EASTERN
GAS TRANSMISSION AND STORAGE, INC.

Eastern Gas Transmission and Storage, Inc.
6603 West Broad Street
Richmond, VA 23230

November 20, 2020

Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street, N.E., Room 1A
Washington, D.C. 20426

Re: Eastern Gas Transmission and Storage, Inc.
Supply Header Project
Docket Nos. CP15-555-000
OEP/DG2E/Gas Branch 4

Dear Secretary Bose:

By Order dated October 13, 2017, the Federal Energy Regulatory Commission (Commission or FERC) authorized Dominion Energy Transmission, Inc. (DETI) to construct and operate certain facilities that comprise the Supply Header Project (SHP or Project). 161 FERC ¶ 61,042 (the Order). On November 1, 2020, Dominion Energy sold certain companies including DETI to Berkshire Hathaway Energy Company. DETI has changed its name to Eastern Gas Transmission and Storage, Inc. (Eastern GTS or EGTS).

An Information Request was received from FERC staff regarding this Project dated October 27, 2020 (10-27-20 Information Request). Eastern GTS hereby submits its response to the 10-27-20 Information Request in the form of a SHP Restoration Plan (Plan) which addresses the nine points listed in the request. To assist FERC staff in locating information relevant to the nine points listed in the 10-27-20 Information Request, attached is a key summarizing where in the Plan the information is located.

Eastern GTS requests that, pursuant to 18 C.F.R. § 388.112, the information filed in Appendix E be treated as controlled unclassified information and privileged and confidential, and that this information not be released to the public. This information is labeled as "CUI//PRIV – Do Not Release" and contains the landowner information, which is customarily treated as privileged and confidential.

Eastern GTS requests that, pursuant to 18 C.F.R. § 388.112, the information filed in Appendix B.5 be treated as Critical Energy Infrastructure Information (CEII), and that this information not be released to the public. This information is labeled "CUI//CEII-Do Not Release" and contains information that is customarily treated as CEII.

If you have any questions, please contact me at 804-771-4399.

Respectfully submitted,

/s/ Matthew R. Bley

Matthew R. Bley

Director, Gas Transmission Certificates
Authorized Representative for Eastern Gas Transmission and Storage, Inc.

cc: Julia Yuan, FERC

Attachments

VERIFICATION

Matthew R. Bley says: that he is Director, Gas Transmission Certificates, Authorized Representative of Eastern Gas Transmission and Storage, Inc.; that he has read the foregoing submittal and is familiar with the contents thereof; that all the statements and matters contained therein are true and correct to the best of his information, knowledge, and belief; and that he is authorized to execute and file the same with the Federal Energy Regulatory Commission.

/s/ Matthew R. Bley
Matthew R. Bley
Director, Gas Transmission Certificates
Authorized Representative for Eastern Gas Transmission and Storage, Inc.

Date: November 20, 2020

Eastern Gas Transmission & Storage, Inc.
Docket No. CP15-555-000
Response to Information Request Dated October 27, 2020
Key to Location(s) of Information in the Plan

#	Information Requested by FERC	Location(s) in the Plan
1	A schedule identifying planned initiation and completion dates for all discrete phases of project disposition and restoration activities.	Sections 3 & 9
2	Identification of all areas where construction has started but no pipeline has been installed (i.e., areas that have been cleared or graded) and a description of how these areas would be restored.	Section 7
3	Identification of all SHP components that DETI plans to place into service, and how those facilities would integrate with DETI's system.	On November 1, 2020, Dominion Energy sold certain companies including DETI to Berkshire Hathaway Energy Company. DETI has changed its name to Eastern Gas Transmission and Storage, Inc. (Eastern GTS or EGTS). Prior to project cancellation, 31% of SHP main line pipeline was installed, and significant work also occurred at three of four existing compressor stations. Given the construction completed to date and the positioning of SHP facilities in relation to EGTS's existing pipeline network, EGTS is currently evaluating options for use of some or all of the SHP. For these reasons EGTS reaffirms its request for a two-year extension of time to construct and place portions of the SHP into service.
4	Identification of all pipeline segments, buildings, foundations, fences, aboveground piping, belowground piping, and appurtenant facilities that would be removed or left in place. This must include a description how each facility would either be left in place or removed from the site, and what methods or procedures Atlantic/DETI would use to dispose of the materials that would be removed.	Sections 6 (Facilities) and 7 (Pipeline)

Eastern Gas Transmission & Storage, Inc.
Docket No. CP15-555-000
Response to Information Request Dated October 27, 2020
Key to Location(s) of Information in the Plan

#	Information Requested by FERC	Location(s) in the Plan
5	A plan for the long-term restoration of disturbed rights-of-way. This must identify the entity that will be responsible for completing and maintaining this restoration.	Sections 5 and 7
6	Discussion of the status of DETI's consultation with landowners on matters pertaining to project disposition and restoration activities on their property, as applicable, including: a. preferences regarding treatment of pipeline segments that have already been installed (i.e., pipeline to be left in place or removed); b. preferences for removal of felled trees that have not been cleared; and c. preferences on how disturbed areas would be restored, depending on their land use type (e.g., forest, agricultural, etc.).	Sections 7.1 and 8 Appendix E.1 *(landowner line list with special conditions for affected parcels)*
7	A table showing the federal, state, and local permits and approvals required for land-disturbing activities associated with project disposition and restoration. Include a discussion of the status of all required federal and state government permit approvals and consultations. Include the agency and individual contacted, the date DETI submitted the application (or a timetable for the DETI submission), or whether DETI have received a permit.	Section 3 Appendix C.1
8	The status of all historic properties requiring any further treatment or avoidance measures as well as a schedule and plans for fulfilling any remaining stipulations of the Programmatic Agreement executed to comply with Section 106 of the National Historic Preservation Act.	Section 3 Appendix C.3

Eastern Gas Transmission & Storage, Inc.
Docket No. CP15-555-000
Response to Information Request Dated October 27, 2020
Key to Location(s) of Information in the Plan

#	Information Requested by FERC	Location(s) in the Plan
9	The status of the implementation of conservation measures and mitigation for ACP and SHP impacts (e.g., tree clearing, ground disturbance) on species protected under the Endangered Species Act.	Section 3 Appendix C.4

Document Accession #: 20201120-5243 Filed Date: 11/20/2020

EASTERN GAS TRANSMISSION AND STORAGE, INC.

SUPPLY HEADER PROJECT

PROJECT RESTORATION PLAN

November 20, 2020

Contents

1 INTRODUCTION

By Order dated October 13, 2017, the Federal Energy Regulatory Commission (Commission or FERC) authorized Atlantic Coast Pipeline, LLC and Dominion Energy Transmission, Inc. (DETI)[1,2] to construct and operate certain facilities that comprise the Atlantic Coast Pipeline (ACP) and the Supply Header Project (SHP) 161 FERC ¶ 61,042 (Order). On July 5, 2020, the cancellation of ACP was announced. Accordingly, planning was initiated for the restoration of the workspaces as acquired by, and in accordance with, the regulations of the Commission and other relevant regulatory authorities. Certain activities associated with the restoration will be required, as described in this Project Restoration Plan (Plan). An Information Request regarding the restoration was received from FERC on October 27, 2020 (10-27-20 Information Request). Eastern GTS hereby submits its response to the 10 27 20 Information Request in the form of this Plan which addresses the nine points listed in the request.

2 EXECUTIVE SUMMARY

The purpose of this Plan is to provide FERC with information pertaining to EGTS's strategy and scope of work to restore the project workspace. An overview map of the project is shown in Appendix A.1.

EGTS is committed to meeting the obligations in its easement agreements and maintaining compliance with its permits and authorizations. EGTS will continue with its ongoing monitoring, reporting, and maintenance activities along the right-of-way until such time that the restoration work authorized by the Commission is complete. During the execution of the restoration work, EGTS may provide additional field inspection and monitoring personnel, as appropriate, in proportion to the restoration activities. EGTS will continue to communicate with landowners to keep them informed as the scope and associated timing is further refined.

Progress at facility sites ranged from none (no ground disturbance or trees felled) to substantially complete as further described in Section 6. At locations where significant construction progress was achieved, EGTS will stabilize the sites and prepare any assets for long term preservation. EGTS owns the property on which each of the facilities is located.

On the two pipeline spreads, progress varied from none (no ground disturbance or trees felled) to substantially complete (pipe installed and permanent revegetation completed). EGTS achieved approximately 24.2 miles of tree felling and approximately 11.7 miles of pipe installation along the approximately 14.5 miles where clearing and grading were completed. Further details on construction progress can be found in the table below. The proposed scope of work for each applicable construction status category can be found in Section 7. A summary of construction progress along the right-of-way is included in Appendix A.2.

[1] On November 1, 2020, Dominion Energy sold certain companies including DETI to Berkshire Hathaway Energy Company. DETI has changed its name to Eastern Gas Transmission and Storage, Inc. (Eastern GTS or EGTS).
[2] Due to the transfer and processing of IT systems, the Dominion Energy logo may not be able to be removed from certain documents associated with this filing. Any inferences with respect to Eastern GTS' use of a Dominion Energy logo, or references to Dominion Energy, should be disregarded as Eastern GTS is no longer affiliated with Dominion Energy and no Dominion Energy entity is a party to this filing.

Approximate Miles of Activity Completed by Spread		
	Spread 13	*Spread 14*
Tree Felling	24.2	0.0
Trees Remaining on Ground	*0.1*	*0.0*
Clearing	24.0	0.0
Grading	14.5	0.0
Pipe Installed	11.7	0.0
Restoration	14.9	0.0
No progress	9.4	3.9

** The numbers in this table do not directly correlate to the restoration categories in Section 7.*
*** Each individual number represents the length of that particular activity across the entirety of the pipeline (33.6 miles).*

This scope assumes that, in accordance with landowner agreements, installed pipe is to be left in place and areas with ground disturbance (i.e., clearing, at a minimum, is complete) will be restored. There is only one parcel where trees were felled and remain (see Section 7.1.1 for further discussion of that parcel). In addition to minimizing environmental impacts, this scope of work will shorten the overall Project duration, allow EGTS to utilize its current permits and authorizations to the extent possible, and minimize the need to supplement and amend those permits and authorizations. All applicable permits and authorizations have been received and can be found in Appendix C.1.

3 ENVIRONMENTAL COMPLIANCE AND PERMITTING

EGTS, through its ongoing consultation efforts with landowners and permitting agencies, expects to minimize impacts to the environment and the landowners. For the scope of work of this Plan, EGTS has identified all applicable permits for the activities listed in this Plan. These permits can be found in Appendix C.1. In addition, wetland/waterbody impacts resulting from the Plan have been identified in Appendix C.2.

All activities requested in this Plan comply with Section 106 of the National Historic Preservation Act. There are no further treatment or avoidance measures for the Project remaining in the Programmatic Agreement. Appendix C.3 includes a table listing each survey report, State Historic Preservation Office(s) concurrence of no impact, and the coverage area.

EGTS will continue to consult with U.S. Fish and Wildlife Service (USFWS) on effects that the proposed Plan may have on federally listed species. To document those effects, EGTS will prepare an applicant-prepared Biological Assessment (BA) and coordinate findings with both FERC and USFWS. Consultation would proceed according to the findings of the BA (e.g., formal or informal Section 7 ESA consultation).

A table detailing the status of all endangered species mitigation activities and procedures is provided in Appendix C.4. The table includes the status of each mitigation commitment and description of past, and proposed activities. EGTS will continue with its ongoing monitoring, maintenance, and reporting activities that have been in place since the completion of the work approved by FERC in the Stabilization Plan.

4 SAFETY MANAGEMENT

During the field execution of the Plan, a detailed scope of work will be provided to the contractors performing the work so that they can prepare comprehensive Site-Specific Safety Plans (SSSP). The SSSPs will be reviewed and approved by EGTS prior to the commencement of work activities.

Each SSSP will cover all the standard safety requirements as well as applicable topics including, but not limited to, Steep Slope Safety, Trenching & Excavations Safety, Material Handling, and other relevant safety guidelines.

In addition, each contractor will develop a COVID-19 plan to give guidance to employees during the pandemic. Their COVID-19 plan will comply with CDC recommendations as well as any state required standards.

5 RESTORATION AND REVEGETATION

An updated Construction Line List has been created, which identifies each parcel on which ground disturbance or tree felling has occurred. This can be found in Appendix E.1. The list identifies the unique landowner metrics for construction status, as well as any unique restoration and revegetation requirements that are documented in the agreement with the landowner. This report provides a listing of restoration activities such as replacement of fencing and gates and seeding requirements.

All restoration activities will adhere to EGTS's 2018 Restoration and Rehabilitation (R&R) Plan, and the Invasive Species Management Plan as previously approved by FERC. Both plans incorporate suggestions from Federal and State/Commonwealth Agencies and documents the requirements to be achieved for the project restoration activities. A copy of the R&R Plan and the Invasive Species Plan are provided in Appendix D and Appendix C.5, respectively.

In addition to its R&R Plan, EGTS will adhere to the requirements of the FERC's *Upland Erosion Control, Revegetation, and Maintenance Plan* and *Wetland and Waterbody Construction and Mitigation Procedures (Plans and Procedures)*, as well as EGTS's related construction, restoration, landowner agreements, and mitigation plans.

EGTS will adhere to the *Plans and Procedures* for long-term restoration of disturbed rights-of-way. EGTS is responsible for completing and maintaining the restoration.

6 FACILITY PROGRESS AND RESTORATION SCOPE

The main facilities included in SHP are compressor station expansions. The progress achieved at these sites varied from none (no ground disturbance or tree felling) to substantially complete, as further described below. Due to the critical locations within EGTS's infrastructure at which these existing facilities are located, the general scope of work proposed is intended to maintain the progress achieved to date while meeting any compliance requirements for compressor stations. As described in the July 10, 2020, letter to FERC, "EGTS is currently evaluating options for use of some or all of SHP." Accordingly, the plans for these sites where significant progress was made do not include restoring the sites to pre-SHP conditions, unless otherwise noted. However, EGTS will complete the necessary restoration and

stabilization work to ensure that it maintains compliance with its permits and authorizations applicable to those sites.

As the expansion activities completed at Crayne, JB Tonkin, and Mockingbird Hill compressor stations affect existing facility operations, some additional construction activities will be required to bring normal operations into compliance with industry standards and regulations, as well as promote a safe workplace for employees. These activities are outlined within the respective facility sections below.

6.1 Crayne Compressor Station

The Crayne Compressor Station is an existing EGTS facility located in Greene County, PA. It is connected to SHP pipelines by existing EGTS infrastructure. New compression and ancillary equipment are included in the SHP scope at this site.

6.1.1 Construction Status

The compressor unit addition was designed as an extension to an existing compressor building. Construction is approximately 85% complete, and the remaining work is located inside the compressor building expansion area. The wall between the original compressor building and the new unit expansion area has been partially removed. The exterior workspace has been restored and required vegetation has been achieved. See Appendix B.1 for construction status photos.

6.1.2 Restoration Scope

The activities proposed at this site as part of the Plan are summarized below:

- Compressor Building Interior
  - Install lighting in the compressor building extension as required under 29 CFR §1910.37 (OSHA requirements related to maintenance, safeguards, and operational features for exit routes).
  - Install fire and gas detection in compressor building extension as required under 49 CFR §192.736.
  - Complete removal of wall between existing compressor building and extension.
  - Install air handlers for ventilation in compressor building extension as required under 49 CFR §192.173.
  - Install conduit and wire to provide electricity for the lighting and air handling noted above.
  - Install heating system in compressor building extension. This is required since the existing building will be open to the extension area.

6.2 JB Tonkin Compressor Station

The JB Tonkin Compressor Station is an existing EGTS facility located in Westmoreland County, PA, at MP 3.9 of TL-636. New compression and ancillary equipment are included in the SHP scope at this site.

6.2.1 Construction Status

Four buildings have been erected – the compressor building, the auxiliary building, the motor control center (MCC) building, and the utility gas building. The turbine/compressor skid is set upon its concrete foundation inside the compressor building, which has not been fully completed. A significant portion of the underground yard piping has been completed. Pig launchers for two pipelines have been installed along with pot drips, valving, and piping. Construction is about 60% complete. See Appendix B.1 for an aerial image of the station with an overall layout of restoration work to be completed.

6.2.2 Restoration Scope

The activities proposed at this site as part of the Plan are summarized below:

- Install security lighting in the station yard as required under 29 CFR §1910.37 (OSHA requirements related to maintenance, safeguards, and operational features for exit routes). Due to the newly erected buildings within the scope of this project, existing lighting is not adequate.
- Install lighting inside the new buildings and stairs as required under 29 CFR §1910.37 (OSHA requirements related to maintenance, safeguards, and operational features for exit routes).
- Install air handlers for ventilation inside the compressor building as required under 49 CFR §192.173. Without adequate air exchanges, the potential for stagnant air and mold growth within the building insulation increases.
- Install the MCC, conduit, and wire to provide electricity for the lighting and air handling noted above.
- Finish buildings (i.e. install three feet of faux stone on the exterior) and complete landscaping required by the Municipality of Murrysville construction permits.
- Install riparian buffer and post construction stormwater system.
- Install one launcher/receiver with pot drip and associated piping. Upon completion of the pipeline reroutes north of Mamont Road and within the station under a separate blanket project, this assembly is required to be installed in a new location inside the facility fence line. An updated plot plan can be found in Appendix B.5 to show this change, as required under Order Condition No. 5. *See paragraphs following this list for more information.*
- Install zone meter. As a result of the piping modifications completed, additional zone measurement is required. Ancillary installations include new dekatherm building, communication, conduit, wire, and measurement equipment.
- Restore permanent fencing along Haymakers Run to the southeast of the facility. This fencing was removed for the installation of the pipeline tie-ins and replaced with temporary fencing.
- Regrade the site to original design contours.
- Seed and mulch or place stone to stabilize disturbed areas.
- Repair and pave damaged station driveway.

The pig launcher referenced above was connected to a pipeline that was operational before SHP construction commenced. The project design incorporated piping modifications that would allow EGTS to perform in-line inspection through the compressor station, as the new SHP pipeline would be connected to the existing pipeline but demarcated by a valve once the modifications had been completed. The section of new SHP pipeline located within the station fence line was completed prior to the cessation of construction, and the launcher is now planned to be installed at its termination point to allow for full in-line inspection capability of the piping modifications.

At the time construction stopped in December 2018, the launcher had already been disconnected from the existing pipeline, so in-line inspection is not currently available on that line. Performing this installation would alleviate any concerns related to future in-line inspection requirements and ensure its safe and reliable operation and service delivery commitments. This installation is not intended to advance the construction of SHP and is required irrespective of the future status of the project.

6.3 Mockingbird Hill Compressor Station

The Mockingbird Hill Compressor Station is an existing EGTS facility located in Wetzel County, WV, at MP 33.6 of TL-635. Extensive civil/site work has been completed, and the relocation of an existing EGTS pipeline within the station property was required to complete the site work. This included valve installations for future connections with SHP station piping. Other modifications were made to piping and valves at the existing compressor station that will be restored to pre-SHP operational conditions to allow for normal station operation.

6.3.1 Construction Status

The civil/site work required in advance of compressor station construction is substantially complete. Extensive site grading has been completed, including the installation of the sediment basin. The graded site pad and material laydown areas were temporarily seeded and have achieved reasonable vegetative growth. Pipeline valves were installed on the rerouted section of the existing pipeline with end caps temporarily installed at connections with planned compressor station interconnection piping. Pipeline right-of-way restoration has not been fully completed. Installation of a new pipeline from the existing compressor station to the new compressor station pad for Mockingbird Hill Compressor Station expansion was started. See Appendix B.1 for an aerial image of the station with an overall layout of restoration work to be completed.

6.3.2 Restoration Scope

The activities proposed at this site as part of the Plan are summarized below:

- Establish permanent stabilization of the compressor station expansion pad and material laydown area. This will require application of topsoil, re-grading, and establishing adequate vegetation. This will also require installation of ECDs which will be removed when permissible.
- Install guardrails on both sides of the permanent access road for compressor station expansion pad, in key locations around the pad, and near material laydown area.
- Install permanent fencing around sediment basin.
- Remove air bridge on temporary access road and clean up roadway.
- Area near rerouted pipeline:
    - Remove isolation valves and interconnect piping.
    - Complete final restoration of pipeline ROW.
    - Install final stone on permanent access road for compressor station expansion pad and extend roadway to mainline gate valve for rerouted pipeline. This is required for Operations personnel to access the valve for routine maintenance.
    - Install permanent fencing and stone around main line gate valve.
- Convert sediment basin to a stormwater pond following final vegetation of compressor station expansion pad.
- Conversion of rock construction entrance to gravel driveway.
- Extend rock channel approximately 100 linear feet below staging area #3 to resolve stormwater erosion issues.
- Install approximately 150 linear feet of rock channel below material laydown area to resolve stormwater erosion issues.
- Install approximately 250 linear feet of rock channel in swale below construction trailer area to prevent stormwater erosion issues.

- Restore approximately 720 linear feet of discharge piping at existing compressor station. This was replaced with piping of a smaller diameter due to SHP flow conditions.
- Remove approximately 180 linear feet of new pipeline installed between existing and new compressor station sites. The new isolation valve installed with this line will also be removed.
- Install permanent fencing around existing valve yard and connect to existing compressor station electrical grounding. Temporary fencing currently in place was installed for security purposes with the expectation of being removed to facilitate further construction activities.
- Remove construction trailer and stabilize area with additional stone.
- Remove ECDs.
- Repair pavement on the main driveway and in front of the gate to existing compressor station where pavement was cut.
- Place stone on access roads, as needed.
- General site cleanup and stabilization, as needed.

6.4 Burch Ridge Compressor Station

The Burch Ridge Compressor Station is an existing EGTS facility located in Marshall County, WV. It is connected to SHP pipelines by existing EGTS infrastructure. No construction activity has occurred at this site; therefore, no further work is needed as part of the project restoration activities.

6.5 Hastings Compressor Station

The Hastings Compressor Station is an existing EGTS facility located in Wetzel County, WV. It is connected to SHP pipelines by existing EGTS infrastructure. No construction activity has occurred at this site; therefore, no further work is needed as part of the project restoration activities.

7 PIPELINE PROGRESS AND RESTORATION SCOPE OF WORK

The scope of work for the purposes of this Plan includes maintaining pipe that has been installed, leaving felled trees in place, and restoring and reclaiming the right-of-way where ground disturbance has occurred. Further refinement of the scope of work will occur through discussions with landowners and permitting/regulatory agencies as necessary. The scope has been developed to minimize further disturbance to the environment and the landowners.

EGTS has identified the locations where trees have been felled and land disturbance has occurred, which would include various phases of construction from clearing through final restoration. The scope of work for the restoration of the project is further described below for each spread and disturbance category.

EGTS will leverage the Best-In-Class (BIC) project team to support restoration activities on steep slopes and areas of instability, if any. This team is comprised of both office and field professionals and can be considered an extension of the project execution team. They will support development of execution plans and will be available during field activities. The development of detailed field execution plans will consider any and all BIC related work performed to date.

7.1 Spread 13

Spread 13 consists of approximately 33.6 miles of pipeline in Harrison, Doddridge, Tyler, and Wetzel Counties, WV. At MP 0.0, the pipeline terminates at an existing EGTS facility, and at MP 33.6, it connects to the Mockingbird Hill Compressor Station. Notices to Proceed for construction activity were granted

from MP 0.0 to 24.8. No activity has taken place on the northern end of the right-of-way between MP 24.8 and MP 33.6.

Project workspace will be restored where various types of ground disturbance have occurred, as described in the following sections. All areas exhibiting soil instability as a result of construction will be permanently stabilized and restored. This may include the use of various permanent rock-type erosion control devices, which have been previously approved in the SWPPP and/or included in the BIC program. In addition, any slips identified within the project workspace will be repaired in accordance with applicable permits and landowner agreements.

7.1.1 Area with Trees Felled

This category includes only section (i.e., parcel) of the project workspace where trees were felled and not removed from the right-of-way. A single right-of-way segment that affects one landowner contains felled timber that was not removed from the right-of-way, as identified in the table below.

Beg. MP	End. MP	Length *(mi)*
5.76	5.89	0.13
	TOTAL	**0.13**

As required per Order Condition 1, EGTS requests modification to the *Plans and Procedures* to allow trees felled to remain left in place on the ground at this parcel. Leaving the trees in place would provide a greater level of environmental protection than the original measure as no further activity is needed, other than the cleanup of survey remnants (survey flagging and stakes, wetland/waterbody delineation markers, etc.) and the removal of all temporary signage, as required. Trees have been on the ground for nearly three years and have adapted to the environment. Natural vegetation has successfully grown around the trees as shown in Photos 1 and 2 of Appendix B.3. EGTS will remove any portion of felled trees that are within waterbodies and are causing damming effects; however, no additional USACE permits are required to hand cut and remove any such trees.

The 2018 FERC FEIS (section 2.3.2.2) and Biological Assessment (section 2.5.2) for the project allowed trees, brush, and other materials removed from the construction right-of-way to be left for beneficial reuse, stabilization, or the Projects' habitat restoration pending landowner approval. No issues regarding federally listed species have been identified based on leaving trees in the right-of-way for the project; rather, leaving trees and brush can help create habitat. Therefore, we are requesting that the trees near in this location be allowed to remain in the workspace. Landowner concurrence to leave the trees has been obtained. Currently, the biological assessment includes leaving felled trees in the area and will be assessed by the USFWS.

The original measure would require unnecessary ground disturbance, including a potential risk of impacting a nearby waterbody. Activities to remove the trees and implement original measures would include:

- Construction of a new access road, including temporary bridge across a stream;
- Installation of erosion and sedimentation controls;
- Large equipment and trucks to remove the trees;
- Clearing and front-end grading; and

- Hydro-seeding and restoration monitoring.

For the reasons listed above, EGTS requests approval to leave trees in place on the one parcel. Additional detail on the location is provided as Appendix B.4. Landowner concurrence is provided as Appendix E.2.

7.1.2 Areas with Clearing Compete

This category includes any areas in which clearing activity was completed, but the construction grade had not yet been established. Restoration on the entire width of the right-of-way may include full contour restoration. Temporary and permanent erosion and sediment controls will be installed and maintained as necessary. Temporary bridge and/or timber mats will be removed when either restoration activity has been completed or they are otherwise no longer needed. Waterbody crossings will be restored at the time the temporary bridges are removed. Permanent fence repair or replacement will be completed, and the right-of-way will be seeded and mulched. These areas are summarized in the table below: Restoration efforts, as explained in Section 5, will be performed in accordance with landowner agreements and applicable permits. Wetland/waterbody impacts have been identified in Appendix C.2.

Beg. MP	End. MP	Length *(mi)*
0.65	5.08	4.43
5.89	9.28	3.39
	TOTAL	**7.82**

7.1.3 Areas with Grading Complete

This category includes any areas in which the entire width of the right-of-way has construction grade established and will require full contour restoration. Temporary and permanent erosion and sediment controls will be installed and maintained as necessary. Temporary bridge and/or timber mat will be removed when either restoration activity requiring their use has been completed or they are otherwise no longer needed. Waterbody crossings will be restored at the time the temporary bridges are removed. Permanent fence repair or replacement will be completed, and the right-of-way will be seeded and mulched. These locations are summarized in the table below. Restoration efforts, as described in Section 5, will be performed in accordance with landowner agreements and applicable permits. Wetland/waterbody impacts have been identified in Appendix C.2.

Beg. MP	End. MP	Length *(mi)*
9.28	10.42	1.14
	TOTAL	**1.14**

7.1.4 Areas with Restoration Achieved

In areas where pipe has not been installed but right-of-way restoration has been achieved as part of the previously approved Stabilization Plan (Accession Nos. 20181219-5240 and 20190424-5136), further disturbance will be minimized to mitigate additional impacts to the environment and the landowners. Temporary bridge and/or timber mat removal in addition to other permanent restoration efforts will be performed as necessary. These areas have been summarized in the table below (includes areas with pipe installed from 7.1.6 below). All work will be completed in accordance with landowner agreements and applicable permits. Wetland/waterbody impacts have been identified in Appendix C.2.

Beg. MP	End. MP	Length *(mi)*
0.00	0.65	0.65
10.42	24.81	14.39
	TOTAL	**15.04**

7.1.5 Areas with No Progress

In areas of the right-of-way which have not been impacted, as identified in the table below, neither tree felling nor ground disturbance have occurred. Therefore, no activities are planned other than the cleanup of survey remnants (survey flagging and stakes, wetland/waterbody delineation markers, etc.) and the removal of all temporary signage, as required. These areas have been summarized in the table below.

Beg. MP	End. MP	Length *(mi)*
5.08	5.76	0.68
24.81	33.56	8.75
	TOTAL	**9.43**

7.1.6 Areas with Pipe Installed

EGTS plans to leave in place all pipe previously installed. Areas where pipe has been installed and the right-of-way has been restored will be avoided to the extent possible to minimize additional impacts to the environment and the landowners.

The installed pipe segments identified in the table below have welded caps installed on either end. For long-term stabilization, EGTS will excavate the ends of each segment in order to fill the pipe with inert gas. This is intended to counter any oxidation effects on the inside of the pipe.

In areas where additional work is required on the right-of-way, restoration efforts will be performed in accordance with landowner agreements and applicable permits. Areas with pipe installed have been summarized in the table below.

Adequate external corrosion control has been installed for sections of installed pipe, and EGTS will continue monitoring activity as part of routine operations as required by Subpart I of 49 CFR 192 (Requirements for Corrosion Control).

