Project and is included as Attachment H.

8.4.3 Waterbodies and Wetlands

A Stream and Wetland Crossing Procedure Plan was developed for the proposed Project and is located in Section 9 of this COM Plan.

8.4.3.1 Virginia Requirements

The Environmental Protection Agency (EPA) issued the Chesapeake Bay Total Maximum Daily Load (TMDL) on December 29, 2010. The Chesapeake Bay TMDL addresses all segments of the Bay and its tidal tributaries and establishes wasteload allocation to reduce nitrogen, phosphorus and sediment discharges into the Bay. The portion of the ACP Project within the GWNF lies within the Chesapeake Bay TMDL Watershed and may be subject to additional Chesapeake Bay TMDL watershed measures during construction, in addition to ESC measures outlined in Sections 8.5 and 8.8.

8.5 EROSION AND SEDIMENT CONTROL MEASURES

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 locations of the erosion and sediment control measures to be installed for each of these stages are described below. Detailed typical drawings of general erosion and sediment control measures are provided in Attachment I, and are also shown on the Construction Alignment Sheets in Attachment B.

8.5.1 Site Preparation

- Survey and flag the construction right-of-way and mark environmentally sensitive areas;
- Install rock access pads during grading;
- Conduct initial clearing, limited to that necessary to install temporary sediment barriers;
- Install all perimeter BMPs immediately after any bulk earth-moving activity;
- 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 right-of-way, and segregate topsoil where necessary; and
- Install temporary slope breakers, also referred to as interceptor dikes, also called temporary right-of-way diversions or water bars, as needed to reduce runoff velocity and divert water off the construction right-of-way.

8.5.2 Pipe Installation

- Excavate new trench to accommodate new/replacement 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 right-of-way and temporary workspaces to original contours to the extent practicable;
- Install permanent interceptor dikes; and
- Replace segregated topsoil.

8.5.3 Restoration

- Conduct right-of-way finish grading 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; and
- Remove temporary sediment barriers from an area when replaced by permanent erosion control measures or when the area has been successfully restored to uniform 70 percent perennial vegetation. Temporary erosion control BMPs will not be removed until inspection by the EI to confirm site stabilization.
- Reseed/replant work areas with native and pollinator species as provided in the Restoration and Rehabilitation Plan (Section 10) and the Visual Resources Plan (Section 20).

8.5.4 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 erosion and sediment control 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.
- The limits of approved work areas (i.e. the construction right-of-way, including ATWS 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.
- Safety fencing will be installed as needed during grading at public access points or around open unattended excavations to warn pedestrians of possible hazards. In addition, lights, signs and other warnings are required at road entrances and road crossings (see West Virginia or 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 right-of-way (e.g., a single-strand electric fence). Safety fencing may not be substituted for wire fencing in active pastures.

- Flagging or marking shall be maintained throughout construction.

- Other large diameter trees on the edge of the construction right-of-way and ATWS areas will be flagged by EIs to save/protect as green recruitment or habitat/shade trees, where feasible.

Virginia Requirements

Refer to Virginia Erosion and Sediment Control (E&S) Handbook for further details on the following requirement:

- Per Virginia Standard & Spec 3.38 (Tree Preservation and Protection), at a minimum the limits of clearing shall be located outside the drip line of any tree to be retained. In addition, heavy equipment, vehicular traffic, or stockpiles shall not be permitted within the drip line of any tree to be retained.

8.5.5 Construction Entrance

A construction entrance will be constructed at any point where construction equipment leaves the right-of-way and enters a paved public road or other paved surface. Typically, a construction entrance consists of filter fabric overlain by 6 inches of coarse aggregate extending a minimum of 70 feet from the edge of the pavement. It 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 shall be provided, as necessary.

The construction entrance must function to remove mud from vehicles and equipment leaving the right-of-way. 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 right-of-way. The use of water to remove sediment tracked onto roadways is not permitted.

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.

Maintenance of the construction entrance may require periodic top dressing with additional stone and cleanout of any structures used to trap sediment. If any inadvertent sediment tracking occurs on the public roadway, the road shall be cleaned thoroughly by the end of each day.

Virginia Requirements

Refer to Virginia E&S Handbook for further details on the following requirement:

- 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 right-of-way 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.

8.5.6 Clearing

Clearing operations include the removal of vegetation within the construction right-of-way. The Timber Removal Plan (Section 4) provides additional information regarding timber removal.

- Clearing will be confined to within the construction right-of-way shown on the Construction Alignment Sheets;
- Trees will be felled into the construction right-of-way to minimize damage to trees and structures adjacent to the right-of-way. Trees that inadvertently fall beyond the edge of the right-of-way will be immediately moved onto the right-of-way and disturbed areas will be immediately stabilized, per landowner approval;
- Slash will be ground up and used as mulch, hauled to an approved disposal site, or burned.
- Stumps excavated from the trench line that are not ground to mulch onsite will be placed along the edge of the construction right-of-way or in temporary extra workspaces. Stumps will be hauled from the extra workspaces to an approved disposal site, used on the right-of-way for restoration purposes, burned, or disposed of according to USFS requirements.
- Felled merchantable timber will be moved to a landing for trucking to nearby mills. Non-merchantable timber will be chipped, hauled off-site, or salvaged for use during restoration activities, or by burning, if permitted. After it is cut, non-merchantable timber that will be retained for restoration purposes will be placed along the edge of the construction right-of-way or temporary work area.
- Existing surface drainage patterns shall not be altered by the placement of timber or brush piles at the edge of the construction right-of-way.
- 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 right-of-way over the pipeline trenching area.
- Erosion and sediment control measures shall be installed immediately following mechanized clearing of trees, brush and vegetation.

Virginia Requirements

- According to VESCH Std. & Spec. 3.38, fires will not be permitted within 100 feet from the drip line of any trees to be retained. Fires will be limited in size to prevent adverse effects on trees, and kept under surveillance.

8.5.7 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, shall be installed following vegetative clearing operations. The primary sediment barrier methods to be used on the ACP Project will include silt fencing, temporary diversion dikes, and sediment traps. Sediment 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. 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 feet to 10 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.

- 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 throughout construction and within 24 hours of each 0.5 inch of rainfall event.

- Sediment removed from erosion controls will be disposed by adding to existing onsite soil stockpiles and stabilizing, or will be reused onsite within the construction right-of-way and outside of any wetlands, streams or riparian areas.

- Maintain all 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.

- Erosion barriers should be constructed of synthetic materials, clean straw bales, or other Forest Service-approved material free of seeds or viable parts of invasive plants.

8.5.7.1 West Virginia Requirement

Refer to West Virginia BMP Manual for further details for the following requirement:

- 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 uniform 70 percent perennial vegetation.

8.5.7.2 Virginia Requirement

Refer to Virginia E&S Handbook for further details for the following requirement:

- Per Virginia Minimum Standard 2, during construction of the project, soil stock piles and borrow areas will be stabilized or protected with sediment trapping measures. Atlantic 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.

- Per Virginia Minimum Standard 3, permanent vegetation will not be considered established until a ground cover is achieved that is uniform, mature enough to survive and will inhibit erosion. 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. Permanent vegetation shall not be considered established until a ground cover is achieved that is uniform, mature enough to survive and will inhibit erosion.

8.5.8 Silt Fencing

- The following specifications can be found in the DEQ Virginia Erosion & Sediment Control Field Manual and are consistent with the FERC Plan and Procedures. 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.

- Silt fencing will be used where the size of the drainage area is not more than one quarter 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 feet 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 some 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 shall be a minimum of 16 inches above grade and shall not exceed 34 inches above ground elevation.

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

- A trench shall 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 shall be fastened to the upslope side of the posts using one inch long (minimum) heavy-duty wire staples or tie wires and the fabric shall be extended into the trench. The posts shall 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 one inch long, tire wires or hog rings. The wire will extend into the trench a minimum of two 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 shall 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-inch by 4-inch trench shall be backfilled and the soil compacted over the filter fabric.

- Remove accumulated sediments when sediment reaches ½ the above-ground height of the fence.

- On USFS lands, all silt fences will be removed and discarded properly after project completion. Soils will be stabilized and seeded as per the Restoration and Rehabilitation Plan (Section 10). Permanent erosion control protective measures will be utilized if seeding alone will not stabilize the site and provide soil stability.

8.5.8.1 Belted Silt Retention Fence (BSRF)

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.

An estimated 125,000 feet of silt fence is anticipated to be needed on USFS lands.

8.5.9 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 a good choice 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.

- 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 shall 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) 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 shall 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.

8.5.9.1 West Virginia Requirements

Refer to West Virginia BMP Manual for detailed specifics on the following requirements.

- Temporary (less than 6 months) diversions must be designed to handle peak discharge from a 2-year/24-hour storm.
- The side slopes shall be no steeper than 2:1
- The design shall include a 10 percent settlement factor.

8.5.9.2 Virginia Requirements

In accordance with VESCH Std. & Spec 3.09 (Temporary Diversion Dike), refer to Virginia E&S Handbook for detailed specifics on the following requirements.

- 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.

8.5.10 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 three 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.

- 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 until the landscape is deemed stable. Permanent features will replace temporary features if the erosional feature does not become stable in the short term (less than 18 months.

- Topsoil will not be used for constructing sediment barriers of any kind.

- 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.

- 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. Filter cloth shall be placed at the stone-soil interface. The length of the stone outlet will be detailed on the Construction Alignment Sheets (Attachment A) 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 shall be 5 feet measured to the base of the stone outlet. Side slopes of the embankment shall be 2:1 or flatter.

- Fill material shall be selected from material that is are 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 ½ 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.

- Subsoil used to create these features will need to be de-compacted prior to replacing it in the pipeline trench, within the right-of-way, or within an approved ATWS.

8.5.10.1 West Virginia Requirements

Refer to West Virginia BMP Manual for further details for the following requirement:

- The sediment trap should have a storage volume of 3600 cubic feet per acre of drainage area. (WV BMP 3.29).

8.5.10.2 Virginia Requirements

Refer to Virginia E&S Handbook for further details for the following requirement:

- Per VESCH Std. & Spec 3.13 (Temporary Sediment Trap), outlet requirements include a combined coarse aggregate/riprap stone section of the embankment (VDOT #3, #357 or #5 Coarse Aggregate and Class I riprap). The length of the stone outlet will be detailed on the Construction Alignment Sheets (Attachment B).

8.5.11 Grubbing and Grading

The construction right-of-way 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.

8.5.12 Topsoil Segregation

During construction, topsoil and subsoil will be disturbed by grading of the right-of-way, trench excavation, and by heavy equipment moving along the right-of-way. Atlantic will conduct topsoil segregation in accordance with the FERC Upland Erosion Control, Revegetation and Maintenance Plan.

In areas where full width topsoil segregation is required, an additional 25 feet of temporary construction workspace would be needed on the working side of the corridor to provide sufficient space to store topsoil. Because of the increased need for additional right-of-way width and loss of additional forestland, and need to remove stumps, which would increase topsoil mixing with the subsoil and the increase the potential for erosion, topsoil segregation is generally not conducted in forested areas.

Either the “ditch plus spoil side” or the “full right-of-way” segregation method would be used where topsoil segregation is necessary.

In areas where topsoil segregation is performed on the MNF and GWNF, the O and A horizons will be segregated from the transition soil horizons AB/ BA. O horizon soils are defined as a soil layer containing a high percentage of organic matter. A horizon soils are defined as the dark subsoil below the O horizon. AB/BA horizon soils are defined as light colored subsoils located below the O and A horizons.

- 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.
- Maintain separation of salvaged topsoil and subsoil throughout all 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 right-of-way.
- Topsoil will not be used for constructing sediment barriers of any kind. In addition, topsoil will never be used for padding the pipe, improving or maintaining roads, or as fill material.
- 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 excessively wet or frozen.
- All perimeter dikes, berms, sediment basins, and other sediment controls shall be in place prior to stripping. These practices must be maintained during topsoiling.
- Side slopes of the stockpile shall not exceed 2:1.
- Perimeter controls must be placed around the stockpile immediately.
- Prior to dumping and spreading topsoil, the subgrade shall be loosened by discing or scarifying to a depth of at least 4 inches to ensure bonding of the topsoil and subsoil.
- Topsoil shall 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 containing Non-Native Invasive Species (NNIS) will be left undisturbed to the degree possible. Cleared vegetation and segregated topsoil from areas of invasive plant infestations will be maintained adjacent to the areas from which they were removed to eliminate the transport of soil-borne propagules to other areas along the right-of-way. The stockpiles will be identified as invasive plant species stockpiles with signs. During reclamation, the materials will be returned to the areas from which they were obtained.

8.5.12.1 West Virginia Requirements

Refer to West Virginia BMP's Handbook for detailed information for the following requirements:

- Seeding of stockpile shall be completed within 7 days of the formation of the stockpile if it is to remain dormant for longer than 21 days in accordance with West Virginia Std & spec 3.10 (Temporary Seeding). Stabilization of stockpiles with a temporary cover (i.e. mulch) in accordance with West Virginia Std & spec 3.12 (Mulching) is also acceptable.

- In areas which are not going to be mowed, the surface should be left rough by not fine grading in accordance with West Virginia Std &Spec 3.08 (Surface Roughening).

8.5.12.2 Virginia Requirements

Refer to Virginia E&S Handbook for detailed information for the following requirements:

- Per VESCH Std & Spec 3.31 (Temporary Seeding) and Virginia Minimum Standard #1 and #2, seeding seeding of stockpile shall 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 Virginia 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 Virginia Std & Spec 3.35 (Mulching) is also acceptable.

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

8.5.13 Tree Stump Removal and Disposal

- Remove tree stumps in upland areas along the entire width of the permanent right-of-way to allow adequate clearance for the safe operation of vehicles and equipment. Stumps within the temporary right-of-way will be removed or ground below the surface in accordance with Atlantic construction specifications to allow the safe passage of equipment, as determined by the Construction Site Supervisor or EI.

- 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 right-of-way in wetlands unless the Construction Site Supervisor 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 right-of-way.

- Dispose of stumps by one of the following methods with the approval of the AO:

- Burned on construction right-of-way, if permitted;

- Chipped, spread across the construction right-of-way in upland areas, and plowed in;

- Used as erosion control or OHV blocking material;

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

8.5.14 Rock Management

Rock, including blast rock, will be used, removed or disposed of 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 shall 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 on the edge of the right-of-way per AO approval;

- Used to create wildlife habitat as directed by the AO;

- Burying of large rock within the construction right-of-way;

- Removed and disposed of at an authorized disposal site;

- Used as riprap for streambank stabilization if permitted by USFS and other regulatory agency(ies) such as the U.S. Army Corps of Engineers (USACE), and provided the rock is uncontaminated and free of soil and other debris. Atlantic has not proposed, and does not currently anticipate the use of riprap for streambank stabilization on USFS lands.

Virginia Requirements:

- 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 lbs. per cubic foot, and otherwise meets the requirement of the VESCH standard and specification.

8.5.15 Temporary Slope Breakers

Temporary slope breakers, also called temporary right-of-way diversions and water bars, are temporary erosion control measures intended to reduce runoff velocity and divert water off the construction right-of-way. Temporary slope breakers may be constructed of materials such as compacted soil, silt fence, or sand bags. Segregated topsoil may not be used for constructing temporary slope breakers.

- Install temporary slope breakers on all 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.

- The temporary diversion should be constructed across the disturbed portion of the right-of-way;

- Positive grade with less than 2 percent slope should be provided to a stabilized outlet; steeper grading may be utilized as necessary to promote positive drainage.

- Direct the outfall of each slope breaker to a stable, well vegetated area or construct an energy-dissipating device (silt fence, staked weed-free straw bales, erosion control fabric) 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 right-of-way where it can run down to the next diversion. These stabilized areas will be reinforced if necessary, and routinely inspected and maintained to prevent erosion off the right-of-way.

- 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.

- 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 throughout construction, and following every rainfall.

- Slope breakers which will not be subject to construction traffic should be stabilized with temporary seeding.

8.5.15.1 West Virginia Requirements

Refer to West Virginia BMP Manual for detailed specifics on the following requirements.

- Closer spacing may be used if determined necessary by the EI. The WV BMP Manual spacing requirements are recommended since they are more stringent than FERC Plan requirements (see Table 8.5.5-1):

TABLE 8.5.5-1

Recommended Spacing and Materials for Permanent Slope Breakers [a]
(WV BMP Manual Std & spec 3.18)

Trench Slope	Distance (feet)
Less than 5%	300
10%	175
15%	125
20%	100
Greater than 25%	75

[a] Slope breaker spacing in areas of steep terrain may be decreased as a result of the steep slopes BIC Program described in Section 2.1.9.5. Accordingly, this table may be revised to reflect more stringent spacing requirements.

8.5.15.2 Virginia Requirements

Refer to Virginia E&S Handbook for detailed information for the following requirements:

- Closer spacing may be used if determined necessary by the EI. The VESCH spacing requirements are recommended since they are more stringent than FERC Plan requirements (see Table 8.5.5-2):

TABLE 8.5.5-2

Recommended Spacing and Materials for Permanent Slope Breakers [a] (VESCH Std & Spec 3.11)

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

[a] Slope breaker spacing in areas of steep terrain may be decreased as a result of the steep slopes BIC Program described in Section 2.5.6. Accordingly, this table may be revised to reflect more stringent spacing requirements.

8.5.16 Timber Mat Stabilization

Atlantic utilizes construction timber mats to provide access through areas such as wetlands and waterbodies, some agricultural fields, 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 right-of-way, thus minimizing land disturbance. This practice may be incorporated in addition to the WV BMP and VESCH practices and requirements.

The use of construction timber mats generally does 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.

8.5.17 Temporary Stabilization

West Virginia Requirements

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 21 days, temporary stabilization (temporary seed, mulch, additional sediment barriers as directed by the EI) must be applied within seven (7) days to that area. E&S measures will be monitored and maintained until conditions improve and final restoration can be completed.

Virginia Requirements

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 seven (7) days to that area. Erosion and sediment control measures will be monitored and maintained until conditions improve and final restoration can be completed.

The seed mixtures and application rates, seeding dates, soil amendment recommendations, and planting recommendations are currently pending additional consultation with the USFS staff.

8.5.17.1Trenching

The trench centerline will be staked after the construction right-of-way 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 right-of-way. Spoil will be contained with erosion and sediment control devices to prevent spoil materials or sediment-laden water from transferring into waterbodies and wetlands or off of the right-of-way;
- If temporary erosion or sediment controls are damaged or removed during trenching, they shall be repaired and/or replaced before the end of the work day;
- Excavated material shall be placed on the uphill side of trenches.

8.5.17.2Trench Breakers

Permanent sacks of sand, polyurethane foam, bentonite clay, or possibly cement bags (in areas of steep terrain) 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, metering and regulating stations).

The need for and spacing of trench breakers will be indicated on the Construction Alignment Sheets (Attachment B). Trench breakers will be installed at the same spacing as and upslope of permanent slope breakers unless determined otherwise by the certifying Professional Engineer.

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 Procedures. Trench breakers will not be installed within a wetland.

8.5.17.3 Trench & Site Dewatering

Dewatering may be periodically conducted to remove accumulated groundwater or precipitation from the construction right-of-way, 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. Section 8.5.20 sets forth criteria for discharge to a well-vegetated area of sufficient length. The Karst Plan (Attachment H) outlines the requirements of site dewatering within karst areas. Karst features will not be utilized for the disposal of water.

8.5.17.4 Dewatering Filter Bag

No discharge of hydrostatic test water is planned on USFS lands. However, trench dewatering on USFS lands may be necessary at locations along the pipeline, for example, if a high water table is encountered. Atlantic utilizes filter bags for dewatering and velocity reduction on a majority of pipeline construction Project in accordance with the dewatering practices illustrated in the WV BMP Manual (Std. & Spec. 3.22 Dewatering) and VESCH (Std. & Spec. 3.26 Dewatering Structure). Design criteria and specifications vary by dewatering bag manufacturer. A variety of filtering dewatering bag products are available on the market. All manufacturers' guidance on the use, design, sizing, maintenance and application of the geotextile dewatering bag shall be followed.

- Conduct dewatering (on or off the construction right-of-way) in a manner that does not cause erosion and does not result in heavily 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.

- 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, the bag will be discarded and replaced.

8.5.17.5 Virginia Requirements

Refer to Virginia E&S Handbook for detailed information for the following requirements:

- If discharging to a well-vegetated area, then per VESCH Std. & Spec 3.26, a minimum filtering length of 75 feet must be available in order for such a method to be feasible. A de-watering 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.

- 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. The accumulated sediment removed from a dewatering device must be spread on-site and stabilized or disposed of at an approved disposal site.

8.5.17.6Pipe Installation

During all phases of the pipe installation process, ensure that all roadway crossings and access points are safe and accessible conditions. 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 shall be restored prior to the end of the work day. Pipe installation will commence according to Atlantic construction and implementation plans and generally consists of stages such as stringing and bending, welding, and lowering-in and tie-ins.

8.5.17.7Backfilling

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, crushed limestone, or screened spoil materials from trench excavation. Material used for backfilling trenches shall be properly compacted in order to minimize erosion and promote stabilization.

8.5.17.8Hydrostatic Testing

While hydrostatic testing will occur on all pipeline sections of the Project, including those of USFS lands, there will be no hydrostatic test water appropriations or test water discharges on USFS lands.

8.5.24 Restoration and Final Cleanup

Restoration of the right-of-way 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 devices to minimize post-construction erosion. Property shall be restored as close to its preconstruction condition as practical unless otherwise specified by the landowner. All temporary ESC measures shall be removed within 30 days after final site stabilization or after the temporary measures are no longer needed. Trapped sediment will be removed or stabilized onsite. 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 shall 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 erosion and sediment controls (i.e. temporary slope breakers, sediment barriers, and mulch) until conditions allow completion of cleanup.

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

- Grade the right-of-way 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 all slopes steeper than 3:1 in accordance with West Virginia Standard & Specification 3.08 (Surface roughening) and Virginia Standard and Specification 3.29 (Surface roughening) on all slopes steeper than 3:1 or that have received final grading but will not be stabilized immediately.

- Spread segregated topsoil back across the graded right-of-way to its original profile.

- The size, density, and distribution of rock on the construction right-of-way shall be similar to adjacent areas not disturbed by construction, or as approved by the AO.

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

- Remove all construction debris (used filter bags, skids, trash, etc.) from all construction work areas unless the landowner or land managing agency approves leaving material onsite for beneficial reuse, stabilization, or habitat restoration. Grade or till the right-of-way 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, Atlantic will follow its *Winter Construction Plan* (Attachment D) and resume clean-up and restoration efforts the following spring. Atlantic 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.

- NNIS measures, as described in Section 11.

8.5.17.9 West Virginia Requirements

Refer to West Virginia BMP Manual for detailed information for the following requirements:

Final site stabilization means that all soil-disturbing activities are completed, and that either a permanent vegetative cover with a density of 70 percent or greater has been established or that the surface has been stabilized by hard cover such as pavement or buildings. It should be noted that the 70 percent requirement refers to the total area vegetated and not just a percent of the site.

8.5.17.10 Virginia Requirements

Refer to Virginia E&S Handbook for detailed information for the following requirement.

Permanent vegetation shall not be considered established until a ground cover is achieved that is uniform, mature enough to survive and will inhibit erosion.

8.5.17.11 Permanent Slope Breakers

Permanent slope breakers will be installed during final grading, where required, to slow runoff velocity and direct water off the right-of-way and prevent sediment deposition into sensitive resources. Permanent slope breakers may be constructed of materials such as soil, stone, or some functional equivalent.

- 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 the same as temporary slope breakers described in Section 8.5.15.

- Construct permanent slope breakers with a minimum of a 2 to 8 percent outslope 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.

- Slope breakers may extend slightly (about 4 feet) beyond the edge of the construction right-of-way to effectively drain water off the disturbed area. Where permanent breakers extend beyond the edge of the construction right-of-way, they are subject to compliance with all applicable survey and permit requirements.

- 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 18-24 inches deep.

8.5.17.12 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 practical; however, areas which could not be avoided will be addressed with slope breakers and RECP. RECPs must be consistent with WV BMP Manual Standard and Specification 3.13 for RECPs and VESCH Standard and Specification 3.36 for Soil Stabilization Blankets and Matting. 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.

- 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.

- 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 minimum 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.

- 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 up-gradient and down-gradient portion of the blanket. The need for and spacing of check slots will based on manufacturers' recommendations.

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

8.5.17.13 Seeding will be done in accordance with Section 10, the Restoration and Rehabilitation Plan. West Virginia Requirements

Refer to West Virginia BMP Manual for detailed information on the following requirements:

- Adjacent blankets will be overlapped, or by abutting product as defined by the manufacturer, and stapled together.

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

8.5.17.14 Virginia Requirements

Refer to Virginia E&S Handbook for detailed information on the following requirements:

- Soil stabilization blankets will be mechanically fastened and used on slopes of 3:1 or greater and in stormwater conveyance channels.

- Adjacent blankets will be overlapped and stapled together.

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

8.5.17.15 Soil Compaction

A Restoration and Rehabilitation Plan has been prepared for the ACP to address post-construction restoration rehabilitation activities on USFS lands. Soil Compaction is addressed in Section 10.3.1.3 of the COM Plan.

8.5.17.16 Revegetation

A Restoration and Rehabilitation Plan has been prepared for the ACP to address post-construction restoration and rehabilitation activities on USFS lands. Revegetation is addressed in Section 10.3.1.2 of the COM Plan.

8.5.17.17 Mulching

A Restoration and Rehabilitation Plan has been prepared for the ACP to address post-construction restoration and rehabilitation activities on USFS lands. Mulching is addressed in Section 10.3.1.9 of the COM Plan.

8.5.18 Vegetative Streambank Stabilization

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

Virginia Requirement:

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 (ft./sec.) and soils are erosion resistant. Above 5 ft./sec., structural measures are generally required. In accordance with VESCH Std. & Spec 3.22 (Vegetative Streambank Stabilization), Atlantic 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.

8.5.19 Structural Streambank Stabilization

Structural streambank stabilization is applicable to streambank sections which are subject to excessive erosion due to increased flows or disturbance during construction. This practice is generally applicable where flow velocities exceed 5 ft./sec. or where vegetative streambank protection is inappropriate. Any non-biodegradable fabric used for bank stabilization will be removed when vegetation is re-established. Although structural streambank stabilization is not anticipated to be necessary to stabilize streambanks; in the event that it is deemed appropriate, Atlantic will consult with the USFS and seek the AO's approval and other permits as necessary.

Virginia Requirement:

In accordance with VESCH Std. & Spec 3.23 (Structural Streambank Stabilization), Atlantic 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 8.5.19-1:

TABLE 8.5.19-1

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.

8.6 ACCESS ROAD CONSTRUCTION

Atlantic has identified roads which will be used to provide access to the proposed ACP pipeline right-of-way and other facilities during construction and operation of the Project. Atlantic will primarily utilize existing roads. Section 2.1.1.4 provides information regarding new access roads proposed to be constructed on USFS lands.