Beg. MP	End. MP	Length *(mi)*
10.42	10.80	0.38
12.38	12.85	0.47
12.91	14.10	1.19
14.20	14.32	0.12
14.40	14.91	0.51
15.06	15.09	0.03
15.20	15.52	0.32
15.65	17.64	1.99
18.09	18.52	0.43
18.58	24.79	6.21
	TOTAL	**11.65**

7.1.7 Access Roads

As part of the project restoration process, EGTS will retain the ability to use any access road previously approved via the NTP process. A summary of these roads and the anticipated restoration usage can be found in the table below. Temporary bridge, timber mat, and/or culvert removal in addition to other permanent restoration efforts will be performed as necessary upon completion of restoration activity. Maintenance of these access roads will be performed as necessary to remain in compliance with landowner agreements and applicable permits, with activities including cleaning out roadside ditches, grading with the use of a motor grader, and placing stone. Wetland/waterbody impacts have been identified in Appendix C.2.

Access Road Number	Const. AR	Planned Activities
31-001-AR02	1	Maintenance as needed
31-001-AR01	2	Access for ROW restoration and slough repair; maintenance as needed
31-003-AR01	3	Access for ROW restoration and slough repair; maintenance as needed
31-005-A002-AR01	4	Access for ROW restoration; maintenance as needed
31-005-A006-AR01	5	Access for ROW restoration and slough repair; maintenance as needed
31-005-A008-AR01	7	Access for ROW restoration; maintenance as needed
31-005-A013-AR01	8	Access for ROW restoration; maintenance as needed
31-005-A017-AR01	9	Access for ROW restoration; maintenance as needed
31-005-A024-AR01	10	Access for ROW restoration; maintenance as needed
31-005-A031-AR01	12	Access for ROW restoration; maintenance as needed
31-005-A035-AR01	13	Access for ROW restoration; maintenance as needed
31-040-AR01	14	Access for ROW restoration; maintenance as needed
31-042-A002-AR01	15	Access for ROW restoration; maintenance as needed
31-044-A006-AR01	17	Access for ROW restoration and slough repair; maintenance as needed
31-044-A013-AR01	19	Access for ROW restoration and slip repair; maintenance as needed
31-056-A013-AR04	20	Maintenance as needed
31-056-A013-AR03	21	Maintenance as needed
31-056-A030-AR01	22	Maintenance as needed
31-074-AR01	23	Maintenance as needed
31-076-AR01	24	Maintenance as needed
31-079-AR01	25	Maintenance as needed
31-086-AR01	26	Access for slough repair; maintenance as needed
31-090-AR01	27	Access for slough repair; maintenance as needed
31-090-AR02	27A	Access for slough repair; maintenance as needed
31-094-AR01	29	Access for slough repair; maintenance as needed
31-098-AR01	30	Debris removal; maintenance as needed
31-100-A002-AR01	32	Access for ROW restoration; maintenance as needed
31-100-A015-AR01	34	Maintenance as needed
31-100-A017-AR02	36	Maintenance as needed
33-001-A002-AR04	37	Access for slip repair; maintenance as needed
33-001-A002-AR03	38	Access for slough repair; maintenance as needed

7.1.8 Contractor Yards

There are six contractor yards located within Spread 13, and the location of each in relation to the nearest point on the pipeline is shown in the table below. These contractor yards will be restored in accordance with landowner agreements and applicable permits.

CY	Nearest MP	Restoration Activities
5	33.6	Previously restored; no activity required
6	33.6	No construction activity has occurred; no restoration required
7	18.6	Previously restored; no activity required
8	18.6	Remove project materials, rock construction entrance, and signage; grade, seed, and mulch as necessary
9	5.2	Remove project materials; remove signage, place stone as necessary
10	10.6	Cut pipe/fittings as necessary for removal; remove project materials and equipment, office trailers, tents/storage facilities, signage, and containments/wash bay; place stone as necessary

7.1.9 Slip Monitoring and Remediation

The SHP area is susceptible to slips, which is evidenced by the extensive slip mitigation methods approved for use during construction as well as various areas which have already required repair. Slips can create adverse erosion control conditions, result in sediment deposits in adjacent waterways, cause landowner complaints, and/or damage the pipeline or other infrastructure. Slips are costly to repair, so it is important to perform remediation activities as soon as possible. For any slips that occur within the certificated workspace in areas where construction activity has taken place, EGTS proposes to mobilize repair personnel and perform repairs using previously approved methods in the SWPPP and/or included in the BIC program. No slip repairs will be completed in areas where tree felling or other construction activities have yet to commence.

7.2 Spread 14

Spread 14 consists of approximately 3.9 miles of pipeline in Westmoreland County, PA. At MP 0.0, this pipeline terminates with an existing EGTS pipeline, and at MP 3.9, it terminates at the JB Tonkin Compressor Station. No construction activity or contractor yard development has commenced in this area; therefore, no further work is needed as part of the project restoration activities.

8 LANDOWNER COORDINATION

The project impacts 289 tracts of land across both spreads, of which 208 (72%) have had some type of ground disturbance or tree felling activities performed. For the tracts with ground disturbance or tree felling, only one (1) tract has felled trees still on the ground. Further tract data can be found in the table below.

Category	No. of Tracts
Total	289
Spread 13	254
Ground Disturbance / Tree Felling	208
Pipe Installed	61
No construction activity	46
Spread 14	35
No construction activity	35

EGTS will continue with its landowner outreach and plans to contact all landowners including those that were not impacted by construction activities. In order to execute its planned restoration scope, EGTS anticipates that further negotiations are required with some landowners so that the work can be completed in an efficient and environmentally compliant manner. EGTS is prioritizing its communications with landowners based whether ground disturbance and/or tree felling occurred on a tract and the type of activity completed.

EGTS will comply with the applicable legal obligations in its agreements with landowners. EGTS will coordinate with landowners to ensure the work is completed to the reasonable satisfaction of the landowner.

9 SCHEDULE

Restoration activity is not anticipated to commence until at least after the upcoming winter season recedes and weather conditions warrant work to progress. EGTS will request to implement this Plan at the conclusion of Section 7 consultation.

Restoration activities described in this Plan are expected to last approximately 6 months. Refer to Appendix F for a breakdown of the approximate timeline by facility.

10 APPENDICES

See following pages for information included in appendices referenced in this document.

10.1 Appendix A – Project Overview Data

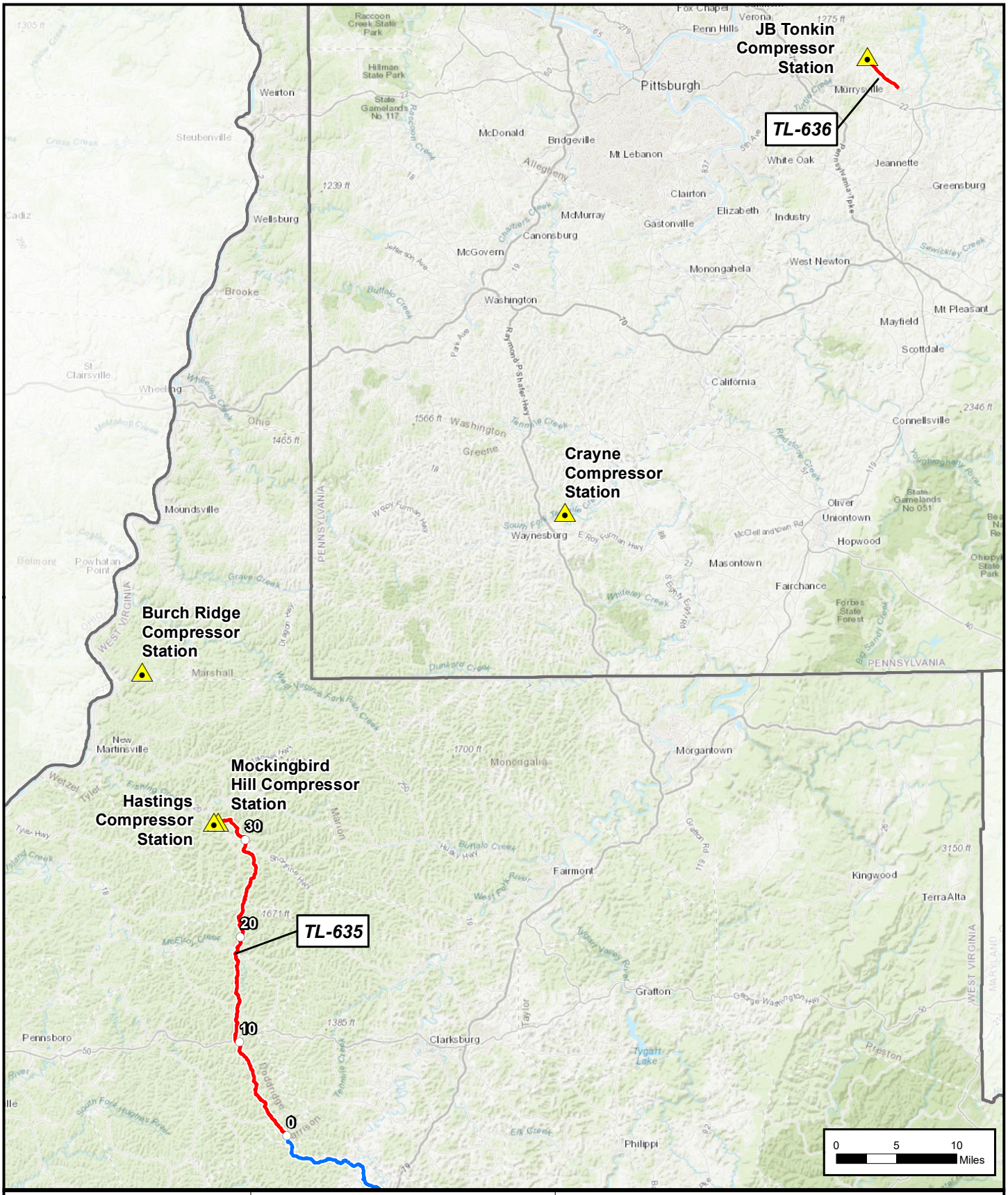
Appendix A

Project Overview Data

10.1.1 Appendix A.1 – Project Overview Map

Appendix A.1

Project Overview Map



Dominion Energy

SHP Compressor Station
SHP Mainline
ACP Mainline

Supply Header Project
Figure 1
Project Overview Map

ERM

FILE: M:\Clients\D-F\DOM\Supply_Header_ArcGIS\COE_Report_Figures_WV_401_WQC_Figures_DRS_SHP_Project_Overview.mxd, REVISED: 08/24/2020, SCALE: 1:700,000 DRAWN BY: JPB

10.1.2 Appendix A.2 – Construction Status Table

Appendix A.2

Construction Status Table

Beginning Station	Beginning Milepost	Ending Station	Ending Milepost	Construction Progress / ROW Category
0+00	0.00	7+00	0.13	Cleared
7+00	0.13	9+80	0.19	Graded
9+80	0.19	268+00	5.08	Cleared
268+00	5.08	304+00	5.76	No activity
304+00	5.76	311+00	5.89	Trees Felled
311+00	5.89	489+91	9.28	Cleared
489+91	9.28	550+00	10.42	Graded
550+00	10.42	570+00	10.80	Restored
570+00	10.80	653+00	12.37	Graded
653+00	12.37	678+50	12.85	Restored
678+50	12.85	681+35	12.90	Graded
681+35	12.90	744+70	14.10	Restored
744+70	14.10	749+00	14.19	Graded
749+00	14.19	756+42	14.33	Restored
756+42	14.33	760+04	14.39	Graded
760+04	14.39	785+84	14.88	Restored
785+84	14.88	794+97	15.06	Graded
794+97	15.06	797+00	15.09	Restored
797+00	15.09	803+48	15.22	Graded
803+48	15.22	819+70	15.52	Restored
819+70	15.52	826+34	15.65	Graded
826+34	15.65	931+65	17.64	Restored
931+65	17.64	955+41	18.09	Graded
955+41	18.09	978+00	18.52	Restored
978+00	18.52	981+20	18.58	Graded
981+20	18.58	1309+00	24.79	Restored
1309+00	24.79	1310+00	24.81	Cleared
1310+00	24.81	1771+98	33.56	No activity

10.2 Appendix B – Project-Specific Documentation

Appendix B

Project Specific Documentation

10.2.1 Appendix B.1 – Facilities Details and Figures

Appendix B.1

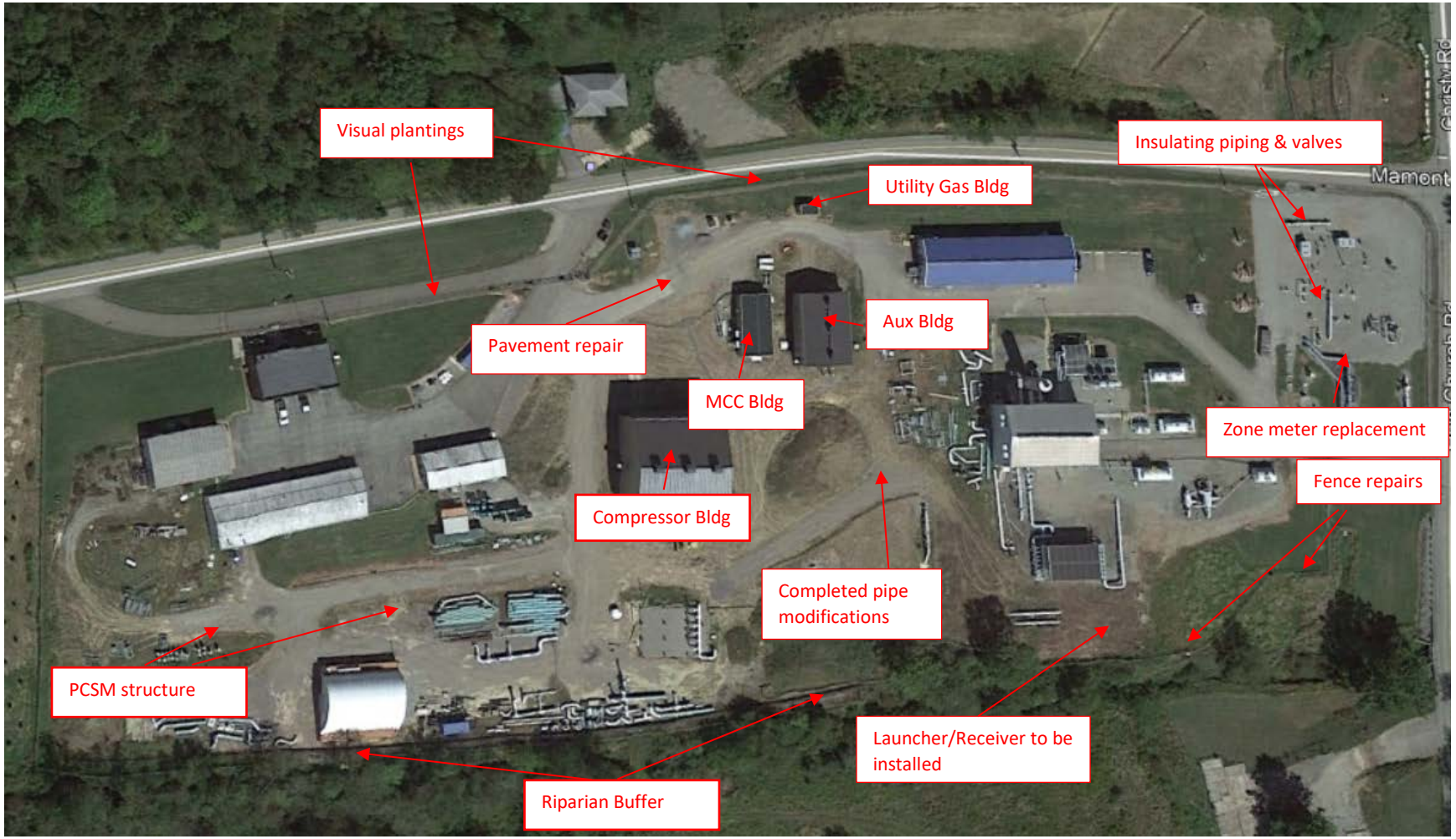
Facilities Details and Figures

Crayne CS: View of compressor building extension exterior; restoration activity completed

Crayne CS: View of installed gas cooler

Crayne CS: Opposite view of gas cooler area

JB Tonkin CS: Aerial view of site and proposed locations of restoration activity

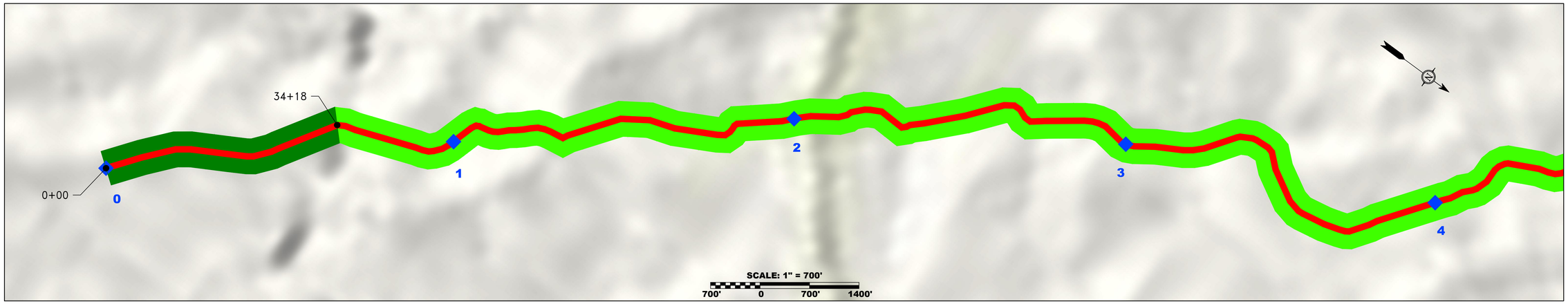


Mockingbird Hill CS - Aerial view of site and locations of proposed restoration activity

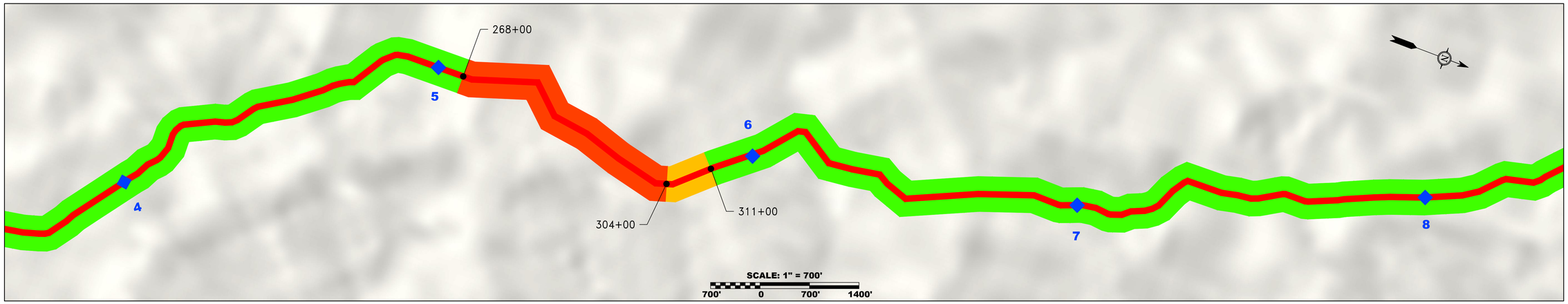
10.2.2 Appendix B.2 – Pipeline Construction Status Maps

Appendix B.2

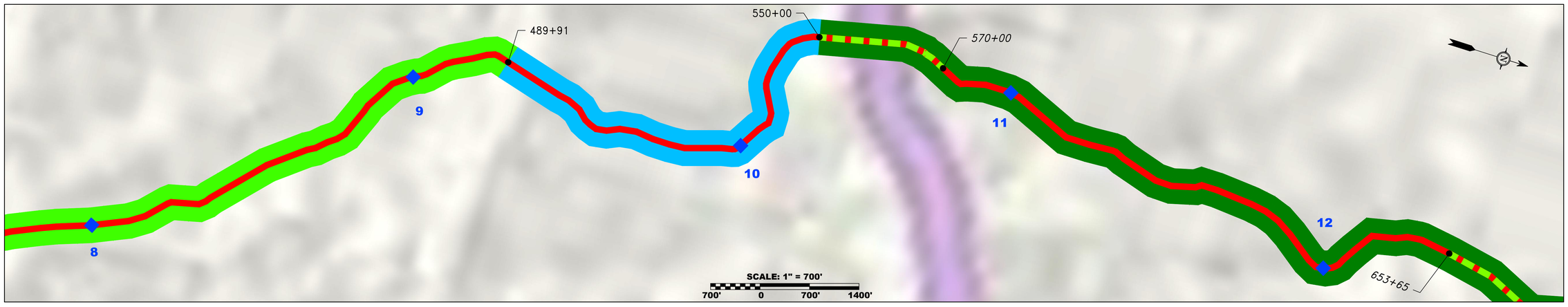
Pipeline Construction Status Maps



WV SHP TL-635 CONSTRUCTION PROGRESS MAP – MILEPOST 0.0 – MILEPOST 4.0



WV SHP TL-635 CONSTRUCTION PROGRESS MAP – MILEPOST 4.0 – MILEPOST 8.0



WV SHP TL-635 CONSTRUCTION PROGRESS MAP – MILEPOST 8.0 – MILEPOST 12.0

LEGEND

- PROPOSED GAS PIPELINE
- INSTALLED GAS PIPELINE
- IFC MILEPOSTS
- TREES NOT FELLED
- TREES FELLED
- CLEARED
- GRADED
- RESTORED

THIS DRAWING WAS PRODUCED WITH COMPUTER AIDED DRAFTING TECHNOLOGY AND IS SUPPORTED BY ELECTRONIC DRAWING FILES. DO NOT REVISE THIS DRAWING VIA MANUAL DRAFTING METHODS.

REVISIONS				
NO.	DATE	DWN.	CHKD.	APPVD.	DESCRIPTION
6	09/08/20	CJF			PROGRESS UPDATE
5	05/28/19	CJF			PROGRESS UPDATE
4	01/08/19	CJF			PROGRESS UPDATE

WV SUPPLY HEADER PROJECT – 30" TL-635 PIPELINE
CONSTRUCTION PROGRESS MAP

DOMINION TRANSMISSION, INC.
925 WHITE OAKS BLVD.
BRIDGEPORT, WV 26330

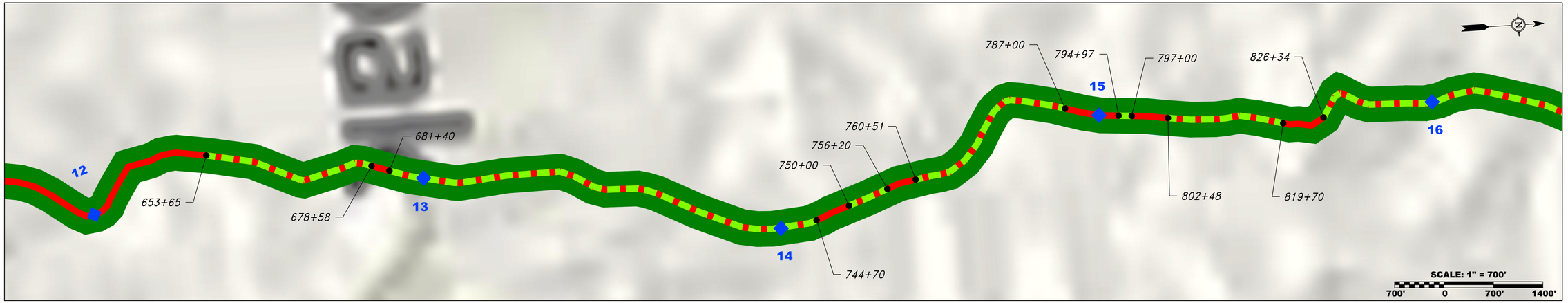
SCALE:	AS SHOWN
DATE:	09/09/20
DRAWN:	FortnCJ
CHECKED:	UberSD
APPROVED:	UberSD

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

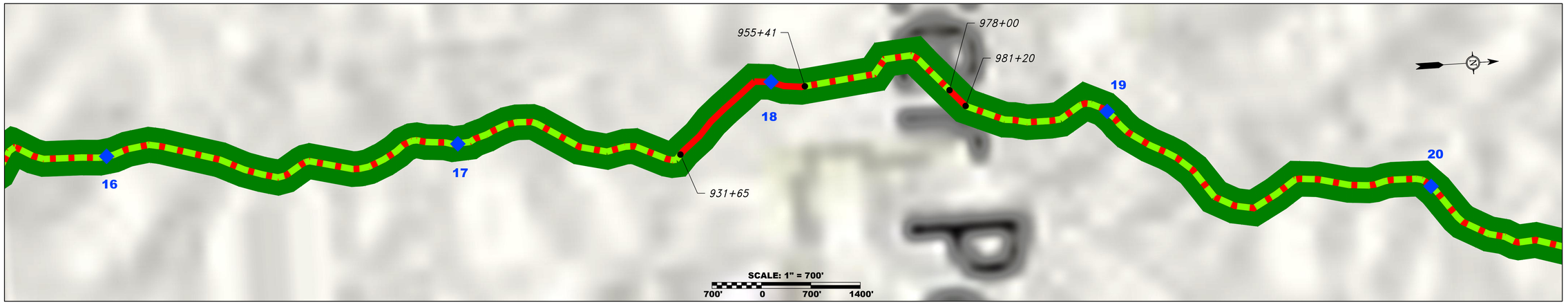
PROJECT NO./DASH NO.	C141330-01
TASK NO.	SUB TASK NO.
005	00
GROUP ID	DRAWING NO.
D	
SHEET 1 OF 3	

9/9/2020 9:39 AM

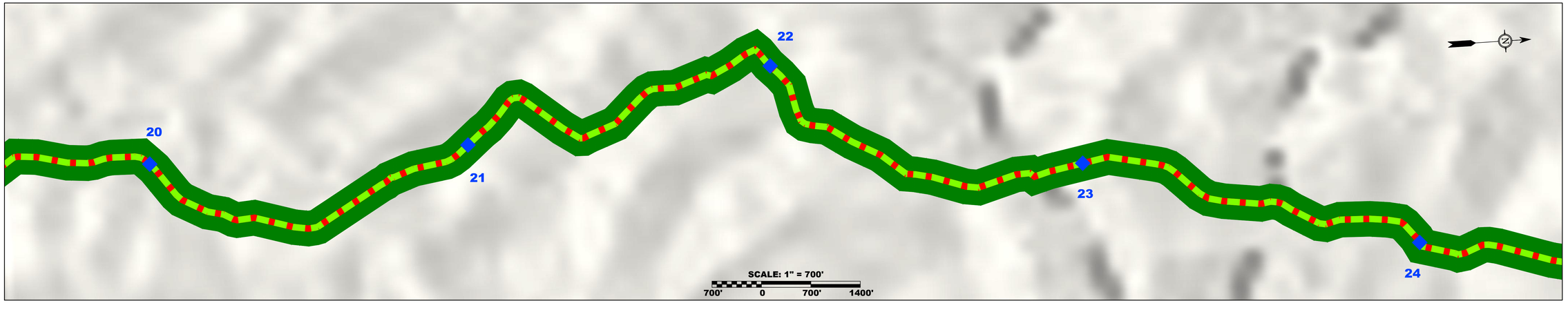
GAI CAD FILE NO.Z:\ENERGY\2014\C141330.01 – DTI – SUPPLY HEADER – SUR\CAD\SURV C141330.01\CONSTRUCTION_ALIGNMENT – WV\DWG\2018 IP ALIGNMENTS_MP0-MP20\DWG\EXHIBITS\2018 FERC STABIL PLANS\2018 FERC STABIL PLANS_24X36.DWG



WV SHP TL-635 CONSTRUCTION PROGRESS MAP – MILEPOST 12.0 – MILEPOST 16.0



WV SHP TL-635 CONSTRUCTION PROGRESS MAP – MILEPOST 16.0 – MILEPOST 20.0



WV SHP TL-635 CONSTRUCTION PROGRESS MAP – MILEPOST 20.0 – MILEPOST 24.0

LEGEND

PROPOSED GAS PIPELINE	TREES NOT FELLED	GRADED
INSTALLED GAS PIPELINE	TREES FELLED	RESTORED
IFC MILEPOSTS	CLEARED	

REVISIONS

NO.	DATE	DWN.	CHKD.	APPVD.	DESCRIPTION
6	09/08/20	CJF			PROGRESS UPDATE
5	05/28/19	CJF			PROGRESS UPDATE
4	01/08/19	CJF			PROGRESS UPDATE

WV SUPPLY HEADER PROJECT – 30" TL-635 PIPELINE
CONSTRUCTION PROGRESS MAP

DOMINION TRANSMISSION, INC.
925 WHITE OAKS BLVD.
BRIDGEPORT, WV 26330

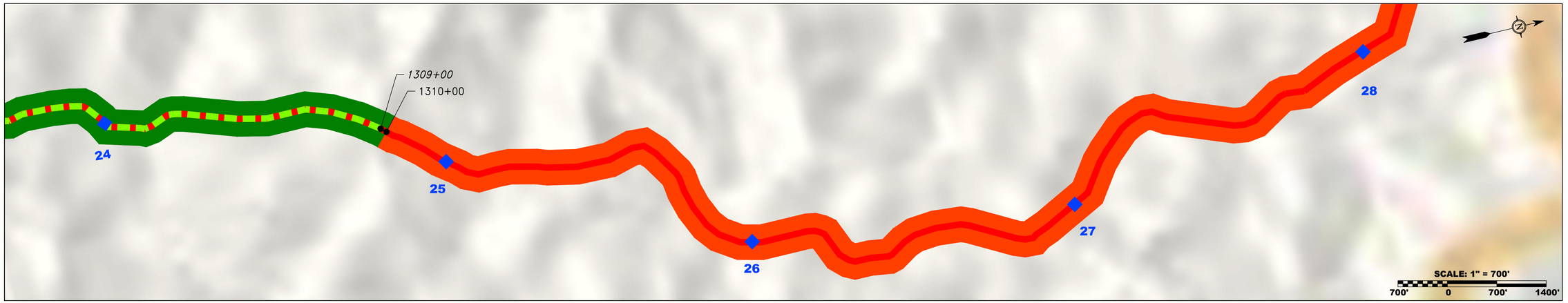
SCALE:	AS SHOWN
DATE:	09/09/20
DRAWN:	FortnCJ
CHECKED:	UberSD
APPROVED:	UberSD

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

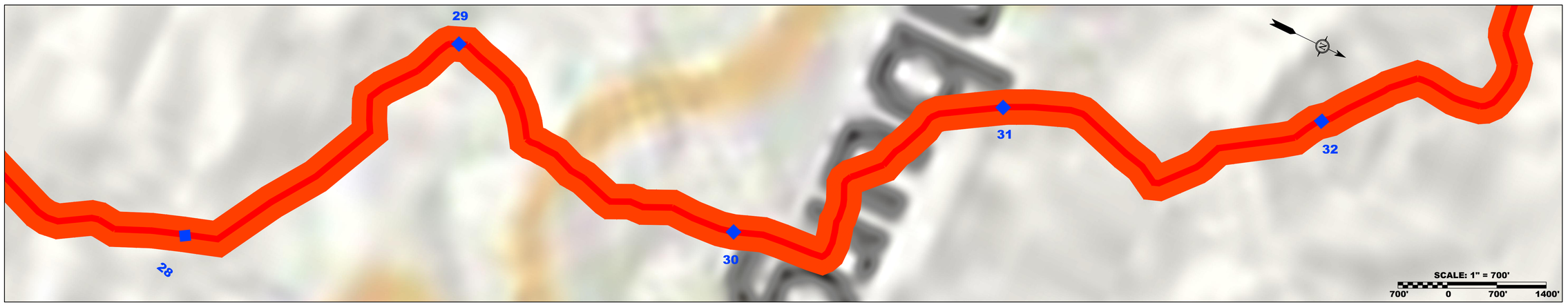
PROJECT NO./DASH NO.	C141330-01
TASK NO.	005
SUB TASK NO.	00
GROUP ID	D
DRAWING NO.	

SHEET 2 OF 3

9/9/2020 9:43 AM



WV SHP TL-635 CONSTRUCTION PROGRESS MAP – MILEPOST 24.0 – MILEPOST 28.0



WV SHP TL-635 CONSTRUCTION PROGRESS MAP – MILEPOST 28.0 – MILEPOST 32.0

WV SHP TL-635 CONSTRUCTION PROGRESS MAP – MILEPOST 32.0 – MILEPOST 33.6

LEGEND

PROPOSED GAS PIPELINE	TREES NOT FELLED	GRADED
INSTALLED GAS PIPELINE	TREES FELLED	RESTORED
IFC MILEPOSTS	CLEARED	

THIS DRAWING WAS PRODUCED WITH COMPUTER AIDED DRAFTING TECHNOLOGY AND IS SUPPORTED BY ELECTRONIC DRAWING FILES. DO NOT REVISE THIS DRAWING VIA MANUAL DRAFTING METHODS.

GAI CAD FILE NO. Z:\ENERGY\2014\C141330.01 – DTI – SUPPLY HEADER – SUR\CAD\SURV C141330.01\CONSTRUCTION_ALIGNMENT – WV\DWG\2018 IP ALIGNMENTS_MP0-MP20\DWG\EXHIBITS\2018 FERC STABIL PLANS\2018 FERC STABIL PLANS_24X36.DWG

REVISIONS

NO.	DATE	DWN.	CHKD.	APPVD.	DESCRIPTION
6	09/08/20	CJF			PROGRESS UPDATE
5	05/28/19	CJF			PROGRESS UPDATE
4	01/08/19	CJF			PROGRESS UPDATE

WV SUPPLY HEADER PROJECT – 30" TL-635 PIPELINE
CONSTRUCTION PROGRESS MAP

DOMINION TRANSMISSION, INC.
925 WHITE OAKS BLVD.
BRIDGEPORT, WV 26330

SCALE:	AS SHOWN
DATE:	09/09/20
DRAWN:	FortnCJ
CHECKED:	UberSD
APPROVED:	UberSD

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

PROJECT NO./DASH NO.	C141330-01
TASK NO.	005
SUB TASK NO.	00
GROUP ID	D
DRAWING NO.	
SHEET	3 OF 3

9/9/2020 9:44 AM

10.2.3 Appendix B.3 – Representative Photos

Appendix B.3

Representative Photos

PHOTO 1 **Spread 13 – MP 5.7**: Right-of-way with felled trees; facing north

PHOTO 2 **Spread 13 – MP 5.9**: Right-of-way with felled trees; facing south

PHOTO 3 **Spread 13 – MP 6.3:** Right-of-way cleared but not graded; facing north

PHOTO 4 **Spread 13 – MP 9.7:** Right-of-way cleared and graded; facing south

PHOTO 5 **Spread 13 – MP 10.3:** Right-of-way cleared and graded; facing south

PHOTO 6 **Spread 13 – MP 22.7:** Right-of-way restored (pipe installed); facing north

PHOTO 7 **Spread 13 – MP 22.7:** Right-of-way restored (pipe installed); facing south

10.2.4 Appendix B.4 – Felled Tree Location

Appendix B.4

Felled Tree Location

Date of Photos: August 25th, 2020

Right-of-Way with felled trees, facing north.

Right-of-Way with felled trees, facing south.

- Photo Point
- Milepost
- TL-635 Centerline
- Access Road
- Restoration Workspace
- Felled Tree Area
- Waterbody
- Wetland

BHE GT&S

Supply Header Project
Felled Trees within the Right-of-Way

ERM

MPLS M:\Clients\D-F\DOM\Supply_Header_ArcGIS\2020\11\Figures\SHP_Felled_Trees.mxd | REVISED: 11/12/2020 | SCALE: 1:1,800

DRAWN BY: JPB

10.2.5 Appendix B.5 – JB Tonkin Plot Plan

Appendix B.5

JB Tonkin Plot Plan

Contains Critical Energy Infrastructure information - Provided Under Separate Cover

10.3 Appendix C – Environmental Documentation

Appendix C

Environmental Documentation

10.3.1 Appendix C.1 – Environmental Permit List

Appendix C.1

Environmental Permit List

Federal Permit Summary

Agency	Permit/Approval	Permit Status
FERC	Certificate under Section 7(c) of the Natural Gas Act and Authorization under Section 7(b) of the Natural Gas Act	Issued in October 2017.
U.S. Army Corps of Engineers (USACE)	Permits under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act	Issued in February 2018 (Accession No. 20180223-5097).
U.S. Fish & Wildlife Service	Consultation under Section 7 of the ESA (T&E)	Consultation is ongoing and is expected to be completed in the first quarter of 2021.
Advisory Council on Historic Preservation	Consultation Section 106 of the National Historic Preservation Act	Programmatic agreement finalized, signed and implemented in January 2018.

Permit Summary

Agency	Permit/Approval	Permit Status
West Virginia Department of Environmental Protection (WVDEP), Department of Water and Waste Management	General Water Pollution Control Permit for Construction Stormwater	Issued in April 2018.
WVDEP, Department of Water and Waste Management	Water Quality Certificate Under Section 401 of the Clean Water Act	Coverage under USACE Nationwide Permit 12.
West Virginia Division of Culture and History	Consultation under Section 106 of the National Historic Preservation Act	Programmatic agreement finalized, signed and implemented in January 2018.
West Virginia Division of Natural Resources, Office of Land and Streams	Stream Activity Permit	Issued between March 2016 and May 2020.
Randolph, Upshur, and Pocahontas Counties	Floodplain Permit	Issued between October 2017 and May 2019.
Pennsylvania Department of Environmental Protection (PADEP), Bureau of Waterways Engineering and Wetlands	Water Quality Certificate Under Section 401 of the Clean Water Act	Issued in December 2017.
PADEP, Bureau of Waterways Engineering and Wetlands	Chapter 105 Water Obstruction and Encroachment Permit	Issued December 2017.
Pennsylvania Historical and Museum Commission, Bureau for Historic Preservation	Consultation under Section 106 of the National Historic Preservation Act	Programmatic agreement finalized, signed and implemented in January 2018.
Westmoreland and Greene County Conservation Districts	Review of Erosion and Sediment Control Plan and Issuance of ESCGP-2	Issued December 2017.

10.3.2 Appendix C.2 – Wetland/Waterbody Impacts

Appendix C.2

Wetland/Waterbody Impacts

Feature ID	MP	EGTS AR #	FERC AR #	Activities During Restoration
sdog001	0.8	--	Pipeline ROW	Remove gabion baskets, mats, culvert, stone
wdog005e	1.3	--	Pipeline ROW	Remove mats
sdoh004	1.3	--	Pipeline ROW	Remove pipe bridge
wdog006f	2.9	--	Pipeline ROW	Remove mats
sdog016	2.9	AR 7	31-005-A008-AR01	Remove mats and culverts
sdog015	2.9	AR 7	31-005-A008-AR01	Remove mats and culverts
wdoa002e	4.0	AR 8	31-005-AO13-AR01	Remove mat bridge
sdog020	4.6	--	Pipeline ROW	Remove mat bridge
sdoj008	5.0	AR 10	31-005-A024-AR01	Remove pipe bridge
sdoj007_1	5.2	AR 11	31-005-A025-AR01	Remove pipe bridge
sdoj007_2	5.2	AR 11	31-005-A025-AR01	Remove pipe bridge
sdoa021	5.3	AR 11	31-005-A025-AR01	Remove pipe bridge
sdoa018 [a]	5.9	AR 12	31-005-A031-AR01	Remove mats and culverts
sdoa005	6.1	AR 12	31-005-A031-AR01	Remove mats and culverts
sdoa011	6.7	--	Pipeline ROW	Remove pipe bridge
sdoj004	7.7	AR 15	31-042-A002-AR01	Remove mats and stone over existing culvert
wdog010f	12.2	--	Pipeline ROW	Remove mats
wdoh006f	14.1	AR 23	31-074-AR01	Remove mats
sdoh020	14.1	AR 23	31-074-AR01	Remove culverts and stone
sdog007_1	14.2	--	Pipeline ROW	Remove mats and culverts
sdog007_2	14.2	AR 23	31-074-AR01	Remove mats and pipe bridge over existing culvert
sdog029	14.2	AR 23	31-074-AR01	Remove mat bridge
sdoh021	14.3	AR 25	31-079-AR01	Remove mats over existing culvert
sdoh021	14.4	AR 27	31-090-AR01	Remove pipe bridge
sdog008_1	15.1	--	Pipeline ROW	Remove mats, culverts, and stone
sdog009	15.2	AR 25	31-079-AR01	Remove mats, culverts, and stone
sdoh009	15.6	--	Pipeline ROW	Remove mats, culverts, and stone
sdoh008_1	15.8	AR 26	31-086-AR01	Remove mats
sdog030	15.8	AR 26	31-086-AR01	Remove culverts, stone, and jersey barriers
sdoh024	16.4	AR 27	31-090-AR01	Remove mat on existing bridge
sdoh010_2	17.8	--	Pipeline ROW	Remove culverts and stone
swzg024_1	24.7	--	Pipeline ROW	Remove mats and culverts
swzg024_2	24.7	--	Pipeline ROW	Remove mats and culverts
swzg024_3	24.7	AR 38	33-001-A002-AR03	Remove mats and culverts
wwzg003f_2	24.7	AR 38	33-001-A002-AR03	Remove mats
swzg024	24.8	--	Pipeline ROW	Remove mats and culverts
wwzg003f_1	24.8	--	Pipeline ROW	Remove mats and culverts
swzh023_1	24.8	AR 38	33-001-A002-AR03	Remove pipe bridge
swzh023_2	24.8	AR 38	33-001-A002-AR03	Remove pipe bridge
swzh023_3	24.8	AR 38	33-001-A002-AR03	Remove pipe bridge
swzh022	25.0	AR 38	33-001-A002-AR03	Remove mat bridge
swzh025	25.4	AR 38	33-001-A002-AR03	Remove mats

[a] Crossing is on County Road 11/15; not crossed by a restoration access road/workspace.

10.3.3 Appendix C.3 – Cultural Resource Reports

Appendix C.3

Cultural Resource Reports

Cultural Resources Reports for the Supply Header Project			
Report Name	**Report Accession Number**	**SHPO Concurrence Accession Number**	**Survey Area**
PA Aboveground Cultural Resources Reconnaissance Survey Report (February 2016)	20160324-5120	20160513-5223	JB Tonkin Compressor Station; and Crayne Compressor Station.
PA Aboveground Cultural Resources Reconnaissance Survey Report, Addendum Report 2 (November 2018)	20181102-5168	20181130-5185	JB Tonkin Compressor Station Yard.
PA Phase I Archaeological Survey Report Revised (March 2016)	20160415-5015	20160901-5260	JB Tonkin Compressor Station; and Crayne Compressor Station
PA Phase I Archaeological Survey Report Addendum 2 (January 2018)	20170728-5119	20170908-5185	JB Tonkin Compressor Station
PA Phase I Archaeological Survey Report Addendum 3 (November 2018)	20191112-5297	20191112-5296	JB Tonkin Compressor Station Yard.
WV Phase I Cultural Resource Survey Report Revised (May 2016)	20160513-5222	20170310-5157	Pipeline ROW and access roads (MP 0.0 to 24.8); Mockingbird Compressor Station; and Contractor Yards 5, 6, 7, 8, 9, and 10.
WV Phase I Cultural Resource Survey Report Addendum 1 (September 2016)	20160930-5311	20171117-5168	Access roads (MP 0.6 to 18.6); and water impoundment area (MP 18.6).
WV Phase I Cultural Resource Survey Report Addendum 3 (January 2018)	20171020-5130	20180103-5170	Pipeline ROW (MP 5.2 to 5.7)
WV Phase I Cultural Resource Survey Report Addendum 4 (January 2018)	20180405-5172	20180515-5257	Pipeline ROW and access roads (MPs 0.0 to 8.0, 11.5 to 17.6; 19.0 to 20.2, 24.4 to 24.8
WV Phase I Cultural Resource Survey Report Addendum 5 (March 2018)	20180405-5172	20180515-5257	Pipeline and access roads (MPs 5.4 to 5.7, 20.4 to 21.7).
WV Phase I Cultural Resource Survey Report Addendum 6 (April 2018)	20180502-5020	20180523-5124	Pipeline ROW (MPs 0.8, 4.0, to 6.7, 9.4, 14.1).
WV Phase I Cultural Resource Survey Report Addendum 7 (November 2018)	20181102-5169	20191112-5296	Staging Area (MP 2.0)
WV Phase I Cultural Resource Survey Report Addendum 8 (November 2018)	20181102-5169	20191112-5296	Pipeline ROW and access roads (MPs 21.1)
WV Phase II Investigations at 46DO89 (March 2017)	20170310-5158	20170505-5036	Site 46DO89 (MP 18.3-18.4)
WV Data Recovery Research Design: Site 46DO89 (July 2017)	20170728-5119	20170908-5185	Site 46DO89 (MP 18.3-18.4)

10.3.4 Appendix C.4 – T&E Species Mitigation Activities

Appendix C.4

T&E Species Mitigation Activities

Species	Agency	Commitment/Conservation Measure	Source Documents	Implementation Status [a]	Comments
MBTA	FWS, FERC	Migratory Bird Plan	FEIS July 2017 Implementation Plan (October 2017) Migratory Bird Plan (Rev 5, Sept 2017)	Ongoing	Migratory Bird Plan adhered to during completed construction activities. Commitment remains for restoration activities and will be addressed in the SHP Restoration Project Biological Assessment. In August 2018 FERC approved the use of bird monitors to allow construction to remove vegetation to remove previously felled trees on the ROW.
Bat Mitigation	FWS, FERC, WVDNR	Install and monitor bat boxes, girdle trees, and construct pond structures for bat mitigation. Onsite implementation planned at the Lewis Wetzel Wildlife Management Area and at Mockingbird CS by ERM.	January 2017 Final Draft BA SHP Myotid Conservation Plan May 2017 FEIS July 2017 (4-269)	Pending	SHP Myotid Conservation Plan updated to reflect actual impacts from prior construction. No new tree felling is planned based on restoration activities. Prior impacts within occupied habitat requiring mitigation include 2 occupied roost trees, 4 primary potential roost trees, and 11 secondary potential roost trees. Therefore, mitigation in the form of 6 bat boxes and girdling of 6 trees is proposed.
Indiana Bat	FWS, FERC	• Tree felling will not occur: o April 1 to November 15 within known use spring staging/fall swarming habitat in VA & WV.	January 2017 Final Draft BA SHP Myotid Conservation Plan FEIS July 2017 (pg. 4-264, 4-265, etc.) Timber Removal Plan (Rev 2, October 2017)	Ongoing	Will maintain commitment through restoration activities
NLEB	FWS, FERC	The Project will not fell trees within 0.25-mile of known hibernacula during any time of year or within 150-feet of known occupied roosts during the pup season (June 1 to July 31).	Mandated by the 4(d) rule; exceptions require a BO with take. January 2017 Final Draft BA FEIS July 2017 (pg. 4-276) Timber Removal Plan (Rev 2, October 2017)	Ongoing	Will maintain commitment through restoration activities
NLEB	FWS, FERC	EGTS will limit specific construction activities (felling, backfilling, and grading) within 150 feet of known roost trees identified to between 0.5 hour after sunrise and 0.5 hour before sunset during the pup season (June 1 to July 31). This no-activity buffer will minimize disturbances around the roost tree during active periods that might negatively impact bats entering and leaving roosts and will allow bats to return to roost trees at dawn and to emerge from roosts at dusk.	January 2017 Final Draft BA SHP Myotid Conservation Plan FEIS July 2017 (pg. 4-276)	Ongoing	Check with construction if no felling needed then status would be complete
Aquatic Species (FWS Enhanced Conservation Measures)	FWS, FERC	FWS enhanced conservation measures • EGTS will alert the FWS and the appropriate state agencies when work begins in the sensitive waterbodies.	FEIS July 2017 Implementation Plan EC 65 (October 2017)	Ongoing	Will maintain commitment through restoration activities
Aquatic Species (FWS Enhanced Conservation Measures)	FWS, FERC	FWS enhanced conservation measures • EIs will be onsite during construction activities and will have stop work authority. FERC third-party compliance monitors will also be onsite during construction, and if compliance issues are identified, the monitors will have the authority to stop work in the area until the compliance issue is resolved. EGTS will use species experts to conduct all required biological monitoring (e.g., species relocations) and will document and report on these activities as they are conducted.	FEIS July 2017 Implementation Plan EC 65 (October 2017)	Ongoing	Will maintain commitment through restoration activities
Aquatic Species (FWS Enhanced Conservation Measures)	FWS, FERC	FWS enhanced conservation measures • There will be an increased buffer between refueling/overnight equipment and vehicle parking areas at sensitive waterbodies (i.e., minimum 300-foot separation).	FEIS July 2017 Implementation Plan EC 65 (October 2017)	Ongoing	Will maintain commitment through restoration activities
Aquatic Species (FWS Enhanced Conservation Measures)	FWS, FERC	FWS enhanced conservation measures • Any spills within 100 feet upslope of ESA sensitive waterbodies will be reported to the appropriate FWS office within 24 hours of identification for input on species-specific mitigation.	FEIS July 2017 Implementation Plan EC 65 (October 2017)	Ongoing	Will maintain commitment through restoration activities
Aquatic Species (FWS Enhanced Conservation Measures)	FWS, FERC	FWS enhanced conservation measures • EGTS will install temporary equipment crossings to reduce the potential for increased erosion and sedimentation resulting from construction equipment and vehicular traffic crossing waterbodies. These temporary crossings will be removed following construction. At ESA sensitive waterbodies, EGTS will not use the onetime pass allowance during clearing activities; rather, equipment will move around or pass over installed bridges to minimize in-stream impacts.	FEIS July 2017 Implementation Plan EC 65 (October 2017)	Ongoing	Will maintain commitment through restoration activities
Aquatic Species (FWS Enhanced Conservation Measures)	FWS, FERC	FWS enhanced conservation measures • No grubbing will occur within 50 feet of ESA sensitive waterbodies between November 15 and April 1. For waterbodies requiring bridge installation during this timeframe, grubbing or grading within an approximately 25-foot area may be required through the riparian buffer to accommodate bridge installation; however, additional erosion and sedimentation control measures will be installed to protect the sensitive waterbody. No grubbing will take place within 50 feet of the waterbody between November 15 and April 1 at waterbodies that are not crossed by the trenchline, but within the construction workspace.	FEIS July 2017 Implementation Plan EC 65 (October 2017)	Ongoing	Will maintain commitment through restoration activities
Aquatic Species (FWS Enhanced Conservation Measures)	FWS, FERC	FWS enhanced conservation measures • EGTS will use compost filter socks at the edges of workspace and access roads within 300 feet of the ESA sensitive waterbodies. The sizing of the compost filter socks will be based on industry-accepted methodology and will typically consist of a single layer of 12 inch or 18-inch diameter compost filter sock. Where sizing calculations suggest use of large diameter compost filter socks, a triple stack of 18-inch-diameter compost filter socks will be used.	FEIS July 2017 Implementation Plan EC 65 (October 2017)	Ongoing	Will maintain commitment through restoration activities
Aquatic Species (FWS Enhanced Conservation Measures)	FWS, FERC	FWS enhanced conservation measures • EGTS will use Priority 1 (green band) belted silt retention fence to cross wetlands and waterbodies. EGTS will conduct installation and daily inspection and maintenance of the silt fence in accordance with the site-specific construction alignment sheets prior to and during trenching operations, stockpiling of saturated trench material, lowering-in or floating the pipeline into the trench, and during backfilling of the trench to contain trench spoils and turbidity within the confines of the construction right-of-way.	FEIS July 2017 Implementation Plan EC 65 (October 2017)	Ongoing	Will maintain commitment through restoration activities

Species	Agency	Commitment/Conservation Measure	Source Documents	Implementation Status [a]	Comments
Aquatic Species (FWS Enhanced Conservation Measures)	FWS, FERC	FWS enhanced conservation measures • EGTS will use erosion and sedimentation control BMPs on access roads identified in the field as having significant erosion potential within 0.25 mile of ESA sensitive waterbodies. If an access road crosses a waterbody with potentially suitable habitat for ESA-listed, proposed, or under review species and the access road requires in-stream activities for improvements, EGTS will conduct surveys prior to any construction activities. If EGTS documents ESA-listed, proposed, or under review species in the waterbody, they will not use the access road unless in-stream activities could be avoided such as through use of an existing bridge.	FEIS July 2017 Implementation Plan EC 65 (October 2017)	Ongoing	Will maintain commitment through restoration activities
Aquatic Species (FWS Enhanced Conservation Measures)	FWS, FERC	FWS enhanced conservation measures • EGTS proposes to complete waterbody crossings during low flow times of the year and when weather forecasts do not predict storm events. In sensitive waterbodies, EGTS will install in-stream silt/turbidity curtains or silt fencing at non-HDD waterbody crossing locations on the downstream side of the work area, as appropriate, based on conditions at the time of crossing.	FEIS July 2017 Implementation Plan EC 65 (October 2017)	Ongoing	Will maintain commitment through restoration activities
Aquatic Species (FWS Enhanced Conservation Measures)	FWS, FERC	FWS enhanced conservation measures • EGTS will implement the BIC Program incremental controls described in Section 4.1.4.2 of the FEIS to mitigate erosion, sedimentation, and slope instability concerns within steep slope areas (defined as slopes with a minimum length of 100 feet and 30 percent or greater).	FEIS July 2017 Implementation Plan EC 65 (October 2017)	Ongoing	Will maintain commitment through restoration activities
Aquatic Species (FWS Enhanced Conservation Measures)	FWS, FERC	FWS enhanced conservation measures • To avoid OHV access along the pipeline rights-of-way and access roads, EGTS has committed to implementing measures such as installing OHV barriers (e.g., signs, fences, vegetation, or boulders). Barriers will be strategically placed to present physical barriers and to erase visual cues signaling the presence of the right-of-way from the access point. EGTS will coordinate with the appropriate landowners and/or land managing agencies to identify locations where unauthorized OHV access is most likely to occur, and to develop the appropriate OHV blocking measures. At key crossing locations, such as sensitive waterbodies, site-specific OHV blocking measures will be developed in consultation with the land-managing agencies and adjacent private landowners, as appropriate.	FEIS July 2017 Implementation Plan EC 65 (October 2017)	Ongoing	Will maintain commitment through restoration activities
Aquatic Species (FWS Enhanced Conservation Measures)	FWS, FERC	FWS enhanced conservation measures • EGTS proposes to use municipal water sources for all water withdrawals previously planned at sensitive waterbodies except for McElroy Creek on the SHP. Water used for dust control will also be appropriated from municipal sources. To minimize potential effects of water withdrawals on the federally listed, proposed, and under review species, EGTS will implement the following measures at sensitive waterbodies. o Use 1 millimeter (0.04 inch) or smaller screens to minimize impingement/entrainment of mussel host fish species and ESA-listed, proposed, and under review species. o Limit water withdrawal to not exceed 10 percent of instantaneous flow. o Ensure that intake velocity does not exceed 0.25 feet per second. o Use floating intake structures to avoid impacts on the stream bed. o Implement applicable TOYRs.	FEIS July 2017 Implementation Plan EC 65 (October 2017)	Ongoing	Will maintain commitment through restoration activities
Aquatic Species (FWS Enhanced Conservation Measures)	FWS, FERC	FWS enhanced conservation measures • For water discharge, EGTS will implement the following measures. o Algaecide will not be added to hydrostatic test water; EGTS will use aeration to control algae in storage containers. o Water will be discharged at a low flow rate to avoid erosion and rutting. o EGTS will restore the discharge site to pre-discharge conditions if vegetation or cover/mulch/duff is removed during discharge. o Filtration or chlorine removal methods will be used when municipal water is placed directly from the municipal source into the pipeline for use; when water is stored in aboveground containments for more than 1 week, the chlorine will dissipate during aeration and additional chlorine removal methods will not be needed. o EGTS will not discharge into sensitive waterbodies. o EGTS will discharge in upland areas a minimum of 300 feet from sensitive waterbodies.	FEIS July 2017 Implementation Plan EC 65 (October 2017)	Ongoing	Will maintain commitment through restoration activities
Snuffbox	FWS, FERC, WVDNR	• Prior to construction, EGTS will relocate freshwater mussels from the workspace prior to placement of temporary dam structures. • Mussel relocations in West Virginia will take place in accordance with the approved protocols. Furthermore, EGTS will adhere to the TOYRs that prohibit in-water work from April 1 and June 30 in McElroy Creek.	WVDNR Stream Activity Permit FEIS July 2017 WV Mussel Survey Protocols (FWS and WVDNR document) January 2017 Final Draft BA	Not Proposed	No in-stream work proposed in waterbodies requiring mussel relocations
Snuffbox	FWS, FERC, WVDNR	Water withdrawals from McElroy Creek where the presence of snuffbox is assumed will adhere to water withdrawal conservation measures.	WVDNR Stream Activity Permit FEIS July 2017 January 2017 Final Draft BA	Ongoing	Will maintain commitment through restoration activities

[a] **Implementation Status Category Definitions**
Not Proposed – Not proposing to implement commitment/conservation measure.
Ongoing – Commitment/conservation measure has and will continue to be implemented.
Pending - Commitment/conservation measure has not yet, but will be, implemented.