The following conditions apply to the use of all access roads:

- During construction and restoration activities, access to the right-of-way is limited to the use of new or existing access roads identified on the construction drawings.

- The only access roads that can be used in wetlands, other than the construction right-of-way, are those existing roads requiring no modification or improvements, other than routine repair, and posing no impact on the wetland.

- The construction right-of-way may be used for access across wetlands when the wetland soil is firm enough to avoid rutting or the construction right-of-way 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 shall 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 right-of-way.

- 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- right-of-way impacts, including impacts to adjacent and/or nearby sensitive resource areas, and implement all appropriate erosion and sediment control measures for construction/improvement of access roads.

- Minimize the use of tracked equipment on public roadways.

- 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.

- All access roads across a waterbody must use an equipment bridge.

- For access through environmentally sensitive areas such as saturated wetland or waterbodies, 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 right-of-way, dig the trench, fabricate and install the pipeline, backfill the trench, and restore the construction right-of-way. All other construction equipment shall use access roads located in upland areas to the maximum extent practical.

- 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.

- Traffic will be restricted on access roads during unfavorable conditions, such as saturated soil. Gravel, wooden mats or a combination of geotextile and gravel may be used to help facilitate operations during wet periods.

- 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 recommended 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.

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

Virginia Requirements:

- 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.

- 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.

- Temporary access roads will follow the contour as much as possible with grades between 2-10 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.

- In accordance with VESCH Std. & Spec 3.20 (Rock Check Dam), Atlantic 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 ½ 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 stormwater management 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 ditch 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.

- Per VESCH Std & Spec 3.17 (Stormwater Conveyance Channel), Atlantic will apply the following general specifications to the construction and maintenance of roadside ditches:
- Trees, stumps, roots and obstructions 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; and
- 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.

8.7 SPECIAL CONSTRUCTION PROCEDURES

Sensitive areas (e.g. wetland/water body 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 erosion and sediment control procedures. Specialized construction often combines several construction stages into one and reduces earth disturbance, reducing the amount of erosion and sediment control measures.

8.7.1 Winter Construction

Atlantic has developed and filed a Project-specific winter construction plan with the FERC application; it is included as Attachment D.

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).

8.7.2 Steep Terrain and Best in Class (BIC) Program

8.7.2.1 Steep Terrain

Atlantic recognizes the increased risk of instability associated with pipeline construction particularly while traversing steep slopes. As a baseline, Atlantic 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 right-of-way;
- buttressing slopes with bagged concrete mix 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 during the time of construction.

For the ACP Project, Atlantic is also committed to identifying mitigation measures beyond standard practices through the 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 and Virginia, 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 ESCP 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 and in the field determinations, 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, and provide a basis to select the most applicable and robust 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 (see FiguresA-1/2 through A-4) 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).

- 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.

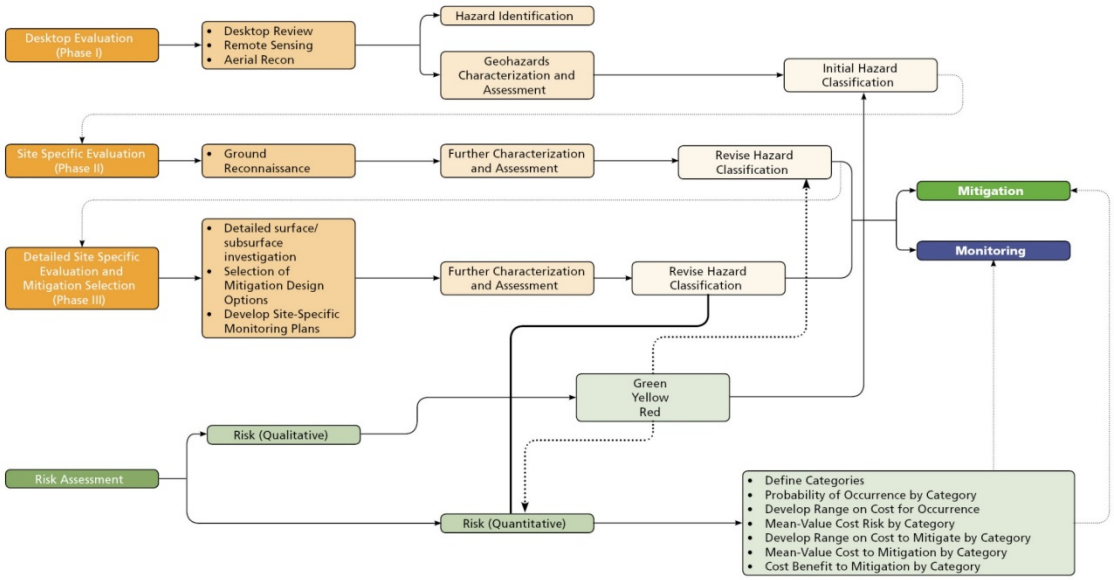
- Hazard Mitigation - Areas for mitigation are selected based upon potential risk to the pipeline, environment, and operations and maintenance. Overall hazard reduction techniques may include BIC construction practices and/or best management practices.

- Site and hazard specific plans have been 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 will address the specific geologic hazard (e.g., slip, stream scour, ground displacement) with detailed mitigation measures, as applicable, for construction and/or operation of the Project. Atlantic will incorporate these measures into ESCP and corresponding SWPPPs.

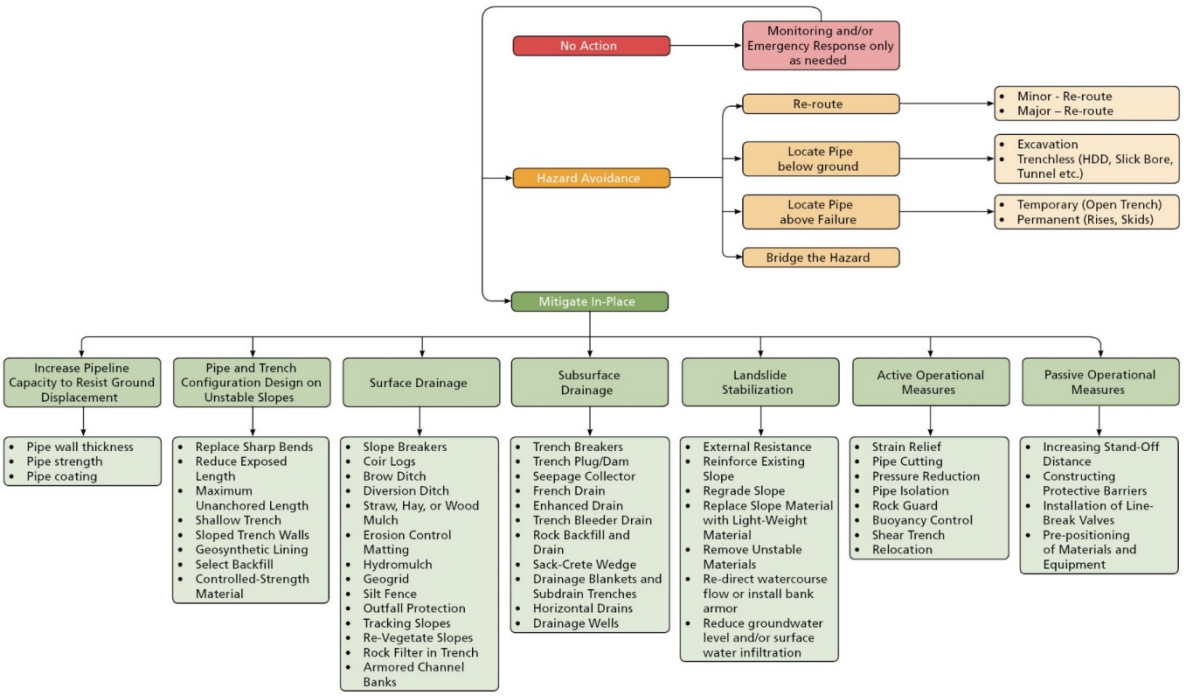
- Hazard Monitoring - Atlantic will monitor mitigation techniques to assess their effectiveness and the need for further mitigation, if appropriate.

The ultimate goal of the BIC Program is to develop project-specific engineering mitigation recommendations targeting un-authorized discharges to water bodies resulting from steep slope, landslide and erosion hazards. The locations where the BIC Program will be implemented are identified on the construction alignment sheets (Attachment A) and on plans developed for a select group of the most challenging and unique steep slopes requiring site-specific designs (Attachment G).

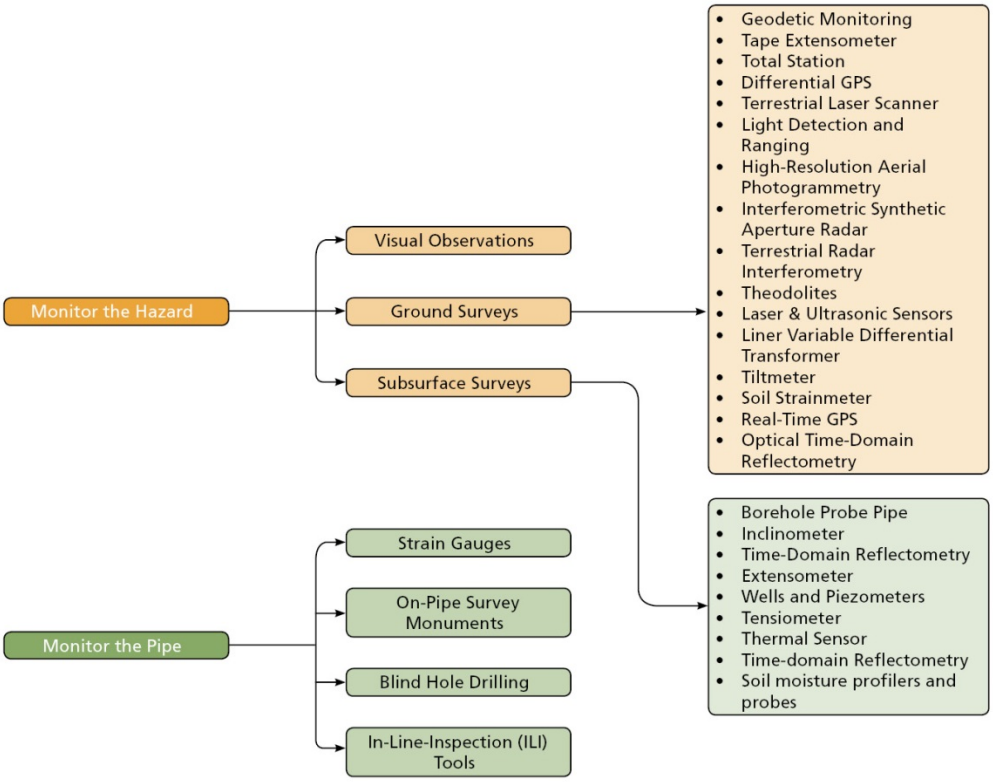
A-1/2: Hazard Identification and Assessment



A-3: Hazard Mitigation



A-4: Hazard Monitoring



Atlantic will provide specific employee training which will be developed from the BIC program. Atlantic 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 module or may be conducted by Energy Infrastructure Environmental Services personnel, or Atlantic 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 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.

8.7.3 Seeps

In the event that subsurface flow is encountered, an under drain will be utilized, as necessary, to divert water away from the right-of-way. 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. These structures may be kept in place or re-installed after construction in a manner that avoids seepage concentrations from the right-of-way while minimizing overall changes to subsurface flow. On steep slopes these seeps, as identified during construction, would go through an incremental layer of field review, per the BIC Program, to determine if additional erosion controls would be required.

8.8 INSPECTION FREQUENCY

Inspection of temporary erosion and sediment control measures with occur at least:

- On a daily basis in areas of active construction or equipment operation;
- On a twice-weekly basis in areas with no construction or equipment operation; and
- Within 24 hours of each stormwater event (runoff from precipitation, snowmelt, surface runoff and drainage, including rainfall events resulting in 0.5 inches or more).

8.8.1 Virginia Requirements

In accordance with CGP condition Part I.B.4, the following will be implemented for construction activities within the Chesapeake Bay TMDL Watershed:

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;

2. Nutrients will be applied in accordance with manufacture's recommendations or an approved nutrient management plan and will not be applied during rainfall events; and

3. Inspection requirements are as follows:

    a. Inspections will be conducted at a frequency of (i) at least once every four business days or (ii) at least once every five business days and no later than 48 hours following a measurable storm event (a measurable storm event is defined as a rainfall event producing 0.25 inches of rain or greater over 24 hours). In the event a measurable storm event occurs when there are more than 48 hours between business days, the inspection will be conducted on the next business day; Note that Atlantic will follow a more stringent or protective inspection frequency stipulated by FERC (see above), and

    b. 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 and approved prior to the term of the CGP. 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 right-of-way 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 right-of-way, representative inspections within the Chesapeake Bay Watershed will include those discrete outfalls. The proposed access roads located within the TMDL watershed will be covered under the general inspections, outlined in Section 8.1, due to accessibility to the roadway.

8.9 CORRECTIVE ACTION

DIT and/or their contractors will take corrective action to any of the inspected areas that have reported deficiencies to the control measures in place. Repairs will be made within 24 hours of identification, or as soon as conditions allow if compliance with this time frame would result in greater environmental impacts.

8.10 REPORTING

Section 3.8 of the COM Plan discusses general inspection reporting requirements. Additional reporting requirements specific to the ESCP are as follows:

- Atlantic will maintain records that identify by milepost:
  - method of application, application rate, and type of fertilizer, pH modifying agent, seed, and mulch used;
  - acreage treated;
  - dates of backfilling and seeding;
  - names of landowners requesting special seeding treatment and a description of the follow-up actions;
  - the location of any subsurface drainage repairs or improvements made during restoration; and
  - any problem areas and how they were addressed.
- Atlantic will submit quarterly reports to the USFS documenting the results of follow-up inspections; any problem areas,; and corrective actions taken for at least 2 years following construction.

8.11 POST-CONSTRUCTION ACTIVITIES AND MAINTANANCE

8.11.1 Monitoring Program

Atlantic and/or their contractors will follow the following post-construction monitoring and maintenance guidelines.

- Restoration will be considered successful if the right-of-way surface condition is similar to adjacent undisturbed lands, construction debris is removed , revegetation is successful, and proper drainage has been restored.
- Once final stabilization is conducted, Atlantic and/or their contractors will conduct follow-up inspections of all disturbed areas, as necessary, to determine the success of

revegetation and address landowner concerns. At a minimum, Atlantic will conduct inspections after the first and second growing seasons.

- NNIS monitoring/treatment will be done in accordance with Section 11, the Non-Native Invasive Plant Species Management Plan.

- Revegetation efforts will continue until revegetation is successful (see Section 10.4).

- Slopes that are found to be eroding excessively within one year of permanent stabilization shall be provided with additional slope stabilizing measures until the problem is corrected.

8.11.2 Monitor and record the success of wetland revegetation annually until wetland revegetation is successful, as described in Section 9.5.3. Maintenance

- The permanent pipeline right-of-way will be maintained in an herbaceous state. Woody vegetation within the permanent right-of-way will be cleared periodically, in order to maintain accessibility of the right-of-way for maintenance and to accommodate pipeline integrity surveys, In uplands, trees and brush will be cleared over the entire width of the permanent right-of-way on an as-needed basis not to exceed once every 3 years. In wetlands and riparian areas, a 10-foot-wide corridor centered over the pipeline will be cleared at a frequency necessary for the corridor to be permanently maintained in an herbaceous state, as allowed by the Procedures. In addition, trees within 15 feet of the pipeline with roots that could compromise the integrity of the pipeline coating may be selectively cut and removed from the permanent right-of-way. stateIn no case shall routine vegetation mowing or clearing occur during the migratory bird nesting season between April 15 and August 1 of any year unless specifically approved in writing by the responsible land management agency or the FWS.

- Atlantic will not conduct routine vegetation mowing or clearing over the full width of the permanent right-of-way in wetlands. 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 within 15 feet of the pipeline with roots that could compromise the integrity of pipeline coating may be selectively cut and removed from the permanent right-of-way. Atlantic will not conduct routine vegetation mowing or clearing in wetlands that are between HDD entry and exit points.

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

- Within 3 years after construction, Atlantic will file a report with the FERC identifying the status of the wetland revegetation efforts and documenting success. For any wetland where revegetation is not successful at the end of 3 years after construction, Atlantic will develop and implement (in consultation with a professional wetland ecologist) a remedial revegetation plan to actively revegetate wetlands. Atlantic will continue revegetation efforts and file a report annually documenting progress in these wetlands until wetland revegetation is successful.

- Atlantic will make efforts to control unauthorized off-road vehicle use, as described in Section 18, the Off-Highway Vehicle Blocking Plan (Blocking Plan).

8.12 STORMWATER MANAGEMENT

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

8.12.1 West Virginia Requirements

The West Virginia Department of Environmental Protection 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 the completion of the construction and final stabilization. The installation of the ACP pipeline is an example of such a Project where the areas disturbed will be returned to their pre-development condition. Therefore, the preparation and implementation of post-construction stormwater management measures for the pipeline portion of the Project is not warranted.

Within the MNF, forest/open space or managed turf will be returned to a vegetative state and characteristics of stormwater runoff should remain unchanged. Therefore, post-construction stormwater management will not be required for the portion of the Project within the MNF.

8.12.2 Virginia Requirements

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 the completion of the construction and final stabilization. The installation of the ACP pipeline is an example of such a Project where the areas disturbed will be returned to their pre-development condition. Therefore, the preparation and implementation of post-construction stormwater management measures for the pipeline portion of the Project is not warranted.

Within the GWNF, forest/open space or managed turf will be returned to a vegetative state and characteristics of stormwater runoff should remain unchanged. Therefore, post-construction stormwater management will not be required for the portion of the Project within the GWNF.

8.13 VARIANCE TO OPEN TRENCH LENGTH

The Virginia Erosion and Sediment Control Law Minimum Standard 16a requires that no more than 500 feet of trench remain open at one time. However, this requirement would significantly slow construction and increase the amount of time the work area remains disturbed. In accordance with 9 VAC 25-870-50, Atlantic will request that VDEQ approve open trench work greater than 500 feet where necessary to facilitate efficient and effective construction in compliance with Virginia Erosion and Sediment Control Law.

Any other variances to this plan or the State Minimum Standards must be approved prior to implementation. The EI will monitor any variance-related activities.

8.14 ADDITIONAL MITIGATION MEASURES FOR U.S. FOREST SERVICE LANDS

On USFS lands, additional measures will be implemented in conformance with the applicable standards and guidelines identified in the MNF and GWNF LRMPs. If a general mitigation measure as described above is more stringent than an applicable standard or guideline, the more stringent measure will be applied.

8.14.1 Monongahela National Forest

- Maintain, restore, or improve soil quality, productivity, and function. Manage soil disturbances from management activities such that they do not result in long-term loss of inherent soil quality and function. (**MNF LRMP SW01**).

- Disturbed soils dedicated to growing vegetation shall be rehabilitated by fertilizing, liming, seeding, mulching, or constructing structural measures as soon as possible, but generally within 2 weeks after Project completion, or prior to periods of inactivity, or as specified in contracts. Rip compacted sites when needed for vegetative re-establishment and recovery of soil productivity and hydrologic function. The intent is to minimize the time that soil is exposed on disturbed sites or retained in an impaired condition. (**MNF LRMP SW03**).

- Erosion prevention and control measures shall be used in program and Project plans for activities that may reduce soil productivity or cause erosion. (**MNF LRMP SW04**).

- Severe rutting resulting from management activities shall be confined to less than 5 percent of an activity area. (**MNF LRMP SW06**). Note: MNF is considering a project-specific LRMP amendment to this standard,

- Use of wheeled and/or tracked motorized equipment may be limited on soil types that include the following soil/site area conditions:

    - Steep Slopes (40 to 50 percent) – Operation on these slopes shall be analyzed on a case-by- case basis to determine the best method of operation while maintaining soil stability and productivity.

    - Very Steep Slopes (more than 50 percent) – Use is prohibited without recommendations from interdisciplinary team review and line officer approval.

    - Susceptible to Landslides – Use on slopes greater than 15 percent with soils susceptible to downslope movement when loaded, excavated, or wet is allowed only with mitigation measures during periods of freeze-thaw and for one to multiple days following significant rainfall events. If the risk of landslides during these periods cannot be mitigated, then use is prohibited.

- Soils Commonly Wet At Or Near The Surface During A Considerable Part Of The Year, Or Soils Highly Susceptible To Compaction. Equipment use shall normally be prohibited or mitigated when soils are saturated or when freeze-thaw cycles occur. (**MNF LRMP SW07**). Note: MNF is considering a project-specific LRMP amendment to this standard,

    - Management actions that have the potential to contribute to soil nutrient depletion shall be evaluated for the potential effects of depletion in relation to on-site acid deposition conditions. (**MNF LRMP SW08**).

- Inventory the soil resource to the appropriate intensity level as needed for Project planning and/or design considerations. (**MNF LRMP SW10**).

- Soil stabilization procedures should take place as soon as practical after earth-disturbing activities are completed or prior to extended periods of inactivity. Special revegetation measures may be required. (**MNF LRMP SW11**).

- Use Forest-wide soils map(s) and county soil survey report interpretations to help determine soil characteristics and protection needs. (**MNF LRMP SW12**).

- Topsoil should be retained to improve the soil medium for plant growth on areas to be disturbed by construction. Topsoil should be salvaged from an area during construction and stockpiled for use during subsequent reclamation, or obtained from an alternate site. On some areas, soil material may have to be added to obtain vigorous plant growth. Soil to be used for this purpose should have chemical tests made to determine its desirability for use. (**SW15**).

- Where the removal of vegetative material, topsoil, or other materials may result in erosion, the size of the area may be limited from which these materials are removed at any one time. (**MNF LRMP SW16**).

- Management activities that may result in accelerated erosion and loss of organic matter should have one or more of the following practices applied to mitigate potential effects:

    - Limiting mineral soil exposure,

    - Appropriately dispersing excess water,

    - Ensuring sufficient effective groundcover,

    - Stabilizing disturbed soils through revegetation, mulching, or other appropriate means,

    - Preventing or minimizing excessive compaction, displacement, puddling, erosion, or burning of soils, and

    - Preventing or minimizing the initiation or acceleration of mass soil movement (e.g., slumps, debris flows, or landslides). (**MNF LRMP SW19**)

- Where new roads and skid roads cross stream channels, channel and bank stability shall be maintained. (**MNF LRMP SW35**).

- When stream crossing structures are removed, stream channels shall be restored to their near natural morphology (width, depth, and gradient associations for streambeds, streambanks, floodplains, and terraces). Disturbed soil shall be stabilized. (**MNF LRMP SW36**).

- New structures (culverts, bridges, etc.) shall be designed to accommodate storm flows expected to occur while the structures are in place. Use scientifically accepted methods for calculating expected storm flows. (**MNF LRMP SW46**).

- Ground disturbance should be avoided within seeps, vernal pools, bogs, fens, and other wetlands during Project implementation. These areas should be managed to protect wet soils and rare plants and provide wildlife watering sources using the following protection:

- No new system roads or skid roads should be located within these areas except at essential crossings. Such crossings should be designed to minimize disturbance to the extent practical.

- Logs should not be skidded through these areas. Keep slash and logs out of them.

- For protection of cold water fisheries, apply the following to the channel buffers of perennial trout streams (stocked and native) during the period of October 1 to June 1:

  - Potential sediment-producing ground disturbance exceeding two consecutive days shall only be initiated after consultation with a Forest fisheries biologist.

  - Sediment-producing ground disturbance during this period shall use additional erosion control measures and seeding or mulching, applied concurrently with the activity. (**MNF LRMP WF14**).

- Work with USDA state and private forestry and county extension agents to identify or develop sources for weed-free straw and mulch. (**MNF LRMP VE20**).

8.14.2 George Washington National Forest

- On all soils dedicated to growing vegetation, the organic layers, topsoil and root mat will be left in place over at least 85 percent of the activity area and revegetation is accomplished within 5 years. (The activity area is the area of potential soil disturbance expected to produce vegetation in the future, for example: timber harvest units, prescribed burn area, grazing allotment, etc.). **(GWNF LRMP FW-5)**. Note: GWNF is considering a project-specific LRMP amendment to this standard,

- Locate and design management activities to avoid, minimize, or mitigate potential erosion. **(GWNF LRMP FW-6)**

- Use ditchlines and culverts when new permanent road construction grades are more than 6 percent and the road will be managed as open for public use. **(GWNF LRMP FW-7)**

- Where soils are disturbed by management activities, appropriate revegetation measures should be implemented. When outside the normal seeding seasons, initial treatments may be of a temporary nature, until permanent seeding can be applied. Revegetation should be accomplished within 5 years. For erosion control, annual plants should make up >50 percent of seed mix when seeding outside the normal seeding season and the area should be reseeded with perennials within 1½ years. **(GWNF LRMP FW-9)**

- Clearcutting is not allowed where high risk soils (as described in Chapter 3-Management Approach for Soils and in the Glossary) are identified. **(GWNF LRMP FW-12)**

- Motorized vehicles are restricted in the channeled ephemeral zone to designated crossings. Motorized vehicles may only be allowed on a case=by-case basis, after site-specific analysis, in the channeled ephemeral zone outside of designated crossings. **(GWNF LRMP FW-15)** Note: GWNF is considering a project-specific LRMP amendment to this standard,

- Management activities expose no more than 10 percent mineral soil in the channeled ephemeral zone. **(GWNF LRMP FW-16)** Note: GWNF is considering a project-specific LRMP amendment to this standard,

- Favor use of native grasses and wildflowers beneficial as wildlife foods when seeding temporary roads, skid roads, log landings and other temporary openings when slopes are less than 5 percent. On slopes greater than 5 percent, favor use of vegetation that best controls erosion. **(GWNF LRMP FW-93)**

- A contractor's sources of fill, soil, shale, and related materials will be pre-approved. Contractors will submit a description of the source. The Project inspector or a qualified designee will inspect the supply source. Use of the source will be prohibited if contaminated by transferable agents of invasive species. **(GWNF LRMP FW-95)**

- The soils of riparian corridors have an organic layer (including litter, duff, and/or humus) of sufficient depth and composition to maintain the natural infiltration capacity, moisture regime, and productivity of the soil (recognizing that floods may periodically sweep some areas within the floodplain of soil and vegetation). **(GWNF LRMP DC 11-03)**

- Exposed mineral soil and soil compaction from human activity may be present but are dispersed and do not impair the productivity and fertility of the soil. Any human-caused disturbances or modifications that cause environmental degradation through concentrated runoff, soil erosion, or sediment transport to the channel or waterbody are promptly rehabilitated or mitigated to reduce or eliminate impacts. **(GWNF LRMP DC 11-04)**

- Management activities expose no more than 10 percent mineral soil within the Project area riparian corridor. **(GWNF LRMP DC 11-003)**

- To minimize the length of streamside disturbance, ensure that approach sections are aligned with the stream channel at as near a right angle as possible. Locate riparian corridor crossings to minimize the amount of fill material needed and minimize channel impacts. Generally, permanent structures or temporary bridges on permanent abutments are provided when developing new crossings on perennial streams. Permanent structures, temporary bridges or hardened fords are used when crossing intermittent streams. **(GWNF LRMP DC 11-050)**

- If culverts are removed, stream banks and channels must be restored to a natural size and shape. All disturbed soil must be stabilized. **(GWNF LRMP DC 11-054)**

- For activities not already covered in the above standards, ground disturbing activities are allowed within the corridor if the activity will cause more resource damage if it were located outside the corridor, on a case-by-case basis following site-specific analysis. Any activity allowed under these conditions is minimized and effective sediment trapping structures such as silt fences, brush barriers, straw bale barriers, gravelling, etc., are required. Sediment control, prior to, or simultaneous with, the ground disturbing activities, is provided. **(GWNF LRMP DC 11-058)**

9.0 STREAM AND WETLAND CROSSING PROCEDURES

9.1.1 PURPOSE

The intent of these Procedures is to identify mitigation measures for minimizing the extent and duration of Project-related disturbance on wetlands and waterbodies in the MNF and GWNF. The Stream and Wetland Crossing Procedures are based on Project-wide wetland and waterbody measures developed by the FERC, modified to take into account standards and guidelines from both Forests' LRMPs. Tables 2.1.1-4 and 2.1.1-5 show waterbodies crossed on MNF and GWNF lands, respectively. Only two wetlands are crossed; both on the GWNF. Wetlands are discussed in Section 9.5. If, prior to Project construction, Atlantic identifies individual measures in the FERC's standard wetland and waterbody procedures considered unnecessary, technically infeasible, or unsuitable due to local conditions, it may request variations to the FERC procedures (and to this COM Plan). Any such request will fully describe alternative measures, and explain how those alternative measures would achieve a comparable level of mitigation.