10.3.5 Appendix C.5 – Invasive Species Plan

Appendix C.5

Invasive Species Plan

Provided Under Separate Cover

10.4 Appendix D – Restoration and Rehabilitation Plan

Appendix D

Restoration and Rehabilitation Plan

Provided Under Separate Cover

10.5 Appendix E – Landowner Documentation

Appendix E

Landowner Documentation

10.5.1 Appendix E.1 – Landowner Line List

Appendix E.1

Landowner Line List

Contains Privileged Information - Provided Under Separate Cover

10.5.2 Appendix E.2 – Landowner Concurrence

Appendix E.2

Landowner Concurrence

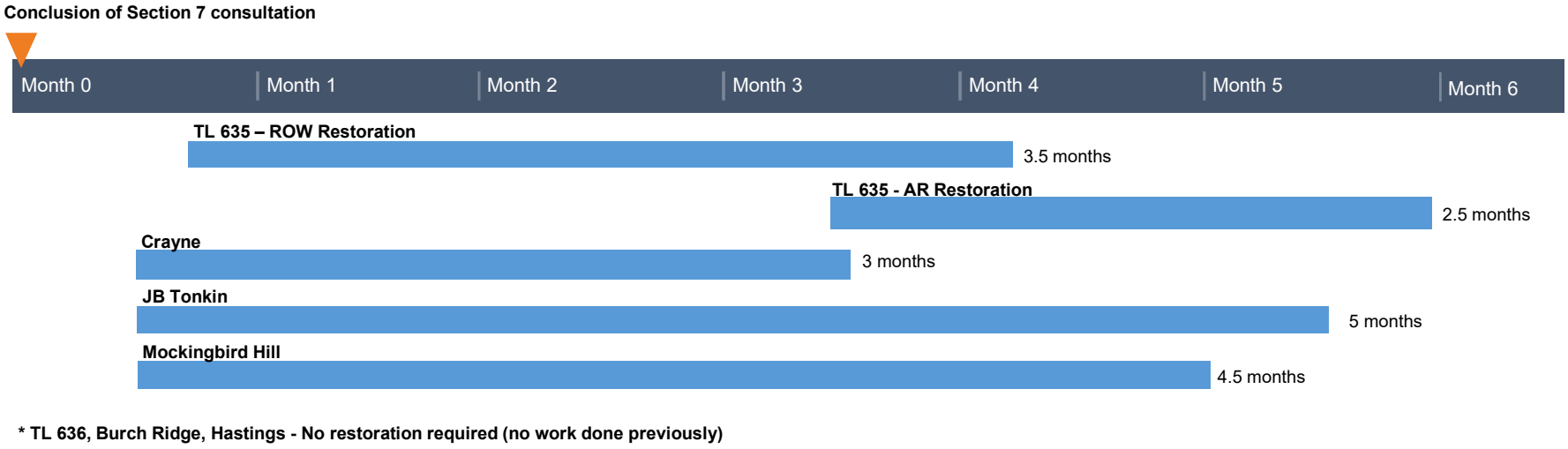
Contains Privileged Information - Provided Under Separate Cover

10.5.3 Appendix F – Restoration Timeline

Appendix F

Restoration Timeline

Supply Header Project
Projected Restoration Timeline



*** TL 636, Burch Ridge, Hastings - No restoration required (no work done previously)**

10.3.5 Appendix C.5 – Invasive Species Plan

Appendix C.5

Invasive Species Plan

ATLANTIC COAST PIPELINE, LLC
ATLANTIC COAST PIPELINE

and

DOMINION ENERGY TRANSMISSION, INC.
SUPPLY HEADER PROJECT

Implementation Plan

EC18 Attachment 2

Update to the *Invasive Plant Species Management Plan*

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

and

DOMINION ENERGY TRANSMISSION, INC.
SUPPLY HEADER PROJECT
Docket No. CP15-555-000

Invasive Plant Species Management Plan

Updated, Rev. 5

Prepared by

ERM

August 2017

TABLE OF CONTENTS

LIST OF TABLES

LIST OF ATTACHMENTS

LIST OF ACRONYMS AND ABBREVIATIONS

ACP	Atlantic Coast Pipeline
Atlantic	Atlantic Coast Pipeline, LLC
DETI	Dominion Energy Transmission, Inc.
EI	Environmental Inspector
FERC	Federal Energy Regulatory Commission
HDD	horizontal directional drill
NCDACS	North Carolina Department of Agriculture and Consumer Services
OHV	off-highway vehicle
PDA	Pennsylvania Department of Agriculture
Plan	Upland Erosion Control, Revegetation, and Maintenance Plan
Procedures	Wetland and Waterbody Construction and Mitigation Procedures
Projects	Atlantic Coastline Pipeline and Supply Header Project
SHP	Supply Header Project
SPCC Plan	Spill Prevention, Control, and Countermeasures Plan
VDACS	Virginia Department of Agriculture and Consumer Services

1.0 INTRODUCTION

Atlantic Coast Pipeline, LLC (Atlantic) – a company formed by four major energy companies – Dominion Energy; Duke Energy Corporation; Piedmont Natural Gas Co., Inc.; and Southern Gas Company – proposes to construct and operate approximately 600 miles of natural gas transmission pipelines and associated aboveground facilities in West Virginia, Virginia, and North Carolina. This Project, referred to as the Atlantic Coast Pipeline (ACP), will deliver up to 1.5 million dekatherms per day of natural gas from supply areas in the Appalachian region to demand areas in Virginia and North Carolina. Atlantic has contracted with Dominion Energy Transmission, Inc. (DETI), a subsidiary of Dominion Energy, Inc., to construct and operate the ACP on behalf of Atlantic.

In conjunction with the ACP, DETI proposes to construct and operate approximately 37.5 miles of pipeline loop and modify existing compression facilities in Pennsylvania and West Virginia. This Project, referred to as the Supply Header Project (SHP), will enable DETI to provide firm transportation service to various customers, including Atlantic.

2.0 PURPOSE

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 "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). 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.

The areas crossed by the ACP and SHP (collectively, the Projects) contain widespread populations of many noxious weeds and other invasive plant species. The purpose of this *Invasive Plant Species Management Plan* is to describe methods to prevent and control the introduction or spread of invasive plant species during and following construction of the Projects. Atlantic and DETI and their Contractors[1] will be responsible for implementing the procedures described in this plan.

3.0 TRAINING

Prior to the start of construction, Atlantic and DETI will conduct environmental training for Company and Contractor personnel. The training program will focus on the Federal Energy Regulatory Commission's (FERC's) *Upland Erosion Control, Revegetation, and Maintenance Plan* (Plan) and *Wetland and Waterbody Construction and Mitigation Procedures* (Procedures); other construction, restoration, and mitigation plans, including this *Invasive Species Management Plan*; and applicable permit conditions. In addition, Atlantic and DETI will provide large-group

[1] Contractor refers to the company or companies retained by Atlantic/DETI or another contractor to construct the proposed facilities.

training sessions before each work crew commences construction with periodic follow-up training for groups of newly assigned personnel.

4.0 JURISDICTION

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 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 invasive species, and that all feasible and prudent measures to minimize the risk of harm will be implemented.

4.1 West Virginia

The West Virginia Noxious Weed Act (Chapter 19, Section 12D of the Code of West Virginia), which is administered by the West Virginia Department of Agriculture, prohibits persons, including corporations, from moving, transporting, delivering, shipping, or offering for shipment noxious weeds into or within the State without a permit from the State Secretary of Agriculture. West Virginia adopts the Federal Noxious Weed List in addition to its own State noxious weed list, and both lists are regulated by the West Virginia Noxious Weed Act. The invasive plant species identified in West Virginia are listed in Table 4-1.

4.2 Virginia

Virginia's Noxious Weed Law is administered by the Virginia Department of Agriculture and Consumer Services (VDACS). The Noxious Weed Law allows the VDACS to list weeds to be regulated; enforce quarantines to regulate the movement of listed weeds; and eradicate and/or suppress weed populations to prevent dissemination. The law defines a 'noxious' weed as a plant not widely disseminated that is determined to be detrimental to crops, surface waters, or other desirable plant, livestock, land, or other property, or to be injurious to the public health or the economy (Code of Virginia § 3.2-800 thru 809).

The Regulations for the Enforcement of the Noxious Weed Law (Virginia Administrative Code 2VAC5-317-20), which became effective in January 2015, list eight noxious weeds. European wand loosestrife was previously listed under the Noxious Weed Law and therefore was included in the survey list for Virginia. These nine species are consistent with those identified during correspondence with the program manager for the VDACS Plant Industry Services (VDACS, 2014). The invasive plant species identified in Virginia are listed in Table 4-1.

4.3 North Carolina

North Carolina noxious weed laws are regulated by the North Carolina Department of Agriculture and Consumer Services (NCDACS). The State Noxious Weed Regulations (North Carolina Administrative Code 48 §1700), adopted under the authority of the North Carolina Plant Pest Law, were enacted to prevent the widespread establishment of harmful non-native plants that are placed on a Noxious Weed List. Plants on the Noxious Weed List are prohibited entry into the State without a permit. Noxious weeds already present in the State are contained by prohibiting movement of the plant outside of regulated areas. In addition to the plant itself,

articles that could contain noxious weed propagules, such as soil or hay, are also regulated. Regulated areas are usually defined by County boundaries and must be described by no more than 20 counties.

TABLE 4-1

Invasive Plant Species Identified Along the Atlantic Coast Pipeline and Supply Header Project

Common Name	Latin Name	Atlantic Coast Pipeline	Supply Header Project
West Virginia [a]			
Tree of heaven	*Ailanthus altissima*	X	X
Marijuana	*Cannabis sativa*		
Nodding plumeless thistle	*Carduus acanthoides*		
Curled thistle	*Carduus crispus*		X
Musk thistle	*Carduus nutans*	X	
Poison hemlock	*Conium maculatum*		
Autumn olive	*Elaeagnus umbellata*	X	X
Morrow's honeysuckle	*Lonicera morrowii*	X	X
Tatarian honeysuckle	*Lonicera tatarica*		X
Purple loosestrife	*Lythrum salicaria*	X	
Japanese stiltgrass	*Microstegium vimineum*	X	X
Opium poppy	*Papaver somniferum*		
Japanese knotweed	*Polygonum cuspidatum*	X	X
Mile-a-minute vine	*Polygonum perfoliatum*		
Kudzu	*Pueraria montana*	X	
Multiflora rose	*Rosa multiflora*	X	X
Johnsongrass	*Sorghum halepense*	X	
Virginia [b]			
Giant hogweed	*Heracleum mantegazzianum*		
Cogongrass	*Imperta cylindrica*		
Water spinach	*Ipomoea aquatic*		
Purple loosestrife	*Lythrum salicaria*		
Wand loosestrife	*Lythrum virgatum*		
Wavyleaf basketgrass	*Oplismenus hirtellus*		
Giant salvinia	*Salvinia molesta*		
Tropical soda apple	*Solanum viarum*		
Beach vitex	*Vitex rotundifolia*		
North Carolina [c]			
Curled thistle	*Carduus crispus*		
Musk thistle	*Carduus nutans*		
Giant hogweed	*Heracleum mantegazzianum*		
Cogongrass/Japanese blood grass	*Imperta cylindrical*		
Water spinach	*Ipomoea aquatic*		
Purple loosestrife	*Lythrum salicaria*		
Wand loosestrife	*Lythrum virgatum*		
Wavyleaf basketgrass	*Oplismenus hirtellus*		
Common reed	*Phragmites australis*		
Mile-a-minute vine	*Polygonum perfoliatum*		
Giant salvinia	*Salvinia molesta*		
Tropical soda apple	*Solanum viarum*		
Witchweed	*Striga* (all species)		
Puncturevine	*Tribulus terrestris*		

TABLE 4-1 (continued)

Invasive Plant Species Identified Along the Atlantic Coast Pipeline and Supply Header Project

Common Name	Latin Name	Atlantic Coast Pipeline	Supply Header Project
Beach vitex	*Vitex rotundifolia*		
Itchgrass	*Rottboellia cochinchinensis*		
Pennsylvania [d]			
Marijuana	*Cannabis sativa*		
Musk thistle/ Nodding thistle	*Carduus nutans*		
Canadian thistle	*Cirsium arvense*		
Bull thistle/ Spear thistle	*Cirsium vulgare*		
Jimsonweed	*Datura stramonium*		
Goatsrue	*Galega officinalis*		
Giant hogweed	*Heracleum mantegazzianum*		
Purple Loosestrife	*Lythrum salicaria*		
Mile-a-minute	*Polygonum perfoliatum*		
Kudzu-vine	*Pueraria lobate*		
Multiflora rose	*Rosa multiflora*		X
Shattercane	*Sorghum bicolor*		
Johnsongrass	*Sorghum halepense*		

[a] Obtained from Article 12D of the West Virginia Noxious Weed Act of 1976, Title 61 Legislative Rules West Virginia Department of Agriculture, Series 14A Rules and additional U.S. Department of Agriculture listed species occurring in the State (U.S. Department of Agriculture, 2014).

[b] Obtained from the Regulations for the Enforcement of the Noxious Weed Law (Virginia Administrative Code 2VAC5-317-20) and correspondence with the Plant Industries Services Program Manager with the Virginia Department of Agriculture and Consumer Services (VDACS, 2014).

[c] Provided by the Plant Pest Administrator with the North Carolina Department of Agriculture and Consumer Services – Plant Industry Division (NCDACS, 2014).

[d] Obtained from the Pennsylvania Noxious Weed Control List (PDA, 2015).

Although North Carolina has outlined 19 noxious weeds on the Noxious Weed List, Atlantic contacted the State Plant Pest Administrator with the NCDACS Plant Industry Division to discuss this list and to confirm what species should be documented during survey efforts (NCDACS, 2014). During this consultation, Atlantic was provided a list of 16 noxious weed species of concern as well as all species of the genus *Striga*. The invasive plant species identified by the NCDACS are listed in Table 4-1.

4.4 Pennsylvania

In Pennsylvania, the Noxious Weed Control Law and Noxious Weed Control List are administered by the Pennsylvania Department of Agriculture (PDA). The PDA is responsible for implementing Federal and Commonwealth eradication and control programs for suppression, control, or eradication of noxious weeds. Under the Noxious Weed Control Law, it is a violation to "sell, transport, plant, or otherwise propagate that weed within the Commonwealth" (PDA, 1997). The Secretary of Agriculture retains the right to designate weed control areas when necessary and to require affected landowners to comply with the control measures required within 30 days of the designation. The invasive plant species identified by the PDA are listed in Table 4-1.

5.0 INVASIVE PLANT SPECIES SURVEYS

Atlantic and DETI are conducting a field survey for State/Commonwealth listed invasive plant species within a 300-foot-wide corridor along the proposed ACP and SHP pipeline routes. A list of the invasive plant species identified through June 2016 in the ACP and SHP survey corridors (approximately 98 percent of the Projects) is provided in Table 4-1. This table and attachment will be updated periodically as surveys are completed. The milepost locations of invasive plant species identified through June 2016 are provided in Attachment A. Table 5-1 identifies invasive species that are adjacent to threatened and endangered plant species along the proposed route. Because this table includes location information for federally listed species, it has been filed under separate cover. The table is marked "Contains Privileged Information – Do Not Release."

6.0 INVASIVE PLANT SPECIES MANAGEMENT

The invasive plant species management program for the ACP and SHP is designed to:

- identify areas supporting invasive plants prior to construction;
- prevent the introduction and spread of invasive plants from construction equipment moving along the right-of-way;
- contain invasive plant propagules by preventing segregated topsoil from being spread to adjacent areas along the construction right-of-way; and
- address invasive plant infestations that develop during restoration and operation of the Projects.

Attachment A identifies the primary and alternative treatment methods for invasive species identified during survey in the ACP Project area and SHP Project area. The primary and/or alternative treatment method will be used based on the growing stage and prevalence of the 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 State/Commonwealth regulations.

6.1 Identification of Problem Areas

As noted above, Atlantic and DETI are conducting surveys for invasive plant species within the ACP Project area and SHP Project area. Additional areas supporting invasive plant species may be identified during preconstruction inspections by Atlantic and DETI's Environmental Inspectors (EI).[2] Prior to construction, the EIs will mark areas of invasive plant infestations by using color-coded flagging, staking, and/or signs on the construction rights-of-way. Identification of existing invasive plant locations will alert EIs and construction personnel to implement control measures during construction.

[2] The role and responsibilities of an EI are defined in the FERC's Plan.

6.2 Treatment Measures

6.2.1 Pre-Treatment

Prior to clearing and grading operations, pre-treatment of invasive plant infestations may be conducted if it will aid in controlling the spread of invasive plant species during construction. The 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 appropriate State/Commonwealth or Federal agency.

Herbicide application is an effective means of reducing the size of 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, as necessary, with State/Commonwealth and/or Federal agencies. Hand application methods (e.g., backpack spraying) will be used to treat occurrences of invasive species within the right-of-way and in other work areas. Preconstruction treatment of infestation areas will be controlled, as described in Section 7.0, to minimize impacts on surrounding vegetation. Aerial spraying will not be used for invasive plant species control along the rights-of-way.

Application of herbicides will be completed in accordance with 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. No herbicides will be applied within 25 feet of known occurrences of federal-listed threatened or endangered plant species. No use of herbicides (or pesticides) will be allowed within 100 feet of a wetland or waterbody, except where allowed by State/Commonwealth or Federal agencies.[3] No spraying of herbicides (or insecticides) will be allowed within a 300-foot karst feature buffer, except where allowed by State/Commonwealth or Federal agencies.

Atlantic and DETI will continue to work with applicable State/Commonwealth and Federal agencies to address invasive plant species control options where protected species and their habitats occur along the ACP and SHP. Mitigation measures to avoid impacts on these species could include hand pulling or spot herbicide treatment (for state-protected species) using a five gallon bucket or tarps to cover the sensitive plants during treatments. No herbicides will be applied within 25 feet of known occurrences of federally-listed threatened and endangered species.

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 and DETI will obtain

[3] Rodeo® Aquatic, for example, is a water-friendly herbicide approved by the PDA, WVDA, VDACS, and NCDACS.

permission from landowners or land managing agencies prior to applications of herbicides within the right-of-way or other work areas. Additionally, Atlantic and DETI will use products which are approved by the U.S. Environmental Protection Agency (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 and DETI 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 are dependent upon proper timing to cut the vegetation prior to the maturation of seed and may require multiple treatments during the growing season.

6.2.2 Preventive Measures during Construction

The following measures will be implemented to prevent the spread of invasive plant species during construction activities.

- Atlantic and DETI 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 an EI to verify that it is clean of soil and debris, which are capable of transporting invasive plant propagules, prior to working on the Projects.
- Atlantic/DETI will install cleaning and washing stations at contractor yards and other locations along the pipeline routes as listed in Table 6.6.2-1. The locations for the stations were selected based on the results of field surveys and other mitigating factors (such as accessibility), the prevalence of invasive plants, the locations of sensitive resources (e.g., wetlands), landowner requirements, and recommendations from State/Commonwealth or Federal agencies.
- The wash stations will be installed prior to construction and removed during/following the restoration of the right-of-way.
- 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 allowed to infiltrate into upland soils within the work area. Debris which collects around the work area will be collected and disposed of at an approved facility.

TABLE 6.2.2-1

Proposed Wash Stations along the Atlantic Coast Pipeline and Supply Header Project

Project/Segment	Approximate Milepost	Description
Atlantic Coast Pipeline		
AP-1	73.1	Entry to the Monongahela National Forest
AP-1	83.9	Exit to the Monongahela National Forest
AP-1	76.9	Entry to the Seneca State Forest
AP-1	80.5	Exit to the Seneca State Forest
AP-1	83.9	Entry to the George Washington National Forest
AP-1	158.1	Exit to the George Washington National Forest
AP-1	141.8	Entry to certified organic farm
AP-1	142.4	Exit to certified organic farm
AP-1	183.3	Entry to the James River WMA
AP-1	184.7	Exit to the James River WMA
AP-1	300.0	Entry to North Carolina
AP-3	12.0	Exit to North Carolina
AP-2	118.8	Entry to a certified organic farm
AP-2	118.9	Exit to a certified organic farm
Contractor Yard Spread 01-A	offline	Equipment cleaning prior to mobilizing to the right-of-way
Contractor Yard Spread 02-A	offline	Equipment cleaning prior to mobilizing to the right-of-way
Contractor Yard – GWNF – 6 Spread 02A-A	offline	Equipment cleaning prior to mobilizing to the right-of-way
Contractor Yard – GWNF – 6 Spread 02A-B	offline	Equipment cleaning prior to mobilizing to the right-of-way
Contractor Yard – GWNF – 6 Spread 02-D	offline	Equipment cleaning prior to mobilizing to the right-of-way
Contractor Yard – GWNF – 6 Spread 03-A	offline	Equipment cleaning prior to mobilizing to the right-of-way
Contractor Yard – GWNF – 6 Spread 03-B	offline	Equipment cleaning prior to mobilizing to the right-of-way
Contractor Yard Spread 03-A	offline	Equipment cleaning prior to mobilizing to the right-of-way
Contractor Yard Spread 04-A	offline	Equipment cleaning prior to mobilizing to the right-of-way
Contractor Yard Spread 04-A-A	offline	Equipment cleaning prior to mobilizing to the right-of-way
Contractor Yard – GWNF – 6 Spread 03A-A	offline	Equipment cleaning prior to mobilizing to the right-of-way
Contractor Yard – GWNF – 6 Spread 03A-B	offline	Equipment cleaning prior to mobilizing to the right-of-way
Contractor Yard Spread 05-C	offline	Equipment cleaning prior to mobilizing to the right-of-way
Contractor Yard – GWNF – 6 Spread 04-A	offline	Equipment cleaning prior to mobilizing to the right-of-way
Contractor Yard Spread 06-C	offline	Equipment cleaning prior to mobilizing to the right-of-way
Contractor Yard Spread 07-B	offline	Equipment cleaning prior to mobilizing to the right-of-way
Contractor Yard Spread 08-A	offline	Equipment cleaning prior to mobilizing to the right-of-way
Contractor Yard Spread 09-A	offline	Equipment cleaning prior to mobilizing to the right-of-way
Contractor Yard Spread 10-A	offline	Equipment cleaning prior to mobilizing to the right-of-way
Contractor Yard Spread 11-C	offline	Equipment cleaning prior to mobilizing to the right-of-way
Supply Header Project		
TL-635	23.7	Entry to the Lewis Wetzel WMA
TL-635	27.3	Exit to the Lewis Wetzel WMA
TL-635	27.6	Entry to the Lewis Wetzel WMA
TL-635	27.7	Exit to the Lewis Wetzel WMA
Contractor Yard 9	5.7	Equipment cleaning prior to mobilizing to the right-of-way
Contractor Yard 10	10.7	Equipment cleaning prior to mobilizing to the right-of-way
Contractor Yard 8	18.6	Equipment cleaning prior to mobilizing to the right-of-way
Contractor Yard 7	19.0	Equipment cleaning prior to mobilizing to the right-of-way
Contractor Yard 4	0.3	Equipment cleaning prior to mobilizing to the right-of-way
Contractor Yards 1, 2, 3	0.4	Equipment cleaning prior to mobilizing to the right-of-way

- 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.

- Topsoil will be segregated, or buried if approved, in all infested areas, including the spoil-side and working-side portions of the construction right-of-way as a method to prevent equipment and workers from transporting and spreading invasive species.

- Cleared vegetation and segregated topsoil from areas with 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. The stockpiles will be identified as 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 with invasive plant infestation will be cleaned prior to leaving the area. Once topsoil has been segregated, subsequent equipment will not require cleaning as it will not come into contact with invasive plant species or topsoil potentially containing propagules. Equipment required for topsoil replacement during restoration will also be cleaned prior to moving out of an area of infestation.

- All equipment which comes in contact with soils potentially contaminated with invasive species will be cleaned prior to being transported from ACP or SHP work sites to other job sites.

Materials used for erosion control (e.g., hay bales or straw mulch) will be certified as weed free.

6.2.3 Post-Construction Treatment Methods

Atlantic's and DETI's objective is to comply with regulatory and Project-specific requirements to prevent the spread of invasive plant species and treat areas of the rights-of-way where invasive plant species form a significant portion of the vegetation community in comparison to adjacent areas. Atlantic and DETI will utilize established restoration procedures to prevent the establishment of 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 invasive plant species.

Following construction, the ACP Project area and SHP Project area will be monitored in accordance with the Plan and Procedures. In the event that invasive plant species become

established in the right-of-way, Atlantic and DETI will implement measures (e.g., mowing or treatment with herbicides) to control invasive plants within the right-of-way and prevent the spread of invasive plants to adjacent lands which do not contain invasive species. In addition, Atlantic and DETI will implement control measures at the aboveground facility sites to prevent the spread of 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 appropriate State/Commonwealth or Federal agency and with the landowner.

Post-construction herbicide applications will be conducted prior to seed maturation where possible and where necessary. Applications will be controlled, as described in Section 7.0, 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 State/Commonwealth and Federal agencies as applicable. Hand application methods (e.g., backpack spraying) will be used to treat occurrences of invasive species within the right-of-way and in other work areas. Following the treatment, a seeding program will be implemented in accordance 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 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 invasive plant species.

Where warranted, Atlantic and DETI will consult with the appropriate State/Commonwealth or Federal agency regarding the use of biological and alternative invasive plant control methods. The implementation of these measures will require approval from the landowner or land managing agency.

Increased accessibility of lands along the proposed pipeline rights-of-way, particularly during operations, could lead to off-highway vehicle (OHV) use into previously restricted or inaccessible areas. Atlantic and DETI will take steps to limit OHV use on the proposed pipeline rights-of-way to avoid issues with revegetation efforts or erosion problems to address landowner concerns or preferences, and to complete additional operational and maintenance activities that may require the use of an OHV. To extent practicable, the use of Atlantic and DETI OHVs will only be on an as needed basis to complete these tasks. In addition to these operational issues, OHV use along the pipeline rights-of-way could allow unintended access to sensitive wildlife habitats, species, or culturally sensitive areas and lead to adverse impacts on these resources.

To avoid OHV access along the pipeline rights-of-way and additional roads opened up for construction equipment and vehicles, Atlantic and DETI will implement measures, as appropriate, to restrict OHV access along the right-of-way. This could include installation of OHV barriers at appropriate locations along the rights-of-way. Barriers may consist of signs,

fences, vegetation, or boulders. Atlantic and DETI will coordinate with the appropriate land managing agencies to identify locations where unauthorized OHV access to Federal and State/Commonwealth lands via the pipeline right-of-way is most likely. At these key crossing locations, site-specific OHV blocking measures will be developed in consultation with the land managing agencies.

7.0 MONITORING

Following construction, invasive plant infestations will be monitored as part of Atlantic's and DETI's restoration monitoring activities as described in the *Restoration and Rehabilitation Plan*. Atlantic/DETI will inspect disturbed areas after the first and second growing seasons, at a minimum, to determine the success of revegetation. Revegetation shall be considered successful if upon visual survey the density and cover of non-nuisance vegetation are similar to adjacent undisturbed lands. Atlantic and DETI will continue revegetation efforts and monitoring until successful revegetation is achieved. Following successful revegetation, Atlantic and DETI's operations staff will monitor and treat invasive plant species as part of its normal operations and maintenance activities in accordance with applicable State/Commonwealth or Federal regulations.

8.0 HERBICIDES

8.1 Herbicide Application and Handling

Herbicide application will be based on information gathered from field surveys and consultations with applicable State/Commonwealth or Federal agencies. Before application, Atlantic or DETI or its Contractors will obtain required State/Commonwealth or local permits and landowner approval. Herbicide application will be conducted in accordance with applicable laws and regulations by a licensed contractor. Additionally, the following protocols will be implemented:

- Atlantic and DETI will not use aerial spraying as a means of invasive plant species control along the right-of-way;
- Atlantic and DETI will not use herbicides within 25 feet of known occurrences of federally-listed endangered or threatened plant species;
- Atlantic and DEIT will not use herbicides (or pesticides) within 100 feet of a waterbody or wetland, except where allowed by State/Commonwealth or Federal agencies;
- Atlantic and DETI will not use spraying of herbicides (or insecticides) within a 300-foot karst feature buffer, except where allowed by State/Commonwealth or Federal agencies.

Hand application methods (e.g., backpack spraying) will be used to treat occurrences of 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; greater than 300 feet from karst features; and greater than 400 feet from public wells. The property owner will be consulted about the presence and location of wells prior to herbicide application;
- 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.

8.2 Herbicide Spills

Atlantic and DETI have prepared and will implement a *Spill Prevention, Control, and Countermeasures Plan* (SPCC Plan) to avoid or minimize the potential impact of hazardous material spills during construction and operation of the Projects. 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 (formally 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.

9.0 FEDERALLY MANAGED LANDS

The ACP crosses approximately 20.0 miles of U.S. Forest Service lands in the Monongahela and George Washington National Forests. For these crossings, Atlantic has prepared a *Construction, Operations, and Maintenance Plan*, which identifies construction procedures and mitigation measures to be implemented on these federally managed lands. The

results of the invasive plant species surveys and proposed control measures on Federal lands are included in this plan.

The ACP also crosses approximately 0.1 mile of National Park Service land along the Blue Ridge Parkway. Atlantic will be using the horizontal directional drill (HDD) construction method to install the proposed pipeline under the Blue Ridge Parkway. The HDD method will avoid direct impacts on the parkway, including impacts on vegetation immediately adjacent to the parkway. This will limit the potential for the spread of invasive species or propagules along the parkway.

10.0 REFERENCES

North Carolina Department of Agriculture and Consumer Services. 2014. Call dated June 2, from G. Blosser (Natural Resource Group, LLC) to P. Wilson.

North Carolina Department of Environmental Quality. 2016a. Natural Heritage Database. Geographic Information Systems Data received March 21, 2016.

North Carolina Department of Environmental Quality. Natural Heritage Program. 2016b. Email dated August 3, from L. Robison to J. Martin.

Pennsylvania Department of Agriculture. 1997. *Legal Reference: Noxious Weed Law Summary*. Available online at: http://www.agriculture.state.pa.us/portal/server.pt/gateway/PTARGS_0_2_75292_10297_0_43/AgWebsite/Files/Publications/NoxiousWeedLawSummary.pdf. Accessed April 2015.

Pennsylvania Department of Agriculture. 2015. *Noxious, Invasive and Poisonous Plant Program.* Available online at: http://www.agriculture.state.pa.us/portal/server.pt/gateway/PTARGS_6_2_24476_10297_0_43/AgWebsite/ProgramDetail.aspx?name=Noxious-Invasive-and-Poisonous-Plant-Program&navid=12&parentnavid=0&palid=116&. Accessed April 2015.

Sheley, R., J. Petroff, M. Borman. 1999. *Introduction to Biology and Management of Noxious Rangeland Weeds*, Corvallis, OR.

U.S. Department of Agriculture. 2014. *Introduced, Invasive, and Noxious Plants*. Available online at: http://plants.usda.gov/java/noxiousDriver. Accessed December 2014.

Virginia Department of Agriculture and Consumer Services. 2014. Call dated June 2, from G. Blosser (Natural Resource Group, LLC) to L. Nichols.

Virginia Department of Conservation and Recreation. 2016. Natural Heritage Program. Natural Heritage Screening and Element Occurrence. Geographic Information Systems Data received October 25, 2016.

West Virginia Division of Natural Resources. 2016. Natural Heritage Program. Geographic Information Systems Data received July 14, 2016.

Document Accession #: 20201120-5243 Filed Date: 11/20/2020

ATLANTIC COAST PIPELINE, LLC
ATLANTIC COAST PIPELINE

and

DOMINION TRANSMISSION, INC.
SUPPLY HEADER PROJECT

Invasive Species Management Plan

ATTACHMENT A
Invasive Plant Species Identified along the Atlantic Coast Pipeline and Supply Header Project

ATTACHMENT A

Invasive Plant Species Identified along the Atlantic Coast Pipeline and Supply Header Project [a]

Facility, State/ Commonwealth, County/City	Approximate Milepost	Invasive Plant Species	Prevalence (percent)	Primary Treatment Method	Secondary Treatment Method
ATLANTIC COAST PIPELINE					
AP-1					
West Virginia					
Harrison	0.0	*Rosa multiflora, Elaeagnus umbellata, Microstegium vimineum*	0-10, 10-25, 0-10	Ground herbicide application	Spot herbicide application
Harrison	0.7	*Elaeagnus umbellata, Lonicera morrowii*	0-10, 0-10	Ground herbicide application	Spot herbicide application
Harrison	0.8	*Ailanthus altissima*	25-50	Ground herbicide application	Spot herbicide application
Harrison	1.0	*Elaeagnus umbellata*	25-50	Ground herbicide application	Spot herbicide application
Lewis	1.1	*Elaeagnus umbellata, Rosa multiflora*	25-50, 25-50	Ground herbicide application	Spot herbicide application
Lewis	1.3	*Ailanthus altissima*	25-50	Ground herbicide application	Spot herbicide application
Lewis	3.8	*Elaeagnus umbellata, Rosa multiflora, Lonicera morrowii*	10-25, 0-10, 0-10	Ground herbicide application	Spot herbicide application
Lewis	6.8	*Carduus nutans*	0-10	Ground herbicide application	Spot herbicide application
Lewis	8.2	*Microstegium vimineum*	50-75	Mechanical	Ground herbicide application
Lewis	8.3	*Microstegium vimineum*	50-75	Mechanical	Ground herbicide application
Lewis	11.3	*Sorghum halepense*	10-25	Ground herbicide application	Spot herbicide application
Lewis	11.6	*Carduus nutans*	10-25	Ground herbicide application	Spot herbicide application
Lewis	12.6	*Lonicera morrowii, Rosa multiflora*	0-10, 0-10	Ground herbicide application	Spot herbicide application
Lewis	12.8	*Lonicera morrowii, Rosa multiflora, Elaeagnus umbellata*	0-10, 0-10, 0-10	Ground herbicide application	Spot herbicide application
Lewis	13.4	*Ailanthus altissima, Rosa multiflora, Microstegium vimineum*	0-10, 10-25, 10-25	Ground herbicide application	Spot herbicide application
Lewis	13.6	*Lonicera morrowii, Rosa multiflora, Elaeagnus umbellata*	0-10, 0-10, 10-25	Ground herbicide application	Spot herbicide application
Lewis	13.8	*Rosa multiflora, Elaeagnus umbellata*	10-25, 0-10	Ground herbicide application	Spot herbicide application
Lewis	13.9	*Lonicera morrowii, Rosa multiflora, Elaeagnus umbellata*	10-25, 0-10, 0-10	Ground herbicide application	Spot herbicide application
Lewis	14.0	*Elaeagnus umbellata, Lonicera morrowii, Rosa multiflora*	0-10, 0-10, 0-10	Ground herbicide application	Spot herbicide application
Lewis	14.3	*Elaeagnus umbellata*	0-10	Ground herbicide application	Spot herbicide application
Lewis	14.4	*Lonicera morrowii*	0-10	Ground herbicide application	Spot herbicide application
Lewis	14.5	*Elaeagnus umbellata, Lonicera morrowii, Rosa multiflora*	0-10, 0-10, 0-10	Ground herbicide application	Spot herbicide application
Lewis	14.8	*Lonicera morrowii, Rosa multiflora, Ailanthus altissima, Elaeagnus umbellata*	0-10, 0-10, 0-10, 10-25	Ground herbicide application	Spot herbicide application
Lewis	14.9	*Lonicera morrowii, Elaeagnus umbellata, Rosa multiflora*	0-10, 10-25, 0-10	Ground herbicide application	Spot herbicide application
Lewis	15.3	*Microstegium vimineum, Ailanthus altissima*	0-10, 0-10	Ground herbicide application	Spot herbicide application
Lewis	15.4	*Rosa multiflora, Elaeagnus umbellata, Lonicera morrowii*	0-10, 10-25, 0-10	Ground herbicide application	Spot herbicide application

ATTACHMENT A (cont'd)

Invasive Plant Species Identified along the Atlantic Coast Pipeline and Supply Header Project [a]

Facility, State/ Commonwealth, County/City	Approximate Milepost	Invasive Plant Species	Prevalence (percent)	Primary Treatment Method [b]	Secondary Treatment Method
Lewis	15.5	*Ailanthus altissima*	50-75	Mechanical	Ground herbicide application
Lewis	16.0	*Elaeagnus umbellata, Microstegium vimineum, Ailanthus altissima, Rosa multiflora*	10-25, 0-10, 0-10, 0-10	Ground herbicide application	Spot herbicide application
Lewis	16.1	*Elaeagnus umbellata, Microstegium vimineum, Rosa multiflora, Ailanthus altissima, Lonicera morrowii*	10-25, 0-10, 0-10, 0-10, 0-10	Ground herbicide application	Spot herbicide application
Lewis	16.5	*Elaeagnus umbellata, Microstegium vimineum, Ailanthus altissima*	10-25, 0-10, 0-10	Ground herbicide application	Spot herbicide application
Lewis	17.0	*Ailanthus altissima, Elaeagnus umbellata, Lonicera morrowii, Microstegium vimineum, Rosa multiflora*	0-10, 10-25, 0-10, 0-10, 0-10	Ground herbicide application	Spot herbicide application
Lewis	17.1	*Ailanthus altissima, Elaeagnus umbellata, Lonicera morrowii, Microstegium vimineum, Rosa multiflora*	0-10, 10-25, 0-10, 0-10, 0-10	Ground herbicide application	Spot herbicide application
Lewis	17.3	*Elaeagnus umbellata, Lonicera morrowii, Rosa multiflora*	0-10, 0-10, 0-10	Ground herbicide application	Spot herbicide application
Lewis	17.4	*Elaeagnus umbellata, Rosa multiflora, Lonicera morrowii*	0-10, 0-10, 0-10	Ground herbicide application	Spot herbicide application
Lewis	17.6	*Microstegium vimineum, Rosa multiflora, Elaeagnus umbellata*	0-10, 0-10, 0-10	Ground herbicide application	Spot herbicide application
Lewis	18.6	*Microstegium vimineum, Rosa multiflora*	10-25, 0-10	Ground herbicide application	Spot herbicide application
Lewis	18.7	*Elaeagnus umbellata, Microstegium vimineum*	0-10, 25-50	Ground herbicide application	Spot herbicide application
Lewis	18.8	*Elaeagnus umbellata, Microstegium vimineum, Rosa multiflora*	10-25, 10-25, 0-10	Ground herbicide application	Spot herbicide application
Lewis	19.0	*Lonicera morrowii, Elaeagnus umbellata, Microstegium vimineum, Rosa multiflora, Ailanthus altissima*	0-10, 0-10, 0-10, 0-10, 0-10	Ground herbicide application	Spot herbicide application
Lewis	20.2	*Lonicera morrowii, Elaeagnus umbellata, Microstegium vimineum, Rosa multiflora*	0-10, 0-10, 0-10, 0-10	Ground herbicide application	Spot herbicide application
Lewis	20.6	*Lonicera morrowii, Rosa multiflora*	10-25, 0-10	Ground herbicide application	Spot herbicide application
Lewis	20.9	*Elaeagnus umbellata, Microstegium vimineum, Ailanthus altissima, Lonicera morrowii*	0-10, 10-25, 0-10, 0-10	Ground herbicide application	Spot herbicide application
Lewis	21.1	*Microstegium vimineum, Rosa multiflora*	10-25, 0-10	Ground herbicide application	Spot herbicide application
Lewis	21.4	*Elaeagnus umbellata, Microstegium vimineum, Rosa multiflora*	0-10, 0-10, 0-10	Ground herbicide application	Spot herbicide application
Lewis	21.9	*Rosa multiflora, Elaeagnus umbellata*	0-10, 0-10	Ground herbicide application	Spot herbicide application
Upshur	23.2	*Elaeagnus umbellata, Lonicera morrowii*	10-25, 0-10	Ground herbicide application	Spot herbicide application
Upshur	23.3	*Polygonum cuspidatum*	0-10	Ground herbicide application	Spot herbicide application
Upshur	24.4	*Elaeagnus umbellata, Rosa multiflora*	0-10, 0-10	Ground herbicide application	Spot herbicide application
Upshur	24.8	*Ailanthus altissima, Elaeagnus umbellata*	0-10, 50-75	Mechanical	Ground herbicide application
Upshur	25.1	*Elaeagnus umbellata, Rosa multiflora*	25-50, 10-25	Ground herbicide application	Spot herbicide application
Upshur	25.2	*Microstegium vimineum, Elaeagnus umbellata*	75-100, 10-25	Ground herbicide application	Spot herbicide application
Upshur	26.1	*Elaeagnus umbellata, Rosa multiflora*	0-10, 0-10	Ground herbicide application	Spot herbicide application
Upshur	26.2	*Rosa multiflora, Elaeagnus umbellata, Lonicera morrowii*	0-10, 0-10, 0-10	Ground herbicide application	Spot herbicide application

ATTACHMENT A (cont'd)

Invasive Plant Species Identified along the Atlantic Coast Pipeline and Supply Header Project [a]

Facility, State/ Commonwealth, County/City	Approximate Milepost	Invasive Plant Species	Prevalence (percent)	Primary Treatment Method [b]	Secondary Treatment Method
Upshur	26.5	*Rosa multiflora*	0-10	Ground herbicide application	Spot herbicide application
Upshur	27.4	*Carduus nutans*	0-10	Ground herbicide application	Spot herbicide application
Upshur	27.7	*Elaeagnus umbellata, Rosa multiflora*	0-10, 0-10	Ground herbicide application	Spot herbicide application
Upshur	28.3	*Elaeagnus umbellata, Rosa multiflora, Microstegium vimineum*	0-10, 0-10, 0-10	Ground herbicide application	Spot herbicide application
Upshur	28.9	*Elaeagnus umbellata, Lonicera morrowii, Rosa multiflora*	0-10, 10-25, 0-10	Ground herbicide application	Spot herbicide application
Upshur	29.0	*Carduus nutans*	0-10	Ground herbicide application	Spot herbicide application
Upshur	29.1	*Lonicera morrowii, Rosa multiflora*	25-50, 25-50	Ground herbicide application	Spot herbicide application
Upshur	29.3	*Elaeagnus umbellata, Lonicera morrowii, Rosa multiflora*	0-10, 10-25, 10-25	Ground herbicide application	Spot herbicide application
Upshur	29.6	*Elaeagnus umbellata, Rosa multiflora, Lonicera morrowii*	10-25, 0-10, 0-10	Ground herbicide application	Spot herbicide application
Upshur	29.8	*Rosa multiflora, Elaeagnus umbellata, Lonicera morrowii*	10-25, 10-25, 10-25	Ground herbicide application	Spot herbicide application
Upshur	30.1	*Carduus nutans*	0-10	Ground herbicide application	Spot herbicide application
Upshur	30.6	*Rosa multiflora, Elaeagnus umbellata, Lonicera morrowii, Microstegium vimineum*	0-10, 0-10, 0-10, 10-25	Ground herbicide application	Spot herbicide application
Upshur	31.1	*Rosa multiflora, Elaeagnus umbellata, Lonicera morrowii, Microstegium vimineum*	0-10, 0-10, 0-10	Ground herbicide application	Spot herbicide application
Upshur	31.2	*Rosa multiflora, Elaeagnus umbellata, Lonicera morrowii*	10-25, 10-25, 10-25	Ground herbicide application	Spot herbicide application
Upshur	31.6	*Elaeagnus umbellata, Lonicera morrowii*	0-10	Ground herbicide application	Spot herbicide application
Upshur	31.7	*Polygonum cuspidatum*	10-25	Ground herbicide application	Spot herbicide application
Upshur	32.0	*Ailanthus altissima, Elaeagnus umbellata*	10-25, 0-10	Ground herbicide application	Spot herbicide application
Upshur	32.1	*Rosa multiflora, Elaeagnus umbellata*	0-10, 0-10	Ground herbicide application	Spot herbicide application
Upshur	32.3	*Elaeagnus umbellata*	0-10	Ground herbicide application	Spot herbicide application
Upshur	32.4	*Rosa multiflora, Elaeagnus umbellata, Lonicera morrowii, Ailanthus altissima*	10-25, 10-25, 10-25, 10-25	Ground herbicide application	Spot herbicide application
Upshur	32.5	*Lonicera morrowii, Rosa multiflora, Ailanthus altissima*	10-25, 0-10, 0-10	Ground herbicide application	Spot herbicide application
Upshur	32.7	*Rosa multiflora*	0-10	Ground herbicide application	Spot herbicide application
Upshur	33.6	*Lonicera morrowii, Rosa multiflora*	0-10, 10-25	Ground herbicide application	Spot herbicide application
Upshur	34.4	*Polygonum cuspidatum, Elaeagnus umbellata, Rosa multiflora*	50-75, 0-10, 0-10	Mechanical	Ground herbicide application
Upshur	36.0	*Microstegium vimineum*	10-25	Ground herbicide application	Spot herbicide application
Upshur	36.2	*Microstegium vimineum, Rosa multiflora*	10-25, 0-10	Ground herbicide application	Spot herbicide application
Upshur	36.4	*Microstegium vimineum*	10-25	Ground herbicide application	Spot herbicide application
Upshur	36.7	*Microstegium vimineum, Rosa multiflora*	10-25, 0-10	Ground herbicide application	Spot herbicide application
Upshur	36.8	*Rosa multiflora*	0-10	Ground herbicide application	Spot herbicide application
Upshur	37.1	*Rosa multiflora*	10-25	Ground herbicide application	Spot herbicide application

ATTACHMENT A (cont'd)

Invasive Plant Species Identified along the Atlantic Coast Pipeline and Supply Header Project [a]

Facility, State/ Commonwealth, County/City	Approximate Milepost	Invasive Plant Species	Prevalence (percent)	Primary Treatment Method [b]	Secondary Treatment Method
Upshur	37.4	*Rosa multiflora, Microstegium vimineum, Elaeagnus umbellata*	0-10, 0-10, 0-10	Ground herbicide application	Spot herbicide application
Upshur	37.5	*Rosa multiflora, Elaeagnus umbellata*	10-25, 0-10	Ground herbicide application	Spot herbicide application
Upshur	37.7	*Elaeagnus umbellata, Rosa multiflora*	0-10, 0-10	Ground herbicide application	Spot herbicide application
Upshur	37.9	*Elaeagnus umbellata, Rosa multiflora*	0-10, 0-10	Ground herbicide application	Spot herbicide application
Upshur	39.5	*Rosa multiflora*	75-100	Mechanical	Ground herbicide application
Upshur	39.7	*Elaeagnus umbellata*	10-25	Ground herbicide application	Spot herbicide application
Upshur	40.6	*Rosa multiflora, Elaeagnus umbellata*	0-10, 0-10	Ground herbicide application	Spot herbicide application
Upshur	43.6	*Microstegium vimineum, Rosa multiflora, Elaeagnus umbellata*	10-25, 10-25, 0-10	Ground herbicide application	Spot herbicide application
Randolph	44.8	*Rosa multiflora, Lonicera morrowii, Elaeagnus umbellata, Lythrum salicaria, Microstegium vimineum*	10-25, 10-25, 0-10, 0-10, 0-10	Ground herbicide application	Spot herbicide application
Randolph	49.3	*Rosa multiflora*	0-10	Ground herbicide application	Spot herbicide application
Randolph	49.5	*Carduus nutans, Sorghum halepense, Rosa multiflora*	10-25, 0-10, 0-10	Ground herbicide application	Spot herbicide application
Randolph	49.9	*Elaeagnus umbellata*	0-10	Ground herbicide application	Spot herbicide application
Randolph	50.4	*Microstegium vimineum, Rosa multiflora*	25-50, 0-10	Ground herbicide application	Spot herbicide application
Randolph	50.9	*Rosa multiflora, Elaeagnus umbellata, Microstegium vimineum*	0-10, 10-25, 50-75	Mechanical	Ground herbicide application
Randolph	51.1	*Rosa multiflora, Ailanthus altissima, Elaeagnus umbellata*	10-25, 10-25, 0-10	Ground herbicide application	Spot herbicide application
Randolph	51.5	*Elaeagnus umbellata, Rosa multiflora*	0-10, 10-25	Ground herbicide application	Spot herbicide application
Randolph	51.6	*Elaeagnus umbellata, Rosa multiflora*	0-10, 10-25	Ground herbicide application	Spot herbicide application
Randolph	52.0	*Elaeagnus umbellata, Rosa multiflora*	10-25, 0-10	Ground herbicide application	Spot herbicide application
Randolph	52.3	*Elaeagnus umbellata, Lonicera morrowii, Rosa multiflora*	10-25, 0-10, 10-25	Ground herbicide application	Spot herbicide application
Randolph	52.4	*Rosa multiflora, Elaeagnus umbellata, Lonicera morrowii*	10-25, 10-25, 0-10	Ground herbicide application	Spot herbicide application
Randolph	52.6	*Rosa multiflora, Elaeagnus umbellata*	0-10, 10-25	Ground herbicide application	Spot herbicide application
Randolph	52.9	*Elaeagnus umbellata, Rosa multiflora*	10-25, 10-25	Ground herbicide application	Spot herbicide application
Randolph	53.5	*Rosa multiflora, Elaeagnus umbellata*	0-10, 0-10	Ground herbicide application	Spot herbicide application
Randolph	54.0	*Elaeagnus umbellata*	0-10	Ground herbicide application	Spot herbicide application
Randolph	54.1	*Elaeagnus umbellata*	0-10	Ground herbicide application	Spot herbicide application
Randolph	54.4	*Rosa multiflora, Elaeagnus umbellata*	0-10, 0-10	Ground herbicide application	Spot herbicide application
Randolph	56.2	*Elaeagnus umbellata*	0-10	Ground herbicide application	Spot herbicide application
Randolph	56.4	*Elaeagnus umbellata*	25-50	Ground herbicide application	Spot herbicide application
Randolph	57.1	*Elaeagnus umbellata*	10-25	Ground herbicide application	Spot herbicide application
Randolph	57.3	*Rosa multiflora, Elaeagnus umbellata*	0-10, 0-10	Ground herbicide application	Spot herbicide application
Randolph	57.6	*Elaeagnus umbellata*	10-25	Ground herbicide application	Spot herbicide application
Randolph	57.7	*Rosa multiflora*	0-10	Ground herbicide application	Spot herbicide application

ATTACHMENT A (cont'd)

Invasive Plant Species Identified along the Atlantic Coast Pipeline and Supply Header Project [a]

Facility, State/ Commonwealth, County/City	Approximate Milepost	Invasive Plant Species	Prevalence (percent)	Primary Treatment Method [b]	Secondary Treatment Method
Randolph	58.3	*Pueraria montana*	10-25	Ground herbicide application	Spot herbicide application
Randolph	58.4	*Rosa multiflora*	0-10	Ground herbicide application	Spot herbicide application
Randolph	59.5	*Rosa multiflora*	0-10	Ground herbicide application	Spot herbicide application
Randolph	59.6	*Elaeagnus umbellata, Polygonum cuspidatum, Rosa multiflora*	25-50	Ground herbicide application	Spot herbicide application
Randolph	60.2	*Polygonum cuspidatum*	75-100	Mechanical	Ground herbicide application
Randolph	60.7	*Rosa multiflora*	0-10	Ground herbicide application	Spot herbicide application
Randolph	61.0	*Microstegium vimineum*	10-25	Ground herbicide application	Spot herbicide application
Randolph	63.5	*Rosa multiflora*	10-25	Ground herbicide application	Spot herbicide application
Randolph	63.9	*Rosa multiflora*	10-25	Ground herbicide application	Spot herbicide application
Randolph	64.5	*Rosa multiflora*	25-50	Ground herbicide application	Spot herbicide application
Randolph	64.6	*Rosa multiflora*	10-25	Ground herbicide application	Spot herbicide application
Randolph	65.0	*Rosa multiflora, Elaeagnus umbellata, Lonicera morrowii*	10-25, 0-10, 0-10	Ground herbicide application	Spot herbicide application
Randolph	65.1	*Lonicera morrowii, Rosa multiflora*	0-10, 0-10	Ground herbicide application	Spot herbicide application
Randolph	65.2	*Rosa multiflora*	10-25	Ground herbicide application	Spot herbicide application
Randolph	65.4	*Elaeagnus umbellata, Rosa multiflora*	10-25, 25-50	Ground herbicide application	Spot herbicide application
Randolph	65.5	*Rosa multiflora, Elaeagnus umbellata*	25-10, 0-10	Ground herbicide application	Spot herbicide application
Randolph	65.7	*Rosa multiflora, Lonicera morrowii, Microstegium vimineum, Rosa multiflora*	0-10, 0-10, 0-10, 0-10	Ground herbicide application	Spot herbicide application
Pocahontas	67.4	*Rosa multiflora*	0-10	Ground herbicide application	Spot herbicide application
Pocahontas	67.7	*Rosa multiflora*	25-50	Ground herbicide application	Spot herbicide application
Pocahontas	68.6	*Elaeagnus umbellata, Rosa multiflora*	0-10, 0-10	Ground herbicide application	Spot herbicide application
Pocahontas	69.0	*Rosa multiflora*	0-10	Ground herbicide application	Spot herbicide application
Pocahontas	69.1	*Elaeagnus umbellata*	10-26	Ground herbicide application	Spot herbicide application
Pocahontas	69.2	*Elaeagnus umbellata, Carduus ntans, Rosa multiflora*	0-10, 0-10, 0-10	Ground herbicide application	Spot herbicide application
Pocahontas	69.3	*Rosa multiflora*	10-25	Ground herbicide application	Spot herbicide application
Pocahontas	70.3	*Elaeagnus umbellata, Rosa multiflora*	0-10, 0-10	Ground herbicide application	Spot herbicide application
Pocahontas	70.5	*Rosa multiflora*	0-10	Ground herbicide application	Spot herbicide application
Virginia					
None Identified					
AP-2					
North Carolina					
None identified					

ATTACHMENT A (cont'd)

Invasive Plant Species Identified along the Atlantic Coast Pipeline and Supply Header Project [a]

Facility, State/ Commonwealth, County/City	Approximate Milepost	Invasive Plant Species	Prevalence (percent)	Primary Treatment Method [b]	Secondary Treatment Method
AP-3					
None Identified					
SUPPLY HEADER PROJECT					
TL-636					
Pennsylvania					
Westmoreland	0.5	*Microstegium vimineum*	25-50	Ground herbicide application	Spot herbicide application
Westmoreland	0.7	*Microstegium vimineum, Lonicera tartarica*	25-50, 50-75	Mechanical	Ground herbicide application
Westmoreland	2.2	*Lonicera tartarica*	50-75	Mechanical	Ground herbicide application
Westmoreland	3.2	*Rosa multiflora*	0-10	Ground herbicide application	Spot herbicide application
TL-635					
West Virginia					
Harrison	0.1	*Elaeagnus umbellata*	25-50	Ground herbicide application	Spot herbicide application
Harrison	0.2	*Elaeagnus umbellata, Rosa multiflora*	50-75, 25-50	Mechanical	Ground herbicide application
Harrison	0.3	*Microstegium vimineum*	50-75	Mechanical	Ground herbicide application
Harrison	0.4	*Microstegium vimineum*	50-75	Mechanical	Ground herbicide application
Harrison	0.5	*Elaeagnus umbellata, Microstegium vimineum*	0-10, 25-50	Ground herbicide application	Spot herbicide application
Harrison	0.6	*Elaeagnus umbellata, Microstegium vimineum*	25-50, 25-50	Ground herbicide application	Spot herbicide application
Doddridge	0.8	*Elaeagnus umbellata, Microstegium vimineum*	50-75, 50-75	Mechanical	Ground herbicide application
Doddridge	0.9	*Microstegium vimineum*	25-50	Ground herbicide application	Spot herbicide application
Doddridge	1.9	*Microstegium vimineum*	25-50	Ground herbicide application	Spot herbicide application
Doddridge	2.1	*Microstegium vimineum*	50-75	Mechanical	Ground herbicide application
Doddridge	2.3	*Microstegium vimineum*	25-50	Ground herbicide application	Spot herbicide application
Doddridge	2.4	*Microstegium vimineum*	50-75	Mechanical	Ground herbicide application
Doddridge	2.5	*Microstegium vimineum*	25-50	Ground herbicide application	Spot herbicide application
Doddridge	2.8	*Microstegium vimineum*	50-75	Mechanical	Ground herbicide application
Doddridge	3.1	*Microstegium vimineum*	75-100	Mechanical	Ground herbicide application
Doddridge	3.9	*Microstegium vimineum*	75-100	Mechanical	Ground herbicide application
Doddridge	4.0	*Ailanthus altissima, Elaeagnus umbellata, Microstegium vimineum,*	0-10, 25-50, 50-75	Ground herbicide application	Spot herbicide application
Doddridge	4.1	*Microstegium vimineum*	75-100	Mechanical	Ground herbicide application
Doddridge	4.2	*Microstegium vimineum, Rosa multiflora*	75-100, 75-100	Mechanical	Ground herbicide application
Doddridge	4.4	*Microstegium vimineum*	25-50	Ground herbicide application	Spot herbicide application
Doddridge	4.5	*Microstegium vimineum*	25-50	Ground herbicide application	Spot herbicide application
Doddridge	4.6	*Microstegium vimineum*	75-100	Mechanical	Ground herbicide application

ATTACHMENT A (cont'd)

Invasive Plant Species Identified along the Atlantic Coast Pipeline and Supply Header Project [a]

Facility, State/ Commonwealth, County/City	Approximate Milepost	Invasive Plant Species	Prevalence (percent)	Primary Treatment Method [b]	Secondary Treatment Method
Doddridge	5.9	*Elaeagnus umbellata, Lonicera morrowii, Microstegium vimineum*	25-50, 25-50, 50-75	Ground herbicide application	Spot herbicide application
Doddridge	6.0	*Elaeagnus umbellata, Microstegium vimineum*	25-50, 25-50	Ground herbicide application	Spot herbicide application
Doddridge	6.2	*Microstegium vimineum*	50-75	Mechanical	Ground herbicide application
Doddridge	6.3	*Microstegium vimineum*	50-75	Mechanical	Ground herbicide application
Doddridge	6.4	*Rosa multiflora*	25-50	Ground herbicide application	Spot herbicide application
Doddridge	6.6	*Microstegium vimineum*	25-50	Ground herbicide application	Spot herbicide application
Doddridge	7.0	*Microstegium vimineum*	25-50	Ground herbicide application	Spot herbicide application
Doddridge	7.3	*Microstegium vimineum*	50-75	Mechanical	Ground herbicide application
Doddridge	7.4	*Microstegium vimineum*	75-100	Mechanical	Ground herbicide application
Doddridge	7.6	*Microstegium vimineum*	50-75	Mechanical	Ground herbicide application
Doddridge	7.7	*Microstegium vimineum*	50-75	Mechanical	Ground herbicide application
Doddridge	7.8	*Microstegium vimineum*	50-75	Mechanical	Ground herbicide application
Doddridge	7.9	*Lonicera tatarica*	25-50	Ground herbicide application	Spot herbicide application
Doddridge	8.1	*Microstegium vimineum*	50-75	Mechanical	Ground herbicide application
Doddridge	8.2	*Microstegium vimineum*	50-75	Mechanical	Ground herbicide application
Doddridge	8.4	*Microstegium vimineum*	25-50	Ground herbicide application	Spot herbicide application
Doddridge	8.7	*Microstegium vimineum*	75-100	Mechanical	Ground herbicide application
Doddridge	8.8	*Microstegium vimineum*	50-75	Mechanical	Ground herbicide application
Doddridge	8.9	*Microstegium vimineum*	75-100	Mechanical	Ground herbicide application
Doddridge	9.0	*Microstegium vimineum*	75-100	Mechanical	Ground herbicide application
Doddridge	9.3	*Microstegium vimineum*	10-25	Ground herbicide application	Spot herbicide application
Doddridge	9.5	*Microstegium vimineum*	50-75	Mechanical	Ground herbicide application
Doddridge	9.6	*Microstegium vimineum*	50-75	Mechanical	Ground herbicide application
Doddridge	9.7	*Microstegium vimineum*	75-100	Mechanical	Ground herbicide application
Doddridge	9.8	*Microstegium vimineum, Rosa multiflora*	75-100, 25-50	Mechanical	Ground herbicide application
Doddridge	10.0	*Microstegium vimineum*	25-50	Ground herbicide application	Spot herbicide application
Doddridge	10.7	*Rosa multiflora*	10-25	Ground herbicide application	Spot herbicide application
Doddridge	11.2	*Microstegium vimineum*	10-25	Ground herbicide application	Spot herbicide application
Doddridge	11.3	*Microstegium vimineum*	25-50	Ground herbicide application	Spot herbicide application
Doddridge	11.4	*Microstegium vimineum, Rosa multiflora*	25-50, 25-50	Ground herbicide application	Spot herbicide application
Doddridge	11.5	*Carduus crispus, Microstegium vimineum*	10-25, 25-50	Ground herbicide application	Spot herbicide application
Doddridge	11.6	*Microstegium vimineum*	25-50	Mechanical	Ground herbicide application
Doddridge	11.7	*Microstegium vimineum*	25-50	Ground herbicide application	Spot herbicide application