9.1.2 DEFINITIONS

- "Waterbody" includes 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:
    - "minor waterbody" includes all waterbodies less than or equal to 10 feet wide at the water's edge at the time of crossing;
    - "intermediate waterbody" includes all waterbodies greater than 10 feet wide but less than or equal to 100 feet wide at the water's edge at the time of crossing; and
    - "major waterbody" includes all waterbodies greater than 100 feet wide at the water's edge at the time of crossing.
- "Wetland" includes any area that is not in actively cultivated or rotated cropland and that satisfies the requirements of the current federal methodology for identifying and delineating wetlands.

9.2 PRECONSTRUCTION FILING

For any wetlands and waterbodies on USFS lands, the following information will be submitted to the AO prior to the beginning of construction, for the review and written approval by the AO. Such information must also be approved in writing by the FERC:

- site-specific justifications for extra work areas that would be closer than 50 feet from a waterbody or wetland; and
- site-specific justifications for the use of a construction right-of-way greater than 75-feet-wide in wetlands.

9.3 ENVIRONMENTAL INSPECTORS

At least one EI having knowledge of the wetland and waterbody conditions in the Project area is required for each construction spread. The number and experience of EIs assigned to each construction

spread will be appropriate for the length of the construction spread and the number/significance of resources affected. The responsibilities of the EI are outlined in the Plan.

9.4 WATERBODY CROSSINGS

9.4.1 NOTIFICATION PROCEDURES AND PERMITS

Atlantic will do the following:

- Apply to the 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.
- Apply for state-issued waterbody crossing permits and obtain individual or generic section 401 water quality certification or waiver.
- Notify appropriate federal and state authorities, including the USFS, at least 48 hours before beginning trenching or blasting within the waterbody, or as specified in applicable permits.

9.4.2 INSTALLATION

9.4.2.1 Time Window for Construction

Unless expressly permitted or further restricted by the appropriate federal or state agency in writing on a site-specific basis, instream work, except that required to install or remove equipment bridges, will occur during the following time windows:

Monongahela National Forest

- coldwater fisheries - June 1 through September 15; and
- warmwater fisheries - July 1 through March 31.

George Washington National Forest

- Virginia Brook Trout fisheries – April 1 – September 30

The MNF specifies that stream crossing construction on temporary and permanent roads should be completed as soon as practical, with mitigation as needed to minimize the potential for sedimentation **(MNF LRMP SW-62).** The GWNF specifies that construction of crossings is completed on all channeled ephemerals as soon as possible after work has started on the crossing. Permanent and temporary roads on either side of crossings within the channeled ephemeral zone are to be graveled **(MNF LRMP SW-24).**

The Project will comply with **GWNF LRMP 11-048**, which stipulates that for any road construction within riparian corridors, in-stream use of heavy equipment or other in-stream disturbance activities is limited to the amount of time necessary for completion of the project, that construction of crossings is completed on all streams as soon as possible after work has started on the crossing, and that permanent and temporary roads on either side of stream crossings within the riparian corridor are

graveled. The Project will comply with **GWNF LRMP 11-049**, which stipulates that when constructing roads within the riparian corridor, each road segment will be stabilized prior to starting another segment, and that stream crossings will be stabilized before road construction proceeds beyond the crossing.

9.4.2.2 Extra Work Areas

Atlantic will do the following:

- Locate all extra work areas (such as staging areas and additional spoil storage areas) at least 100 feet away from water's edge, except where the adjacent upland consists of cultivated or rotated cropland or other disturbed land.
- Submit for review and written approval by the AO, site-specific justification for each extra work area with a less than 100-foot setback from the water's edge, except where the adjacent upland consists of cultivated or rotated cropland or other disturbed land. The justification will specify the conditions that will not permit a 50-foot setback and measures to ensure the waterbody is adequately protected. Such information must also be approved in writing by the FERC.
- Limit the size of extra work areas to the minimum needed to construct the waterbody crossing.

9.4.2.3 Crossing Procedures

Atlantic will do the following on all USFS lands:

- Comply with the USACE, or its delegated agency, permit terms and conditions.
- Construct crossings as close to perpendicular to the axis of the waterbody channel as engineering and routing conditions permit.
- Where pipelines parallel a waterbody, maintain buffers of undisturbed vegetation between the waterbody (and any adjacent wetland) and the construction right-of-way, except where maintaining this offset will result in greater environmental impact. These buffer widths are 100 feet for perennial streams, and large intermittent streams (i.e. >50 acre drainage areas), 50 feet for small intermittent streams (i.e. <50 acre drainage area) and 25 feet for ephemeral streams. These buffer widths may be adjusted based on site-specific conditions, upon review and approval of the USFS.
- Where waterbodies meander or have multiple channels, route the pipeline to minimize the number of waterbody crossings.
- Maintain adequate waterbody flow rates to protect aquatic life, and prevent the interruption of existing downstream uses.
- Waterbody buffers (e.g., extra work area setbacks, refueling restrictions) will be clearly marked in the field with signs and/or highly visible flagging until construction-related ground disturbing activities are complete.
- Crossing of waterbodies when they are dry or frozen and not flowing may proceed using standard upland construction techniques in accordance with the Plan, provided that the EI

verifies that water is unlikely to flow between initial disturbance and final stabilization of the feature. In the event of perceptible flow, Atlantic will comply with all applicable Procedure requirements for "waterbodies".

The following standards apply to MNF lands:

- Design crossings so stream flow does not pond above the structure during normal flows to reduce sediment deposition and safely pass high flows **(MNF LRMP SW60).**

- Provide passage for fish and other aquatic organisms at all new or reconstructed stream crossings of existing or potential fish-bearing streams. Exceptions may be allowed to prevent the upstream migration of undesired species **(MNF LRMP WF21).**

- Allow pipelines within channel buffers but limit them to essential crossings **(MNF LRMP MG41).**

- Avoid construction of pipelines running parallel to streams **(MNF LRMP MG40).**

- Restore steam channels when stream crossing structures are removed to their near-natural morphology (width, depth, and gradient associations for streambeds, streambanks, floodplains, and terraces). Stabilize disturbed soil **(MNF LRMP SW36).**

The following standards apply to GWNF lands:

- Improve connectivity of stream systems through replacement of standard culverts with crossing structures that allow for full passage of all aquatic organisms **(GWNF LRMP Strategy).**

- In the channeled ephemeral zones, up to 50 percent of the basal area may be removed down to a minimum basal area of 50 square feet per acre. Removal of additional basal area is allowed on a case=by=case basis when needed to benefit riparian-dependent resources. **(GWNF LRMP FW-17)** Note: GWNF is considering a project-specific LRMP amendment to this standard,

- Tree removals from the core of the riparian corridor may only take place if needed to: enhance the recovery of the diversity and complexity of vegetation native to the site; rehabilitate both natural and human-caused disturbances; provide habitat improvements for aquatic or riparian species; or threatened, endangered, sensitive, and locally rare species; reduce fuel build-up; provide for public safety; for approved facility construction/renovation; or as allowed in standards 11-015 or 11-024. **(GWNF LRMP 11-019).** Note: GWNF is considering a project-specific LRMP amendment to this standard,

- Use culverts, temporary bridges, hardened fords, or corduroy where needed to protect channel or bank stability when crossing channeled ephemeral streams **(GWNF LRMP FW-23).**

9.4.2.4 Spoil Pile Placement and Control

All spoil from minor and intermediate waterbody crossings, and upland spoil from major waterbody crossings will be placed in the construction right-of-way at least 10 feet from the water's edge

or in additional extra work areas as described in Section 8.2.2. Atlantic will use sediment barriers to prevent the flow of spoil or silt-laden water into any waterbody.

9.4.2.5 Equipment Bridges

Only clearing equipment and equipment necessary for installation of equipment bridges will cross waterbodies prior to bridge installation. Atlantic will limit the number of such crossings of each waterbody to one per piece of clearing equipment. Atlantic will construct and maintain equipment bridges to allow unrestricted flow and to prevent soil from entering the waterbody. Examples of such bridges include:

- equipment pads and culvert(s);
- equipment pads or railroad car bridges without culverts;
- clean rock fill and culvert(s); and
- flexi-float or portable bridges.

Additional options for equipment bridges may be utilized by Atlantic that achieves the performance objectives noted above. Atlantic will not use soil to construct or stabilize equipment bridges.

Atlantic will design and maintain each equipment bridge to withstand and pass the highest flow expected to occur while the bridge is in place and align culverts to prevent bank erosion or streambed scour. If necessary, install energy dissipating devices downstream of the culverts.

Atlantic will design and maintain equipment bridges to prevent soil from entering the waterbody and remove temporary equipment bridges as soon as practicable after permanent seeding. If there will be more than 1 month between final cleanup and the beginning of permanent seeding and reasonable alternative access to the right-of-way is available, Atlantic will remove temporary equipment bridges as soon as practicable after final cleanup.

Culverts and bridges will be designed to accommodate storm flows expected to occur while the structures are in place and use scientifically accepted methods for calculating expected storm flows (MNF SW46). Atlantic will construct stream crossings and bridges to withstand major storm and runoff events (GWNF Climate Change Strategy).

9.4.2.6 Roads and Skid Trails

During watershed or Project-level analysis, Atlantic will assess existing or proposed road stream crossings for effects to stream channel form and function, including channel stability, passage of storm flows and associated debris, and passage of aquatic organisms. It will prioritize crossings to address or correct identified concerns **(GWNF LRMP SW32).**

Where new roads cross stream channels, channel and bank stability shall be maintained **(MNF LRMP SW35).** Where new roads cross streams or high-risk areas, disturbed soils will be stabilized and designed drainage structures will be installed as soon as the soil is disturbed, in concert with the beginning of the work. High-risk areas include landslide prone areas, steep slopes, and highly erosive soils **(MNF LRMP RF07).**

Skid trails used for logging may cross riparian corridors at designated crossings. If crossing a perennial or intermittent stream is unavoidable, Atlantic will use a temporary bridge or other approved method within the state BMP. Stabilization of skid trails will occur as soon as possible to minimize soil

movement downslope (GWNF FW-142). Skidding of trees should be directed in a manner that prevents creation of channels or gullies that concentrate water flow to adjacent streams **(GWNF LRMP FW143).**

9.4.2.7 Dry-Ditch Crossing Methods

Unless approved otherwise by the appropriate federal or state agency, Atlantic will install the pipeline using one of the dry-ditch methods outlined below for crossings of waterbodies up to 30 feet wide (at the water's edge at the time of construction) that are state-designated as either coldwater or significant coolwater or warmwater fisheries, or federally- designated as critical habitat.

Dam and Pump

The dam-and-pump method may be used without prior approval for crossings of waterbodies where pumps can adequately transfer streamflow volumes around the work area, and there are no concerns about sensitive species passage. 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 pump intakes to minimize entrainment of fish;
- prevent streambed scour at pump discharge; and
- continuously monitor the dam and pumps to ensure proper operation throughout the waterbody crossing.

Flume Crossing

The flume crossing method requires implementation of the following steps:

- install flume pipe after blasting (if necessary), but before any trenching;
- use sand bag or sand bag and plastic sheeting diversion structure or equivalent to develop an effective seal and to divert stream flow through the flume pipe (some modifications to the stream bottom may be required to achieve an effective seal);
- properly align flume pipe(s) to prevent bank erosion and streambed scour;
- do not remove flume pipe during trenching, pipelaying, or backfilling activities, or initial streambed restoration efforts; and
- remove all flume pipes and dams that are not also part of the equipment bridge as soon as final cleanup of the stream bed and bank is complete.

9.4.2.8 Temporary Erosion and Sediment Control

Atlantic will install sediment barriers (as defined in section IV.F.3.a of the Plan) immediately after initial disturbance of the waterbody or adjacent upland. Sediment barriers will be properly

maintained throughout construction and reinstalled as necessary (such as after backfilling of the trench) until replaced by permanent erosion controls or restoration of adjacent upland areas is complete. Temporary erosion and sediment control measures are addressed in more detail in the Plan; however, the following specific measures will be implemented at stream crossings:

- install sediment barriers across the entire construction right-of-way at all waterbody crossings, where necessary to prevent the flow of sediments into the waterbody. Removable sediment barriers (or driveable berms) must be installed across the travel lane. These removable sediment barriers can be removed during the construction day, but must be re-installed after construction has stopped for the day and/or when heavy precipitation is imminent;

- where waterbodies are adjacent to the construction right-of-way and the right-of-way slopes toward the waterbody, install sediment barriers along the edge of the construction right-of-way as necessary to contain spoil within the construction right-of-way and prevent sediment flow into the waterbody; and

- use temporary 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.

9.4.2.9 Trench Dewatering

Atlantic will dewater the trench (either on or off the construction right-of-way) in a manner that does not cause erosion and does not result in silt-laden water flowing into any waterbody. Atlantic will remove the dewatering structures as soon as practicable after the completion of dewatering activities.

9.4.3 RESTORATION

Atlantic will do the following:

1. Use clean gravel or native cobbles for the upper 1 foot of trench backfill in all waterbodies that contain coldwater fisheries.

2. For open-cut crossings, stabilize waterbody banks and install temporary sediment barriers within 24 hours of completing instream construction activities. For dry-ditch crossings, it will complete streambed and bank stabilization before returning flow to the waterbody channel.

3. Return all waterbody banks to preconstruction contours or to a stable angle of repose as approved by the EI

4. Install erosion control fabric or a functional equivalent on waterbody banks at the time of final bank recontouring. Atlantic will 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. Anchor erosion control fabric with staples or other appropriate devices.

5. Comply with the USACE or its delegated agency, permit terms and conditions in the application of riprap for bank stabilization.

6. Unless otherwise specified by state permit, limit the use of riprap to areas where flow conditions preclude effective vegetative stabilization techniques such as seeding and erosion control fabric.

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

8. Install a permanent slope breaker across the construction right-of-way at the base of slopes greater than 5 percent that are less than 50 feet from the waterbody, or as needed to prevent sediment transport into the waterbody. In addition, install sediment barriers as outlined in the Plan. In some areas, with the approval of the EI, an earthen berm may be suitable as a sediment barrier adjacent to the waterbody.

Numbers 3 through 7 above also apply to those perennial or intermittent streams not flowing at the time of construction.

Atlantic will maintain, enhance, or restore vegetation conditions that provide (**MNF LRMP SW31):**

- Ecological functions of riparian, wetland, and aquatic ecosystems.
- Canopy conditions that regulate riparian and stream temperature regimes for native and desired non-native fauna and flora.
- Natural recruitment potential for large woody debris and other sources of nutrient inputs to aquatic ecosystems.
- Bank and channel stability and structural integrity.
- Habitat and habitat connectivity for aquatic and riparian-dependent species and upland species that use riparian corridors.
- Buffers to filter sediment.

If culverts are removed, banks and channel will be restored to a natural size and shape. All disturbed soil will be stabilized **(GWNF LRMP FW-25).** Temporary stream crossings will be removed and rehabilitated **(GWNF LRMP FW-144).**

9.4.4 POST-CONSTRUCTION MAINTENANCE

The permanent pipeline right-of-way will be maintained in an herbaceous state. Woody vegetation within the permanent right-of-way will be cleared periodically, in order to maintain accessibility of the right-of-way for maintenance and to accommodate pipeline integrity surveys, In uplands, trees and brush will be cleared over the entire width of the permanent right-of-way on an as-needed basis not to exceed once every 3 years. In wetlands and riparian areas, a 10-foot-wide corridor centered over the pipeline will be cleared at a frequency necessary for the corridor to be permanently maintained in an herbaceous state, as allowed by the Procedures. In addition, trees within 15 feet of the pipeline with roots that could compromise the integrity of the pipeline coating may be selectively cut and removed from the permanent right-of-way.

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

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

9.5 WETLAND CROSSINGS

Wetland crossings shall minimize disturbance to the wetland **(MNF LRMP MG33).**

New road construction will avoid wetlands where feasible. If a wetland cannot be avoided, road construction may be allowed as long as the subsurface drainage patterns can be preserved and maintained. Any road that would cross a wetland will cross in a way that minimizes disturbance to the wetland (MNF RF06).

Atlantic will route the pipeline to avoid wetland areas to the maximum extent possible. If a wetland cannot be avoided or crossed by following an existing right-of-way, Atlantic will route the new pipeline in a manner that minimizes disturbance to wetlands.

Atlantic will limit the width of the construction right-of-way to 75 feet or less. Prior written approval of the AO will be sought where topographic conditions or soil limitations require that the construction right-of-way width within the boundaries of a federally delineated wetland be expanded beyond 75 feet. Such requests must also be approved in writing by the FERC.

Wetland boundaries and buffers will be clearly marked in the field with signs and/or highly visible flagging until construction-related ground disturbing activities are complete.

Ground disturbance will be avoided to the extent practicable within seeps, vernal pools, bogs, fens, and other wetlands during Project implementation. These areas will be managed to protect wet soils and rare plants and provide wildlife watering sources using the following protection (**MNF LRMP SW51):**

- No new road will be located within these areas except at essential crossings. Such crossings should be designed to minimize disturbance to the extent practical.
- Logs will not be skidded through these areas and slash and logs will be kept out of them.
- Where available, a canopy of 60-100 percent crown closure will be maintained within and adjacent to these areas, unless a more open canopy is needed for Threatened, Endangered, and Protected species or Regional Forest Sensitive Species management.
- Mast trees or shrubs may be planted in seeps if mast plants are currently lacking.

9.5.1 INSTALLATION

9.5.1.1 Extra Work Areas and Access Roads

Atlantic will locate all extra work areas (such as staging areas and additional spoil storage areas) at least 100 feet away from wetland boundaries, except where the adjacent upland consists of cultivated or rotated cropland or other disturbed land.

Atlantic will submit to the AO for review and written approval, site-specific justification for each extra work area with a less than 100-foot setback from wetland boundaries, except where adjacent upland consists of cultivated or rotated cropland or other disturbed land. The justification will specify the site-specific conditions that will not permit a 50 foot setback and measures to ensure the wetland is adequately protected. Such requests must also be approved in writing by the FERC.

The construction right-of-way may be used for access when the wetland soil is firm enough to avoid rutting or the construction right- of-way has been appropriately stabilized to avoid rutting (e.g., with timber riprap, prefabricated equipment mats, or terra mats). Severe rutting resulting from management activities shall be confined to less than 5 percent of an activity area **(MNF LRMP SW06).**

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, Atlantic will limit all other construction equipment to one pass through the wetland using the construction right-of-way.

The only access roads, other than the construction right-of-way, that can be used in wetlands are those existing roads that can be used with no modifications or improvements, other than routine repair, and no impact on the wetland.

9.5.1.2 Crossing Procedures

Atlantic will comply with U.S. Army Corps of Engineers 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. Atlantic will use "push-pull" or "float" techniques to place the pipe in the trench where water and other site conditions allow. Atlantic will 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.

Atlantic will limit construction equipment operating in wetland areas to that needed to clear the construction right-of-way, dig the trench, fabricate and install the pipeline, backfill the trench, and restore the construction right-of-way.

Atlantic will cut vegetation just above ground level, leaving existing root systems in place, and remove it from the wetland for disposal.

Atlantic will limit pulling of tree stumps and grading activities to directly over the trenchline. It will not grade or remove stumps or root systems from the rest of the construction right-of-way in wetlands unless the Construction Site Supervisor and EI determine that safety-related construction constraints require grading or the removal of tree stumps from under the working side of the construction right-of-way.

Atlantic will segregate the top 1 foot of topsoil from over the trenchline within wetland areas, except in areas where standing water is present or soils are saturated. Immediately after backfilling is complete, Atlantic will restore the segregated topsoil to its original location.

Atlantic will not use rock, soil imported from outside the wetland, tree stumps, or brush riprap to support equipment on the construction right-of-way.

If standing water or saturated soils are present or if construction equipment causes ruts or mixing of the topsoil and subsoil in wetlands, Atlantic will use low-ground-weight construction equipment, or operate normal equipment on timber riprap, prefabricated equipment mats, or terra mats.

Atlantic will remove all Project-related material used to support equipment on the construction right-of-way upon completion of construction.

9.5.1.3 Temporary Sediment Control

Atlantic will install sediment barriers (as defined in section IV.F.3.a of the Plan) immediately after initial disturbance of the wetland or adjacent upland. Sediment barriers must be properly maintained throughout construction and reinstalled as necessary (such as after backfilling of the trench). Except as noted below in this Section, Atlantic will maintain sediment barriers until replaced by permanent erosion controls or restoration of adjacent upland areas is complete. Temporary erosion and sediment control measures are addressed in more detail in the Plan.

Atlantic will install sediment barriers across the entire construction right-of-way immediately upslope of the wetland boundary at all wetland crossings where necessary to prevent sediment flow into the wetland.

Where wetlands are adjacent to the construction right-of-way and the right-of-way slopes toward the wetland, Atlantic will install sediment barriers along the edge of the construction right-of-way as necessary to contain spoil within the construction right-of-way and prevent sediment flow into the wetland.

Atlantic will install sediment barriers along the edge of the construction right-of- way as necessary to contain spoil and sediment within the construction right-of-way through wetlands. Remove these sediment barriers during right-of-way cleanup.

If soils are commonly wet at or near the surface during a considerable part of the year, or if soils are highly susceptible to compaction, equipment use will normally be avoided or mitigated by Atlantic when soils are saturated or when freeze-thaw cycles occur **(MNF LRMP SW07d).**

9.5.1.4 Trench Dewatering

Atlantic will dewater the trench (either on or off the construction right-of-way) in a manner that does not cause erosion and does not result in silt-laden water flowing into any wetland. Atlantic will remove the dewatering structures as soon as practicable after the completion of dewatering activities.

9.5.2 RESTORATION

Where the pipeline trench may drain a wetland, Atlantic will construct trench breakers at the wetland boundaries and/or seal the trench bottom as necessary to maintain the original wetland hydrology. Atlantic will restore pre-construction wetland contours to maintain the original wetland hydrology.

For each wetland crossed, Atlantic 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 right-of-way 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 addition, Atlantic will install sediment barriers as outlined in the Plan. In some areas, with the approval of the EI, an earthen berm may be suitable as a sediment barrier adjacent to the wetland.

Atlantic will not use fertilizer, lime, or mulch unless required in writing by the appropriate federal or state agency.

Atlantic will consult with the appropriate federal or state agencies to develop a Project- specific wetland restoration plan. The restoration plan shall include measures for re-establishing herbaceous and/or woody species, controlling the invasion and spread of non-native invasive species and noxious weeds (e.g., purple loosestrife), and monitoring the success of the revegetation and weed control efforts. Atlantic will provide this plan to the FERC staff upon request.

Atlantic will ensure that all disturbed areas successfully revegetate with wetland herbaceous and/or woody plant species.

Atlantic will remove temporary sediment barriers located at the boundary between wetland and adjacent upland areas after revegetation and stabilization of adjacent upland areas are judged to be successful as specified in section VII.A.4 of the Plan.

9.5.3 POST-CONSTRUCTION MAINTENANCE AND REPORTING

The permanent pipeline right-of-way will be maintained in an herbaceous state. Woody vegetation within the permanent right-of-way will be cleared periodically, in order to maintain accessibility of the right-of-way for maintenance and to accommodate pipeline integrity surveys, In uplands, trees and brush will be cleared over the entire width of the permanent right-of-way on an as-needed basis not to exceed once every 3 years. In wetlands and riparian areas, a 10-foot-wide corridor centered over the pipeline will be cleared at a frequency necessary for the corridor to be permanently maintained in an herbaceous state, as allowed by the Procedures. In addition, trees within 15 feet of the pipeline with roots that could compromise the integrity of the pipeline coating may be selectively cut and removed from the permanent right-of-way. Atlantic will not conduct any routine vegetation mowing or clearing in wetlands that are between HDD entry and exit points.

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

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

Atlantic will monitor and record the success of wetland revegetation annually until wetland revegetation is successful.

Wetland revegetation will be considered successful if all of the following criteria are satisfied:

- the affected wetland satisfies the current federal definition for a wetland (i.e., soils, hydrology, and vegetation);
- vegetation is at least 80 percent of either the cover documented for the wetland prior to construction, or at least 80 percent of the cover in adjacent wetland areas that were not disturbed by construction;
- if natural rather than active revegetation was used, the plant species composition is consistent with early successional wetland plant communities in the affected ecoregion; and
- non-native invasive species and noxious weeds are absent, unless they are abundant in adjacent areas that were not disturbed by construction.

For any wetland where revegetation is not successful at the end of 3 years after construction, Atlantic will develop and implement (in consultation with a professional wetland ecologist) a remedial revegetation plan to actively revegetate wetlands. Atlantic will continue revegetation efforts and file a report annually documenting progress in these wetlands until wetland revegetation is successful.

9.6 HYDROSTATIC TESTING

9.6.1 NOTIFICATION PROCEDURES AND PERMITS

No hydrotest water withdrawals or discharges are planned on USFS lands.

10.0 RESTORATION AND REHABILITATION PLAN

10.1 PURPOSE

This Restoration and Rehabilitation Plan was prepared for the ACP to address post-construction restoration and rehabilitation activities on USFS lands and describes the processes and measures that will be implemented to mitigate the impacts to habitats and scenery. USFS lands are managed in accordance with various management directives, including standards and guidelines for restoration and revegetation activities. This Restoration and Rehabilitation Plan has been written to conform to FERC requirements and procedures and industry-accepted practices and standards, and guidelines contained within the MNF and GWNF LRMPs and site-specific requirements and recommendations for restoration developed in consultation with USFS staff. Furthermore, the Restoration and Rehabilitation Plan will be implemented in conjunction with the 2013 versions of the FERC Plan and Procedures as well as other relevant sections of this COM Plan.