ATTACHMENT A (cont'd)

Invasive Plant Species Identified along the Atlantic Coast Pipeline and Supply Header Project [a]

Facility, State/ Commonwealth, County/City	Approximate Milepost	Invasive Plant Species	Prevalence (percent)	Primary Treatment Method [b]	Secondary Treatment Method
Doddridge	11.8	*Microstegium vimineum*	25-50	Ground herbicide application	Spot herbicide application
Doddridge	11.9	*Microstegium vimineum*	50-75	Mechanical	Ground herbicide application
Doddridge	12.2	*Microstegium vimineum*	50-75	Mechanical	Ground herbicide application
Doddridge	12.4	*Microstegium vimineum*	25-50	Ground herbicide application	Spot herbicide application
Doddridge	12.7	*Microstegium vimineum*	75-100	Mechanical	Ground herbicide application
Doddridge	12.9	*Elaeagnus umbellata, Microstegium vimineum*	50-75, 50-75	Mechanical	Ground herbicide application
Doddridge	13.3	*Elaeagnus umbellata*	50-75	Mechanical	Ground herbicide application
Doddridge	13.8	*Elaeagnus umbellata*	25-50	Ground herbicide application	Spot herbicide application
Doddridge	13.9	*Microstegium vimineum*	50-75	Mechanical	Ground herbicide application
Doddridge	14.0	*Elaeagnus umbellata, Microstegium vimineum, Rosa multiflora*	10-25, 0-10, 0-10	Ground herbicide application	Spot herbicide application
Doddridge	14.2	*Elaeagnus umbellata*	10-25	Mechanical	Ground herbicide application
Doddridge	14.4	*Elaeagnus umbellata*	25-50	Ground herbicide application	Spot herbicide application
Doddridge	14.6	*Elaeagnus umbellata*	50-75	Mechanical	Ground herbicide application
Doddridge	15.1	*Microstegium vimineum*	50-75	Mechanical	Ground herbicide application
Doddridge	15.4	*Elaeagnus umbellata*	10-25	Ground herbicide application	Spot herbicide application
Doddridge	15.6	*Microstegium vimineum*	50-75	Mechanical	Ground herbicide application
Doddridge	16.7	*Microstegium vimineum*	50-75	Mechanical	Ground herbicide application
Doddridge	16.9	*Microstegium vimineum*	25-50	Ground herbicide application	Spot herbicide application
Doddridge	17.1	*Microstegium vimineum*	50-75	Mechanical	Ground herbicide application
Doddridge	17.3	*Microstegium vimineum, Rosa multiflora, Elaeagnus umbellata*	25-50, 0-10, 0-10	Ground herbicide application	Spot herbicide application
Doddridge	17.4	*Microstegium vimineum*	25-50	Ground herbicide application	Spot herbicide application
Doddridge	17.5	*Microstegium vimineum, Rosa multiflora*	25-50, 50-75	Ground herbicide application	Spot herbicide application
Doddridge	17.8	*Ailanthus altissima, Microstegium vimineum*	0-10, 25-50	Ground herbicide application	Spot herbicide application
Doddridge	18.0	*Microstegium vimineum, Rosa multiflora, Elaeagnus umbellata*	0-10, 0-10, 0-10	Ground herbicide application	Spot herbicide application
Doddridge	18.5	*Polygonum cuspidatum, Rosa multiflora, Elaeagnus umbellata*	10-25, 0-10, 0-10	Ground herbicide application	Spot herbicide application
Doddridge	18.6	*Elaeagnus umbellata, Fallopia japonica*	50-75, 25-50	Mechanical	Ground herbicide application
Doddridge	19.0	*Ailanthus altissima, Rosa multiflora, Polygonum cuspidatum, Microstegium vimineum*	0-10, 0-10, 0-10, 25-50	Ground herbicide application	Spot herbicide application
Doddridge	19.8	*Microstegium vimineum*	25-50	Ground herbicide application	Spot herbicide application
Doddridge	19.9	*Microstegium vimineum*	25-50	Ground herbicide application	Spot herbicide application
Doddridge	20.0	*Microstegium vimineum*	50-75	Mechanical	Ground herbicide application
Doddridge	20.1	*Microstegium vimineum*	50-75	Mechanical	Ground herbicide application
Doddridge	20.5	*Microstegium vimineum, Rosa multiflora, Elaeagnus umbellata*	0-10, 0-10, 0-10	Ground herbicide application	Spot herbicide application

ATTACHMENT A (cont'd)

Invasive Plant Species Identified along the Atlantic Coast Pipeline and Supply Header Project [a]

Facility, State/ Commonwealth, County/City	Approximate Milepost	Invasive Plant Species	Prevalence (percent)	Primary Treatment Method [b]	Secondary Treatment Method
Doddridge	20.7	*Fallopia japnoica*	25-50	Ground herbicide application	Spot herbicide application
Doddridge	21.0	*Microstegium vimineum, Rosa multiflora, Elaeagnus umbellata*	0-10, 0-10, 0-10	Ground herbicide application	Spot herbicide application
Doddridge	21.3	*Microstegium vimineum*	75-100	Mechanical	Ground herbicide application
Doddridge	21.9	*Microstegium vimineum*	0-10	Ground herbicide application	Spot herbicide application
Doddridge	22.0	*Microstegium vimineum*	25-50	Ground herbicide application	Spot herbicide application
Doddridge	22.5	*Microstegium vimineum*	50-75	Mechanical	Ground herbicide application
Doddridge	22.6	*Microstegium vimineum*	50-75	Mechanical	Ground herbicide application
Tyler	22.8	*Ailanthus altissima, Microstegium vimineum*	50-75, 75-100	Mechanical	Ground herbicide application
Tyler	22.9	*Microstegium vimineum*	25-50	Ground herbicide application	Spot herbicide application
Tyler	23.1	*Rosa multiflora*	25-50	Ground herbicide application	Spot herbicide application
Tyler	23.4	*Microstegium vimineum*	50-75	Mechanical	Ground herbicide application
Tyler	23.5	*Ailanthus altissima, Microstegium vimineum, Rosa multiflora*	10-25, 25-50, 25-50	Ground herbicide application	Spot herbicide application
Wetzel	23.8	*Microstegium vimineum, Rosa multifora*	25-50, 0-10	Ground herbicide application	Spot herbicide application
Wetzel	24.0	*Microstegium vimineum*	25-50	Ground herbicide application	Spot herbicide application
Wetzel	25.6	*Microstegium vimineum, Rosa multiflora*	25-50, 0-10	Ground herbicide application	Spot herbicide application
Wetzel	28.4	*Ailanthus altissima, Microstegium vimineum, Rosa multiflora*	0-10, 0-10, 0-10	Ground herbicide application	Spot herbicide application
Wetzel	28.8	*Microstegium vimineum*	50-75	Mechanical	Ground herbicide application
Wetzel	29.0	*Microstegium vimineum, Rosa multiflora, Ailanthus altissima*	25-50, 10-25, 10-25	Ground herbicide application	Spot herbicide application
Wetzel	29.4	*Microstegium vimineum*	25-50	Ground herbicide application	Spot herbicide application
Wetzel	29.6	*Rosa multiflora, Elaeagnus umbellata, Microstegium vimineum, Ailanthus altissima*	25-50, 25-50, 10-25, 0-10	Ground herbicide application	Spot herbicide application
Wetzel	29.9	*Microstegium vimineum, Elaeagnus umbellata*	25-50, 0-10	Ground herbicide application	Spot herbicide application
Wetzel	31.1	*Elaeagnus umbellata, Lonicera morrowii, Rosa multiflora*	0-10, 0-10, 0-10	Ground herbicide application	Spot herbicide application
Wetzel	32.2	*Microstegium vimineum, Ailanthus altissima, Polygonum cuspidatum*	25-50, 10-25, 0-10	Ground herbicide application	Spot herbicide application
Wetzel	32.5	*Microstegium vimineum*	10-25	Ground herbicide application	Spot herbicide application
Wetzel	32.8	*Microstegium vimineum*	25-50	Ground herbicide application	Spot herbicide application
Wetzel	32.9	*Microstegium vimineum*	25-50	Ground herbicide application	Spot herbicide application
Wetzel	33.1	*Microstegium vimineum*	25-50	Ground herbicide application	Spot herbicide application
Wetzel	33.5	*Microstegium vimineum, Rosa multiflora, Polygonum cuspidatum, Lonicera tartarica,*	50-75, 0-10, 0-10, 25-50	Mechanical	Ground herbicide application

[a] Information related to invasive plant species within U.S. Forest Service lands is included in the *Construction, Operations, and Maintenance Plan*.

10.4 Appendix D – Restoration and Rehabilitation Plan

Appendix D

Restoration and Rehabilitation Plan

ATLANTIC COAST PIPELINE, LLC
ATLANTIC COAST PIPELINE

and

DOMINION ENERGY TRANSMISSION, INC.
SUPPLY HEADER PROJECT

Supplemental Filing
March 1, 2018

APPENDIX C

Update to the *Restoration and Rehabilitation Plan*

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

and

DOMINION ENERGY
TRANSMISSION, INC.
SUPPLY HEADER PROJECT
Docket No. CP15-555-000

Restoration and Rehabilitation Plan

Rev 8

Prepared by

February 2018

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

LIST OF ACRONYMS AND ABBREVIATIONS

ACP	Atlantic Coast Pipeline
ANST	Appalachian National Scenic Trail
Atlantic	Atlantic Coast Pipeline, LLC
ATWS	Additional Temporary Work Space
BFM	Bonded Fiber Matrix
BMP	Best Management Practice
COM	Construction, Operations, and Maintenance
DETI	Dominion Energy Transmission, Inc.
EI	Environmental Inspector
FERC	Federal Energy Regulatory Commission
GWNF	George Washington National Forest
MNF	Monongahela National Forest
NRCS	Natural Resources Conservation Service
Plan	Upland Erosion Control, Revegetation, and Maintenance Plan
Procedures	Wetland and Waterbody Construction and Mitigation Procedures
Projects	Atlantic Coast Pipeline and Supply Header Projects
RU	Revegetation Unit
SHP	Supply Header Project
USFS	U.S. Forest Service
VDEQ	Virginia Department of Environmental Quality
WMA	Wildlife Management Area

1.0 INTRODUCTION

Atlantic Coast Pipeline, LLC (Atlantic) – a company formed by four major energy companies – Dominion Energy Resources, Inc.; Duke Energy Corporation; Piedmont Natural Gas Co., Inc.; and Southern Company Gas – proposes to construct and operate approximately 600 miles of natural gas transmission pipelines and associated aboveground facilities in West Virginia, Virginia, and North Carolina. This Project, referred to as the Atlantic Coast Pipeline (ACP), will deliver up to 1.5 million dekatherms per day of natural gas from supply areas in the Appalachian region to demand areas in Virginia and North Carolina. Atlantic has contracted with Dominion Energy Transmission, Inc. (DETI), a subsidiary of Dominion Resources, Inc., to construct and operate the ACP on behalf of Atlantic.

In conjunction with the ACP, DETI proposes to construct and operate approximately 37.5 miles of pipeline loop and modify existing compression facilities in Pennsylvania and West Virginia. This Project, referred to as the Supply Header Project (SHP), will enable DETI to provide firm transportation service to various customers, including Atlantic.

2.0 PURPOSE

This *Restoration and Rehabilitation Plan* was prepared for the ACP and SHP (collectively, the Projects) to address post-construction restoration and rehabilitation activities. The plan will be implemented in conjunction with the 2013 versions of the Federal Energy Regulatory Commission's (FERC's) *Upland Erosion Control, Revegetation, and Maintenance Plan* (Plan) (FERC, 2013a) and *Wetland and Waterbody Construction and Mitigation Procedures* (Procedures) (FERC, 2013b) as well as Atlantic's and DETI's other construction, restoration, and mitigation plans (e.g., *Spill Prevention, Control, and Countermeasures Plan*, *Invasive Plant Species Management Plan*, and *Winter Construction Plan*). In addition, where state-specific erosion and sediment control requirements are more stringent than the FERC Plan and Procedures, the more stringent requirements will be implemented. The measures described in this plan reflect generally accepted best management practices (BMP) for restoration and rehabilitation of pipeline projects.

Atlantic and DETI have consulted with the U.S. Department of Agriculture's Natural Resources Conservation Service (NRCS) and other Federal, State/Commonwealth, and local agencies, including Federal and State/Commonwealth land managing agencies, to identify appropriate seed mixes for use during restoration. Based on discussions to date with the local NRCS offices, Federal and State/Commonwealth agencies, and subject matter experts, seed mixes have been developed and added to this plan. Seed mixes and how they were developed are described below. A more detailed description of seed mixes by region is presented in Appendix A.

On most pipeline projects, the seed mixes used for rights-of-way restoration generally consist of cool season grass species that grow well in the local area. Cool season grasses typically become established quickly and form a dense mat of grass and roots that is effective in controlling soil erosion in areas that have been disturbed by pipeline construction. These grasses may also provide food and habitat for some wildlife.

Atlantic is planning to incorporate regionally-specific and endemic forb (flowering plant) seeds in its traditionally all-grass seed mix. The incorporation and development of native flowering plants on the pipeline rights-of-way will create, where conditions and land management practices are suitable (i.e., areas with slope less than or equal to about 15 percent), substantial acreages of pollinator habitat where this type of habitat is currently non-existent, primarily previously forested areas.

Atlantic has consulted with various county offices of the NRCS, Federal land management resource specialists at the U.S. Forest Service (USFS) and U.S. Fish and Wildlife Service, soil and water conservation districts, the Xerces Society, private groups, and organizations that have specific knowledge of both perennial cover grasses as well as native pollinator forb species seed mixes. Atlantic has obtained recommendations regarding species, seeding rates, mulching during planting, and maintenance mowing. Atlantic has also met and consulted with various national, State/Commonwealth, and local groups and experts on pollinators and pollination species endemic to the region that the pipeline crosses to learn which native forb seed mixes will be complimentary to the various grass seed mixes. These meetings and consultations provided information about the appropriate seeding rates and percentages of each type of seed within a specific seed mix, as well as the location each seed mix is to be used considering the various soil types, elevations, temperatures, and other growing conditions along the rights-of-way.

Through consultations with regional native seed experts, particularly those working with the NRCS and the Xerces Society, Atlantic has determined that native flowering forbs grow best and reproduce most successfully when planted with native warm season grasses. Warm season grasses are slower to establish than cool season grasses, and are bunch grasses instead of mat forming. Warm season grasses and forbs do not provide soil coverage that is as dense or as effective at controlling erosion as cool season grasses. Therefore, Atlantic was advised and has elected to use native warm season grass and forb mixtures only in areas with gradual or low percent slopes. In general, in areas of the rights-of-way with slopes greater than 15 percent Atlantic will use cool season grass mixes without flowering forbs to most effectively control the potential for erosion. These areas are specified in Section 5.7.5 and in Appendix A.

Atlantic is committed to use only forb species that are native to the area or region where they will be planted, to try to source seed from local growers, as available, and to avoid the introduction of non-native and potentially invasive species to the extent practicable.

3.0 TRAINING

Prior to the start of construction, Atlantic and DETI 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 and DETI will provide large-group training sessions before each work crew commences construction with periodic follow-up training for groups of newly assigned personnel.

4.0 VEGETATION TYPES IN PROJECT AREA

Atlantic and DETI characterized vegetation types in the ACP Project area and SHP Project area based on review of the U.S. Geological Survey's National Gap Analysis Program Land Cover Data and recent digital aerial photography augmented by field reconnaissance (2014 through 2017). Based on these data, the proposed ACP pipeline facilities cross upland forest/woodland (268.9 miles), cultivated cropland (86.2 miles), wetlands (82.1 miles), pasture land (63.6 miles), tree plantation/harvested forest (61.1 miles), developed land (22.4 miles), open land (17.1 miles), and open water (3.3 miles). The proposed SHP pipeline facilities cross upland forest/woodland (33.0 miles), pasture land (2.2 miles), developed land (1.3 miles), cultivated cropland (0.5 mile), wetlands (0.3 mile), open water (0.2 mile), tree plantation/harvested forest (less than 0.1 mile), and open land (less than 0.1 mile). The types of upland woodland/forest crossed by the Projects include coniferous forests, deciduous forests, mixed forests, deciduous savanna and glades, and floodplain and riparian forests.

5.0 BEST MANAGEMENT PRACTICES

Based on FERC requirements identified in the Plan and Procedures and industry-accepted practices, Atlantic and DETI have identified and developed BMPs for restoration and rehabilitation of areas disturbed by construction. These BMPs have been used to establish Atlantic's and DETI's standards for restoration and revegetation as described below. It is noted that states in which the Projects are located may in some cases have erosion and sediment control requirements that are more stringent than requirements in the FERC Plan and Procedures. Where this occurs, the more stringent requirements will be implemented as depicted on the state-specific erosion and sediment control plans.

5.1 EROSION CONTROL

Atlantic and DETI anticipate that construction activities requiring the installation of temporary erosion control devices will begin with access road preparation and timber clearing in 2017, and continue through the completion of construction in late 2019. Construction of the pipelines will be followed by restoration of the rights-of-way, stabilization of the soil, and seeding (where needed). Atlantic and DETI 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 and DETI will resume clean-up and restoration efforts the following Spring. Atlantic and DETI will monitor and maintain temporary erosion controls (e.g., temporary slope breakers, sediment barriers, or mulch) until conditions allow for completion of cleanup and installation of permanent erosion control structures.

Temporary erosion control measures and permanent erosion control devices to be employed during and after construction are described below.

- Slope Breakers – Temporary and permanent slope breakers will be installed, where required, to slow runoff velocity and direct water off the rights-of-way.

Temporary slope breakers, such as earthen berms, will be installed prior to the start of construction activities. Permanent slope breakers will be installed during final grading.

- Temporary Sediment Barriers – Temporary sediment barriers, such as belted silt retention fence, compost filter sock or a combination of barriers, will be installed at the base of slopes adjacent to road, wetland, and waterbody crossings, and in other areas where required to prevent the transport of sediment off the construction rights-of-way.

- Permanent Trench Breakers – Sacks of subsoil or sand, polyurethane foam, concrete, or bentonite clay installed around the pipe will remain in the trench to prevent subsurface channeling of water along the trench.

- Mulch – Straw (weed free), hay (weed free), erosion-control fabric, or other equivalent material will be placed on the rights-of-way, where required, to protect the soil surface from water and wind erosion and to optimize the soil moisture regime necessary for successful revegetation, especially on dry, sandy sites.

During construction, the effectiveness of temporary erosion control devices will be monitored by Atlantic's and DETI's Environmental Inspectors (EIs). Where appropriate for local resource needs, 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 for the life of the project by Atlantic and DETI operating personnel during the long-term operation and maintenance of the pipeline systems.

5.2 SOIL RESTORATION

Successful revegetation is dependent on appropriate soil conditions and can be influenced by several factors, including soil texture, drainage class, salinity, and acidity. Soil characteristics along the pipeline routes and access roads and at contractor yards and aboveground facility sites are identified in Resource Report 7. Unless otherwise approved by a land managing agency or landowner, soil restoration will include:

- removal of excavated rock that is not returned to the trench and is considered construction debris, or in some cases, some of the excavated rock will be buried in the cut that was pulled to create a level work surface;

- distribution of rock on the work area that is of similar size and density to adjacent areas not disturbed by construction;

- grading of the rights-of-way to restore preconstruction contours to the extent practicable; and

- preparation of the soil for revegetation.

5.3 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 and DETI will minimize impacts by implementing the mitigation measures for compaction and rutting as described in the Plan and Procedures. Atlantic and DETI will test for soil compaction:

- in residential and agricultural areas (e.g., active croplands, pastures, nurseries, and orchards);
- in other areas requested by the land managing agency or landowner;
- in undisturbed areas adjacent to the construction workspace with the same soil type under similar moisture conditions to approximate 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, compaction may be impossible to measure and rectify without additional damage. If compaction testing is impeded by rock or roots, Atlantic and DETI may conclude that there is a suitable amount of large material in the soil to rectify potential compaction. Soil compaction will be remediated prior to re-spreading of salvaged topsoil.

5.4 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 segregation will be:

- performed in the trenchline within non-saturated wetlands, croplands, pastures, hayfields, residential areas, and in other areas requested by the land managing agency or landowner;
- conducted as described in the Plan and Procedures;
- stockpiled on the rights-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. Topsoil segregation will generally not occur in forested areas. Most forested areas are not

conducive to topsoil segregation due to the amount of root materials present and the wider construction rights-of-way that would be required to store segregated topsoil.

5.5 RE-CONTOURING

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

- restore the ground surface as closely as practicable to original contours to restore natural overland water flow patterns, aquifer recharge, and drainage patterns;
- re-contour disturbed areas in a fashion designed to stabilize slopes, remove ruts and scars, and support successful revegetation; and
- restore, to original or better condition, drainage ditches, and culverts that are diverted or damaged during construction.

5.6 STEEP SLOPE AREAS

Areas with steep slopes along the pipeline routes may make the establishment of vegetation more difficult due to the increased potential for stormwater runoff and erosion by water. In areas with slopes greater than 15 percent, Atlantic and DETI are planning to use seed mix prescriptions that utilize appropriate cool season grass species to quickly stabilize the disturbed areas and minimize erosion and sedimentation. Appendix B quantifies by county the major soil drainage and slope classes crossed by the Projects. Soil drainage classes were used to determine some of the grass seed types utilized in specific mixes (see Section 5.7.5).

The use of fast-growing cool season grasses will help to ensure faster soil stabilization in steeper terrain because of the faster development of stable root systems, which hold the soil in place. Additionally, in areas with slopes greater than 35 percent, the rights-of-way will be restored to natural contours to the extent practicable or in accordance with requests from land managing agencies or landowners. These steep slope areas are mostly located along the route in the Appalachian region of West Virginia and western Virginia but occasionally in other areas along the entire rights-of-way. 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 rights-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 and DETI 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 rights-of-way in steep slope areas. Specifically, as discussed in Resource Report 6, Atlantic and DETI are committed to employing best in class 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.

Also as discussed in Resource Report 6, Atlantic and DETI will implement the Slip Avoidance, Identification, Prevention, and Remediation – Policy and Procedure. Atlantic and DETI conducted geotechnical studies along the proposed pipeline routes in Pennsylvania, 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 Projects.

The following lists some of the design and construction mitigation measures that will be implemented during construction in steep slope areas:

- targeted management and diversion of surface water around landslide sites, including the use of ditches, berms, slope breakers, and/or grading;
- mitigation of surface erosion by armoring or otherwise stabilizing surface soils using riprap, coir cloth, hydroseeding, mulching, and/or tracking;
- targeted management of water sources along the trench, including the use of trench breakers and/or added drainage piping in the trench;
- targeted mitigation of seeps, springs, or other subsurface water encountered along the rights-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, sack-crete placements, key trenches, and/or shear trenches; and
- reduction in surcharge on steep slope areas by reducing excess or saturated backfill.

5.7 SITE PREPARATION AND SEEDING

Atlantic and DETI will complete final grading and permanent erosion control measures within 20 days after backfilling of the trench (10 days in residential areas), seasonal or other weather conditions permitting. In the event that these timeframes cannot be met or construction or restoration activities are interrupted for an extended period, mulch will be spread prior to seeding. In these cases, all slopes within 100 feet of wetlands or waterbodies will be mulched at a rate of 3 tons per acre.

5.7.1 Seedbed Preparation

Proper preparation of the soil surface and seedbed is essential for rapid and healthy revegetation (Virginia Department of Environmental Quality, 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 rights-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 land managing agencies or landowners or as needed to support the establishment of pollinator habitat, 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 and DETI 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, which are needed to prepare an adequate seedbed. When hydroseeding, Atlantic and DETI will scarify the soil surface prior to seeding to anchor the seed to the soil surface and encourage germination. Where residential lawns or landscaped areas are disturbed or as needed to support the establishment of pollinator habitat, more intensive ground and seedbed preparations may be required, including rock collection, grading, and soil preparation/amending.

5.7.2 Seeding

Seeding will not be conducted in actively cultivated croplands unless requested by the landowner. In residential areas, lawns will be restored on a schedule established during easement negotiations with the landowner. On all other lands, Atlantic and DETI 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 and DETI 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 addition, as part of the restoration and rehabilitation plan to revegetate disturbed areas along the pipeline routes, Atlantic and DETI will use cool season grasses to revegetate areas with slopes greater than 15 percent.

All seed will be certified weed free. The EIs will review all seed tags prior to use to ensure that the seed is properly certified.

5.7.2.1 Pollinator Habitat Planting

Atlantic, in support of a 2014 Presidential Memorandum that directs federal agencies to cooperate on the development of a national pollinator strategy, has committed to a pollinator habitat initiative where suitable along the rights-of-way. The successful establishment of pollinator habitat will require specialized soil preparation, seeding techniques, and maintenance practices.

The most common causes for failed establishment when planting pollinator species are: (1) poor soil/seed contact and planting the seed more than one-quarter inch deep in the soil, and (2) competition from annual weeds, non-natives, or invasive vegetation. To prevent competition from other vegetation, Atlantic will reduce the existing seed bank in the rights-of-way. The seed bank will be reduced by clearing the existing vegetation (done during construction) and by using herbicides.

Additional soil preparation is also needed to ensure seed germination. The soil surface must be relatively smooth and compact to allow shallow seeding, no more than one-quarter inch deep. Typically, planting will include the use of a nurse crop or cover crop to ensure proper soil erosion control and the survival of the pollinator plant species. Cover crops (e.g., annual oats) are also generally used in traditional rights-of-way seeding.

The warm season grasses and endemic forbs used to establish pollinator habitat need to be planted in the Spring. Therefore,

- For Fall, Rights-of-way Restoration: Plant a cover crop and then plant the pollinator seed mix with a nurse crop in the Spring after an herbicide application.
- For Spring, Rights-of-way Restoration: Apply an herbicide prior to planting but after the weed seeds germinate and then plant the pollinator seed mix and a nurse crop together.
- For Summer, Rights-of-way Restoration: Plant a cover crop and then plant the pollinator seed mix with a nurse crop in the Spring after an herbicide application.

Atlantic plans to plant the pollinator species in both the permanent and construction rights-of-way. Atlantic has proposed seed mixes based on the recommendations from consultations with State/Commonwealth and Federal agencies. These seed mixes are described in more detail below and in Appendix A.

5.7.2.2 Pollinator Habitat Maintenance

Additional mowing is required in the first two years to reduce the height of the weeds and to prevent them from going to seed which will greatly reduce weed competition. Spot use of herbicides should be an option to control woody and invasive plants. Pollinator habitat experts recommend periodic prescription burning of the rights-of-way to reduce accumulated duff (i.e., dead vegetation on top of the ground) so that the pollinator species (flowers) can continue to reseed and maintain a viable population. Mowing close, at a height of four inches, and or

thatching/raking may be viable alternatives to prescribed burning. Maintenance practices should be adapted to what is proven to be the best practices to ensure quality pollinator habitat.

5.7.3 Seeding Revegetation Units along the Pipeline Route

After consultations with Federal, State/Commonwealth, local resource and land managing agencies, and subject matter experts and in order to ensure optimum seed germination and growth, the areas crossed by the Projects were divided into four Revegetation Units (RUs). One of the RUs is dependent on and defined by the steepness of the slopes crossed by the proposed pipelines. This RU can occur in site-specific locations anywhere along the pipeline corridors. The three other RUs are based on physiographic regions, and cover areas that are relatively homogenous with regards to factors such as soil type, vegetation, and climate that will affect the revegetation potential of the area. Each RU has distinct seed mix prescriptions. The four RUs include the following:

- Steep to Very Steep Slope RU;
- Mountain Physiographic Region RU;
- Piedmont Physiographic Region RU; and
- Coastal Plain Physiographic Region RU.

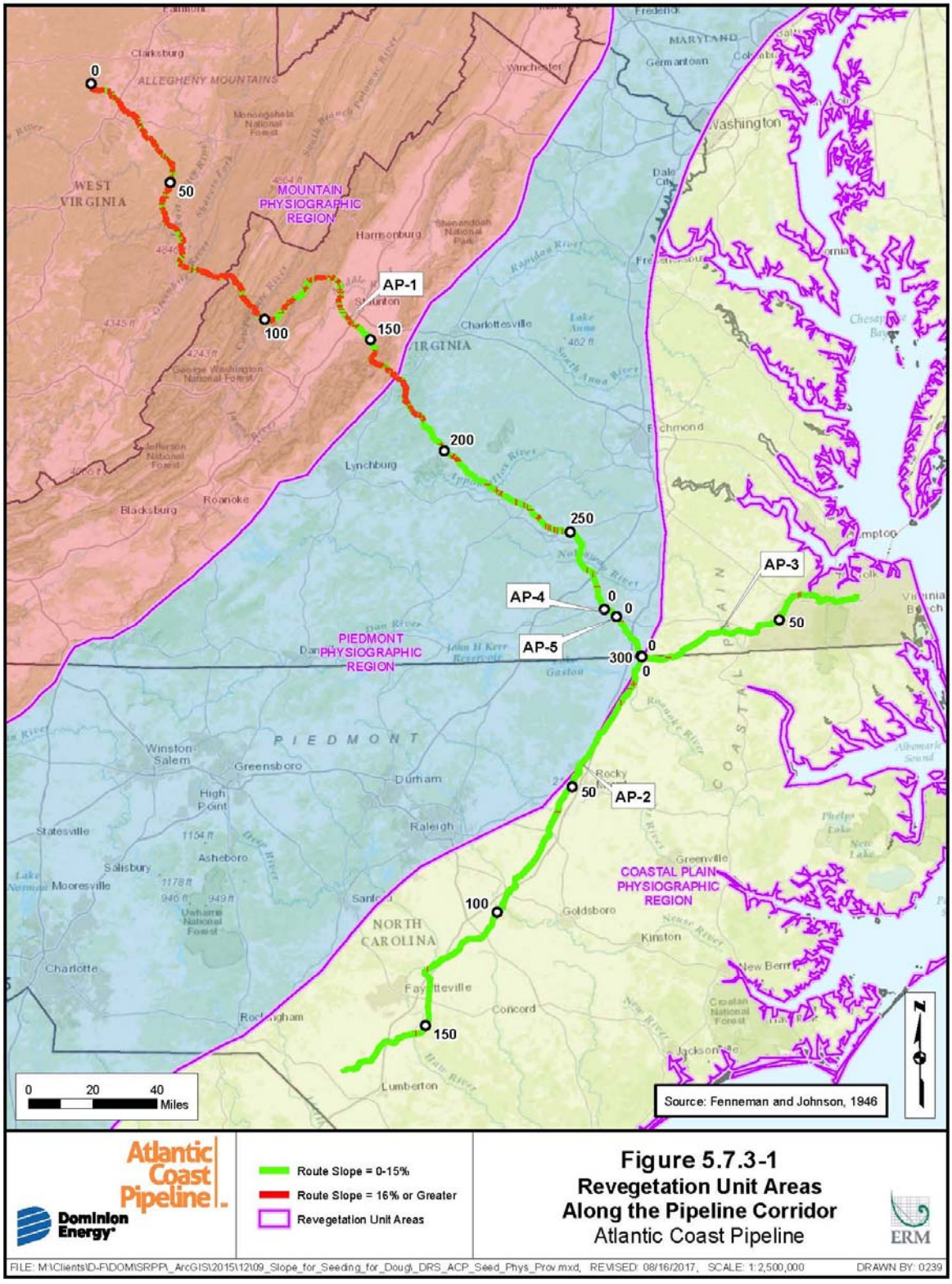
Figure 5.7.3-1 shows the distribution of the RUs, including the areas with slopes greater than 15 percent, along the pipeline route. Seed mix descriptions specific for each RU are provided in Appendix A.

5.7.3.1 Steep to Very Steep Slope

Although the Steep to Very Steep Slope RU includes areas with greater than 15 percent slope located anywhere along the Projects, most of these areas are located within the mountainous areas of the western Piedmont Physiographic RU and the Mountain Physiographic RU (see Figure 5.7.3-1). To a much lesser extent, the Steep to Very Steep Slope RU may also be found in smaller, site-specific areas along the pipeline rights-of-way where the steepness of the local terrain increases the erosion potential. The areas in this RU require appropriate seed mix prescriptions, erosion control measures, and BMPs that are able to quickly stabilize the disturbed areas to minimize erosion and sedimentation.

5.7.3.2 Mountain Physiographic Region

The ACP Project area extends across the Mountain Physiographic Region RU in West Virginia and western Virginia (see Figure 5.7.3-1). In West Virginia, the RU encompasses the Western Allegheny Plateau, Central Appalachians, and Ridge and Valley ecoregions. The SHP Project area also extends across the Western Allegheny Plateau in northeastern West Virginia and southwestern Pennsylvania. In Virginia, this RU encompasses the Ridge and Valley, Blue Ridge (mountains), and the Southeastern Plains ecoregions. The soils in the Mountain Region RU generally consist of shallow soils with a loamy surface and subsoil texture. Steep slopes with shallow, stony, droughty soils are common throughout the area, and many mountainous soils have been severely eroded due to steepness. In less steep areas, the soils are deep and stable (less erodible).


0
50
100
150
200
250
300
AP-1
AP-2
AP-3
AP-4
AP-5
MOUNTAIN PHYSIOGRAPHIC REGION
PIEDMONT PHYSIOGRAPHIC REGION
COASTAL PLAIN PHYSIOGRAPHIC REGION
WEST VIRGINIA
VIRGINIA
NORTH CAROLINA
ALLEGHENY MOUNTAINS
Clarksburg
Harrisonburg
Charlottesville
Lynchburg
Roanoke
Blacksburg
Winston-Salem
Greensboro
High Point
Durham
Raleigh
Rocky
Asheboro
Statesville
Salisbury
Mooresville
Charlotte
Rockingham
Fayetteville
Lumberton
Goldsboro
Kinston
Greenville
New Bern
Concord
Germantown
Washington
Richmond
Virginia Beach
Jacksonville
0 20 40 Miles
Source: Fenneman and Johnson, 1946
Route Slope = 0-15%
Route Slope = 16% or Greater
Revegetation Unit Areas
Atlantic Coast Pipeline
Dominion Energy
ERM
Figure 5.7.3-1
Revegetation Unit Areas
Along the Pipeline Corridor
Atlantic Coast Pipeline
FILE: M:\Clients\D-F\DOM\SRPP_ArcGIS\2015\12\09_Slope_for_Seeding_for_Doug_DRS_ACP_Seed_Phys_Prov.mxd; REVISED: 08/16/2017; SCALE: 1:2,500,000 DRAWN BY: 0239

5.7.3.3 Piedmont Physiographic Region

The proposed ACP Project area extends across the Piedmont Physiographic Region RU in Virginia and encompasses the Piedmont, Northern Piedmont, and Southeastern Plains ecoregions. The Piedmont ecoregion is an area of rolling landscape, gentle hills and valleys with a few isolated mountains (see Figure 5.7.3-1). The Piedmont is characterized by deep, weathered, very old eroded rock surfaces. The ecoregion primarily consists of agricultural land and managed woodlands. The temperate climate supports forests dominated by hardwood species. In general, the Piedmont and Northern Piedmont ecoregions are similar, as they are characterized by irregular plains, open valleys, and hills with stony soils that support both forested and agricultural lands. The Southeastern Plains ecoregion consists of flat plains interspersed with croplands, pastures, forests, and wetlands with primarily sandy soils. The overall climate is warm with a much longer rainy season, which contributes to a longer growing season compared to the Piedmont and Northern Piedmont ecoregions.

5.7.3.4 Coastal Plain Region

The proposed ACP Project area extends across the Coastal Plain Region RU in Virginia and North Carolina (see Figure 5.7.3-1). This RU encompasses two ecoregions: the Southeastern Plains and Mid-Atlantic Coastal Plain. As described above, the Southeastern Plains region consists of flat plains interspersed with croplands, pastures, forests, and wetlands with primarily sandy soils. The Mid-Atlantic Coastal Plain ecoregion borders the Piedmont ecoregion and the Atlantic Ocean, and contains a mix of forests, agricultural lands, and wetlands. The soils crossed by the proposed ACP Project area in these ecoregions are generally well drained soils with a loamy surface and subsoil texture.

5.7.4 Summary of State and Federal Agencies and Subject Matter Experts Consulted

Table 5.7.4-1 provides a list of the Federal and State/Commonwealth agencies, and subject matter experts consulted to determine the appropriate seed mix prescriptions and BMPs to revegetate areas disturbed by the construction of the ACP and SHP facilities.

TABLE 5.7.4-1

Summary of Federal and State/Commonwealth Agencies and Subject Matter Expert Consultations

Contact Name	Agency/ Organization	County	Title/Role	Phone	Email
West Virginia					
Greg Stone	NRCS - State Office	All Counties	Acting State Resource Conservationist	304-284-7579	greg.stone@wv.usda.gov
Jeff Griffith	USDA NRCS	Harrison; Lewis; Doddridge	District Conservationist	304-624-9232 x 110	jeff.griffith@wv.usda.gov
Jack O'Connell	USDA NRCS	Pocahontas	District Conservationist	304-799-4317	jack.oconnell@wv.usda.gov
Barbara Sargent	West Virginia Department of Natural Resources	Wetzel	Wildlife Biologist	304-637-0245	barbara.d.sargent@wv.gov

TABLE 5.7.4-1 (continued)

Summary of Federal and State/Commonwealth Agencies and Subject Matter Expert Consultations

Contact Name	Agency/ Organization	County	Title/Role	Phone	Email
Cliff Brown	West Virginia Department of Natural Resources	Wetzel	Wildlife Biologist	304-637-0245	clifford.l.brown@wv.gov
Idun Guenther	NRCS	Pocahontas	District Conservationist	304-255-9225	idun.guenther@wv.usda.gov
Susan Davis	NRCS	Pocahontas	Soil Conservationist	304-799-4317	susan.davis@wv.usda.gov
Rob Silvester	West Virginia Department of Natural Resources	Randolph	District Wildlife Biologist	304-924-6211	rob.a.silvester@wv.gov
Steve Rauch	West Virginia Department of Natural Resources	Randolph; Wetzel	District Wildlife Biologist	304-825-6787	steven.e.rauch@wv.gov
Ben Collier	NRCS	Randolph; Upshur	District Conservationist	304-636-6703 x 305	ben.collier@wv.usda.gov
Jeremy Bennett	NRCS	Randolph; Upshur	District Conservationist	304-457-4516	jeremy.bennett@wv.nrcs.gov
Dustin Adkins	NRCS	Tyler; Wetzel	District Conservationist	304-758-2173 x 1	dustin.adkins@wv.usda.gov
Katie Fitzsimmons	NRCS	Marshall	District Conservationist	304-242-0576 x 108	katie.fitzsimmons@wv.usda.gov
Virginia					
Amy Ewing	Virginia Department of Game and Inland Fisheries	Virginia Counties	Environmental Services Biologist/Fish & Wildlife Information Manager	804-367-2211	Amy.Ewing@dgif.virginia.gov
Charles Ivins	NRCS	Augusta; Highland	District Conservationist	540-248-6218 x 122	charles.ivins@va.usda.gov
Charles Simmons	NRCS	Bath	District Conservationist	540-463-7124 x111	charles.simmons@va.usda.gov
Justin Folk	NRCS/Virginia Department of Game and Inland Fisheries	Bath	Private Lands Wildlife Biologist	540-248-6218 x 108	justin.folks@va.usda.gov
Davie Wade Harris	NRCS	Brunswick	District Conservationist	434-848-2145 x 102	davie.harris@va.usda.gov
David Harris	NRCS	Buckingham; Cumberland	District Conservationist	434-983-4757 x 101	david.harris@va.usda.gov
Bryan Poovey	U.S. Fish and Wildlife Service	Chesapeake; Suffolk (City); (Great Dismal Swamp National Wildlife Refuge)	Forestry Scientist	757-986-3705	bryan_poovey@fws.gov
David Bryd	U.S. Fish and Wildlife Service	Great Dismal Swamp NWR	Forestry Scientist	804-824-2412	david_byrd@fws.gov
Robert E. Williams	NRCS	Chesapeake	District Conservationist	757-547-7172 x 102	robert.williams@va.usda.gov
Bob Glennon	NRCS	Eastern Virginia Counties	Private Lands Biologist	757-357-7004 x 126	robert.glennon@va.usda.gov
Anthony Howell	NRCS	Dinwiddie	District Conservationist	804-469-7297 x 106	anthony.howell@va.usda.gov
Harvey Baker	NRCS	Greensville	District Conservationist	434-634-2115 x 109	harvey.baker@va.usda.gov
Jay Jeffreys	Virginia Department of Game and Inland Fisheries	Highland; Nelson	Biologist	540-248-9360	jay.jeffreys@dgif.virginia.gov

TABLE 5.7.4-1 (continued)

Summary of Federal and State/Commonwealth Agencies and Subject Matter Expert Consultations

Contact Name	Agency/ Organization	County	Title/Role	Phone	Email
Kory Kirkland	NRCS	Nelson	District Conservationist	540-967-0233 x 111	kory.kirkland@va.usda.gov
Jeffray Jones	NRCS	All Counties	State Biologist	804-287-1691	jeffray.jones@va.usda.gov
J.B. Daniel	NRCS	Prince Edward	Agronomist Director	434-392-4171	j.b.daniel@va.usda.gov
Derek Hancock	NRCS	Nottoway; Prince Edward	District Conservationist	434-392-4127 x 101	derek.hancock@va.usda.gov
Yamika Bennett	NRCS	Southampton	District Conservationist	757-653-2532 x 122	yamika.bennett@va.usda.gov
Michael A. Faulk	NRCS	Suffolk (City)	District Conservationist	757-357-7004 x 114	mike.faulk@va.usda.gov
Ryan McCormick	National Park Service		Specialist Coordinator	828-348-3441	
J. Christopher Ludwig	DCR	All Counties	Chief Biologist	804-371-6206	Chris.Ludwig@dcr.virginia.gov
Marc Puckett	DGIF	All Counties	QMAP Coordinator	434-392-9645	Marc.Puckett@dgif.virginia.gov
North Carolina					
Renessa Hardy-Brown	NRCS	Cumberland	District Conservationist	910-484-8479	renessa.brown@nc.usda.gov
Terry Best	NRCS	Halifax	District Conservationist	252-583-3481	terry.best@nc.usda.gov
Brian Loadholt	NRCS	Johnston	District Conservationist	919-934-7156	brian.loadholt@nc.usda.gov
Patrick Evens	NRCS	Nash	District Conservationist	252-459-4116 x 124	patrick.evans@nc.usda.gov
Paul Boone	NRCS	Northampton	District Conservationist	252-534-2591	paul.boone@nc.usda.gov
Jeremy Ruston	NRCS	Robeson	District Conservationist	910-739-5478	jeremy.roston@usda.gov
Gavin Thompson	NRCS	Sampson	District Conservationist	910-592-7963	gavin.thompson@nc.usda.gov
David Little	NRCS	Wilson	District Conservationist	252-237-2711	david.little@nc.usda.gov
Pennsylvania					
Chris Droste	Westmoreland Conservation District	Westmoreland	Erosion Control Specialist	724-837-5271	chris@wcdpa.com
Subject Matter Experts					
Mark Fiely	Ernst Seeds	All Counties	Horticulturist	800-873-3321	hortpath@ernstseed.com
Jeremy Hamlington	Roundstone Native Seed	All Counties	Horticulturist	270-531-3034	jeremy@roundstoneseed.com
Bob Glennon	NRCS / The Xerces Society	All Counties	Private Lands Biologist	757-357-7004 x 126	robert.glennon@va.usda.gov
Nancy Lee Adamson	The Xerces Society for Invertebrate Conservation & NRCS East National Technology Support Center	All Counties	Pollinator Conservation Specialist	336-370-3443	nancy@xerces.org

5.7.5 Seed Mix Recommendations

Appendix A compiles the recommended seeding mixes and amendments provided by Federal, State/Commonwealth, local resource, and land managing agencies and subject matter

experts into seed mix prescriptions by County/City and by spread for the Projects. Seed mixes and methods for revegetation and restoration of the Federal and State/Commonwealth lands crossed by the pipelines are addressed in Sections 6 and 7. The Virginia Department of Game and Inland Fisheries has requested that it be responsible for the reseeding of Wildlife Management Area (WMA) lands crossed in Virginia and under the jurisdiction of that agency.

The recommended seed mix prescriptions for each RU are listed by pipeline and milepost in Appendix C.

5.7.5.1 Steep to Very Steep Slope Seed Mixes

As described in Sections 5.7.3, the Steep to Very Steep Slope RU includes areas with high erosion potential (e.g., slopes greater than 15 percent). These areas require appropriate seed mixtures and erosion control measures that are able to quickly stabilize disturbed areas. The recommended seed mixes include the use of cool season grasses, which are identified by County in Appendix A.

5.7.5.2 Mountain Physiographic Region Seed Mixes

Excessively to Moderately Well Drained Sites

West Virginia

The proposed Mountain Physiographic Region Seed Mix P-MUDW01 (Tables 5.7.5-1 and 5.7.5-2) was designed to be compatible with the Mountain Physiographic Region RU in areas with slopes of 15 percent or less. The mix is based on selected native grass and forb species suitable for the restoration of excessively to moderately well-drained mountainous areas in West Virginia.

Virginia

The proposed Mountain Physiographic Region Seed Mix P-VABCHNP01 (Tables 5.7.5-3 and 5.7.5-4) was designed to be compatible with the Mountain Physiographic Region RU in areas with slopes of 15 percent or less. The mix is based on selected native grass and forb species suitable for restoration in excessively to moderately well-drained mountainous areas in Virginia. As requested by the Virginia Department of Environmental Quality (VDEQ), a woody shrub seed mix (Seed Mix VDEQ1; see Table 2.2.5-1 of Appendix A) will also be added to the above recommended grasses and forb mixes in forested areas crossed by the pipeline in Virginia.

Somewhat Poorly to Very Poorly Drained Sites

West Virginia

The proposed Mountain Physiographic Region Seed Mix P-MUDW02 (Tables 5.7.5-5 and 5.7.5-6) was designed to be compatible with the Mountain Physiographic Region RU in areas with slopes of 15 percent or less. The mix is based on selected native grasses and forb

species suitable for restoration in somewhat poorly to very poorly-drained mountainous areas in West Virginia.

Virginia

The proposed Mountain and Upland Seed Mix P-VABCHNP02 (Tables 5.7.5-7 and 5.7.5-8) was designed to be compatible with the Mountain Physiographic Region RU in areas with slopes of 15 percent or less. The mix is based on selected native grasses and forb species suitable for restoration in somewhat poorly to very poorly-drained mountainous areas in Virginia.

TABLE 5.7.5-1

Seed Mix P-MUDW01: Recommended Mountain Physiological Region
Grass Seed Mix and Application Rates for Excessively to Moderately Well Drained Sites in West Virginia [a]

Common Name	Scientific Name	Height (feet)	Sun Exposure	Seed Mix Rate (lbs/acre/PLS) [b]
Little Bluestem	*Schizachyrium scoparium*	2 - 4	Full Sun	0.250
Virginia Wild Rye	*Elymus virginicus*	2 - 4	Full Sun	0.250
Tall Dropseed	*Sporobolus compositus*	2 - 3	Full Sun	0.050
Purple Top	*Tridens flavus*	3 - 5	Part Shade	0.058
Indian Grass	*Sorghastrum nutans*	3 - 6	Full Sun	0.167
Switchgrass	*Panicum virgatum*	3 - 7	Full Sun	0.183
Fall Panicum	*Panicum anceps*	2 - 4	Part Shade	0.042
Total	—	—	—	1.0

Sources: Roundstone Native Seed, 2015; Glennon, 2015.

[a] Recommended seeding application rate is 8 to 18 pounds per acre.

[b] lbs/acre/PLS = pounds per acre of pure live seed

TABLE 5.7.5-2

Seed Mix P-MUDW01: Recommended Mountain Physiological Region
Forb Seed Mix and Application Rates for Excessively to Moderately Well Drained Sites in West Virginia

Common Name	Scientific Name	Color	Bloom Period	Seed Application Rate (lbs/acre/PLS) [a]
Lance Leaved Coreopsis	*Coreopsis lanceolata*	Yellow	Spring,Summer	0.385
Smooth Beardtongue	*Penstemon digitalis*	White	Spring	0.146
Common Milkweed	*Asclepias syriaca*	Pink	Spring, Summer	0.128
Goat's Rue	*Tephrosia virginiana*	White/Pink	Spring, Summer	0.128
Partridge Pea	*Cassia fasciculata*	Yellow	Summer	0.745
Slender Mountain Mint	*Pycnanthemum tenuifolium*	White	Summer	0.069
Early Goldenrod	*Solidago juncea*	Yellow	Summer	0.086
Bergamot	*Monarda fistulosa*	Lavender	Summer	0.103
Spiked Blazing Star	*Liatris spicata*	Pink	Summer	0.343
Sneezeweed	*Helenium autumnale*	Yellow	Summer, Fall	0.128
Gray Goldenrod	*Solidago nemoralis*	Yellow	Fall	0.086
Iron Weed	*Vernonia altissima*	Purple	Summer, Fall	0.343
Tall Coreopsis	*Coreopsis tripteris*	Yellow	Summer, Fall	0.051
Total				2.74

Sources: Roundstone Native Seed, 2015; Glennon, 2015.

[a] lbs/acre/PLS = pounds per acre of pure live seed

TABLE 5.7.5-3

Seed Mix P-VABCHNP01: Recommended Mountain Physiographic Region
Grass Seed Mix and Application Rates for Excessively to Moderately Well Drained Sites in Virginia

Common Name	Scientific Name	Cultivar or Germplasm	Drilled Seeding Rate [a] (weight of pure live seed (PLS) per acre)	Seeds per Square Foot
Little Bluestem	*Schizachyrium scoparium*	Piedmont (NC) or Suther Germplasm (NC)	8 ounces	3
Broomsedge	*Andropogon virginicus*	—	8 ounces	3
Purple Top	*Tridens flavus*	North Carolina or Kentucky Ecotype	3 ounces	3
Common milkweed	*Asclepias syriaca*	—	3 ounces	0.210
Total	—	—	22 ounces	9.21

Source: Glennon, 2017; Roundstone Native Seed, 2017.

[a] If the broadcast method is more feasible, increase the perennial grasses in the mixture by 50 percent.

TABLE 5.7.5-4

Seed Mix P-VABCHNP01: Recommended Mountain Physiographic Region
Forb Seed Mix and Application Rates for Excessively to Moderately Well Drained Sites in Virginia

Common Name [a]	Scientific Name	Flowering Season	Drilled Seeding Rate [b] (ounces/acre - weight of pure live seed (PLS) per acre)	Seeds per Square Foot
Showy Tickseed	*Bidens aristosa*	Late Summer	11	3
Pea, Partridge (A)	*Chamaecrista fasciculata*	Mid-Summer	32	3
Susan, Black-eyed (B)	*Rudbeckia hirta*	Early Summer	2	3
Bergamot, Spotted (P)	*Monarda punctata*	Summer	2	3
Bergamot, Wild (P)	*Monarda fistulosa*	Summer	2	3
Beardtongue, Eastern Smooth (P)	*Penstemon laevigatus*	Late Spring	7	3
Penstemon, Talus Slope (P)	*Penstemon digitalis*	Late Spring	5	3
Slender Mountain Mint (P)	*Pycnanthemum tenuifolium*	Late Summer	1	3
New England Aster	*Aster novae-angliae*	Late Summer	2	3
Total	**—**	**—**	**64.0 ounces/acre (4.0 lbs/acre)**	**27**

Source: Glennon, 2017; Roundstone Native Seed, 2017.

[a] Forb types include (A) for annual flowers, (B) for biennial flowers, and (P) for perennial flowers.

[b] If the broadcast method is more feasible, increase the perennial grasses in the mixture by 50 percent.

TABLE 5.7.5-5

Seed Mix P-MUMP02: Recommended Mountain Physiographic Region
Grass Seed Mix and Application Rate for Somewhat Poorly to Very Poorly Drained Sites in West Virginia [a]

Common Name	Scientific Name	Height (feet)	Sun Exposure	Seed Mix Rate (lbs/acre/PLS)[b]
Switchgrass	*Panicum virgatum*	3 - 7	Full Sun	0.233
Red Top Panicum	*Panicum rigidulum*	2 - 4	Full Sun	0.017
Fowl Manna Grass	*Glyceria striata*	3 - 5	Part Shade	0.008
Virginia Wild Rye	*Elymus virginicus*	2 - 4	Full Sun	0.217
Canada Wild Rye	*Elymus canadensis*	2 - 5	Part Shade	0.167
Deer Tongue Grass	*Panicum clandestinum*	2 - 4	Full Sun	0.058
Big Bluestem	*Andropogon gerardii*	4 - 10	Full Sun	0.167
Frank's Sedge	*Carex frankii*	1 - 2	Part Shade	0.042
Fox Sedge	*Carex vulpinoidea*	2 - 3	Part Shade	0.025
Fall Panicum	*Panicum anceps*	2 - 4	Part Shade	0.067
Total	—	–	—	1.0

Sources: Roundstone Native Seed, 2015; Glennon, 2015.

[a] Recommended seeding application rate is 8 to 18 pounds per acre.

[b] lbs/acre/PLS = pounds per acre of pure live seed

TABLE 5.7.5-6

Seed Mix P-MUMP02: Recommended Mountain Physiographic Region
Forb Seed Mix Application Rate for Somewhat Poorly to Very Poorly Drained Sites in West Virginia

Common Name	Scientific Name	Color	Bloom Period	Seed Application Rate (lbs/acre/PLS)[a]
Ohio Spiderwort	*Tradescantia ohiensis*	Blue	Spring, Summer	0.167
Smooth Beardtongue	*Penstemon digitalis*	White	Spring	0.083
Butterfly Milkweed	*Asclepias tuberosa*	Orange	Spring, Summer	0.083
Blackeyed Susan	*Rudbeckia hirta*	Yellow	Spring, Summer	0.134
Wild Senna	*Senna marilandica*	Yellow	Summer	0.668
Hoary Mountain Mint	*Pycnanthemum incanum*	White	Summer	0.033
Lupine	*Lupinus perennis*	Blue	Summer	0.501
Bergamot	*Monarda fistulosa*	Lavender	Summer	0.083
Boneset	*Eupatorium perfoliatum*	White	Summer	0.083
Joe-Pye Weed	*Eupatorium fistulosum*	Pink	Summer, Fall	0.125
Showy Tickseed	*Bidens aristosa*	Yellow	Summer, Fall	0.501
Sneezeweed	*Helenium autumnale*	Yellow	Summer, Fall	0.125
Rough Goldenrod	*Solidago rugosa*	Yellow	Fall	0.083
Total	—	—	—	2.67

Sources: Roundstone Native Seed, 2015; Glennon, 2015.

[a] lbs/acre/PLS = pounds per acre of pure live seed

TABLE 5.7.5-7

Seed Mix P-VABCHNP02: Recommended Mountain Physiographic Region
Grass Seed Mix and Application Rates for Somewhat Poorly to Very Poorly Drained Sites in Virginia [a]

Common Name	Scientific Name	Cultivar or Germplasm	Drilled Seeding Rate [a] (weight of pure live seed (PLS) per acre)	Seeds per Square Foot
Beaked Panicum	*Panicum anceps*	SC or MD Ecotype	4 ounces	3
Redtop Panicum	*Panicum rigidulum*	NC Ecotype	3 ounces	3
Slender Rush	*Juncus tenuis*	—	1 ounce	3
Total	—	—	8 Ounces	9

Source: Glennon, 2015; Roundstone Native Seed, 2017.

[a] If the broadcast method is more feasible, increase the perennial grasses in the mixture by 50 percent.

TABLE 5.7.5-8

Seed Mix P-VABCHNP02: Recommended Mountain Physiographic Region
Forb Seed Mix and Application Rates for Somewhat Poorly to Very Poorly Drained Sites in Virginia

Common Name [a]	Scientific Name	Flowering Season	Drilled Seeding Rate [b] (ounces/acre - weight of pure live seed (PLS) per acre	Seeds per Square Foot
New England Aster	*Symphyotrichum puniceum*	Fall	3	3
Bergamot, Wild (P)	*Monarda fistulosa*	Summer	1	3
Ironweed, New York (P)	*Vernonia novaboracensis*	Late Summer	7	3
Rough-stemmed goldenrod	*Solidago rugosa*	Late Summer	3	3
Joe Pye Weed, Spotted (P)	*Eutrochium fistulosus*	Late Summer	2	3
Pea, Partridge (A)	*Chamaecrista fasciculata*	Mid-Summer	32	3
Rosemallow (P)	*Hibiscus moscheutos*	Summer	2	3
Showy Tickseed	*Bidens aristosa*	Late Summer	11	3
Total	—	—	**61.0 ounces/ acre (3.8 lbs/acre)**	**24**

Source: Glennon, 2017; Roundstone Native Seed, 2017.

[a] Forb types include (A) for annual flowers, (B) for biennial flowers, and (P) for perennial flowers.

[b] If the broadcast method is more feasible, increase the perennial grasses in the mixture by 50 percent.

As requested by the Virginia Department of Environmental Quality (VDEQ), a woody shrub seed mix (Seed Mix VDEQ1; see Table 2.2.5-1 of Appendix A) will also be added to the above recommended grasses and forb mixes in forested areas crossed by the pipeline in Virginia.

Pennsylvania

In Pennsylvania, the SHP pipeline (approximately 3.9 miles) will be collocated with DETI's existing LN-25 pipeline in Westmoreland County. In general, the SHP pipeline will be constructed within and directly adjacent to the existing LN-25 pipeline rights-of-way which is seeded with cool season grasses. As presented in Appendix A, the recommended seed mixtures, rates, and amendments for the SHP were based on existing site conditions and compatibility with existing grasses, which includes the use of cool season grasses. No pollinator species specific to the area were recommended.

5.7.5.3 Piedmont Physiographic Region Seed Mixes

Excessively to Moderately Well Drained Sites

Virginia

The proposed Mountain Physiographic Seed Mix P-VABCHNP01 that is described in Section 5.7.5.2 was designed to also be compatible with the Piedmont Physiographic Region RU in excessively to moderately well drained areas in Virginia. As requested by the Virginia Department of Environmental Quality (VDEQ), a woody shrub seed mix (Seed Mix VDEQ1; see Table 2.2.5-1 of Appendix A) will also be added to the above recommended grasses and forb mixes in forested areas crossed by the pipeline in Virginia.