Atlantic has consulted with the USDA's Natural Resources Conservation Service and is still in the process of consulting with the USFS and state/commonwealth land managing agencies, to identify appropriate seed mixes, soil amendments, and cultural practices for use during restoration. Based on consultations with the USFS to date, a variety of seed mixes, including natives and pollinator-friendly species, and seeding techniques appropriate to the various conditions expected to be found along the pipeline route in the MNF and GWNF are provided.

10.2 TRAINING

Prior to the start of construction, Atlantic will conduct environmental and safety training for Company and Contractor personnel. The training program will focus on the FERC's Plan and Procedures; other construction, restoration, and mitigation plans, including this *Restoration and Rehabilitation Plan*; and applicable permit conditions. In addition, Atlantic will provide large-group training sessions before each work crew commences construction with periodic follow-up training for groups of newly assigned personnel.

Training for environmental inspectors will also include:

- emergency contacts and numbers;
- pipeline right-of-way rehabilitation and restoration techniques specific for the NFS lands;
- seeding techniques on steep slope sites; and
- erosion minimization and control measures.

10.3 RESTORATION AND REHABILITATION

This section provides a description of restoration and rehabilitation measures and BMPs that would be used to restore the pipeline right-of way on USFS lands. These measures and BMPs are based on FERC requirements and industry-accepted practices, in addition to site-specific requirements and recommendations for restoration developed in conjunction with USFS staff.

10.3.1 Restoration and Rehabilitation Measures and Best Management Practices

10.3.1.1 Erosion Control

Construction of the pipeline will be followed by restoration of the right-of-way, stabilization of the soil, and seeding (where needed). Atlantic will complete final grading and installation of permanent

erosion control structures (e.g., trench breakers or permanent slope breakers) generally within 20 days after backfilling the trench (10 days in residential areas), seasonal or other weather conditions permitting. 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, Atlantic will resume clean-up and restoration efforts the following spring. Atlantic 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.

Temporary erosion control measures and permanent erosion control devices to be employed during and after construction are described in Section 8 – Upland Erosion Control Plan.

During construction, the effectiveness of temporary erosion control devices will be monitored by Atlantic's EI. The USFS will also employ its own compliance monitors. Monitoring reports will identify follow-up actions; subsequent inspection/reporting will ensure the follow-up action has been completed, and that erosion control devices continue to function. Where appropriate for local resource priorities, the role of the EI may be filled by agricultural or horticultural monitors. The effectiveness of revegetation and permanent erosion control devices will be monitored by Atlantic operating personnel during the long-term operation and maintenance of the pipeline systems.

10.3.1.2 Soil Restoration

Successful revegetation is dependent on appropriate soil conditions and can be influenced by several factors, including soil texture, soil compaction (density), soil microbial health, drainage class, salinity, and acidity. Unless otherwise approved by the USFS, soil restoration will include:

- removal of excavated rock as described in Section 2.1.6– Lowering-in and Backfilling;
- distribution of rock on the work area as described in Section 2.1.6– Lowering-in and Backfilling;
- grading of the right-of-way to restore preconstruction contours to the extent practicable; and
- preparation of the soil for revegetation as described in Section 10.3.1.8.

10.3.1.3 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. Atlantic will minimize impacts by implementing the mitigation measures for compaction and rutting as described in the Atlantic's Upland Erosion Control Plan (see Section 8). Atlantic will test for soil compaction:

- in areas requested by the USFS;
- in all areas prior to topsoil replacement;
- in undisturbed areas adjacent to the construction workspace with the same soil type under similar moisture conditions to approximate preconstruction 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, a representative compaction measurement may be difficult to obtain. If compaction testing is impeded by rock or roots, Atlantic will investigate the use of other methods to measure compaction (e.g., use of pocket penetrometer) or 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.

10.3.1.4 Topsoil Segregation, Replacement, and Soil Conditioning

The potential mixing of topsoil or surface soil with the subsoil from construction activities could result in a loss of soil fertility. To prevent mixing of the soil horizons or incorporation of additional rock into the topsoil, topsoil will be:

- segregated as described in the Plan and Procedures;
- stockpiled on the right-of-way; and
- excluded from materials used for padding the pipe.

Topsoil will be layered above subsoil where seeds stored in the soil will be encouraged to grow.

10.3.1.5Measures to prevent the spread of non-native invasive plant species are provided in Section 11, the Non-Native Invasive Plant Species Management Plan. Re-Contouring

Grading will be conducted prior to construction where necessary to provide a reasonably level work surface. Upon completion of construction, Atlantic 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 drainage ditches and culverts that are diverted or damaged during construction to their original or better condition.

10.3.1.6 Steep Slope Areas

Areas with steep slopes along the pipeline route may make the establishment of vegetation more difficult due to the increased potential for erosion by water. Slopes greater than 35 percent will be restored to natural contours to the extent practicable, or in accordance with specific requests from the USFS. 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 right-of-way, and encourage retention of soils; and

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

In addition to these general measures, Atlantic 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 right-of-way in steep slope areas (see Section 8.7.3 for details). Atlantic is committed to employing BIC measures to protect the environment in steep slope areas. Best in Class is defined as the most efficient and/or protective design or configuration with the least environmental impact providing reliable construction and operations.

Atlantic will implement the Slope Stability Policy and Procedure and is conducting geotechnical studies along the proposed pipeline routes in West Virginia, and western Virginia in steep terrain areas to assess the potential for landslides and landslips to occur during construction and operation of the Project.

The following lists some of the special design and construction mitigation measures that will be implemented if a problem is encountered 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 right-of-way using subsurface drains or other special drainage measures;
- engineering of the backfill around or within steep slope areas to dry the backfill, add compaction, improve backfill soil strength, and reduce saturation;
- installation of targeted structures to stabilize backfill using engineered fill, retaining walls, bagged concrete mix, key trenches, and/or shear trenches; and
- reduction in surcharge on steep slope areas by reducing excess or saturated backfill.

10.3.1.7 Site Preparation and Seeding

Atlantic will complete final grading and permanent erosion control measures within 20 days after backfilling of the trench, seasonal or other weather conditions permitting. In the event that this timeframe cannot be met or construction or restoration activities are interrupted for an extended period, mulch will be spread prior to seeding. In these cases, slopes within 100 feet of wetlands or waterbodies will be mulched at a rate of 3 tons per acre (FERC, 2013a). In accordance with the USFS requirements, the mulch material will not include the use of hay. Instead, materials may include clean straw, wood or paper fiber, coconut fiber, synthetic mulch, or other USFS-approved material that is not likely to contain seeds or viable parts of invasive plants..

10.3.1.8 Seedbed Preparation

Proper preparation of the soil surface and seedbed is essential for rapid and healthy revegetation (Virginia DEQ, 1992). Successful germination of seed is enhanced by a well-prepared seedbed, the suitability of which decreases rapidly after rainfall.

Seedbed preparation starts immediately after soil has been replaced on the right-of-way and final grading, contouring, and de-compaction activities are complete. Seedbed preparation will be conducted immediately prior to seeding to prepare a firm seedbed conducive to proper seed placement. Seedbed preparation will also be performed to break up surface crusts and to reduce weeds that develop between the initial ground clearing and final seeding.

Unless otherwise specified by the USFS, the seedbed will be prepared in disturbed areas to a depth of 3 to 4 inches using appropriate equipment (e.g., cultipacker roller) to provide a seedbed that is firm, yet rough. Atlantic will imprint exposed soils with a sheepsfoot, landfill compactor, tractor with studded tires, or land imprinter equipment. Soil imprinting, or tracking, leaves divots on the ground surface that trap moisture and seeds, creating catchments for native plant material to be spread across the seeded area (West Virginia Department of Environmental Protection, 2012). In addition, a seedbed with a rough surface is conducive to the capturing or lodging of seed when broadcasted or hydroseeded, and can reduce runoff and erosion potential. The rough seedbed surface will also retain soil moisture for seedling germination and promote faster establishment of vegetation.

In compacted areas, additional measures such as chisel plowing or disking may be necessary to improve water infiltration and soil aeration necessary to prepare an adequate seedbed. When hydroseeding, Atlantic will scarify the soil surface prior to seeding to anchor the seed to the soil surface and encourage germination.

10.3.1.9 Lime and Fertilizer Application

In general, and in accordance with the Plan and Procedures, upland areas will have a fertilizer and pH supplement (i.e., lime) mixed in to the upper two inches of topsoil. No lime or fertilizer will be used within 100 feet of wetlands or waterbodies or within 300 feet of karst features. In upland areas without specific fertilization requirements, Atlantic will:

- Provide soil nutrient additions where suggested by soil chemistry or soil fertility data. However, in absence of this data, the USFS recommends the application of 600 – 800 pounds per acre of 10-20-10 (Nitrogen, Phosphorous, and Potassium), 400 pounds per acre of 15-30-15, or 800 -1,000 pounds per acre of10-10-10 fertilizer. Lime will be applied at the rate of 1,500 - 4,000 pounds per acre (pelletized or dust) or 4,000 pounds per acre as hydro Lime.

- avoid fertilizer drift through restricted application times that exclude periods of high winds or heavy rains; and

- store and mix all fertilizers in upland areas and away from karst features, where contamination of wetlands, waterbodies, or karst features will be avoided.

Mulching and Binders

In general, and in accordance with the Plan, Atlantic will apply mulch to slopes immediately after seeding to prevent erosion or as specified by the USFS. Mulch materials will be anchored to the soil with

stakes or liquid mulch tackifiers. No tackifiers will be used within 100 feet of wetlands and waterbodies or within 300 feet of karst features.

Possible mulch materials and application techniques are described below.

- salvaged wood materials, including slash and non-merchantable timber, will be retained in forested areas and placed on the right-of-way after final grading, re-contouring, and seeding is complete. Woody debris is expected to support revegetation while preventing erosion and providing micro-habitat for various species.

- native wood chip materials will be used in forested systems and will be generated from cleared materials that are chipped and stockpiled on the edge of the right-of-way. Native wood chips are expected to aid in the successful revegetation of disturbed areas.

- wood fiber hydromulch may be used in shrubby areas to augment biomass salvaged during clearing. Hydromulch is evenly distributed and absorbs water quickly, which enhances seed survival rates and discourages erosion during regeneration of shrubby species.

- bonded fiber matrix (BFM), a type of hydromulch designed to control erosion on steep slopes, may also be used where appropriate. BFM slurry contains thermally processed wood fibers (approximately 80 percent), water (approximately 10 percent), and tackifiers and polymer-based binding agents that are quick to dry upon application. BFM is hydraulically applied, which allows for controlled application on steep slopes where access may be difficult. BFM will only be applied to stable slopes where final grading has been completed and water runoff has been diverted from the slope face. Once BFM has had 24 to 48 hours to cure, an erosion-resistant blanket is formed that is flexible, absorbent, and biodegradable, and that will accelerate plant growth. BFM may be used in conjunction with slope breakers and other erosion control devices on slopes longer than 70 feet. BFM application rates will depend on manufacturers specifications, based upon the slope of the disturbed areas (Terra Novo, 2016).

- Weed-free straw will be used to preserve the soil base in areas where native salvaged material is not available. In areas that are seeded by drill, Atlantic will apply one bale of clean straw per 1,000 square feet. Where broadcast seeding is used, Atlantic will apply two bales of clean straw per 1,000 square feet, or in accordance with requirements specified by the USFS.

Additional guidelines and specifications recommended by USFS to be implemented in the MNF and GWNF are described below:

- Materials must be certified weed free or be accompanied by vendor's test results for noxious weed content.

- Seeded areas can be mulched with weed free straw at a rate of 2,000 – 4,000 pounds per acre, hand spread or blown, fiber mulch hydroseeded at 1500 - 2000 pounds per acre, or other appropriate material.

- natural biodegradable products are preferred. Materials must be demonstrated to be free of invasive species, including but not limited to plants, pests, and pathogens.

- hydraulic erosion control products must be suitable for wildlife.
- if the use of stabilization netting is required/permitted, wildlife friendly geotextiles must be used. These products must either not contain netting, or netting must be made of 100 percent biodegradable non-plastic materials such as jute, sisal, or coir fiber. Plastic netting (such as polypropylene, nylon, polyethylene, and polyester), even if advertised as biodegradable, is not an acceptable alternative. Any netting used must also have a loose-weave design with movable joints between horizontal and vertical twines to reduce the chance for wildlife entanglement, injury, or death.
- avoid the use of silt fences reinforced with metal or plastic mesh.
- when no longer required, (after soils are stable and the vegetative cover is established), temporary erosion control and sediment control products should be promptly removed.
- any products that require mixing with water need to have a Forest Service-approved water source. The source of water must not be contaminated with non-native invasive organisms that could spread into streams.

Hydroseeding

- wood-fiber hydraulic mulches are generally short-lived and require a 24-hour period to dry before rainfall occurs.
- wood fiber naturally has tackifying properties, but fiber alone may not be sufficient on steep slopes. In those cases the addition of a tackifier will help keep the seeds in contact with the soil.
- as wood chips, shredded woody materials, and other high-carbon materials decompose, they remove plant nutrients such as nitrogen from the soil. This can reduce soil fertility and make it difficult for grasses to grow. This should be taken into account when planning restoration seeding.

10.3.1.10 Revegetation

The goal of the revegetation is to address the stabilization of the right-of-way post-construction by using appropriate seed mixes. Initially, the primary goal of seeding is to establish a vegetative cover to minimize surface erosion and sedimentation resulting from precipitation and surface flow. The secondary goal is the establishment of an assortment of native species beneficial for wildlife and pollinators.

Atlantic has consulted with the USFS and State/Commonwealth land managing agencies, to identify appropriate seed mixes and other cultural practices for use during restoration. Based on discussions with the MNF and GWNF to date, a variety of seed mixes, including native and pollinator-friendly species, and seeding techniques appropriate to the various conditions expected to be found along the pipeline route are provided.

Atlantic will perform seeding of permanent vegetation during the fall of the year construction is completed, within the recommended seeding dates, and within six working days of final grading, weather and soil conditions permitting. Atlantic will prioritize seeding and other restoration work in high-elevation areas, in an attempt to avoid restoration delays due to winter-related weather and field conditions. If seeding cannot be done within recommended fall timeframes, appropriate temporary

erosion control measures will be installed and temporary grass cover will be seeded. If temporary grass cover is used, seeding of permanent vegetation will occur at the beginning of the next recommended seeding season.

In the MNF and GWNF appropriate seasons for seeding can vary dramatically depending on elevation. Spring seeding can be conducted from March 15th – June 1st, and fall seeding can be done from August 15th – October 15th, but neither timeframe is appropriate in its entirety at all elevations. Atlantic will consult with the USFS for the most appropriate timeframes for specific elevations and for seeding or treatments outside normal or appropriate seasons.

Seed Mix Recommendations

- The recommended USFS guidance and application techniques, and seed mixtures prescriptions tailored for the MNF and GWNF for temporary and permanent erosion control and special site conditions and habitats are provided below.
    - Seed shall be Virginia- or West Virginia- certified seed (bag tags attached; seed certification shall meet each state's standards for their certified seed classification) or alternative seed sourced from approved distributors.
- All leguminous seed shall be either be pre-inoculated from a supplier, or mixed with inoculant specified for use on that particular seed according to manufacturer's directions. Inoculants shall be manually applied at double the manufacturer's rate. Inoculant shall be mixed with legume seed prior to mixing with other seeds. For hydroseeding, use a minimum of five times the dry seeding rate of inoculant.
- When using native seed, use as local an ecotype as is available, in the following order of preference: from within state; from mountain regions of an adjoining state; or from within 100 miles, as long as it is within the Appalachian mountain ecosystem.
- A minimum of 100 pounds per acre of seed will be applied when seeding for permanent erosion control, unless otherwise specified by the seed mix provider.
- All seeding must occur promptly after construction halts, either temporarily or permanently. Erosion control seed mixtures must be sufficient to stabilize sites for varying lengths of time, and seed mixes may need to vary depending on that timeframe.
- Areas to be planted with species beneficial for wildlife after pipeline installation will be treated with temporary erosion control mix during a normal seeding season.
- Areas not to be treated with wildlife seed species will be treated with permanent erosion control seeding during a normal seeding season.
- Seeding rates should be doubled when hydroseeding.

Recommended Seed Mixtures by habitat area:

Temporary Erosion Control Seed Mixes

Table 10.3.1-1 provides a summary seed mixtures and application rates by slope class recommended to be used in disturbed areas on NFS lands for temporary erosion control under the following conditions:

- wherever erosion control is needed outside of normal seeding seasons;
- concurrent with permanent erosion control; and
- prior to permanent seeding with wildlife mixes, where such follow-up is appropriate.

TABLE 10.3.1-1

Seed Mix FS01: Recommended Seed Mixes for Temporary Erosion Control by Slope Class

Seed Mix/Slope Class	Common Species Name	Scientific Name	Number of Seeds (seeds/feet^2) [a]	Seeding Application Rate (lbs/acre/PLS) [b]
0 to 30 Percent Slope				
1	Annual Rye Grass	*Lolium multiflorum*	34.87	7.00
	Cereal Rye	*Secale cereale*	18.60	45.00
	Brown Top Millet	*Panicum ramosum*	13.77	8.00
Total				60.00
31 to 50 Percent Slope				
2	Annual Rye Grass	*Lolium multiflorum*	52.31	10.50
	Cereal Rye	*Secale cereale*	27.89	67.50
	Brown Top Millet	*Panicum ramosum*	20.66	12.00
Total				90.00
50 to ≥ 70 Percent Slope				
3	Annual Rye Grass	*Lolium multiflorum*	78.46	15.75
	Cereal Rye	*Secale cereale*	41.84	101.25
	Brown Top Millet	*Panicum ramosum*	30.99	18.00
Total				135.00

Source: USFS, 2016; Roundstone, 2017.

[a] Seeds per square feet.

[b] lbs/acre/PLS = pounds per acre of pure live seed

Permanent Erosion Control Seed Mix

Table 10.3.1-2 provides a summary of seed mixtures and application rates that are recommended to be used in disturbed areas on NFS lands for permanent erosion control under the following conditions:

- only during normal seeding season in Spring and Fall;
- on slopes too steep or inaccessible for planting equipment, i.e., in slopes 50 percent or greater; or
- on areas planned to be left not in final grade for more than 1 year.

TABLE 10.3.1-2

Seed Mix FS02: Recommended Seed Mix for Permanent Erosion Control

Type	Common Species Name [a]	Scientific Name	Number of Seeds (seeds/feet^2) [a]	Seeding Application Rate (lbs/acre/PLS) [b]
Non-native	Creeping Red Fescue	*Festuca rubra*	2.58	0.250
	Oats [c]	*Avena sativa*	14.25	32.000
Native – Highly Preferred	Indian Grass	*Sorghastrum nutans*	16.07	4.000
	Purple Top	*Tridens flavus*	18.68	1.750
Native - Preferred	Upland Bentgrass	Agrostis perennans	11.48	0.063
	Canada Wild Rye	*Elymus canadensis*	5.23	2.000
	Deer Tongue Grass	*Panicum clandestinum*	8.03	1.000
	Spiked Blazing Star	*Liatris spicata*	0.82	0188
	New England Aster	Aster novae-angliae	3.44	0.125
	False Sunflower	Heliopsis helianthoides	1.81	0.750
	Canada Tick Trefoil	*Desmodium canadense*	0.83	0.500
	Slender Lespedeza	*Lespedeza virginica*	1.00	0.250
	Slender Mountain Mint	*Pycnanthemum tenuifolium*	8.61	0.063
	Virginia Wild Rye	Elymus virginicu	4.59	2.000
	Bergamot	Monarda fistulosa	2.17	0.250
	Wild Senna	Senna marilandica	0.45	0.750
Native – Moderately Preferred	Partridge Pea	Cassia fasciculata	0.65	0.375
	Blackeyed Susan	Rudbeckia hirta	9.18	0.250
	Switchgrass	Panicum virgatum	4.46	0.750

Source: USFS, 2016; Roundstone, 2017.

[a] Seeds per square feet.

[b] lbs/acre/PLS = pounds per acre of pure live seed.

[c] Use Spring Oats instead of Cereal Rye as a nurse crop because it is less competitive with Native species.

Special Site Conditions Seed Mixes (Native Species for Wildlife and Pollinators)

Seed mixtures FS03 – for Dry Uplands or Highlands (Table 10.3.1-3), FS04 – for Riparian Habitat Areas (Table 10.3.1-4), FS05 – for Wetland Habitat Areas (Table 10.3.1-5), and FS06 for Dry Low pH Habitat Areas (Table 10.3.1-6) are provided below, and are to be applied as permanent vegetation in areas accessible to necessary drill or other planting equipment (in areas where slopes are less than 40 percent).

TABLE 10.3.1-3

Seed Mix FS03: Recommended Seed Mix for Dry Uplands or High Elevation Habitat Areas [a]

Type	Common Species Name	Scientific Name	Number of Seeds (seeds/feet^2) [b]	Seeding Application Rate (lbs/acre/PLS) [c]
Non-native	Oats [d]	*Avena sativa*	14.25	32.000
Native	Indian Grass	*Sorghastrum nutans*	16.07	4.000
	Switchgrass	*Panicum virgatum*	4.46	0.750
	Virginia Wild Rye	*Elymus virginicus*	5.74	2.500
	Purple Top	*Tridens flavus*	16.01	1.500
	Canada Wild Rye	*Elymus canadensis*	6.54	2.500
	Deer Tongue Grass	*Panicum clandestinum*	6.03	0.750
	Upland Bentgrass	*Agrostis perennans*	11.48	0.063
	Blackeyed Susan	*Rudbeckia hirta*	9.18	0.250
	Common Milkweed	*Asclepias syriaca*	0.28	0.250
	False Sunflower	*Heliopsis helianthoides*	1.81	0.750
	Partridge Pea	*Cassia fasciculata*	0.86	0.500
	Canada Tick Trefoil	*Desmodium canadense*	0.83	0.500
	Slender Mountain Mint	*Pycnanthemum tenuifolium*	8.61	0.083
	Bergamot	*Monarda fistulosa*	5.38	0.188
	Tall Goldenrod	*Solidago altissima*	4.02	0.250
	New England Aster	*Aster novae-angliae*	3.44	0.125
	Wild Senna	*Senna marilandica*	0.30	0.500

Source: USFS, 2016; Roundstone, 2017.

[a] Reduce planting application rate by 5 percent for each slope class (i.e., 0 - 8, 8 -15, or 15 – 30 percent) below slope class 30 – 50 percent. “High Elevation” areas are habitat sites with elevations higher than 3,000 feet above sea mean level.

[b] Seeds per square feet.

[c] lbs/acre/PLS = pounds per acre of pure live seed.

[d] Use Spring Oats instead of Cereal Rye as a nurse crop because it is less competitive with Native species.

TABLE 10.3.1-4

Seed Mix FS04: Recommended Seed Mix for Riparian Habitat Areas [a]

Type	Common Species Name	Scientific Name	Number of Seeds (seeds/fee[t2) [b]	Seeding Application Rate (lbs/acre/PLS) [c]
Non-native	Oats [d]	*Avena sativa*	14.25	32.000
Native - Grasses	Upland Bentgrass	*Agrostis perennans*	11.48	0.063
	Big Bluestem	*Andropogon gerardii*	13.22	4.000
	Indian Grass	*Sorghastrum nutans*	8.03	2.000
	Virginia Wild Rye	*Elymus virginicus*	9.18	4.00
	Deer Tongue Grass	*Panicum clandestinum*	16.07	2.000
Native - Forbs	Boneset	*Eupatorium perfoliatum*	5.74	0.125
	Sneezeweed	*Helenium autumnale*	5.74	0.125
	Joe-Pye Weed	*Eupatorium fistulosum*	8.61	0.188
	Wild Senna	*Senna marilandica*	0.30	0.500
	New York Ironweed	*Vernonia noveboracensis*	0.86	0.125
	Swamp Milkweed	*Asclepias incarnata*	0.10	0.063
	American Senna	*Senna hebecarpa*	0.25	0.500
	Canada Tick Trefoil	*Desmodium canadense*	0.83	0.500
	Slender Mountain Mint	*Pycnanthemum tenuifolium*	17.22	0.125
	Bergamot	*Monarda fistulosa*	5.38	0.188
	Tall Goldenrod	*Solidago altissima*	4.02	0.250
	New England Aster	*Aster novae-angliae*	3.44	0.125

Source: USFS, 2016; Roundstone, 2017.

[a] Reduce planting application rate by 5 percent for each slope class (i.e., 0 - 8, 8 -15, or 15 – 30 percent) below slope class 30 – 50 percent.

[b] Seeds per square feet.

[c] lbs/acre/PLS = pounds per acre of pure live seed.

[d] Use Spring Oats instead of Cereal Rye as a nurse crop because it is less competitive with Native species.

TABLE 10.3.1-5

Seed Mix FS05: Recommended Seed Mix for Wetland Habitat Areas [a]

Type	Common Species Name	Scientific Name	Number of Seeds (seeds/feet2) [b]	Seeding Application Rate (lbs/acre/PLS) [c]
Non-native	Oats [d]	*Avena sativa*	14.25	32.000
Native - Grasses	Bottlebrush Grass	*Elymus hystrix*	0.86	0.500
	Deer Tongue Grass	*Panicum clandestinum*	10.04	1.250
	Nodding Sedge	*Carex crinita*	4.13	0.250
	Path Rush	*Juncus tenuis*	25.83	0.250
	Red Top Panicum	*Panicum rigidulum*	27.38	1.500
	Soft Rush	*Juncus effusus*	51.65	0.5000
	Squarrose Sedge	*Carex squarrosa*	2.30	0.250
	Switchgrass	*Panicum virgatum*	4.46	0.750
	Wool Grass	*Scirpus cyperinus*	51.65	0.250
Native - Forbs	Blue False Indigo	*Baptisia australis*	0.30	0.500
	Great Blue Lobelia	*Lobelia siphilitica*	11.48	0.063
	New York Ironweed	*Vernonia noveboracensis*	1.72	0.250
	Wild Senna	*Senna marilandica*	0.45	0.750
	Sweet Joe-Pye Weed	*Eupatorium purpureum*	1.93	0.125
	Spotted Joe-Pye Weed	*Eupatorium maculatum*	8.03	0.250
	Swamp Milkweed	*Asclepias incarnata*	0.30	0.188
	American Senna	*Desmodium canadense*	0.38	0.750

Source: USFS, 2016; Roundstone, 2017.

[a] Reduce planting application rate by 5 percent for each slope class (i.e., 0 - 8, 8 -15, or 15 – 30 percent) below slope class 30 – 50 percent.

[b] Seeds per square feet.

[c] lbs/acre/PLS = pounds per acre of pure live seed.

[d] Use Spring Oats instead of Cereal Rye as a nurse crop because it is less competitive with Natives.

TABLE 10.3.1-6

Seed Mix FS06: Recommended Seed Mix for Dry Acidic Habitat Areas [a]

Type	Common Species Name	Scientific Name	Number of Seeds (seeds/feet^2) [b]	Seeding Application Rate (lbs/acre/PLS) [c]
Non-native	Oats [d]	*Avena sativa*	14.25	32.000
Native - Grasses	Indian Grass	*Sorghastrum nutans*	16.07	4.000
	Purple Top	*Tridens flavus*	18.68	1.750
	Purple Love Grass	*Eragrostis spectabilis*	5.74	0.250
	Canada Wild Rye	*Elymus canadensis*	5.23	2.000
	Deer Tongue Grass	*Panicum clandestinum*	14.06	1.750
	Virginia Wild Rye	*Elymus virginicus*	4.59	2.000
	Splitbeard Bluestem	*Andropogon ternarius*	1.24	0.250
	Switchgrass	*Panicum virgatum*	4.46	0.750
Native - Forbs	Tall Goldenrod	*Solidago canadensis*	6.03	0.375
	New England Aster	*Aster novae-angliae*	3.44	0.125
	False Sunflower	*Heliopsis helianthoides*	0.90	0.375
	Canada Tick Trefoil	*Desmodium canadense*	0.41	0.250
	Slender Lespedeza	*Lespedeza virginica*	0.50	0.125
	Slender Mountain Mint	*Pycnanthemum tenuifolium*	8.61	0.063
	Bergamot	*Monarda fistulosa*	5.38	0.188
	Wild Senna	*Senna marilandica*	0.30	0.500
	Partridge Pea	*Cassia fasciculata*	0.54	0.313
	Blackeyed Susan	*Rudbeckia hirta*	9.18	0.250

Source: USFS, 2016; Roundstone 2017.

[a] Reduce planting application rate by 5 percent for each slope class (i.e., 0 - 8, 8 -15, or 15 – 30 percent) below slope class 30 – 50 percent.

[b] Seeds per square feet.

[c] lbs/acre/PLS = pounds per acre of pure live seed.

[d] Use Spring Oats instead of Cereal Rye as a nurse crop because it is less competitive with Native species.

Seeding Methods

Seeding may be conducted with the use of a seed drill, a mechanical broadcast seeder, or by hydroseeding. In the absence of requirements to the contrary, the standard application method will be seeding with a seed drill equipped with a cultipacker in areas with slopes less or equal to 40 percent. In rocky soils or where site conditions may limit the effectiveness of this equipment, other alternatives may be appropriate (e.g., use of a chain drag) to lightly cover seed after application, as approved by an EI. Broadcast or hydroseeding at double the recommended seeding rates may be used in lieu of drilling in areas with slopes with slopes greater than or equal to 40 percent. In problematic areas, ACP will consult with the USFS staff and develop an alternative method to seed a problematic area, usually in areas with slopes between 40 to 50 percent or greater..

Broadcast seeding will be used for areas with minimal to moderate slopes and will be performed by dry dispersal or wet broadcast seeding. Wet broadcast seeding is an effective treatment for temporary erosion control and may be used when hydroseeding late in the season or on certain site conditions where hydroseeding is not practical. To support successful seed germination, seed will be broadcast once soil compaction has been rectified and soil composition includes proper aeration and water percolation to support plant development. Where seed is broadcast, the seedbed will be restructured with a cultipacker or imprinter after seeding. Once seed is broadcast, Atlantic will rake the area lightly to encourage plant establishment and minimize the seed that migrates from the site.

Hydroseeding involves the mixing of slurry (i.e., seed, water, fertilizer, tackifier, or mulch) in a truck-mounted mixing tank and ground application via a pressurized pump. Hydroseeding is the preferred method of seed dispersal on steep slopes greater than 50 percent (on USFS lands – areas inaccessible to drill or planting equipment), where site conditions require seed adherence to the disturbed soil. Prior to hydroseeding, Atlantic will scarify the seedbed to facilitate lodging and germination of seed. Tackifiers will be applied where necessary so that seed adheres to soil. Polymer binders, if selected, will be used in accordance with manufacturer's specifications to ensure proper compatibility with fertilizers and to avoid foaming that might otherwise result from excessive agitation. All chemical components will be mixed and administered in accordance with manufacturer guidelines. In addition, hydroseeding near wetlands or waterbodies will only be conducted in accordance with the FERC Plan and Procedures and other applicable USFS regulations.

Visual Resource-Related Plantings

Pending discussions with MNF and GWNF staff, Atlantic will address the supplementation of seeding with the planting of tree seedlings or small shrubs. While no additional supplemental plantings are anticipated or proposed for the permanent or temporary right-of-way, supplemental plantings are being considered based on consultation with USFS to mitigate visual impacts. The planting of additional shrubs along the right-of-way would help to reduce the contrast between the right-of-way and surrounding areas. Other measures being considered to minimize visual impacts include feathering of the cleared construction corridor edges. Right-of-way feathering and the planting of woody vegetation in temporary construction areas are discussed in Section 20.

10.3.2 Additional Restoration Mitigation Measures for U.S. Forest Service Lands

On USFS lands, additional measures will be implemented, in conformance with LRMP standards and guidelines, and recommendations from USFS staff. If a mitigation measure or BMP is more stringent than its counterpart USFS mitigation measure below, the more stringent measure will be applied.

10.3.2.1 Monongahela National Forest

- use of wheeled and/or tracked motorized equipment may be limited on soil types that include the following soil/site area conditions: d) soils commonly wet at or near the surface during a considerable part of the year, or soils highly susceptible to compaction. Equipment use shall normally be prohibited or mitigated when soils are saturated or when freeze-thaw cycles occur (MNF LRMP SW07). MNF is considering a project-specific LRMP amendment to this standard.

- management actions that have the potential to contribute to soil nutrient depletion shall be evaluated for the potential effects of depletion in relation to on-site acid deposition conditions (MNF LRMP SW08).

- inventory the soil resource to the appropriate intensity level as needed for Project planning and/or design considerations (MNF LRMP SW10). consider liming soils with a surface pH of less than 5.5 on seeding project, except where there is an objective to maintain acidic ecosystems (MNF LRMP SW13). topsoil should be salvaged from an area during construction and stockpiled for use during subsequent reclamation, or obtained from an alternate site. On some areas, soil material may have to be added to obtain vigorous plant growth. Soil to be used for this purpose should have chemical tests made to determine its desirability for use (MNF LRMP SW15).

- Mulch must be applied to all disturbed soils in the MNF.

- On USFS lands where topsoil will be segregated, O and A horizons and transition soil horizons AB and BA are considered topsoil.

- Post-construction and post-disturbance monitoring for revegetation should be conducted in perpetuity, for the life of the Project on USFS lands.

10.3.2.2 George Washington National Forest

- where soils are disturbed by management activities, appropriate revegetation measures should be implemented. When outside the normal seeding seasons, initial treatments may be of a temporary nature, until permanent seeding can be applied. Revegetation should be accomplished within 5 years. For erosion control, annual plants should make up >50 percent of seed mix when seeding outside the normal seeding season and the area should be reseeded with perennials within 1½ years (GWNF LRMP FW-9).

- clearcutting is not allowed where high risk soils (soils very susceptible to nutrient depletion and acidification) are identified (GWNF LRMP FW-12).

- on USFS lands where topsoil will be segregated, O and A horizons and transition soil horizons AB and BA are considered topsoil.

- post-construction and post-disturbance monitoring for revegetation should be conducted in perpetuity, for the life of the Project on USFS lands.

10.3.3 Riparian Restoration

Following initial stream bank stabilization, Atlantic will restore the banks of waterbodies to preconstruction contours to the extent practicable. In steep-slope areas, re-grading may be required to reestablish stable contours capable of supporting preconstruction drainage patterns. Riparian areas will be revegetated with native species across the entire width of the construction corridor. Restoration of riparian areas will be designed to:

- restore stream bank integrity, including both shore crossings up to the ordinary high water mark;

- withstand periods of high flow without increasing erosion and downstream sedimentation; and

- include temporary erosion control fencing, which will remain in place until stream bank and riparian restoration is complete.

Permanent bank stabilization and erosion control devices (e.g., natural structures, rock riprap, and/or large woody debris) will be installed as necessary on steep banks in accordance with permit requirements to permanently stabilize the banks and minimize sediment deposition into waterbodies.

10.3.3.1 Forested Riparian Areas

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 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 and in consultation with the USFS, Atlantic 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.

10.3.4 Wetland Restoration

Restoration of wetland areas will include seeding as discussed above. Atlantic will employ clearing and construction techniques designed to support regeneration of existing wetland vegetation, including the following:

- clearing vegetation at ground level in all non-forested wetland areas outside of the trench line to leave existing root systems intact to help stabilize soils, preserve existing ground elevations, and promote revegetation through sprouting and from existing seed stocks;
- using equipment mats to prevent soil compaction and allow intact root systems to regrow;
- replacing the topsoil segregated from the trenchline in unsaturated wetlands to promote reestablishment of existing wetland species and preserving the vegetative propagules (i.e., seeds, tubers, rhizomes, and bulbs) within the soil, which will have the potential to germinate or sprout when the topsoil is replaced; and
- limiting the removal of stumps to the trench area in forested wetlands, except where safety considerations necessitate additional stump removal, as retained stumps will facilitate reestablishment of woody species by enabling re-sprouting from existing root structures.

In accordance with the Procedures, sediment barriers will be installed immediately following clearing activities occurring within wetlands or adjacent upland areas along the pipeline right-of-way. Where necessary, sediment barriers will be installed across the construction right-of-way immediately upslope of the wetland boundary to prevent sediment flow into wetlands. Sediment barriers will be properly maintained throughout construction, reinstalled as necessary, and removed after restoration is complete and revegetation has stabilized the disturbed areas.

right-of-way Scrub-shrub and forested wetlands will not be allowed to fully reestablish within portions of the permanent right-of-way centered over the pipeline trench lines. Atlantic will periodically remove woody species from wetlands to facilitate post-construction inspections of the permanently maintained right-of-way. Where the pipeline crosses wetlands, Atlantic will maintain a 10-foot-wide corridor centered over the pipeline in an herbaceous condition, and remove deep rooted trees within a 30-foot-wide corridor centered over the pipeline.

10.3.5 Exposed Bedrock

In areas with exposed bedrock or bedrock, Atlantic will restore the area using crushed rock rather than attempting to revegetate the area.

10.4 RESTORATION MONITORING AND MAINTENANCE

10.4.1 Restoration Monitoring

The purpose of the monitoring program is to evaluate the long-term status and effectiveness of restoration efforts and to determine locations where additional maintenance may be required. Restoration monitoring on USFS lands will include both qualitative and quantitative evaluations. The primary objectives of restoration monitoring are to:

- assess of the effectiveness of the temporary and permanent erosion control structures to ensure the stability of the right-of-way and to ensure that runoff is naturally controlled in place, with no accelerated erosion or wash-outs. The monitoring of the right-of-way for significant and/or new erosion will be conducted regularly by routine aerial surveillance or site reconnaissance surveys. It is anticipated that any active erosion will be apparent during the first two years following restoration or after the first runoff event.

- monitor to assess, through quantitative analysis, the success of reseeding and planting efforts for years 3 through 5. Monitoring plots will be used to measure plant ground cover.

- monitor the survival of any special planting for visual impact mitigation, if applicable, and the extent to which the restored right-of-way blends in with the adjacent undisturbed areas.

10.4.1.1 Revegetation Performance Criteria/Standard

The long-term goal of restoration is to restore structure and function on disturbed areas that will eventually lead to the establishment of self-sustaining native or introduce plant community. To determine whether disturbed areas are progressing toward this goal, the following performance criteria will be used to assess restoration success along restored sites on USFS lands. If the performance criteria or performance is met on a restored area in a five-year time, or earlier if deemed appropriate, the restored area will be released from restoration maintenance. On USFS lands, monitoring of vegetation will be conducted for the life-span of the pipeline operations.

- Restoration will be considered successful if ground cover (plant cover) of native or introduced plant species (see section above regarding seed mix recommendations provided by USFS to be used in the USFS lands) is equal to or greater than 80 percent ground cover.

10.4.1.2 Qualitative Monitoring

Qualitative monitoring will be conducted in years 1 to 5 at all restored areas on USFS lands. The goal of the qualitative monitoring is to document and evaluate the need for remediation to ensure the restored areas are progressing toward the performance success standard.

During monitoring, the extent of plant ground cover is estimated at each restored site. Other site characteristics that are monitored in addition to ground cover include soil erosion, natural recruitment of native plant species, reproduction, non-native invasive plant species abundance, wildlife use, and pattern of established vegetation (i.e., pattern of large interspaces). Lack of erosion at a site provides evidence that the soils have been adequately stabilized. Natural recruitment and/or reproduction indicates that important functional processes are in place that facilitate regeneration, such as pollination and seed

dispersion. Non-native invasive plant species potentially compete with the seeded species and relatively high abundance can have negative effects on site conditions. Evidence of wildlife use is an indicator that habitat conditions are being restored.

Based on monitoring observations, the restored site is given a success rating and determinations are made regarding activities, which include reseeding the site, spot seeding, or erosion control. Recommendations could also include waiting another year or two prior to any remediation to allow for favorable re-establishment conditions. Photography will also be used to help document the status of the recovery of all sites.

10.4.1.3 Quantitative Monitoring

Performance of the revegetation success will be measured on restored areas in the third growing season (or sooner if deemed appropriate) to determine if the restoration performance standard described above have been met. Sample locations within the restored areas will be randomly selected. Sample size adequacy will be calculated to ensure sufficient samples are taken to estimate the mean success parameters with an appropriate level of confidence.

Revegetation success will be monitored by using a quadrant (1 x1 meters in size) sampling method to assess plant cover in the monitoring plots. Quadrants will be randomly placed in each of the monitoring plots in each of the six revegetation seeding mixes areas (see Seeding Mixes Recommendations Section above) to measure plant ground cover. The location and number of monitoring plots will be determined and agreed upon in consultations with the USFS.

10.4.1.4 Reporting

Atlantic will document its observations of restoration success following the field inspections and monitoring and will provide summary reports to USFS and FERC. Areas that need remedial action will be identified by milepost and will include a description of additional erosion controls or restoration work anticipated. Reports, including a summary of corrective actions proposed, will be submitted within three months of identifying these conditions. Areas where control applications for noxious weeds are needed will be reported.

10.4.2 Permanent Right-of-Way Maintenance

The permanent pipeline right-of-way will be maintained in an herbaceous state. Woody vegetation within the permanent right-of-way will be cleared periodically, in order to maintain accessibility of the right-of-way for maintenance and to accommodate pipeline integrity surveys, In uplands, trees and brush will be cleared over the entire width of the permanent right-of-way on an as-needed basis not to exceed once every 3 years. In wetlands and riparian areas, a 10-foot-wide corridor centered over the pipeline will be cleared at a frequency necessary for the corridor to be permanently maintained in an herbaceous state, as allowed by the Procedures. In addition, trees within 15 feet of the pipeline with roots that could compromise the integrity of the pipeline coating may be selectively cut and removed from the permanent right-of-way. Atlantic will use mechanical mowing or cutting along their right-of-way for normal vegetative maintenance. Atlantic will monitor the right-of-way for infestations of non-native invasive species that may have been created or exacerbated by construction, restoration, or maintenance activities, and will treat such infestations in consultation with applicable agencies in accordance with its *Non-Native Invasive Plant Species Management Plan*.

11.0 NON-NATIVE INVASIVE PLANT SPECIES MANAGEMENT PLAN

11.1 PURPOSE

The areas crossed by the ACP (Project) contain widespread populations of many noxious weeds and other non-native invasive plant species. The purpose of this *Non-Native Invasive Plant Species Management Plan* is to describe methods to prevent and control the introduction or spread of non-native invasive plant species during and following construction of the Project on USFS lands. Atlantic and its Contractors[15] will be responsible for implementing the procedures described in this plan.

11.1.1 Training

Prior to the start of construction, Atlantic will conduct environmental training for Company and Contractor personnel. The training program will focus on the FERC's Plan and Procedures; other construction, restoration, and mitigation plans, including this *Non-Native Invasive Plant Species Management Plan*; and applicable permit conditions. In addition, Atlantic will provide large-group training sessions before each work crew commences construction with periodic follow-up training for groups of newly assigned personnel.

11.2 JURISDICTION

Noxious weeds are plant species designated by federal, state/commonwealth, or county/city governments as injurious to public health, agriculture, recreation, wildlife, or property (Sheley et al., 1999). The more general term "non-native invasive species" is used for species that are non-native to an ecosystem and whose introduction causes or is likely to cause economic or environmental harm or harm to human health (Executive Order 13112). Non-native invasive plants include not only noxious weeds, but other plants that are not native to an area. Both noxious weeds and non-native invasive plants are considered opportunistic species that flourish in disturbed areas and prevent native plants from establishing successive communities.

Under Executive Order 13112, a Federal agency shall not authorize, fund, or carry out actions likely to cause or promote the introduction or spread of non-native invasive species in the United States or elsewhere unless it has been determined that the benefits of such actions outweigh the potential harm caused by non-native invasive species, and that all feasible and prudent measures to minimize the risk of harm will be implemented.

The non-native invasive species found on the MNF and GWNF are monitored by the USFS as outlined in the respective Forests' LRMPs. The results of the non-native invasive species surveys along the proposed route on USFS lands have been included in this report as Attachment J.

11.3 NON-NATIVE INVASIVE PLANT SPECIES SURVEYS

Atlantic conducted field surveys for USFS-listed non-native invasive plant species within a 300-foot-wide corridor along the proposed ACP pipeline route. A list of the non-native invasive plant species identified through July 2016 in the ACP survey corridors is provided in Table 11.3-1. The milepost locations of non-native invasive plant species identified through July 2016 are provided in Attachment J.

[15] Contractor refers to the company or companies retained by Atlantic or another contractor to construct the proposed facilities.

TABLE 11.3-1

Non-Native Invasive Plant Species Identified Within the Monongahela and George Washington National Forests

Latin Name	Common Name	Atlantic Coast Pipeline
Acer platanoides	Norway maple	
Ailanthus altissima	Tree of heaven	
Alliaria petiolata	Garlic mustard	X
Amaranthus hybridus	Common pigweed or green amaranth	
Ampelopsis brevipendunculata	Porcelain berry	
Anthoxanthum odoratum	Sweet vernal grass	
Arctium minus	Lesser burrdock	
Arthraxon hispidus	Jointed grass or small carpetgrass	
Barbarea vulgaris	Winter cress or yellow rocket	
Berberis thunbergii	Japanese barberry	X
Bidens aristosa	Ozark tickseed sunflower	
Bromus commutatus	Hairy chess or meadow brome	
Bromus inermis var. inermis	Smooth brome	
Bromus sterilis	Barren bromegrass or poverty brome	
Bromus tectorum var. tectorum	Downy chess or cheatgrass	
Butomus umbellatus	Flowering rush	
Carduus crispus	Curled thistle	
Carduus nutans	Musk Thistle	
Celastrus orbiculata	Oriental bittersweet	
Centaurea biebersteinii (C. maculosa)	Spotted knapweed	
Chrysanthemum leucanthemum	Ox-eye daisy	
Cichorium intybus	Chicory	
Cirsium arvese	Canada thistle	
Cirsium vulgare	Bull thistle	
Clerodendrum trichotomum	Harlequin glorybower	
Coronilla varia	Crown vetch	
Daucus carota	Queen Anne's lace	
Dioscorea oppositifolia	Chinese yam	
Dipsacus laciniatus	Cut-leaved teasel	
Echium vulgare	Viper's bugloss	
Elaeagnus angustifolia	Russian olive	
Elaeagnus umbellata	Autumn olive	X
Elytrigia repens	Quackgrass	
Epipactis helleborine	Broadleaf hellborine	
Festuca aruninacea	Kentucky 31 fescue	
Festuca elatior	Tall fescue	
Festuca pratensis	Meadow fescue	
Glechoma hederacea	Ground ivy or gill-over-the-ground	
Heracleum mantegazzianum	Giant hogweed	
Heracleum mantegazzianum	Giant hogweed	
Hesperis matronalis	Dame's rocket	
Hieracium pretense	King devil or field hawkweed	
Holcus lanatus	Velvet grass	
Hydrilla verticillata	Hydrilla	
Hydrilla verticillata	Hydrilla	
Hypericum perforatum	Common St. John's wort	
Iris pseudacorus	Yellow iris or yellow flag	
Lespedeza bicolor	Japanese bushclover	

TABLE 11.3-1

Non-Native Invasive Plant Species Identified Within the Monongahela and George Washington National Forests (cont'd)

Latin Name	Common Name	Atlantic Coast Pipeline
Lespedeza cuneata	Sericea lespedeza	
Ligustrum obtusifolium	Regal privet or border privet	
Ligustrum vulgare	European privet or common privet	
Lonicera spp.	Japanese amur, Morrow's, Tartarian, or Bell's honeysuckle	
Lysimachia nummularia	Moneywort or creeping jenny	
Lythrum salicaria	Purple loosestrife	
Melilotus alba	White sweet clover	
Melilotus officinalis	Yellow sweet clover	
Microstegium vimineum	Japanese stiltgrass	X
Muscari botryoides	Grape hyacinth	
Myriophyllum spicatum	Eurasian water-milfoil	
Orinthogalum umbellatum	Star of Bethlehem	
Orithogalum nutans	Drooping star of Bethlehem	
Paulownia tomentosa	Princess-tree	
Perilla frutescens	beefstakeplant	
Phleum pretense	Timothy	
Phragmites australis	Common reed	
Plantago major	Great plantain	
Poa compressa	Canada bluegrass	
Poa pratensis	Kentucky bluegrass	
Poa trivialis	Rough bluegrass	
Polygonum aviculare	Knotweed	
Polygonum cespitosum var. longisetum	Asiatic water pepper	
Polygonum cuspidatum	Japanese knotweed	
Polygonum sachalinense	Sachaline or giant knotweed	
Poncirus trifoliate	Hardy orange	
Potamogeton crispus	Curly pondweed	
Pueraria lobate	Kudzu	
Ranunculus ficaria	Lesser celandine or fig buttercup	
Rhamnus cathartica	Common buckthorn	
Rhodotypos scandens	Jetbead	
Rorippa sylvestris	Creeping yellow cress	
Rosa multiflora	Multiflora rose	X
Rubus phoenicolasius	Wineberry	
Rumex acetosella	Sheep sorrel	
Rumex crispus	Yellow dock or curly dock	
Sorghum halepense	Johnsongrass	
Spiraea japonica	Japanese spiraea	
Stellaria media	Common chickweed	
Tussilago farfara	Colt's-foot	X
Verbascum Thapsus	Great mullein	
Vinca minor	Periwinkle	

11.4 NON-NATIVE INVASIVE PLANT SPECIES MANAGEMENT

The non-native invasive plant species management program for the ACP is designed to:

- identify areas supporting non-native invasive plants prior to construction;
- prevent the introduction and spread of non-native invasive plants from construction equipment moving along the right-of-way;
- contain non-native invasive plant propagules by preventing segregated topsoil from being spread to adjacent areas along the construction right-of-way; and
- address non-native invasive plant infestations that develop during restoration and operation of the Project.

Attachment J identifies the primary and alternative treatment methods for non-native invasive species identified during survey in the ACP Project area. The primary and/or alternative treatment method will be used based on the growing stage and prevalence of the non-native invasive species. Methods may vary based on proximity to environmental features (e.g., wetlands, open water, sensitive species locations, and agricultural fields), in accordance with USFS regulations, and MNF and GWNF LRMPs. Atlantic has reached out to the West Virginia Natural Heritage Program for herbicide treatment recommendations adjacent to sensitive features, but has not yet received a response. Recommendations from the Virginia Natural Heritage Program have been incorporated into the COM Plan. Populations of *Regional Forester's Sensitive Species and Occurrence Analysis Results* species found adjacent to non-native invasive plant species and their recommended herbicide treatment/application are included in Attachment J. Identification of Problem Areas

As noted above, Atlantic conducted surveys for non-native invasive plant species within the ACP Project area. Additional areas supporting non-native invasive plant species may be identified during preconstruction inspections by Atlantic's EIs[16]. Prior to construction, the EIs will mark areas of non-native invasive plant infestations by using color-coded flagging, staking, and/or signs on the construction right-of-way. Atlantic will, in consultation with the USFS, determine whether soil disturbance can reasonably be avoided within infested areas, for example by not topsoiling in these areas. Identification of existing non-native invasive plant locations will alert EIs and construction personnel to implement control measures during construction.

11.4.1 Treatment Measures

11.4.1.1 Pre-Treatment

Prior to clearing and grading operations, pre-treatment of non-native invasive plant infestations may be conducted if it will aid in controlling the spread of non-native invasive plant species during construction. In general, pre-treatment will be used when the plant species has not yet gone to seed for the year and has the possibility of producing seed prior to removal during construction.

Control measures to be implemented may include the application of herbicide or mechanical measures such as mowing. The control measure chosen will be the best method available for the time, place, and species, as determined through consultation with the USFS.

[16] The role and responsibilities of an EI are defined in the FERC Plan.

Herbicide application is an effective means of reducing the size of non-native invasive plant species populations. Herbicide treatment methods will be based on species-specific and area-specific conditions (e.g., annual vs. perennial species; proximity to wetlands, open water, riparian areas, or agricultural areas; and time of year), and will be coordinated with the USFS prior to implementation. Hand application methods (e.g., backpack spraying) will be used to treat occurrences of non-native invasive species within the right-of-way and in other work areas. Within 60 feet of any identified sensitive plant species, only hand-pulling on NNIS species will be permitted. Preconstruction treatment of infestation areas will be controlled, as described in Section 7.0, to minimize impacts on surrounding vegetation.

Only herbicides and application methods approved by the USFS will be used on USFS lands, subject to USFS permission and coordination. Application of herbicides will be completed in accordance with label directions and applicable chemical contact times (as specified by the manufacturer) in advance of clearing and grading within the construction right-of-way. Treatment may be restricted in areas that are not readily accessible (e.g., difficult topography, saturated/inundated soils) or where there are documented occurrences of protected species that could be adversely impacted by herbicide applications; such instances will be evaluated on a case-by-case basis with the USFS. Atlantic will continue to work with the USFS to address non-native invasive plant species control options where protected species and their habitats occur along the ACP.

In accordance with 18 CFR 380.15(f)(3), herbicides will not be used as a treatment unless authorized by the landowner or land managing agency. Atlantic will obtain permission from the USFS prior to applications of herbicides within the right-of-way or other work areas. Additionally, Atlantic will use products that are approved by the EPA for use as herbicides, and applications of these products will be in accordance with applicable regulations.

In addition to complying with 18 CFR 380.15(f)(3), Atlantic will: 1) use herbicides which are registered with the EPA; 2) apply herbicides according to specifications of the *Federal Insecticide, Fungicide, and Rodenticide Act*; and 3) use only certified applicators to apply herbicides.

Mechanical control (e.g., mowing or disking) can also be an effective control measure for annual species. The efficacy of mechanical control measures is dependent upon proper timing to cut the vegetation prior to the maturation of seed and may require multiple treatments during the growing season.

11.4.1.2 Preventive Measures during Construction

The following measures will be implemented to prevent the spread of non-native invasive plant species during construction activities.

- Atlantic will direct its Contractors to clean equipment and vehicles prior to initial arrival at contractor yards and staging areas.
- All equipment (including timber mats) will be cleaned prior to arriving on the construction site. The equipment will be inspected by the Contractor and EI to verify that it is clean of soil and debris, which are capable of transporting non-native invasive plant propagules, prior to working on the Project.
- Atlantic will install wash stations for construction equipment near the entrance and exit points of each contiguous USFS tract, outside the Forest boundaries.
- Cleaning will be conducted using high pressure washing equipment, compressed air, and/or manually to remove excess soil and debris from the tracks, tires, and blades of equipment.

- Wash water will be managed on site at the wash station. The water will be filtered or contained so that it does not transport non-native invasive plant species seeds or plant parts off-site and does not contaminate soil, groundwater, or surface water. If any hydro or petro-chemicals are present in the wash water, it will not be released on USFS lands, but taken to an approved West Virginia/Virginia waste disposal site.

- The Contractor and EI 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 an inspection has been completed.

- Cleared vegetation and segregated topsoil from areas of non-native invasive plant infestations will be maintained adjacent to the areas from which they were removed to eliminate the transport of soil-borne propagules to other areas along the right-of-way. The stockpiles will be identified as non-native invasive plant species stockpiles with signs. The Contractor will install sediment barriers (e.g., silt fence) around the stockpiles to ensure the material is not transported to adjacent areas. During reclamation, the materials will be returned to the areas from which they were obtained.

- Equipment required for initial vegetation clearing and/or topsoil segregation in areas of non-native invasive plant infestation will be cleaned prior to leaving the area. Once the topsoil has been segregated, subsequent equipment will not require cleaning as it will not come into contact with non-native invasive plant species or topsoil potentially containing propagules. Equipment required for topsoil replacement during restoration activities will also be cleaned prior to moving out of an area of infestation.

- All equipment that comes in contact with soils potentially contaminated with non-native invasive species will be cleaned prior to being transported from ACP work sites to other job sites.

- Materials used for erosion control (e.g., straw mulch) will be certified as weed free.

11.4.1.3 Post-Construction Treatment Methods

Atlantic's objective is to comply with regulatory and Project-specific requirements to prevent the spread of non-native invasive plant species and to treat areas of the right-of-way where, in comparison to adjacent areas, non-native invasive plant species form a significant portion of the vegetation community. Atlantic will utilize established restoration procedures to prevent the establishment of non-native invasive plant species in areas disturbed by construction.

In non-frozen soil conditions, the construction Contractor will implement restoration procedures on disturbed lands immediately following construction. In frozen soil conditions, restoration activities will be delayed until the spring or summer following construction. In either case, ongoing revegetation and monitoring efforts will ensure adequate vegetative cover to discourage the establishment of non-native invasive plant species.

Following construction, the ACP Project area will be monitored in accordance with the Plan and Procedures. In the event that non-native invasive plant species become established in the right-of-way, Atlantic will implement measures (e.g., mowing or treatment with herbicides) to control non-native invasive plants within the right-of-way and prevent the spread of non-native invasive plants to adjacent lands which do not contain non-native invasive species. In addition, Atlantic will implement control measures at the aboveground facility sites to prevent the spread of non-native invasive plant species onto adjacent properties. Weed infestations that develop during operations as a result of construction will be

treated using approved herbicides or mechanical methods (e.g., mowing) as appropriate for the species and in accordance with applicable laws and regulations. The method selected will be the best available for the time, place, and species as determined through consultation with the USFS.

Post-construction herbicide applications will be conducted prior to seed maturation where possible and where necessary. Applications will be controlled to minimize impacts on surrounding vegetation. Herbicide treatment methods will be based on species-specific and area-specific conditions as described above and will be coordinated with the USFS as applicable. Hand application methods (e.g., backpack spraying) will be used to treat occurrences of non-native invasive species within the right-of-way and in other work areas. Following treatment, the need for supplemental seeding will be determined in consultation with the USFS. If supplemental seeding is determined to be appropriate it will implemented in a manner consistent with the *Restoration and Rehabilitation Plan*. The timing of subsequent revegetation efforts will be based on the persistence of the herbicide.

Mechanical methods entail the use of equipment to mow or disk non-native invasive plant species populations. Mechanical treatments will be conducted prior to seed maturation where required. If such a method is used, subsequent seeding will be conducted, if necessary, to re-establish a desirable vegetative cover that will stabilize the soils and slow the potential reoccurrence of non-native invasive plant species.

Where warranted, Atlantic will consult with the USFS regarding the use of biological and alternative non-native invasive plant control methods. The implementation of these measures will require approval from the USFS.

11.4.1.4 Monitoring

Following construction, non-native invasive plant infestations will be monitored as part of Atlantic's restoration monitoring activities as described in the Restoration and Rehabilitation Plan. NNIS control measures shall be considered successful if upon visual survey the density and cover of non-NNIS are similar in density and cover to nearby non-forested, undisturbed lands. NNIS and noxious weeds are absent, unless they are abundant in areas that were not disturbed by construction.

Atlantic will continue NNIS monitoring and treatment until the conditions articulated above are achieved. Atlantic's operations staff will monitor and treat non-native invasive plant species as part of its normal operations and maintenance activities in accordance with applicable USFS regulations.

11.5 HERBICIDES

11.5.1 Herbicide Application and Handling

To comply with the MNF and GWNF LRMPs, a selective herbicide application method will be utilized. Herbicide application will be based on information gathered from field surveys and consultations with the USFS. Before application, Atlantic or its Contractors will obtain required USFS approval. Herbicide application will be conducted in accordance with applicable laws and regulations by a licensed contractor. Hand application methods (e.g., backpack spraying) will be used to treat occurrences of non-native invasive species within the right-of-way and in other work areas. Calibration checks of equipment will be conducted at the beginning of spraying and periodically to ensure proper application rates.

Herbicides will be transported to the site with the following provisions:

- on-site herbicide quantities will be limited where practical;

- concentrate will be transported in approved containers only, in a manner that will prevent tipping or spilling, and in a compartment that is isolated from food, clothing, and safety equipment;
- mixing will be conducted in an upland area and at a distance greater than 100 feet from waterbodies or wetlands; greater than 200 feet from private wells, private land, riparian corridors, open water, or other sensitive areas;
- herbicides will not be ground applied within 60 feet of any known threatened, endangered, proposed, or sensitive plant, buffers will be clearly marked, and physical barriers must be sufficient to protect the non-target vegetation from herbicide drift and flow;
- storage and handling of all herbicides and equipment will be in accordance with all applicable regulations; and
- all herbicide equipment and containers will be maintained as needed and inspected for leaks on a daily basis.

11.5.2 Herbicide Spills

Atlantic has prepared and will implement a SPCC Plan to avoid or minimize the potential impact of hazardous material spills during construction and operation of the Project. In accordance with this plan, herbicide contractors will be responsible for keeping spill kits in their vehicles and in herbicide storage areas to allow for quick and effective response to spills. Response to an herbicide spill will vary depending on the material spilled, and the size and location of the spill. The order of priorities after discovering a spill are to protect the safety of personnel and the public, minimize damage to the environment, and conduct cleanup and remediation activities.

All herbicide contractors will obtain and have readily available copies of the appropriate Safety Data Sheets (formerly known as Material Safety Data Sheets) and labels for the herbicides used. All herbicide spills will be reported in accordance with applicable laws and requirements. Further information regarding spill response and reporting is provided in the SPCC Plan.

11.6 OTHER CONTROL MEASURES

As outlined in the MNF and GWNF LRMPs, Atlantic will use a secondary treatment method in the event the temperature requirements have been exceeded and/or the wind speed has been exceeded on the day of application. Other control measures like hand pulling, and/or basal spot treatment may be utilized. Treatment methods would be species specific or based on proximity to sensitive features. Stem-specific treatments should be used on rock outcrops or sinkholes. Atlantic will ensure soil-active herbicides will not be used on slopes over 45 percent or on aquifer recharge zones. These areas will be marked by buffers. Atlantic will continue to coordinate with the USFS during construction to ensure these treatment measures are implemented as an alternative to the primary method of herbicide application.

11.7 TREATMENT SCHEDULE

Atlantic will provide the USFS with a treatment schedule once the Project nears the construction timeframes.

12.0 SPILL PREVENTION, CONTROL, AND COUNTERMEASURE PLAN

12.1 PURPOSE

The purpose of this SPCC Plan is to identify preventive measures, such as training, equipment inspection, and refueling procedures, to reduce the likelihood of spills; and mitigation measures, such as containment and cleanup, to minimize potential impacts should a spill occur. Atlantic's construction Contractors, [17] whose activities could result in a spill of fuel or other hazardous materials, will be required to adopt the following protocols for spill prevention, cleanup, and reporting during construction of the ACP.

Transportation and temporary storage of hazardous materials, including fuels, oils, hydraulic fluid, and blasting materials, could be required on USFS lands. The locations of temporary storage areas for these materials on USFS lands will be determined in consultation with USFS staff and discussions with the construction contractor.

12.2 TRAINING

Prior to the start of construction, Atlantic will conduct environmental and safety training for Company and Contractor personnel. The training program will focus on the FERC Plan and Procedures; other construction, restoration, and mitigation plans, including this SPCC Plan; and applicable permit conditions. In addition, Atlantic will provide large-group training sessions before each work crew commences construction with periodic follow-up training for groups of newly assigned personnel.

Experienced, well-trained personnel are essential for the successful implementation of the SPCC Plan. Contractors will provide spill prevention and response training to their work crews. The training program will be designed to improve awareness of safety requirements, 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 and the provisions of this plan.

12.3 ROLES AND RESPONSIBILITIES

A. **Spill Coordinator –** Each Contractor will appoint a Spill Coordinator who will be responsible for coordinating Contractor Work Crews for spill cleanup, conducting site investigations, and completing spill reports. The Spill Coordinator will report spills to an EI, who will initiate the spill reporting process (see Section 12.6). The Spill Coordinator will be responsible for completing a Spill Report Form (Attachment K) within 24 hours of the occurrence of a spill, regardless of the size of the spill.

B. **Contractor Work Crews –** Contractor Work Crews will comply with this 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.

C. **Environmental Inspectors –** The EIs will monitor the Contractors' compliance with the provisions of the SPCC Plan to ensure that spill resources are allocated and cleanup is accomplished in accordance with this plan and applicable regulatory requirements. The EIs will work in conjunction with Atlantic's environmental team to promptly report spills to appropriate federal, state/commonwealth, and local agencies, as required, and to

[17] Contractor or Contractors refer to the company or companies retained by Atlantic or another contractor to construct the proposed facilities.

coordinate with these agencies regarding contacting additional parties or agencies as may be required.

12.4 PREVENTIVE MEASURES

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 onsite to meet the provisions of this plan. The Contractors will comply with applicable environmental and safety laws and regulations, and the standards within the MNF and GWNF LRMPs. Contractors will ensure that a copy of this plan is available onsite to all Construction Work Crew members and Forest Service Fire Management personnel (**GWNF LRMP FW-149; MNF LRMP FM01**). All cleanup and other construction-related spill activities will be completed by the appropriate Contractors.

Spill prevention measures are described below.

12.4.1 Staging Areas and Facility Sites:

A. Prior to construction, the Contractors will provide site-specific descriptions and maps depicting locations of fixed and mobile hazardous material containers and the types of materials located within containers. The site-specific descriptions and maps will identify the direction, rate of flow, and total quantity of petroleum or hazardous liquid that could be discharged from containers or from major equipment failures.

B. Contractors will visually inspect aboveground storage containers for leaks and spills on a regular basis and whenever containers are refilled. Contractors will maintain inspection records for every container.

C. Contractors will construct secondary containment structures (e.g., temporary liners and seamless impermeable berms) around aboveground single wall, storage containers so that liquids will be contained and collected in specified areas isolated from waterbodies in the event of a leak or spill. Double wall containers will not require secondary containment. Storage containers will not be placed in areas subject to periodic flooding and washout.

D. Secondary containment structures must provide a containment volume equal to a minimum of 110 percent of the maximum storage volume of the storage container for single wall containers.

E. Secondary containment structures must be constructed so that no outlet is provided and a spill will be contained within the containment structure. Accumulated rainwater may be removed if authorized by the EI. Accumulated water with a visible sheen will be collected for proper storage, transport, and disposal.

F. Contractors will remove all secondary containment structures at the conclusion of the Project. Contractors also will be responsible for returning the storage impoundment area to its original contours and appearance upon completion of the Project.

G. Hazardous materials, including chemicals, fuels, and lubricating oils, will be stored only at designated staging areas and in appropriate service vehicles. Containers will be located in a manner that minimizes the possibility of contamination to water resources, including drinking water, groundwater dependent ecosystems, karst areas, and cave soils and their natural hydrology. The storage areas will be located at least 100 feet away from

wetlands, waterbodies, and springs; at least 200 feet away from private water supply wells; at least 300 feet away from karst features; and at least 400 feet away from municipal water supply wells unless a larger buffer is required by regulatory agencies. Containers will not be located within 500 feet of a developed recreation area or Scenic Area.

H. Storage containers will display labels that identify the contents of the container and whether the contents are hazardous. Contractors will maintain and provide to Atlantic, when requested, copies of all Safety Data Sheets (formerly known as Material Safety Data Sheets). All containers used for the storage of hazardous materials, including chemicals, fuels, and lubricating oils, will be of material and construction compatible with the material stored and the conditions of storage such as pressure and temperature. All containers will be in good condition.

I. Contractors will conduct routine equipment maintenance, such as oil changes, in staging areas and will dispose of waste oil in an appropriate manner (e.g., the Contractors will collect the waste oil in labeled, sealed containers and transport the waste oil to a recycling facility).

J. Contractors will correct visible leaks in storage containers as soon as possible. Leaks outside of secondary containment, regardless of volume, will be reported to the Spill Coordinator and an EI.

K. Drain valves on temporary storage containers will be locked to prevent accidental or unauthorized discharges from the containers.

L. All fuel nozzles will be equipped with functional automatic shut-off valves.

M. The drivers of tank trucks will be responsible for spill prevention and the provision of secondary containment during tank truck unloading. Procedures for loading and unloading tank trucks will meet the minimum requirements established by applicable law and associated regulations. Drivers will observe and control the fueling operations at all times to prevent overfilling. Contractors will be responsible for training drivers of tank trucks to comply with these provisions.

N. Prior to departure of a tank truck, all outlets of the vehicle will be closely examined by the driver for leakage and tightened, adjusted, or replaced, as necessary, to prevent liquid leakage while in transit. Contractors will be responsible for training drivers of tank trucks to comply with these provisions.

O. Pumps operating within 100 feet of a waterbody or wetland boundary will utilize appropriate secondary containment systems to prevent spills

P. All machinery will arrive on the right-of-way in a clean, washed condition, maintained free of fluid leaks. All equipment will be in good working order and inspected on a regular basis.

Q. Overnight parking of equipment, as well as refueling and servicing of construction equipment, will be restricted to upland areas at least 100 feet away from waterbodies, wetlands, and springs; at least 200 feet from private water-supply wells; at least 300 feet from karst features; and at least 400 feet from municipal water-supply wells. Where this

is not practicable, and where the EI finds in advance no reasonable alternative, the equipment will be fueled by designated personnel with specific training in refueling, spill containment, and cleanup, under the supervision of an EI. Prior to refueling, appropriate steps will be taken (including deployment of secondary containment structures) to prevent spills and provide for prompt cleanup in the event of a spill.

R. Fuel trucks transporting fuels to construction areas will only travel on approved access roads.

S. Contractors will keep a spill kit onsite and on all equipment in case of machinery leaks or spills. If a spill kit is used, it will be replaced within 24 hours.

1. Restricted Refueling Areas will be identified in the field with flagging or signs. A site-specific plan and written approval from an EI will be required to refuel in restricted areas.

2. Approval must be received from an Atlantic representative and, where necessary, appropriate regulatory permits must be obtained, prior to refueling in Restricted Refueling Areas.

3. In large wetlands where no upland site is available for refueling, auxiliary fuel tanks may be mounted to equipment to minimize the need for refueling.

4. Trained Contractor personnel must be available for refueling, and an EI or another trained Atlantic representative must be present.

5. Equipment such as large, stationary pumps will be fitted with auxiliary tanks as appropriate. The auxiliary tanks will be placed within secondary containment which provides for a containment volume equal to a minimum of 110 percent of the volume of the auxiliary tanks.

6. Refueling within Restricted Refueling Areas will take place in areas designated by an EI. Fuel trucks with a capacity in excess of 300 gallons will not be allowed within a Restricted Refueling Area unless adequate secondary containment is provided.

7. Refueling of dewatering pumps, generators, and other small, portable equipment will be performed using approved containers with a maximum volume of 5 gallons.

12.4.2 Staging Areas and Facility Sites:

A. Contractors will stock a sufficient supply of sorbent and barrier materials at construction staging areas to allow the rapid containment and recovery of a spill. Sorbent and barrier materials will also be used to contain runoff from spill areas.

B. Shovels and 55 gallon drums will be kept at each individual staging area. If small quantities of soil become contaminated within the staging area, they will be collected and placed in the drums. The drums will be labelled to indicate the contents of the drum, including the spilled/recovered material.

C. Large quantities of contaminated soil will be collected using heavy equipment and will be stored in drums or other suitable containers prior to disposal. The drums will be labelled to indicate the contents of the drum, including the spilled/recovered material.

D. The Contractors will dispose of all contaminated soil in accordance with applicable state/commonwealth and Federal regulations.

E. Right-of-way

1. Each construction crew will have adequate absorbent materials and containment booms on hand to enable the rapid and complete cleanup of spills, as well as sufficient tools and materials to stop leaks.

2. Contractors must maintain spill kits containing a sufficient quantity of absorbent and barrier materials to adequately contain and recover foreseeable spills. These kits may include, but are not limited to: absorbent pads, straw bales, absorbent clay, sawdust, floor drying agents, spill containment barriers, plastic sheeting, skimmer pumps, and 55 gallon drums. The equipment will be located near fuel storage areas and other locations, as necessary, to be readily available in the event of a spill.

3. All fuel equipment, and where practicable, service trucks, will carry adequate spill response materials. Spill response materials present on trucks will consist of absorbent pads, absorbent material, plastic bags, and a shovel.

4. The Spill Coordinator will inform the EIs and all Contractor personnel of the location of spill control equipment and materials, and have them readily accessible while construction activities are occurring.

5. If a spill kit is used, it will be replaced within 24 hours.

F. Concrete Coating

1. 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.

G. Hydrostatic Testing

1. 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 site-specific procedures will be developed to prevent, contain and clean potential spills.

12.5 SPILL RESPONSE

A. The first priorities after discovering a spill are to protect the safety of personnel and the public and to minimize damage to the environment. Actions to be taken immediately following a spill will include the following:

1. The safety of the situation (including the surrounding public) will be assessed.

2. Sources of ignition will be removed from the area by trained personnel if safe to do so.

3. The source of the spill will be shut off by trained personnel if safe to do so.

4. Efforts to contain the spill immediately will be initiated by trained personnel if safe to do so.

5. Cleanup activities will be initiated as soon as possible after the spill is contained using properly trained and protected personnel with adequate spill cleanup materials and equipment (see Section 12.7).

6. As necessary, Dominion will deploy one of several emergency response contractors it has under contract in West Virginia and Virginia to further contain and clean up the spill.

12.6 SPILL REPORTING

A. All spills will be reported immediately to Atlantic. Reports will include the following information (found on the Spill Report Form):

1. Date, time, and location of the spill.

2. Type of material spilled.

3. Amount of material spilled.

4. Extent of spill area.

5. Whether the material has reached or has the potential to reach a wetland, waterbody, or karst feature.

6. Status of spill containment and cleanup.

7. Circumstances leading up to the spill.

B. Atlantic's environmental team will report the spill to the MNF or GWNF, as appropriate, as well as the applicable state regulatory agencies if the spill meets or exceeds a reportable threshold. Table 12.6-1 lists the federal and state/commonwealth agencies that would be contacted if a spill meets or exceeds a reportable threshold.

C. Federal standards for reportable quantities (RQ) of hazardous materials are listed at 40 CFR 302.4, which is incorporated into this SPCC Plan by reference. Additional requirements by state/commonwealth are as follows:

1. West Virginia:

a. Hazardous waste spills must be reported when equal to or exceeding the Federal RQs at 40 CFR 302.4 (see e.g., W. Va. CSR § 60-3-5).

b. Oil spills must be reported when "causing a film or sheen upon or discoloration of the surface of the water or adjoining shorelines or cause

a sludge or emulsion to be deposited beneath the surface of the water or upon adjoining shorelines" (see CWA 111; 40 CFR 110.3(b); and, by analogy, W. Va. Legislative Rules § 31-1).

c. Toxic air pollutant spills must be reported when exceeding (i) 1 pound for ethylene oxide and vinyl chloride, (ii) 10 pounds for acrylonitrile and butadiene, or (iii) 50 pounds for all others (W. Va. CSR § 45-27-10.4).

TABLE 12.6-1

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
West Virginia				
Department of Environmental Protection (WVDEP)	Emergency 24-hour Hotline for Hazardous Waste Release	800-642-3074	24-hour hotline	Entire State
WVDEP	Elkview Emergency Response Unit	304-558-5938	Monday – Friday 8:00 am – 4:00 pm	Entire State
Virginia				
DEQ	Pollution Response Program- Valley Regional Office	540-574-7800	Monday – Friday 8:30 am – 4:30 pm	Augusta, Highland, and Nelson Counties
DEQ	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
DEQ	Pollution Response Program- Piedmont Regional Office	804-527-5020	Monday – Friday 8:30 am – 4:30 pm	Dinwiddie, Brunswick, and Greensville Counties
DEQ	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
DEQ	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

2. Virginia:

a. Oil discharges to land must be reported in amounts equal to or greater than 25 gallons (or less if certain recordkeeping and clean-up requirements are not met) (Va. Code § 62.1-44.34:19).

b. An oil spill that discharges or may reasonably be expected to discharge into commonwealth waters must be reported, regardless of amount (Va. Code § 62.1-44.34:19).

c. Hazardous waste spills must be reported when equal to or exceeding Federal RQs at 40 CFR 302.4 (see 9 Virginia Code 25-880-70, generally describing applicable reporting quantities).

D. Contractors are responsible for assisting Atlantic and DTI with preparing follow-up written incident reports to regulatory agencies upon request.

12.7 SPILL CONTAINMENT AND CLEANUP

A. Land Spill

1. Berms will be constructed with available equipment to physically contain the spill and sorbent materials will be applied to the spill area. Traffic on contaminated soils will be prevented to the extent practicable. Some traffic on contaminated soils may be necessary to avoid impacts on adjacent or sensitive resources (e.g., wetlands).

2. Contaminated soils and vegetation will be removed and disposed of at a properly licensed waste disposal facility.

3. Waste materials from the spill will be disposed of according to applicable regulatory requirements.

4. The following information will be provided to an EI and Atlantic and DTI as available following containment and cleanup (but no later than 24 hours after transport and disposal of the contaminated waste material):

   a. The amount of the spilled material that was recovered during cleanup.

   b. Proposed reclamation of remaining contaminated areas.

   c. Storage method for the contaminated waste material before transport and disposal.

   d. Transport and disposal documentation for the contaminated waste material.

5. If necessary, an Emergency Response Contractor will be secured for large spills to further contain and clean up the spill.

B. **Wetland or Waterbody Spill**: The following measures will be implemented immediately to control a spill into a wetland or waterbody:

1. For spills in standing water, floating booms, skimmer pumps, and holding tanks will be readily available and used, as appropriate, by the Contractors to recover and contain released materials on the surface of the water.

2. Berms and/or trenches will be constructed in upland areas to contain a spill before it enters a wetland or waterbody. Deployment of booms, skimmers, and sorbent materials will be utilized if the spill reaches a waterbody. The spilled product will be retrieved and the contaminated area cleaned-up in accordance

with recommendations from the Spill Coordinator and applicable regulations and guidelines.

3. If necessary, an Emergency Response Contractor will be secured for large spills in wetlands or waterbodies to further contain and clean up the spill.

4. Approvals or permits from regulatory agencies may be required to place equipment into a wetland or waterbody. Therefore, Contractors must receive written permission from Atlantic or DTI before placing equipment into a wetland or waterbody for the purpose of spill cleanup.

C. Karst: In addition to the measures described above, the following procedures will be implemented in areas of karst terrain:

1. Buffers of 300 feet around karst features (e.g., sinkholes, caves, sinking or losing streams, ponors, pinnacled bedrock, and large springs) within or adjacent to the construction right-of-way will be marked with signs and/or highly visible flagging until construction related ground disturbing activities are completed.

2. Equipment refueling will not be permitted within flagged or marked buffer areas for karst features or areas draining into karst features, except by hand-carried cans (5 gallon maximum capacity), when necessary.

3. Equipment servicing and maintenance areas will be sited outside of flagged or marked buffer areas for karst features or areas draining into karst features.

4. Erosion and sediment controls will be implemented, as appropriate, to prevent runoff resulting from construction equipment washing operations (if applicable) to directly enter a karst feature by locating these operations outside of karst buffer areas.

5. Construction equipment, vehicles, materials, hazardous materials, chemicals, fuels, lubricating oils, and petroleum products will not be parked, stored, or serviced within 300 feet of a karst feature.

6. Equipment will be checked for leaks daily by the Contractors prior to beginning work in karst areas; and damaged or defective equipment will be removed or repaired prior to use in karst areas.

7. Atlantic or DTI will notify the National Response Center and either the West Virginia Department of Environmental Protection or Virginia DEQ if a reportable spill impacts a karst feature .

12.8 CERTIFICATION BY A PROFESSIONAL ENGINEER

This SPCC Plan has been certified by a professional engineer in accordance with 40 CFR 112.7 – *General Requirements for Spill Prevention, Control, and Countermeasure Plans*.

_____ _____

Professional Engineer Date

12.9 CERTIFICATION BY THE CONTRACTOR

The Contractor listed below agrees to follow the requirements of Atlantic's *Spill Prevention, Control, and Countermeasure Plan* during all work activities conducted for Atlantic.

_____ _____

Contractor Date

_____ _____

Responsible Official (Print Name) Title

_____

Responsible Official (Signature)

13.0 CONTAMINATED MEDIA PLAN

13.1 BACKGROUND

Atlantic searched federal and state/commonwealth databases to identify contaminated sites in the vicinity of the proposed ACP facilities. The EPA's Facility Registry System map service was used to locate sites within 1 mile of the proposed facilities that are listed on the Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) and the Assessment, Cleanup and Redevelopment Exchange System (ACRES) (EPA, 2014).[18] In addition, various map services and databases for known contaminated sites were reviewed for each state/commonwealth.

Review of EPA records identified no Federal Brownfield sites and three Federal Superfund sites within one mile of the proposed ACP facilities, none of which are in the MNF or GWNF. Sites identified in the state/commonwealth databases consist of landfills, solid waste sites, and Leaking Underground Storage Tanks (LUST). No landfills, solid waste sites, or LUST sites were identified in the MNF or GWNF.

The locations of the contaminated sites listed in Table 13.1-1 are based on publicly available geospatial point data. Point data alone are insufficient for identifying the boundaries and extent of contamination at each site. Atlantic has submitted information requests to the EPA and state/commonwealth agencies for additional information regarding the location and extent of contamination at the sites. If contaminated sites are found to be crossed or impacted by the proposed routes, Atlantic will investigate options for avoiding these sites, including route variations. This *Contaminated Media Plan* will be updated, as appropriate, based on the results of the information requests.

[18] CERCLIS and ACRES sites are commonly known as Federal Superfund and Brownfield sites, respectively.

TABLE 13.1-1

Contaminated Sites, Landfills, and Leaking Underground Storage Tanks Near the Atlantic Coast Pipeline [a]

County/ City and State/ Commonwealth	Pipeline Segment	Nearest Milepost	Site Name	Distance and Direction from Centerline (ft)	Facility Type	Surface Drainage Direction from Project [c]	Open or Closed Status [d]
ATLANTIC COAST PIPELINE							
CERCLIS and ACRES Sites Identified within 1 mile of the Centerline and Aboveground Facilities							
Chesapeake, VA	AP-3	81.9	Money Point Creosote Site	4,109 N	Superfund Site	Down Gradient	Active
Chesapeake, VA	AP-3	81.9	Eppinger & Russel Co Inc.	4,472 N	Superfund Site	Down Gradient	Active
Chesapeake, VA	AP-3	82.4	Borden Smith Douglass	54 S	Superfund Site	Side Gradient	Active
Landfill and Solid Waste Sites Identified within 0.5 mile of the Centerline and Aboveground Facilities							
Augusta, VA	AP-1	141.5	Jolivue Landfill/Augusta Regional Landfill	915 NE	Closed MSW Landfill and Active MSW Landfill Complex	Up Gradient	Closed
Chesapeake, VA	AP-3	81.0	Dominion Chesapeake Energy Center	317 E	Closed Industrial Landfill and Active Industrial Landfill	Side Gradient	Closed
Chesapeake, VA	AP-3	82.5	Atlantic Aggregate Recyclers	884 NE	Inert Landfill	Up Gradient	Closed
Southampton, VA	AP-3	34.5	SPSA-Boykins Transfer Station	131 SW [b]	Active Waste Transfer Station	Down Gradient	Open
Southampton, VA	AP-3	34.5	SPSA-Franklin Transfer Station	137 SW [b]	Closed Waste Transfer Station	Up Gradient	Closed
Leaking Underground Petroleum Storage Tank (LUST) Sites within 1000 feet of the Centerline and Aboveground Facilities							
Highland, VA	AP-1	87.6	Bussard Residence	207 N [b]	LUST	Up Gradient	Closed
Highland, VA	AP-1	109	VDOT McDowell Area Headquarters	52 E [b]	LUST	Up Gradient	Closed
Highland, VA	AP-1	109	VDOT McDowell	173 N [b]	LUST	Up Gradient	Closed
Augusta, VA	AP-1	134.0	Deerfield Grocery	833 S	LUST	Down Gradient	Closed
Augusta, VA	AP-1	143.9	Starkey Residence	148 SW	LUST	Side Gradient	Closed
Nelson, VA	AP-1	194.5	Ridge Crest Baptist Church	980 SW	LUST	Up Gradient	Closed
Buckingham, VA	AP-1	235.2	Betty Brown Property	646 E	LUST	Up Gradient	Closed
Brunswick, VA	AP-1	301.4	Russel Residence	992 E	LUST	Side Gradient	Closed
Southampton, VA	AP-3	23.6	Cooke Residence	889 NW	LUST	Up Gradient	Closed
Suffolk, VA	AP-3	62.0	City of Suffolk Pump Station 11	244 NW	LUST	Side Gradient	Closed
Chesapeake, VA	AP-3	78.6	Deep Creek Pharmacy	160 S	LUST	Down Gradient	Closed
Chesapeake, VA	AP-3	78.8	Mid Atlantic Repair, Inc.	535 S	LUST	Down Gradient	Closed
Chesapeake, VA	AP-3	78.8	Watkins Motor Lines, Inc.	363 S	LUST	Down Gradient	Closed
Chesapeake, VA	AP-3	80.1	Deep Creek Pumping Station	725 N	LUST	Up or Side Gradient	Closed
Chesapeake, VA	AP-3	81.1	Chesapeake Energy Center	923 E	LUST	Up or Side Gradient	Closed
Chesapeake, VA	AP-3	81.2	IMTT-Chesapeake Terminal	626 NW	LUST	Up or Side Gradient	Closed
Chesapeake, VA	AP-3	81.5	Chesapeake Energy Center	698 S	LUST	Up or Side Gradient	Closed
Chesapeake, VA	AP-3	81.6	Chesapeake Energy Center	748 S	LUST	Up or Side Gradient	Open

TABLE 13.1-1

Contaminated Sites, Landfills, and Leaking Underground Storage Tanks Near the Atlantic Coast Pipeline [a] (cont'd)

County/ City and State/ Commonwealth	Pipeline Segment	Nearest Milepost	Site Name	Distance and Direction from Centerline (ft)	Facility Type	Surface Drainage Direction from Project [c]	Open or Closed Status [d]
Leaking Underground Petroleum Storage Tank (LUST) Sites within 1000 feet of the Centerline and Aboveground Facilities							
Chesapeake, VA	AP-3	81.6	Chesapeake Energy Center	730 S	LUST	Up or Side Gradient	Closed
Chesapeake, VA	AP-3	81.6	Chesapeake Energy Center	720 S	LUST	Up or Side Gradient	Closed
Chesapeake, VA	AP-3	81.7	Chesapeake Energy Center	850 S	LUST	Up or Side Gradient	Closed
Chesapeake, VA	AP-3	82.0	One Steel Recycling	899 N	LUST	Down Gradient	Closed
Chesapeake, VA	AP-3	82.4	Quest Transport LLC	305	LUST	Side Gradient	Closed
Chesapeake, VA	AP-3	82.4	Former Smith Douglass Plant	431 S	LUST	Side Gradient	Closed

[b] Sites are nearest to aboveground facilities not the centerline. Mileposts for these sites are identified for the nearest milepost in a direct line to the centerline.

[c] USGS topographic maps were reviewed to evaluate the topographic disposition of each site in relation to the Project.

[d] Active = Superfund sites are reported as active in EPA files; however, an active status does not necessarily mean that any ongoing investigations or cleanups are taking place or are planned to take place at the site.

Closed = specific requirements for site closure varies between states/commonwealths, but generally speaking, this means that the tank has been removed, the site has been remediated, and any remaining contaminant concentrations do not pose an unacceptable risk to human health or the environment.

13.2 PURPOSE

Atlantic recognizes the potential for encountering unknown contaminated soil or groundwater during construction. This *Contaminated Media Plan* describes the steps that Atlantic and its Contractors[19] will implement in the event that suspected contaminated soil or groundwater is encountered during construction.

13.3 TRAINING

Prior to the start of construction, Atlantic will conduct environmental and safety training for Atlantic and Contractor personnel. The training program will focus on the FERC Plan and Procedures; other construction, restoration, and mitigation plans, including this *Contaminated Media Plan*; and applicable permit conditions. In addition, Atlantic will provide large-group training sessions before each work crew commences construction with periodic follow-up training for groups of newly assigned personnel.

13.4 IDENTIFICATION OF CONTAMINATED MEDIA AND INITIAL RESPONSE

Contractor personnel and Atlantic's EIs will observe work areas during construction for signs of potential contamination, including:

- discoloration of soil;
- chemical-like odors from soil or water;
- oily sheens or puddles on soil;
- oily sheens on water;
- buried drums or other waste containers;
- buried waste (e.g., garbage, debris, ash, medical waste, or clinical containers);
- discolored surface water;
- differences in vegetation growth (phytotoxicity); and/or
- evidence of waste treatment practices.

If signs of contamination are encountered on USFS lands, the Contractor will stop work in the vicinity of the suspected contamination; restrict access to the suspected contamination site; and notify the crew foreman, an EI, the Spill Coordinator (identified in the SPCC Plan), and Atlantic. The EI will immediately notify the designated USFS representative.

13.5 CONTAINMENT AND CHARACTERIZATION

The Contractor will initiate measures to avoid the spread of contaminants until the type of contaminant, its concentration, potential exposure routes, and management options are evaluated. If signs of potential contamination are observed during construction, the following response actions will be implemented.

A. If potentially contaminated soil or groundwater is exposed during excavation activities, excavation will stop in the area of potential contamination and an EI and Atlantic representative will be contacted immediately.

[19] Contractor refers to the company or companies retained by Atlantic or another contractor to construct the proposed facilities.

B. If potentially contaminated soil will not be backfilled, the soil will be placed on an impervious surface or 10-mil polyethylene and covered with 10-mil polyethylene to prevent rainfall run-on and run-off. The potentially contaminated soil will not be moved from the site by the Contractor unless approved to do so by the EI and/or Atlantic representative.

C. If potentially contaminated groundwater is draining from the sides of the excavation and standing in the trench, temporary trench plugs will be installed to avoid the migration of the potentially contaminated groundwater to uncontaminated areas within the trench. Potentially contaminated groundwater will not be pumped from the trench.

D. If a trench or excavation will be left open and precipitation may occur, measures will be implemented to prevent precipitation run-off from entering the trench (e.g., by installing waterbars to divert runoff from the trench and trench plugs to prevent the flow of contaminated water in the trench).

Concurrent with the management of the contaminated media, representative soil and groundwater samples, as applicable, will be collected for chemical analysis. Appropriate tests or analyses will be conducted by a qualified laboratory. Initial testing will be based on field observations and the suspected nature of the contamination. Laboratory analyses could include: total petroleum hydrocarbons, oil and grease, pH, volatile organic compounds, semi-volatile organic compounds, polychlorinated biphenyls, and/or metals.

Depending on the nature and extent of the contamination, Atlantic will notify the MNF or GWNF, as appropriate, and the appropriate federal, state/commonwealth, and local regulatory agencies. Appropriate agencies include, but are not be limited to, the following:

A. West Virginia Department of Environmental Protection at 1-800-642-3074 (24-hours).

B. Virginia Department of Emergency Management at 1-800-468-8892 (24-hours, in-state calls only) or at 1-804-674-2400 (24-hours, out-of-state calls). Online spill reporting for non-emergency releases can be completed at http://www.deq.virginia.gov/Programs/PollutionResponsePreparedness/PollutionReportingForm.aspx.

C. National Response Center (Washington, D.C.) at 1-800-424-8802 (24 hours).

13.6 AVOIDANCE OR RESPONSE PLANS

If the contaminant identified is found to be a health or safety hazard or harmful to the pipeline or operation of its CP system, a route variation may be considered to avoid the area of contamination. Applicable permits and regulatory approvals will be obtained prior to proceeding with a route variation.

If the contaminant does not pose a health or safety concern and will not otherwise interfere with the pipeline, a written plan for completing construction within the contaminated area will be prepared. Test pits or borings may be excavated within the right-of-way to assess the extent of the contamination. Depending on the nature and extent of contaminated media, site-specific measures will be identified to complete construction across the contaminated area. These measures may include:

- storing excavated soil on an impervious surface or a sheet of 10-mil polyethylene;
- avoiding water withdrawals from the trench;
- removing and disposing of contaminated media at an approved disposal facility;
- replacing contaminated soil with clean backfill; and/or

- implementing staged withdrawal and disposal of standing trench water during backfilling to avoid overflow and runoff.

Contaminated soil will not be placed back in the trench unless approved by the appropriate regulatory agency and by Atlantic in writing. Site-specific construction plans for areas of contamination will be developed in accordance with environmental regulations, and approval of the plans by appropriate regulatory agencies will be obtained prior to implementation of the plans.

14.0 CULTURAL RESOURCES

14.1 PURPOSE

The purpose of this section is to summarize the cultural resources studies conducted to date, remaining studies which are yet to be completed, and procedures that should be followed if an unanticipated discovery occurs.

14.2 SUMMARY OF CULTURAL RESOURCES INVESTIGATIONS ON USFS LANDS

In order to minimize the potential during construction for accidental discovery of cultural resources, Atlantic contracted GAI Consultants, Inc. (GAI) to conduct Phase I archaeological survey and historic architectural reconnaissance of the Project's defined Area of Potential Effect (APE) in the GWNF and the MNF. The studies encompass locations associated with the proposed undertaking where there will be alteration and disturbance of surface and subsurface soils that contain or have potential to contain archaeological sites, including proposed construction areas, access roads, staging areas, etc. The APE along the pipeline consists of a 91.4-meter) (300-foot) corridor centered on the proposed pipeline. The APE for access roads consists of a 15.2 meter (50-foot) corridor centered on the proposed/existing roadways. An APE wider than the proposed limit of disturbance was studied for both the pipeline and access roads to allow flexibility in final design. Any project changes that would result in ground disturbance outside the current APE would be subject to supplemental field surveys.

In the MNF, cultural resources studies have been completed for the proposed Project to date and a combined technical report has been reviewed and accepted by the MNF.

In the GWNF, field studies are in progress in the area of Ft. Lewis, including a section of the proposed pipeline corridor and a few access roads. Further, study of portions of an additional access road (GWNF Road 1755) is pending survey permission. An addendum report for these sections will be submitted after fieldwork is completed. Phase I Cultural Resources Survey has been completed for the remainder of the proposed Project and a combined technical report has been reviewed and accepted by GWNF personnel. To date, GAI recorded four new pre-contact-period archaeological sites, two new historic-era archaeological sites, and six pre-contact-period isolated finds. GAI also re-identified two previously recorded pre-contact-period archaeological sites, but was unable to re-identify two other previously recorded archaeological sites. Four newly-identified sites (44AU0914, 44AU0915, 44AU0917, 44AU0918) and two previously recorded sites (44AU0780, 44AU0781) were determined to warrant additional study. Phase II Archaeological Testing was conducted at these six sites. All six sites contain precontact-period lithic scatters. A few pieces of precontact-period ceramic were also recovered from Site 44AU0781. A small historic-period artifact scatter, as well as remains of a charcoal hearth related to iron furnace fuel production, were encountered at Site 44AU0917. A Phase II technical report for these six sites is in progress and is planned to be submitted to the GWNF in January 2017. To date, no architectural resources have been recorded.

A separate detailed Unanticipated Discoveries Plan (UDP) has been prepared for each the GWNF (Attachment L) and the MNF (Attachment M) in order for Atlantic to comply with the relevant state and federal regulations concerning the protection of cultural resources. Procedures outlined in the UDPs must be followed during construction. As per the UDP, EIs and possibly Archaeological Monitors will have the responsibility to monitor altered and disturbed areas for potential archaeological remains throughout construction. The EI and the Archaeological Monitor will be responsible for advising the construction contractor's personnel on the procedures to follow in the event that an unanticipated discovery is made. A copy of each UDP will be maintained by the EI, the Archaeological Monitor, and at the construction field office. Training will occur as part of the pre-construction on-site training program for foremen, company inspectors, and construction supervisors. The EI will advise all operators of equipment involved in grading, stripping, or trenching activities to:

- Stop work immediately if they observe any indications of the presence of cultural materials, animal bone, or possible human bone.
- Immediately contact the EI (if not available contact the Construction Site Supervisor).
- Treat human remains with dignity and respect.

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15.0 THREATENED AND ENDANGERED PLANTS AND ANIMALS

Information on threatened and endangered plants and animals as well as USFS species of concern is contained within the Biological Evaluation submitted to the USFS in November, 2016 and an updated report is scheduled to be filed in February, 2017. The Biological Evaluation is incorporated by reference into this COM Plan.

16.0 FUGITIVE DUST CONTROL AND MITIGATION PLAN

16.1 PURPOSE

The purpose of this *Dust Control Plan* is to identify potential sources of fugitive dust emissions arising from construction activities and to provide direction to Contractors [20] on measures for avoiding, minimizing, and controlling fugitive dust. This plan is based on the *Fugitive Dust Control & Mitigation Plan* prepared in connection with Atlantic's application to the FERC for the entire ACP. Fugitive dust includes total suspended particulates, particulate matter with an aerodynamic diameter less than 10 micrometers, and particulate matter with an aerodynamic diameter less than 2.5 micrometers (collectively, "fugitive dust").

Fugitive dust will result from land clearing, grading, excavation, concrete work, and vehicle traffic on paved and unpaved roads. The amount of fugitive dust generated at any given time will be a function of construction activity, soil type, soil moisture content, wind speed, precipitation, vehicle traffic, vehicle types, and roadway characteristics. Fugitive dust emissions will be greater during dry periods and in areas of fine-textured soils subject to surface activity. The ACP will employ proven BMPs to control and limit releases of fugitive dust, such as the application of water to disturbed surfaces or roads.

16.2 TRAINING

Prior to the start of construction, Atlantic will conduct environmental and safety training for Company and Contractor personnel. The training program will focus on the FERC Plan and Procedures; other construction, restoration, and mitigation plans, including this *Dust Control Plan*; and applicable permit conditions. In addition, Atlantic will provide large-group training sessions before each work crew begins construction with periodic follow-up training for groups of newly assigned personnel.

EIs and/or construction supervisors will be responsible to ensure that contractor personnel are complying with all dust control measures and have authority to enforce and require compliance with this plan.

16.3 FUGITIVE DUST SOURCES

Fugitive dust is generated by the mechanical disturbance of granular material exposed to air. Dust from open sources is termed "fugitive" because it is not discharged to the atmosphere in a confined flow stream.

The following construction activities have the potential to generate fugitive dust:

- vehicle and equipment movement on paved and unpaved surfaces;
- vegetation removal;
- clearing, grading, and excavation;
- soil stabilization; and
- bulk/pile material loading, unloading, and hauling.

[20] Contractor refers to the company or companies retained by Atlantic or another contractor to construct the proposed facilities

16.4 DUST CONTROL MEASURES

16.4.1 Application of Water or Other Dust Suppressant

Atlantic will make all practicable efforts to minimize fugitive dust emissions from construction activities. Atlantic will have one or more water trucks available per spread that will load water from approved permitted sources to spray areas for dust control. Disturbed and trafficable areas will be kept sufficiently damp during working hours in dry conditions to minimize wind-blown or traffic-generated dust emissions.

Areas to be watered include, but are not limited to, the following:

- the construction corridor for each pipeline, including ATWS;
- contractor yards and staging areas;
- access roads;
- aboveground facility sites;
- active grading areas;
- un-stabilized areas;
- soil stockpiles; and
- parking areas.

The frequency at which water trucks will spray construction areas will vary based on weather and site conditions. More frequent applications will be required in dry conditions and where dust generation is likely.

16.4.2 Use of Approved Access Roads

Atlantic will install signs to direct traffic to designated access roads for construction of the ACP. Any traffic that deviates from designated access roads will be redirected to designated access roads and reported to the appropriate supervisor and an EI for corrective action. [21] All vehicles and equipment leaving a work site will implement BMPs to prevent dirt or mud from being transferred or tracked to public roads. For example, track-out onto paved public roads will be cleaned up as needed and in a timely manner using street sweeping or an equivalent method.

16.4.3 Enforcing Speed Limits

All vehicle and equipment traffic will be limited to a speed limit of 15 miles per hour on or in designated access roads, the construction right-of-way, contractor yards, and other work areas. Atlantic will post speed limit signs on designated access roads to ensure that all equipment/vehicle operators are aware of the speed limit on the road that is being travelled. Any observations of excessive speeds will be reported to the appropriate supervisor and an EI for corrective action. EIs will have the authority to adjust speed limits for individual operations based on site-specific conditions to minimize fugitive dust.

16.4.4 Best Management Practices for Open-body Haul Trucks

If excessive dust is generated from open-body haul trucks, corrective measures will be implemented to mitigate the generation of dust. Corrective measures may include: adjusting speed limits along designated haul roads during periods where conditions contribute to excessive dust; misting/wetting

[21] The role and responsibilities of an EI are defined in the Federal Energy Regulatory Commission's *Plan.*

soils or other materials prior to loading into haul trucks; or covering open-body haul trucks to prevent fugitive dust emissions.

16.4.5 Restoration of Disturbed Areas

All disturbed areas will be stabilized and restored as soon as practicable, which will minimize conditions favorable to dust generation (see Section 8, the Erosion Control and Sedimentation Plan, and Section 10, the Restoration and Rehabilitation Plan).

16.4.6 Maintenance of Spoil Stockpiles

If construction is inactive for more than 7 days, the Contractor will cover or stabilize spoil piles with a soil binder, tackifier, mulch, vegetation, or equivalent method in accordance with applicable permit requirements and regulations. If sustained winds are likely in areas susceptible to dust, temporary fencing may be installed to reduce wind speeds around spoil piles and minimize dust.

17.0 PUBLIC ACCESS PLAN

17.1 PURPOSE

The purposes of this *Public Access Plan* are to:

- Identify measures for informing casual users of the MNF and GWNF about construction of the ACP.
- Identify measures to inform specific user groups whose activities may intersect ACP construction about any closures, detours, restrictions, alternative access routes, etc. associated with ACP construction.
- Ensure the safety of recreational users of MNF and GWNF lands, while at the same time minimizing impacts to recreational use, during the period of pipeline construction.

17.2 RESPONSIBILITIES

The following individuals are responsible for developing and coordinating ACP Project information to be used to inform the public about Project construction on the National Forests.

ACP Public Affairs:
Name: _____
Phone: _____
E-mail: _____

Monongahela National Forest Public Affairs:
Name: _____
Phone: _____
E-mail: _____

George Washington National Forest Public Affairs:
Name: _____
Phone: _____
E-mail: _____

17.3 PROJECT WIDE MEASURES

The ACP Project website, found at https://www.dom.com/corporate/what-we-do/atlantic-coast-pipeline, provides general information about the Project. The website also provides a telephone hotline, allowing members of the public to speak to a Project representative. Prior to the start of construction, ACP will add contact information for FERC and USFS representatives to its website as well.

17.4 NATIONAL FOREST-SPECIFIC MEASURES

- Prior to and during construction, ACP public affairs representatives will work with public affairs specialists from both the MNF and GWNF as necessary to provide updated Project information for communication to Forest users.

- ACP public affairs representatives will work with public affairs specialists from the MNF and GWNF to plan and implement any targeted outreach to particular groups of Forest users, e.g. hiking, hunting or fishing organizations, and the general public, etc.

- Prior to ACP construction activity in any particular part of either Forest, ACP will post temporary signs on Forest roads used as construction access roads alerting road users to the presence of logging and construction vehicles on the roads.

- Prior to construction, ACP will work with both Forests to identify any specific road or trail closures or detours necessary to facilitate pipeline construction and ensure safety of the public.

- On roads and trails that cross the pipeline right-of-way, ACP will post temporary signs informing road and trail users of any closures, detours, or other restrictions associated with crossing the construction zone. All signage will be developed in consultation with the Forest public affairs specialists.

- On Forest roads remaining open during construction, ACP will employ flagmen during periods of active construction at road/pipeline right-of-way intersections, when construction equipment or vehicles may be crossing the road.

- On Forest trails that cross the pipeline right-of-way, ACP will post temporary signs at trailheads informing trail users of any closures, detours, or other restrictions associated with crossing the construction zone. All signage will be developed in consultation with the Forest public affairs specialists and trails specialists.

- On Forest trails that cross the pipeline right-of-way that remain open during construction, ACP will erect exclusion fencing on either side of such trails where they cross the construction zone, with appropriate signage warning hikers to stay on the trail. During periods of active construction when vehicles and equipment may be crossing over the trail, ACP will employ flagmen/spotters to escort hikers safely across the construction zone. If temporary trail detours are employed, detour routes will be developed in consultation with Forest recreational specialists, and the routes will be prominently demarcated.

- At portions of the construction right-of-way between road and trail crossings, ACP will post signs at or near the edge of the work area, at approximate 200 feet spacings or as dictated by terrain and visibility, warning the public that the construction right of way is closed to public entry.

- In areas of active blasting, signage and flaggers will be posted in accordance with the *Blasting Plan.* This includes providing 48-hour notice to surrounding residents and businesses, posting of warning signs at approaches to the blast area, with minimum 4-inch lettering on a contrasting background, and stationing of flaggers at roads and trails at least 1,000 feet from the entrance to any areas of active blasting.

18.0 OFF HIGHWAY VEHICLE BLOCKING PLAN

18.1 PURPOSE

The purpose of this Blocking Plan (Blocking Plan is to prevent OHV travel along the proposed pipeline, proposed access roads, and onto adjacent or nearby USFS lands. OHV travel along the proposed pipeline and access roads could lead to unauthorized entrance to restricted areas, could damage sensitive biological and cultural resources, could create or exacerbate erosion, could impede right-of-way restoration, and could compromise the integrity of the right-of-way. Consequently, both of the Forests and the pipeline operator have an interest in preventing unauthorized OHV use along the proposed pipeline and its access roads.

The Blocking Plan identifies a process for determining where OHV blocking measures are necessary, for identifying approaches appropriate at specific locations, and for follow-up monitoring to assess the effectiveness of the measures, and adjust accordingly. Examples of methods that may be used include boulders, stumps, berms, gates, visual marking, downed woody debris, visual screening, and rough road access.

18.2 OHV USE ON USFS LANDS

The ACP Project crosses through no areas of either the MNF or the GWNF where OHV use is authorized. The pipeline right-of-way will be maintained in an herbaceous state for pipeline surveillance and maintenance purposes. In predominantly forested areas where the right-of-way crosses Forest roads, the right-of-way can present a tempting linear path for some OHV users, despite Forest rules prohibiting such use. While such unauthorized use is difficult to stop entirely, measures to discourage OHV use of the right-of-way are appropriate.

The blocking measures must take into consideration that access to every point along the pipeline by maintenance and repair crews is necessary. Blocking measures must be designed to avoid creating unreasonable impediments to pipeline maintenance vehicles or larger equipment that must access the right-of-way in emergency events or major maintenance work.

18.3 LOCATIONS REQUIRING BLOCKING MEASURES

Blocking measures will be considered at all Forest roads crossed by the ACP, and other locations determined by the AO to be likely access points for OHVs to travel along the pipeline. These locations are provided in Table 18.3-1.

TABLE 18.3-1

Potential OHV Blocking Locations a

Forest Road No.	Approximate Milepost	Access Road No.	Road Crossing Method
Un-numbered road connecting with MNF Road 212	81.8	05-001-E064.AR1	N/A
MNF Road 1014 (Shock Run)	83.2	N/A	Open cut
MNF Road 1017 (Upper Shock Run)	83.3	05-001E064.AR3	Open cut
MNF Road 55 (Allegheny Road)	83.7	N/A	Open cut
MNF Road 55 (Allegheny Road)	83.8	N/A	Open cut
MNF Road 55 (Allegheny Road)	83.8	N/A	Open cut
Un-numbered road connecting with Highway 84	85.0	06-001-B001.AR3	N/A
Un-numbered road connecting with Highway 84	85.4	06-001-B001.AR4	N/A
GWNF Road 124	93.6	36-014-AR2	N/A
Un-numbered Road connecting with GWNF Road 614	94.1	36-014.AR3	N/A
GWNF Road 281C	96.3	N/A	Open Cut
GWNF Road 281	96.3	36-026.AR1	Open cut
GWNF Road 1748	97.1	N/A	Open Cut
GWNF Road 1748	97.2	N/A	Open Cut
GWNF Road 309	99.6	36-016.AR2	N/A
GWNF Road 348.1	116.5		Open cut
GWNF Road 449	117.0	N/A	Open cut
GWNF Road 449	117.1	N/A	Open cut
New road connecting to GWNF Road 449	117.2	07.001-AR1-AR4	N/A
Un-numbered road connecting to GWNF Road 449A	118.0	07-001.AR1-AR 6	Open Cut
GWNF Road 449A	118.7	07-001-AR3	Open cut
GWNF Road 449A	118.8	N/A	Open cut
GWNF Road 449B	119.1	N/A	Open cut
GWNF Road 466A	120.2	07-001.AR1-AR8	Open cut
GWNF Road 466	120.4	07-001.AR1-AR9	Open cut
GWNF Road 1755	121.2	07-001-AR1-AR7	Open cut
GWNF Road 1755	121.4	N/A	Open cut
GWNF Road 1755	121.8	N/A	Open cut

[a] Best current estimate of blocking locations; will be updated in consultation with USFS

18.4 BLOCKING MEASURES

The following blocking measures will be considered for installation at each of the locations listed in Table 18.3-1. The site-specific measures, and placement of any physical barriers, will be approved by the AO.

- Berms. Berms will be placed across the right-of-way where it intersects an existing road. Berm slopes shall not exceed 30 per cent. Berms will be placed across the right-of-way as part of erosion control, strategically placed to reduce visibility and mimic local topography.

- Rock and woody material distribution. Large rocks, stumps, limbs, and related material removed and stockpiled during construction will be strategically placed, without making it appear as a challenging obstacle course. The placement will be done in a manner to present a physical barrier as well as to erase visual cues signaling the presence of the right-of-way from the access point.

- Utilize existing vegetation. At locations where the pipeline has been bored beneath paved roads, vegetation between the bore pits and the road way will be left in place, except for sufficient clearing to allow access by construction vehicles and equipment.

- Surface preparation. At locations where the pipeline has open cut across the access point (as opposed to where the pipeline has been bored beneath paved roads), the right-of-way will be back-bladed or raked by bulldozer or by hand, to erase the traces of the intersection of the pipeline right-of-way with the access point.

- Gates. Where deemed appropriate by the AO, locking gates may be installed according to USFS specifications. Gate openings will be a minimum of 16 feet wide to accommodate pipeline maintenance vehicles and equipment.

- Signs. Signs warning the public that OHV use is prohibited along the pipeline right-of-way will be installed if requested by the USFS. Signs may dissuade some OHV users, but they may also call attention to the right-of-way, so their effectiveness is best judged by USFS recreation staff.

18.5 POST-CONSTRUCTION MONITORING

The Project EI will document the establishment of OHV blocking measures at each crossing location upon completion. The documentation will identify what measures were installed, the date of completion, and will include photographs of the sites. In conjunction with its post-construction restoration monitoring, Atlantic will monitor each site for two years following completion of construction activities on the specific spread, and will annually prepare a report documenting their effectiveness. Each OHV blocking location will be visited to photograph the site, assess whether OHV use appears to be occurring and what, if any corrective measures are recommended. Any necessary corrective measures will be determined in consultation with USFS staff.

After two years, the locations will be monitored periodically by USFS and pipeline operations staff to determine whether further corrective action is warranted. Regular aerial patrols[22] will also note changed conditions on the right-of-way, such as the appearance of vehicle tracks that may provide evidence of unauthorized OHV use along the pipeline.

[22] ACP pipelines are currently scheduled for aerial surveillance on a monthly basis.

19.0 WATER QUALITY MONITORING PLAN

The purpose of this plan is to describe how water quality monitoring activities will be conducted on USFS lands where stream crossings are planned. Stream crossing methods are designed to minimize stream bank and bed erosion thus preventing the release of sediment into streams, and are short-term in duration. Streams less than 10-feet-wide will be crossed within 24 hours and streams 10-feet-wide to 100-feet-wide will be crossed in 48 hours, unless rock is encountered and requires blasting or other rock removal methods. Atlantic will install the pipeline using dry-ditch methods for crossings of waterbodies on the MNF and GWNF (dam and pump or flume crossing methods), which further limits sediment release and elevated turbidity downstream of crossing areas.

This plan augments the other construction, restoration, and mitigation plans prepared for the Project. Atlantic will install stream crossings in accordance with the FERC Procedures, which stipulate how crossings are planned, constructed, restored and monitored.

19.1 JURISDICTIONS

The MNF lies in West Virginia and GWNF is located in Virginia. Only West Virginia has numeric standards applicable to turbidity. This Water Quality Monitoring Plan has been written to conform to the West Virginia numeric standards and will be applicable to both National Forests. Virginia provides narrative guidance with respect to erosion and sediment control[23], and these guidelines have also been incorporated in the procedures described in this plan.

19.2 BACKGROUND AND PURPOSE

Excess turbidity in aquatic systems can adversely affect aquatic life or other beneficial use of a waterbody. The biological effects of excess turbidity are exerted primarily as a result of reduced light penetration or as a smothering effect associated with reduced dissolved oxygen. Turbidity is a measure of the 'cloudiness' of water, which is analytically measured as the degree to which light is scattered and absorbed by suspended sediment. Turbidity is most commonly measured using a nephelometric instrument called a turbidimeter and expressed in terms of Nephelometric Turbidity Units (NTU) (Oregon DEQ, 2010). Most published criteria for turbidity in the United States and Canada are in the form of a limited increase above background.

The purpose of this Water Quality Monitoring Plan is to monitor and address chronic impacts to water quality. Corrective actions utilizing BMPs will be implemented when necessary to address sources of chronic turbidity.

19.3 NUMERIC STANDARD

As articulated in West Virginia guidance, chronic turbidity should not exceed 10 NTUs over background turbidity when the background is 50 NTUs or less, or have more than a 10 percent increase in turbidity (plus 10 NTU minimum) when the background turbidity is more than 50 NTUs averaged over any four-day period. The turbidity standard does not contain an acute criterion for cold or warm waters designations. This standard will apply to all stream crossings as measured 50 feet above (background) and 50 feet below the crossing area for streams $\leq$ 30 feet in width.

Construction related to stream crossings will adhere to timing restrictions related to aquatic life according to agency guidelines or specifications contained in state water quality permits. Timing restrictions are based on readily available data from agency consultation letters or online data. Additional

[23] http://www.deq.virginia.gov/Programs/Water/StormwaterManagement/Publications/ESCHandbook.aspx

consultations with state and federal agencies, as well as field survey data for protected species will occur to further refine timing restrictions.

19.4 INSPECTION AND MONITORING

As articulated in the *Stream and Wetland Crossing Procedures*, one or more EIs having knowledge of the wetland and stream conditions in the project area is required for each construction spread. The EIs will be responsible for the inspection of all in-stream activities (e.g. setting of flumes or dam and pump operations, and their removal) and to take all required water quality measurements.

Measurements of turbidity will occur at all stream crossings that are state-designated as either coldwater or significant coolwater or warmwater fisheries. Monitoring will be accomplished through the use of a hand held turbidity meter (e.g., YSI 6600 V2-2 data sonde, or similar), for short term continuous monitoring and grab samples. The turbidity meter will be calibrated prior to the commencement of construction and as required throughout the duration of the monitoring activities.

Monitoring will occur at a minimum rate of 4 times per day during the period when active construction is occurring, in both the background location (50 feet above activity) and downstream location (50 feet below activity). The first monitoring event will occur approximately 30 minutes prior to the commencement of construction, and the second will occur a minimum 2-4 hours after start of instream construction. Measurements of turbidity grab samples will continue during instream pipeline installation activities. Once the crossing is complete and restoration occurs, monitoring will be conducted for four days at a minimum rate of 1 time per day. Should the chronic turbidity reading (4-day average) exceed standards, remediation of the source will occur and monitoring will continue once per day until the source is addressed and readings are within water quality standards.

Attached is an example of a daily Turbidity Monitoring Data Sheet. All incidents of exceeding the numeric limits identified in Section 6.0 shall result in the prompt implementation of mitigation measures (described below).

19.5 CONSERVATION MEASURES

Atlantic will implement the following BMPs for all stream crossings to reduce impacts:

- develop and implement a state-approved ESCP;
- installing sediment barriers;
- appropriately site sediment filtering devices associated with trench dewatering activities;
- reducing the volume of large equipment operating in or near the waterbody; and/or
- halting work, if necessary to address issue or implement corrective actions.

In addition, Atlantic will develop site-specific BMPs to address steep slopes and unique crossing conditions.

19.6 REPORTING

The EI will complete a Turbidity Monitoring Data Sheet daily, and is responsible for identifying, documenting, and overseeing corrective actions, as necessary. Daily Turbidity Monitoring Data Sheets will be submitted to the ECC to be included with a final construction report and will be made available to the USFS within two weeks of the crossing.

Turbidity Monitoring Data Sheet

Project Name & Permit Number: ______________________________

Site Address (Location): ______________________________

Monitor Name: ______________________________

Company: ______________________________

Phone Number: ______________________________

Date & Time of Sample: ______________________________

Weather Conditions: ______________________________

Upstream Location* / Reading (NTU)	Downstream Location* / Reading (NTU)	Turbidity Increase (Downstream - Upstream) (NTU)	Allowable Turbidity Increase (NTU)	Turbidity Increase Above Standard? (Y/N)	Contractor Notified of results? (Y/N)

Upstream Location* / Reading (NTU)	Downstream Location* / Reading (NTU)	Turbidity Increase (Downstream - Upstream) (NTU)	Allowable Turbidity Increase (NTU)	Turbidity Increase Above Standard? (Y/N)	Contractor Notified of results? (Y/N)

Upstream Location* / Reading (NTU)	Downstream Location* / Reading (NTU)	Turbidity Increase (Downstream - Upstream) (NTU)	Allowable Turbidity Increase (NTU)	Turbidity Increase Above Standard? (Y/N)	Contractor Notified of results? (Y/N)

Mitigation Measures Taken By Contractor (if turbidity increase is above standard): [continue on back]

____

____

____

* Number of feet from activity; **Source**: City of Bellevue, Department of Planning & Community Development, P.O. Box 90012 □ Bellevue, Washington □ 98009

20.0 VISUAL RESOURCES PLAN

The LRMP for the GWNF includes the following standard:

The Forest Scenic Integrity Objectives are met for all new projects (including special uses). Existing conditions may not currently meet the assigned Scenic Integrity Objective. **(GWNF LRMP FW-182).**

The GWNF is considering whether a project-specific LRMP amendment may be necessary, based on the results of visual analyses that have been submitted separately to the GWNF.

20.1 FEATHERING VEGETATION CLEARING ON THE RIGHT-OF-WAY

At the request of the USFS, Atlantic is considering "feathering" the edges of the right-of-way during construction on USFS lands. Feathering the edges of the right-of-way refers to the selective clearing of trees and vegetation at specific locations along the edges of the right-of-way such that existing vegetation, including fully grown trees, are left up to 10 feet within the boundaries of the construction right-of-way to create a visually uneven edge along both sides of the right-of-way (Figure 20-1). When viewed axially or along the length of the right-of-way at these locations, there are no parallel, straight edges and the cleared right-of-way appears more natural. Atlantic is considering applying this process within long straight line tangents of pipeline corridor where immediate foreground and foreground views (i.e., from trail or road crossings) and middleground and background views (i.e., from highways) of the pipeline corridor would be present from publicly accessible locations.

If implemented, vegetation that is left standing within the edges of the construction right-of-way would extend 5 to 10 feet into the right-of-way, and would occur periodically along both edges of the right-of way in the selected areas. These areas would be identified and mapped by Atlantic on drawings, and the trees to be left standing would be flagged in the field and reviewed with the USFS prior to construction.

20.2 REPLANTING THE RIGHT-OF-WAY

Atlantic will replant the entire construction right-of-way with seed mixes that it has selected in consultation with the USFS. These seed mixes consists of a selection of warm season native grasses, some select cool season grasses in steep slope areas, and various native flowering forbs/pollinator species. Where it crosses USFS land, the temporary construction right-of-way will have a nominal width of 125 feet, including the 53.5-foot-wide permanent right-of-way that is centered on the installed pipeline. To reduce the time required for revegetation of the construction right-of-way with woody vegetation, and thus reduce the visual contrast of the cleared construction right-of-way on USFS lands, Atlantic is also considering active replanting of the outer most 20 feet of the working side of the construction right-of-way and the remaining outer 13 feet of the spoil side of the construction right-of-way, including all additional temporary extra workspace areas, with a combination of indigenous tree and shrub seedlings (Figure 20-2). If replanting is conducted, tree and shrub species, seed stocks, and planting densities used within these areas will be selected based on availability within the project area, as well as consultations with USFS staff. Atlantic would monitor the planted areas for successful growth of the seedlings, but would not plan to actively maintain or mange the planted areas, which would allow natural revegetation from surrounding forest species and sprouting of stumps to occur and supplement the growing seedlings. Atlantic will limit stump removal to those areas requiring extensive grading and the area in the immediate trench vicinity. Stumps that have been ground to below grade would maintain their root systems, which not only helps stabilize the soil but allows many trees to regenerate from their stumps, facilitating restoration progress.

Additionally, in the area between the edge of the 53.5-foot-wide permanent right-of-way and the replanted area described above (about 38 feet on the working side of the construction right-of-way), Atlantic will allow the natural regrowth and succession of trees and shrubs following the initial planting after construction of grasses and forbs. During operation of the ACP pipeline, only the 53.5-foot-wide permanent right-of-way will be periodically mowed and maintained in an herbaceous state.

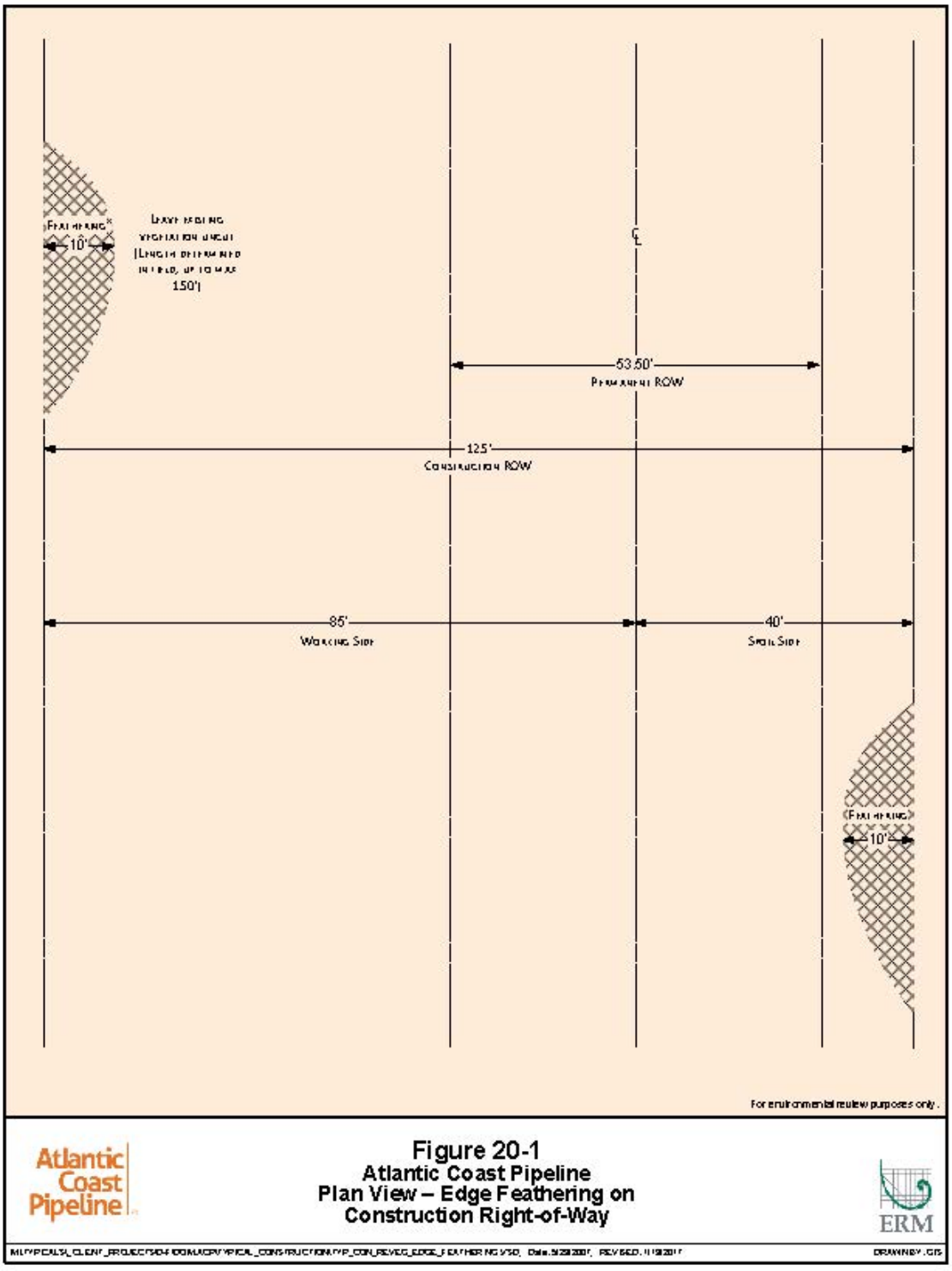
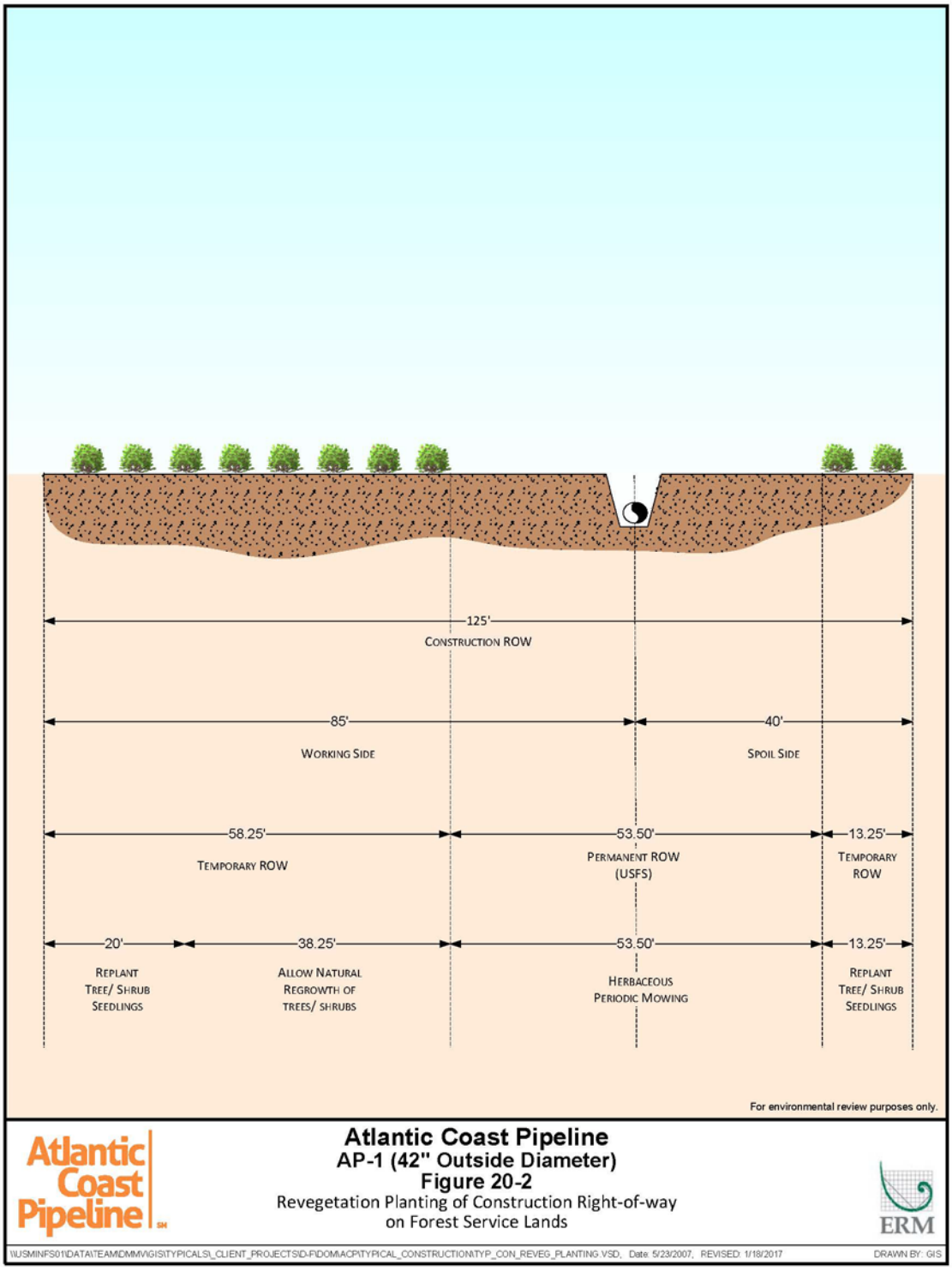


Figure 20-1
Atlantic Coast Pipeline
Plan View – Edge Feathering on Construction Right-of-Way


125'
CONSTRUCTION ROW
85'
WORKING SIDE
40'
SPOIL SIDE
58.25'
TEMPORARY ROW
53.50'
PERMANENT ROW
(USFS)
13.25'
TEMPORARY
ROW
20'
REPLANT
TREE/ SHRUB
SEEDLINGS
38.25'
ALLOW NATURAL
REGROWTH OF
TREES/ SHRUBS
53.50'
HERBACEOUS
PERIODIC MOWING
13.25'
REPLANT
TREE/ SHRUB
SEEDLINGS
For environmental review purposes only.
Atlantic Coast Pipeline
Atlantic Coast Pipeline
AP-1 (42" Outside Diameter)
Figure 20-2
Revegetation Planting of Construction Right-of-way
on Forest Service Lands
ERM
\\USMINFS01\DATA\TEAM\DMMV\GIS\TYPICALS_CLIENT_PROJECTS\D-F\DOM\ACP\TYPICAL_CONSTRUCTION\TYP_CON_REVEG_PLANTING.VSD, Date: 5/23/2007, REVISED: 1/18/2017
DRAWN BY: GIS

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NOTE: ATTACHMENTS ARE PROVIDED UNDER SEPARATE COVER EXCEPT WHERE NOTED

ATLANTIC COAST PIPELINE, LLC
ATLANTIC COAST PIPELINE

Construction, Operations, and Maintenance Plan

ATTACHMENT A

Right-of-Way Configurations

Referenced in Section 2

ATLANTIC COAST PIPELINE, LLC
ATLANTIC COAST PIPELINE

Construction, Operations, and Maintenance Plan

ATTACHMENT B

Alignment Sheets

Referenced in Section 2

ATLANTIC COAST PIPELINE, LLC
ATLANTIC COAST PIPELINE

Construction, Operations, and Maintenance Plan

ATTACHMENT C

Slope Stability Policy and Procedure

Referenced in Sections 2, 6 and 8

ATLANTIC COAST PIPELINE, LLC
ATLANTIC COAST PIPELINE

Construction, Operations, and Maintenance Plan

ATTACHMENT D

Winter Construction Plan

Referenced in Sections 2 and 8

ATLANTIC COAST PIPELINE, LLC
ATLANTIC COAST PIPELINE

Construction, Operations, and Maintenance Plan

ATTACHMENT E

Fire Prevention and Suppression Standards

Referenced in Section 5

ATLANTIC COAST PIPELINE, LLC
ATLANTIC COAST PIPELINE

Construction, Operations, and Maintenance Plan

ATTACHMENT F

Access Road Improvement Maps

To Be Provided at a Later Date

Referenced in Sections 2, 4, 7, and 8

ATLANTIC COAST PIPELINE, LLC
ATLANTIC COAST PIPELINE

Construction, Operations, and Maintenance Plan

ATTACHMENT G

Soil Survey

Referenced in Sections 2, 8 and 10

ATLANTIC COAST PIPELINE, LLC
ATLANTIC COAST PIPELINE

Construction, Operations, and Maintenance Plan

ATTACHMENT H

Karst Monitoring and Mitigation Plan

Referenced in Sections 2, 6, and 8

ATLANTIC COAST PIPELINE, LLC
ATLANTIC COAST PIPELINE

Construction, Operations, and Maintenance Plan

ATTACHMENT I

Typical Erosion & Sedimentation Control Details

Referenced in Section 8

ATLANTIC COAST PIPELINE, LLC
ATLANTIC COAST PIPELINE

Construction, Operations, and Maintenance Plan

ATTACHMENT J

Non Native Invasive Plant Species Table and Map

Referenced in Sections 8 and 11

ATLANTIC COAST PIPELINE, LLC
ATLANTIC COAST PIPELINE

Construction, Operations, and Maintenance Plan

ATTACHMENT K

Spill Report Form

Referenced in Section 11

ATLANTIC COAST PIPELINE, LLC
ATLANTIC COAST PIPELINE

Construction, Operations, and Maintenance Plan

ATTACHMENT L

George Washington National Forest Unanticipated Discovery Plan

Referenced in Section 14

ATLANTIC COAST PIPELINE, LLC
ATLANTIC COAST PIPELINE

Construction, Operations, and Maintenance Plan

ATTACHMENT M

Monongahela National Forest Unanticipated Discovery Plan

Referenced in Section 14

ATLANTIC COAST PIPELINE, LLC
ATLANTIC COAST PIPELINE

Construction, Operations, and Maintenance Plan

ATTACHMENT N

Permit List

ATLANTIC COAST PIPELINE, LLC
ATLANTIC COAST PIPELINE

Construction, Operations, and Maintenance Plan

ATTACHMENT O

Appalachian National Scenic Trail HDD Plan and Profile Drawings

Referenced in Section 2

ATLANTIC COAST PIPELINE, LLC
ATLANTIC COAST PIPELINE

Construction, Operations, and Maintenance Plan

ATTACHMENT P

Appalachian National Scenic Trail Crossing Contingency Plan

Referenced in Section 2

ATLANTIC COAST PIPELINE, LLC
ATLANTIC COAST PIPELINE

Construction, Operations, and Maintenance Plan

ATTACHMENT Q

Timber Cruise Plan

Referenced in Section 4