Somewhat Poorly to Very Poorly Drained Sites

Virginia

The proposed Mountain Physiographic Seed Mix P-VABCHNP02 described in Section 5.7.5.2 was designed to also be compatible with the Piedmont Physiographic Region RU in somewhat poorly to very poorly drained sites in Virginia. As requested by the Virginia Department of Environmental Quality (VDEQ), a woody shrub seed mix (Seed Mix VDEQ1; see Table 2.2.5-1 of Appendix A) will also be added to the above recommended grasses and forb mixes in forested areas crossed by the pipeline in Virginia.

5.7.5.4 Coastal Plain Physiographic Region Seed Mixes

Excessively to Moderately Well Drained Sites

Virginia

The proposed Coastal Plain Seed Mix P-VACSDGS01 (Tables 5.7.5-9 and 5.7.5-10) was designed to be compatible with the Coastal Plain Physiographic Region RU in areas with slopes of 15 percent or less. The mix is based on selected native grass and forb species suitable for restoration in excessively to moderately well drained coastal areas in Virginia. As requested by the Virginia Department of Environmental Quality (VDEQ), a woody shrub seed mix (Seed Mix VDEQ1; see Table 2.2.5-1 of Appendix A) will also be added to the above recommended grasses and forb mixes in forested areas crossed by the pipeline in Virginia.

North Carolina

The proposed Coastal Plain Seed Mix P-CPDW01 (Tables 5.7.5-11 and 5.11.5-12) was designed to be compatible with the Coastal Plain Physiographic Region RU in areas with slopes of 15 percent or less and is based on selected native grass and forb species suitable for restoration in excessively to moderately well drained coastal areas in North Carolina.

Somewhat Poorly to Very Poorly Drained Sites

Virginia

The proposed Coastal Plain Seed Mix P-VACSDGS02 (Tables 5.7.5-13 and 5.7.5-14) was designed to be compatible with the Coastal Plain Physiographic Region RU in areas with slopes of 15 percent or less. The mix is based on selected native grass and forb species suitable for restoration in somewhat poorly to very poorly drained coastal areas in Virginia.

TABLE 5.7.5-9

Seed Mix P-VACSDGS01: Recommended Coastal Plain Physiographic Region
Grass Seed Mix and Application Rates for Excessively to Moderately Well Drained Sites in Virginia

Common Name	Scientific Name	Cultivar or Germplasm	Drilled Seeding Rate [a] (weight of pure live seed (PLS) per acre)	Seeds per Square Foot
Little Bluestem	*Schizachyrium scoparium*	Piedmont (NC) or Suther Germplasm (NC)	8 ounces	3
Splitbeard Bluestem	*Andropogon ternarius*	Virginia Ecotype	8 ounces	3
Common milkweed	*Asclepias syriaca*	—	3 ounces	0.21
Total	—	—	19 ounces	6.21

Source: Glennon, 2017; Roundstone Native Seed, 2017.

[a] If the broadcast method is more feasible, increase the perennial grasses in the mixture by 50 percent.

TABLE 5.7.5-10

Seed Mix P-VACSDGS01: Recommended Coast Plain Physiographic Region
Forb Seed Mix and Application Rates for Excessively to Moderately Well Drained Sites in Virginia

Common Name [a]	Scientific Name	Flowering Season	Drilled Seeding Rate [b] (ounces/acre - weight of pure live seed (PLS) per acre)	Seeds per Square Foot
Mountain Mint, Narrowleaf (P)	*Pycnanthemum tenuifolium*	Late Summer	1	3
Showy Tickseed	*Bidens aristosa*	Late Summer	11	3
Pea, Partridge (A)	*Chamaecrista fasciculata*	Mid-Summer	32	3
Susan, Black-eyed (B)	*Rudbeckia hirta*	Early Summer	2	3
Bergamot, Spotted (P)	*Monarda punctata*	Summer	2	3
Beardtongue, Eastern Smooth (P)	*Penstemon laevigatus*	Late Spring	7	3
Penstemon, Talus Slope (P)	*Penstemon digitalis*	Late Spring	5	3
Bergamot, Wild (P)	*Monarda fistulosa*	Summer	2	3
Total	**—**	**—**	**62.0 ounces/acre (3.9 lbs/acre)**	**24**

Source: Glennon, 2017; Roundstone Native Seed, 2017.

[a] Forb types include (A) for annual flowers, (B) for biennial flowers, and (P) for perennial flowers.

[b] If the broadcast method is more feasible, increase the perennial grasses in the mixture by 50 percent.

TABLE 5.7.5-11

Seed Mix P-CPDW01: Recommended Coastal Plain Physiographic Region
Grass Seed Mix and Application Rates for Excessively to Moderately Well Drained Sites in North Carolina

Common Name	Scientific Name	Height (feet)	Sun Exposure	Seed Mix Rate (lbs/acre/PLS)[b]
Little Bluestem	*Schizachyrium scoparium*	2- 4	Full Sun	0.250
Virginia Wild Rye	*Elymus virginicus*	2 - 4	Full Sun	0.250
Tall Dropseed	*Sporobolus compositus*	2 - 3	Full Sun	0.050
Purple Top	*Tridens flavus*	3 - 5	Part Shade	0.058
Indian Grass	*Sorghastrum nutans*	3 - 6	Full Sun	0.167
Switchgrass	*Panicum virgatum*	3 - 7	Full Sun	0.183
Fall Panicum	*Panicum anceps*	2 - 4	Part Shade	0.042
Total	—	—	—	**1.0**

Sources: Roundstone Native Seed, 2017; Glennon, 2017.

[a] Recommended seeding application rate is 8 to 18 pounds per acre.

[b] lbs/acre/PLS = pounds per acre of pure live seed.

TABLE 5.7.5-12

Seed Mix P-CPDW01: Recommended Coastal Plain Physiographic Region
Forb Seed Mix and Application Rates for Excessively to Moderately Well Drained Sites in North Carolina

Common Name	Scientific Name	Color	Bloom Period	Seed Application Rate (lbs/acre/PLS)[a]
Lance Leaved Coreopsis	*Coreopsis lanceolata*	Yellow	Spring, Summer	0.266
Spotted Beebalm	*Monarda punctata*	Pink	Spring, Summer	0.124
Common Milkweed	*Asclepias syriaca*	Pink	Spring, Summer	0.107
Smooth Beardtongue	*Penstemon digitalis*	White	Spring	0.107
Bergamot	*Monarda fistulosa*	Lavender	Summer	0.124
Partridge Pea	*Cassia fasciculata*	Yellow	Summer	0.621
Spiked Blazing Star	*Liatris spicata*	Pink	Summer	0.222
Lupine	*Lupinus perennis*	Blue	Summer	0.497
Early Goldenrod	*Solidago juncea*	Yellow	Summer	0.160
Starry Silphium	*Silphium asteriscus*	Yellow	Summer, Fall	0.178
Iron Weed	*Vernonia altissima*	Purple	Summer, Fall	0.222
Sneezeweed	*Helenium autumnale*	Yellow	Summer, Fall	0.124
Hairy Mountain Mint	*Pycnanthemum pilosum*	White	Summer, Fall	0.089
Total	—	—	—	**2.84**

Sources: Roundstone Native Seed, 2017; Glennon, 2017.

[a] lbs/acre/PLS = pounds per acre of pure live seed.

TABLE 5.7.5-13

Seed Mix P-VACSDGS02: Recommended Coastal Plant Physiographic Region
Grass Seed Mix and Application Rates for Somewhat Poorly to Very Poorly Drained Sites in Virginia

Common Name	Scientific Name	Cultivar or Germplasm	Drilled Seeding Rate [a] (weight of pure live seed (PLS) per acre)	Seeds per Square Foot
Panicum, Beaked	*Panicum anceps*	SC or MD Ecotype	4 ounces	3
Panicum, Redtop	*Panicum rigidulum*	NC Ecotype	3 ounces	3
Total	—	—	7 ounces	6

Source: Glennon, 2017; Roundstone Native Seed, 2017.

[a] If the broadcast method is more feasible, increase the perennial grasses in the mixture by 50 percent.

TABLE 5.7.5-14

Seed Mix P-VACSDGS02: Recommended Coastal Plant Physiographic Region
Forb Seed Mix and Application Rates for Somewhat Poorly to Very Poorly Drained Sites in Virginia

Common Name [a]	Scientific Name	Flowering Season	Drilled Seeding Rate (weight of bulk seed per acre)	Seeds per Square Foot
New England Aster	*Aster novae-angliae*	Fall	3	3
Sneezeweed, Common (P)	*Helenium autumnale*	Fall	2	3
Showy Tickseed	*Bidens aristosa*	Late Summer	11	3
New York Ironweed (P)	*Vernonia nova boracensis*	Late Summer	7	3
Goldenrod, Wrinkleleaf (P)	*Solidago rugosa*	Late Summer	2	3
Joe Pye Weed, Spotted (P)	*Eutrochium fistulosus*	Late Summer	2	3
Partridge Pea (A)	*Chamaecrista fasciculata*	Mid-Summer	32	3
Rosemallow (P)	*Hibiscus moscheutos*	Summer	2	3
Narrowleaf Sunflower (P)	*Helianthus angustifolius*	Late Summer	4	3
Total	—	—	**65.0 ounces/acre (4.1 lbs/acre**	**27**

Source: Glennon, 2017; Roundstone Native Seed, 2017.

[a] Forb types include (A) for annual flowers, (B) for biennial flowers, and (P) for perennial flowers.

[b] If the broadcast method is more feasible, increase the perennial grasses in the mixture by 50 percent.

As requested by the Virginia Department of Environmental Quality (VDEQ), a woody shrub seed mix (Seed Mix VDEQ1; see Table 2.2.5-1 of Appendix A) will also be added to the above recommended grasses and forb mixes in forested areas crossed by the pipeline in Virginia.

North Carolina

The proposed Coastal Plain Seed Mix P-CPDW02 (Tables 5.7.5-15 and 5.7.5-16) was designed to be compatible with the Coastal Plain Physiographic Region RU in areas with slopes of 15 percent or less and is based on selected native grass and forb species suitable for restoration in somewhat poorly to very poorly drained coastal areas in North Carolina.

TABLE 5.7.5-15

Seed Mix P-CPDW02: Recommended Coastal Plain Physiographic Region
Grass Seed Mix and Application Rates for Somewhat Poorly to Very Poorly Drained Sites in North Carolina [a]

Common Name	Scientific Name	Height (feet)	Sun Exposure	Seed Mix Rate (lbs/acre/PLS)[b]
Switchgrass	*Panicum virgatum*	3 - 7	Full Sun	0.233
Red Top Panicum	*Panicum rigidulum*	2 - 4	Full Sun	0.017
Fowl Manna Grass	*Glyceria striata*	3 - 5	Part Shade	0.008
Virginia Wild Rye	*Elymus virginicus*	2 - 4	Full Sun	0.217
Deer Tongue Grass	*Panicum clandestinum*	2 - 4	Full Sun	0.058
Big Bluestem	*Andropogon gerardii*	4 - 10	Full Sun	0.167
Frank's Sedge	*Carex frankii*	1 - 2	Part Shade	0.042
Fox Sedge	*Carex vulpinoidea*	2 - 3	Part Shade	0.025
Fall Panicum	*Panicum anceps*	2 - 4	Part Shade	0.067
Total	—	—	—	0.83

Sources: Roundstone Native Seed, 2015; Glennon, 2015.

[a] Recommended seeding application rate is 8 to 18 pounds per acre.

[b] lbs/acre/PLS = pounds per acre of pure live seed

TABLE 5.7.5-16

Seed Mix P-CPDW02: Recommended Coastal Plain Physiographic Region
Forb Seed Mix and Application Rates for Somewhat Poorly to Very Poorly Drained Sites in North Carolina

Common Name	Scientific Name	Color	Bloom Period	Seed Application Rate (lbs/acre/PLS)[a]
Smooth Beardtongue	*Penstemon digitalis*	White	Spring	0.169
Butterfly Milkweed	*Asclepias tuberosa*	Orange	Spring, Summer	0.056
Ohio Spiderwort	*Tradescantia ohiensis*	Blue	Spring, Summer	0.084
Blackeyed Susan	*Rudbeckia hirta*	Yellow	Spring, Summer	0.180
Spiked Blazing Star	*Liatris spicata*	Pink	Summer	0.264
Hoary Mountain Mint	*Pycnanthemum incanum*	White	Summer	0.034
Early Goldenrod	*Solidago juncea*	Yellow	Summer	0.113
Bergamot	*Monarda fistulosa*	Lavender	Summer	0.169
Showy Tickseed	*Bidens aristosa*	Yellow	Summer, Fall	0.366
Starry Silphium	*Silphium asteriscus*	Yellow	Summer, Fall	0.113
Narrow-Leaved Sunflower	*Helianthus angustifolius*	Yellow	Summer, Fall	0.113
Joe-Pye Weed	*Eupatorium fistulosum*	Pink	Summer, Fall	0.141
Total	—	—	—	1.802

Sources: Roundstone Native Seed, 2015; Glennon, 2015.
[a] lbs/acre/PLS = pounds per acre of pure live seed

5.7.6 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 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 (see Appendix A for recommendations).

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 and DETI will rake the area lightly to encourage plant establishment and minimize the seed that migrates from the site (North Carolina Department of Environment and Natural Resources, 2009).

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 60 percent, where site conditions require seed adherence to the disturbed soil. Prior to hydroseeding, Atlantic and DETI 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 and applicable agency guidelines. In addition, hydroseeding near wetlands or waterbodies will only be conducted in accordance with the FERC Plan and Procedures and other applicable agency regulations.

5.8 SEEDBED AUGMENTATION

5.8.1 Lime and Fertilizer Application

Lime and fertilizer recommendations provided by the various Federal, State/Commonwealth, local and land management and subject matter experts consulted for each County/City are provided in Appendix A. Each county crossed by the Projects may have different fertilization and liming requirements based on the soil characteristics and the proposed seed mix prescriptions. 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 and DETI will:

- apply 150 pounds per acre of 10-20-20 (or similar) fertilizer;
- apply phosphorus or potassium during the same installation, if required;
- 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, so as to avoid wetlands, waterbodies, or karst features.

5.8.2 Mulching

Mulching recommendations provided by the various Federal, State/Commonwealth, local and land management agencies, and subject matter experts consulted for each County/City are provided in Appendix A. Each County/City crossed by the Projects may have different mulching requirements based on the landscape characteristics, soil types, and the proposed seed mix prescriptions. In general, and in accordance with the Plan, Atlantic and DETI will apply mulch to slopes immediately after seeding to prevent erosion. In non-forested areas, mulch will be spread uniformly over a minimum of 75 percent of the surface at a rate of 2 tons per acre, or 1 ton per acre if wood chips are used, or per directions from land managing agencies or landowners. In forested areas, if the amount of mulch will likely exceed these parameters due to the shredding of non-merchandisable forest materials cleared from the rights-of-way, Atlantic and DETI will request a variance from FERC prior to applying mulch greater than 1 ton/acre. 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 rights-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 rights-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.

- Straw or hay that has been certified as weed-free 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 and DETI will apply one bale of clean straw or hay per 1,000 square feet. Where broadcast seeding is used, Atlantic and DETI will apply two bales of clean straw or hay per 1,000 square feet, or in accordance with requirements specified by Federal or State/Commonwealth land managing agencies.

5.9 RIPARIAN RESTORATION

Following initial stream bank stabilization, Atlantic and DETI 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.

5.9.1 Non-forested Riparian Areas

All disturbed banks and riparian work areas will be seeded as soon as possible after final grading, weather and soil conditions permitting and subject to the recommended seeding dates for the area. Seeding is intended to stabilize the soil, improve the appearance of the area disturbed by construction, and restore native flora. As discussed above, Atlantic and DETI will determine appropriate seeding prescriptions based upon the vegetative community of the disturbed area, and will continue to consult with land managing agencies regarding seeding requirements for riparian areas.

5.9.2 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. On a site-specific basis and in consultation with land managing agencies or landowners, Atlantic and DETI will design riparian revegetation with the use of fast growing native trees and shrubs placed closest to the bank top to provide canopy recovery as quickly as possible to shade and overhang the waterbodies. Restoration of forested riparian areas on Federal and State/Commonwealth lands will be based upon consultations with the appropriate land managing agencies.

5.10 WETLAND RESTORATION

Atlantic and DETI 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 rights-of-way. Where necessary, sediment barriers will be installed across the construction rights-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.

Seeding of wetlands will be completed according to conditions of applicable permit approvals as well as site conditions (e.g., where direct seed to soil contact cannot be achieved, no seeding will occur, as in inundated wetlands). Seeding within temporarily disturbed wetlands will follow procedures and seed mixes as outlined in Section 5.7 (Site Preparation and Seeding) and Appendix B. Unless specified by landowners or land managing agencies, revegetation will be monitored annually until wetland revegetation is successful in accordance with the Procedures. Wetland revegetation will be considered successful when vegetation community characteristics are similar to the vegetation in adjacent wetland areas that were not disturbed by construction. As described in the Procedures, restored wetland vegetation will include at least 80 percent of the species targeted for restoration, and the density (i.e., percent cover) and distribution (e.g., microsites and patches) of individual plants will be similar to areas not disturbed by construction. Revegetation requirements appropriate for Federal and State/Commonwealth lands will be determined through consultation with those agencies.

After revegetation, Atlantic and DETI anticipate no permanent impact on emergent wetland vegetation within the rights-of-way. Scrub-shrub and forested wetlands will not be allowed to fully reestablish within portions of the permanent rights-of-way centered over the pipeline trench lines. Atlantic and DETI will periodically remove woody species from wetlands to facilitate post-construction inspections of the permanently maintained rights-of-way. Where the pipelines cross wetlands, Atlantic and DETI will maintain a 10-foot-wide corridor centered over the pipelines in an herbaceous condition, and remove deep rooted trees within a 30-foot-wide corridor centered over the pipelines.

5.11 AGRICULTURAL AREAS

Atlantic and DETI will work with individual landowners to address restoration of active agricultural areas. Generally, agricultural areas will be replanted by the landowner or tenant, unless otherwise requested by the landowner. Anticipated impacts on and restoration of irrigation systems, drain tiles, gates, and other structures are discussed in Resource Report 8.

5.12 EXPOSED BEDROCK

In areas with exposed bedrock or bedrock, Atlantic and DETI will restore the area using crushed rock rather than attempting to revegetate the area.

5.13 UPLAND FOREST

Atlantic and DETI have prepared and will implement a *Timber Removal Plan*, which describes construction and restoration activities in areas where timber is removed. The plan also addresses compensation for loss of merchantable timber as well as elements of timber removal/sale that are unique to public lands. Elements of the plan include:

- completion of a timber cruise (on public lands or as agreed to with landowners) to appraise the value of merchantable timber;
- installation of flagging/fencing of timber removal limits, riparian areas, and other exclusion zones prior to timber removal operations;
- identification of access and staging requirements for timber removal, including log landing locations, temporary bridges at waterbody crossings, etc.; and
- identification of timber removal methods (e.g., high line yarder logging, mechanical harvesting, helicopter logging).

Following construction in forested areas, seed mixes, and/or seedlings will be planted in temporary workspace areas in accordance with recommendations from the NRCS, land managing or other applicable agencies, and operators of commercial tree farms. In non-cultivated uplands, including forested areas, the permanent easement for each pipeline will be maintained in an herbaceous state.

6.0 FEDERAL LANDS

The AP-1 mainline will cross approximately 5.2 miles of Federal lands in the Monongahela National Forest (MNF) and approximately 15.98miles of Federal lands in the George Washington National Forest (GWNF), which are administered by the USFS. As described in Atlantic's and DETI's Resource Reports, Federal lands are managed in accordance with various management directives, including standards and guidelines for restoration and revegetation activities. Restoration activities on Federal lands will be in accordance with these standards and guidelines. Additional site-specific requirements for restoration of Federal lands are addressed in the Construction, Operations, and Maintenance Plan (COM Plan) that has been prepared for the ACP in conjunction with USFS staff.

Atlantic has consulted with the USFS staff and other agencies to identify appropriate seed mixes and horticultural 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 in the COM Plan. The recommended seed mix prescriptions for use during restoration of disturbed USFS lands are summarized in Appendix A.

In addition to USFS lands, the AP-1 mainline will also cross approximately 0.1 mile of National Park Service (NPS) lands along the Blue Ridge Parkway. Atlantic is proposing the use of the horizontal directional drill construction method to install the proposed pipeline under the Blue Ridge Parkway at this location. The horizontal directional drill method will avoid direct impacts on the parkway, including impacts on adjacent vegetation.

7.0 STATE LANDS

In West Virginia, the AP-1 mainline crosses 3.7 miles of the Seneca State Forest in Pocahontas County, West Virginia, and the SHP crosses approximately 3.6 miles of the Lewis Wetzel WMA in Wetzel County, West Virginia. Seneca State Forest is managed by the WV Division of Forestry and the Lewis Wetzel WMA is managed by the West Virginia Department of Natural Resources. The AP-1 mainline crosses 1.2 miles of the James River WMA in Nelson County, Virginia, which is managed by the Virginia Department of Game and Inland Fisheries.

The seed mixes, soils amendments, and application rates, including appropriate cultural practices recommended by the appropriate State/Commonwealth staff, for the Lewis Wetzel WMA and the James River WMA in Virginia are provided in Appendix A. The Department of Game and Inland Fisheries has indicated that it may want to be responsible for replanting the right-of-way on its lands. The seed mixes, lime, fertilizer, and mulch application rates recommended by the West Virginia Department of Natural Resources to be used in all newly disturbed areas in the Seneca State Forest are provided in Appendix A.

8.0 SUPPLEMENTAL PLANTING

Where required, Atlantic and DETI will supplement seeding with the planting of tree seedlings or small shrubs to mitigate other impacts, such as visual impacts, or as specified in a species conservation plan.

8.1 NATIONAL FOREST AREAS

See COM plan for details on restoration on the National Forests.

8.2 SENECA STATE FOREST

In the Seneca State Forest, a protected species habitat is located between approximately Mileposts 79.0 and 79.1, approximately 70 feet from the edge of the rights-of-way. To mitigate the impacts of the right-of-way on the sensitive species habitat, native tree seedling will be replanted within a 200-foot-long by 50-foot-wide section of the temporary construction right-of-way. The 200-foot section of the temporary construction right-of-way will be replanted to minimize the effects of increased sunlight infiltration.

8.3 APPALACHIAN NATIONAL SCENIC TRAIL

The AP-1 mainline route approaches from the north and runs roughly parallel to the Appalachian National Scenic Trail (ANST) between approximately Mileposts 152.0 and 156.0, south of Stuart's Draft and within Back Creek Valley. In this area, the pipeline construction and permanent rights-of-way would be visible along the ANST from several different lookout points, including Little Raven's Roost and Cedar Cliffs. To reduce the visibility of the pipeline rights-of-way from these locations and from the Raven's Roost Overlook located on the Blue Ridge Parkway, all portions of the temporary construction work area within this 4-mile area will be replanted with a combination of native trees and shrubs. Typically, this will include approximately 60 feet of temporary construction rights-of-way on the northwest side of the permanent rights-of-way, 15 feet of temporary construction rights-of-way on the southeast side of the permanent rights-of-way, and in some locations an additional 50 feet of the additional temporary work space (ATWS) on either or both outer sides of the temporary construction rights-of-way.

8.4 PINEY MOUNTAIN AREA

To reduce the AP-1 mainline visual impacts at Piney Mountain between approximately Mileposts 158.9 and 159.4, associated with clearing the rights-of-way and as seen from the west side, particularly from the Three Ridges Overlook along the Blue Ridge Parkway, Atlantic will replant the temporary construction rights-of-way and ATWS with a combination of shrub and tree species. The 15 feet of the temporary construction areas nearest to the pipeline will be replanted with shrubs and shallow rooted small trees. The remaining areas of the temporary construction rights-of-way will be replanted with trees. The permanent rights-of-way will be seeded with herbaceous vegetation.

8.5 LONG-LEAF PLANTING IN NORTH CAROLINA

Two small long-leaf pine-wire grass communities will be crossed by segment AP-2 of the ACP between approximately Mileposts 156.5 and 156.6 and between approximately mileposts 156.8 and 156.9 in North Carolina. These communities are important ecologically for a variety of reasons, and as such, Atlantic has agreed to actively replant long-leaf pine within the temporary construction rights-of-way and ATWS along the ACP route where it will be cleared for construction.

8.6 STANLEY SLOUGH PLANTINGS

At Milepost 9.4 on segment AP-3, Atlantic will cross a portion of Stanley Slough and Stanley Slough II, both part of the North Carolina Division of Mitigation Services Wetland Mitigation Bank. In addition to reducing the width of the construction rights-of-way through this area, Atlantic will also plant 25 five-gallon size trees inside the disturbed construction work area on the south side of the installed pipeline. The trees will be planted on an average spacing of 8 feet x 8 feet using planting holes at least twice as wide and as deep as the tree container and backfilled with soil.

Care of plant stock, planting procedures, select fencing, recordkeeping, monitoring/reporting, and plant replacement requirements for this planting area should be considered to be the same as described in Section 8.1 for the National Forests.

9.0 RESTORATION MONITORING AND MAINTENANCE

9.1 MONITORING

The general objectives of the monitoring program will be to determine the status and effectiveness of restoration efforts and to determine locations where additional maintenance may be required. Atlantic and DETI will inspect disturbed areas after the first and second growing seasons to determine the success of revegetation. In agricultural areas, revegetation will be considered successful when the area has been revegetated and is similar to adjacent undisturbed areas of the same field. In all other non-forested areas, revegetation will be considered successful when the density and cover of non-nuisance vegetation is similar to adjacent areas that were not disturbed by construction activities. In Federal and State/Commonwealth forested areas, monitoring activities will be performed until reforestation is determined successful based on pre-defined success criteria, as determined through consultations with Federal and State/Commonwealth land managing agencies.

Atlantic and DETI will continue revegetation efforts until they are successful. Restoration will be considered successful when construction debris is removed, similar vegetative cover or bedrock has been restored, the original surface elevations are restored as closely as practicable to preconstruction contours, the surface condition is similar to adjacent non-disturbed areas, and proper drainage is restored.

9.2 GRAZING DEFERMENTS

Where warranted, Atlantic and DETI will work with landowners or lessees to implement grazing deferment plans (e.g., by fencing off restoration sites) to minimize impacts on emergent vegetation due to grazing.

9.3 PERMANENT RIGHTS-OF-WAY MAINTENANCE

In order to maintain accessibility of the rights-of-way and to accommodate pipeline integrity surveys, vegetation within the permanent easements will be periodically mowed over the pipelines. In accordance with the Plan, in non-cultivated uplands, a 10-foot-wide herbaceous corridor may be maintained annually, as needed. In addition, trees and brush will be cleared over the entire width of the permanent rights-of-way on an as-needed basis not to exceed once every 3 years. In wetlands and riparian areas, the Procedures allow a 10-foot-wide corridor centered over pipelines to be permanently maintained in an herbaceous state. The Procedures also allow for cutting and removing trees greater than 15 feet in height within 15 feet of pipelines in wetlands.

Atlantic and DETI will use mechanical mowing or cutting along their rights-of-way for normal vegetative maintenance. Atlantic and DETI will monitor the rights-of-way for infestations of invasive species that may have been created or exacerbated by construction, restoration, or maintenance activities, and will treat such infestations in consultation with

landowners and applicable agencies in accordance with its *Invasive Plant Species Management Plan*.

10.0 INVASIVE PLANT SPECIES MANAGEMENT

Atlantic and DETI have developed an *Invasive Plan Species Management Plan*, which identifies measures to be implemented to prevent and control the introduction or spread of invasive plant species during and following construction of the Projects. The plan identifies treatment measures for invasive plant species such as the application of herbicide or mechanical measures such as mowing. The plan is incorporated by reference into this *Restoration and Rehabilitation Plan*.

As requested by FERC in the Final Environmental Impact Statement for the Projects, the following protocols for herbicide application will be implemented:

- Atlantic and DETI will not use aerial spraying as a means of invasive plant species control along the rights-of-way;
- Atlantic and DETI will not use herbicides within 25 feet of known occurrences of federally-listed endangered or threatened plant species;
- Atlantic and DEIT will not use herbicides (or pesticides) within 100 feet of a waterbody or wetland, except where allowed by State/Commonwealth or Federal agencies;
- Atlantic and DETI will not use spraying of herbicides (or insecticides) within a 300-foot karst feature buffer, except where allowed by State/Commonwealth or Federal agencies.

11.0 ROLES AND RESPONSIBILITIES

11.1 ENVIRONMENTAL INSPECTORS

EIs will have the authority to stop activities that violate environmental conditions of Federal or State/Commonwealth environmental permits and landowner agreements and to order appropriate corrective action. During revegetation and restoration, the EIs will be responsible for:

- ensuring compliance with the requirements of the Plan and Procedures; Atlantic's and DETI's construction, restoration, and mitigation plans; conditions required by permits and other approvals; this Restoration and Rehabilitation Plan; and environmental requirements identified 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;

- verifying the location of restoration sites, and maintaining appropriate signage for boundaries of sensitive resource areas, waterbodies, wetlands, farm improvements (i.e., repair of fences, drain tiles, irrigation systems, or structures), or areas with special restoration requirements;
- monitoring erosion and sediment control devices and soil stabilization measures in construction areas, and identifying additional needs for new controls or maintenance of existing controls;
- verifying that dewatering activities are properly monitored and do not result in the deposition of sand, silt, and/or sediment into sensitive environmental resource areas, including but not limited to wetlands, waterbodies, cultural resource sites, and sensitive species habitats;
- ensuring that subsoil and topsoil are tested in agricultural and residential areas to measure compaction and determine the need for corrective action;
- advising the Construction Inspector when environmental conditions (such as wet 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 soils imported for agricultural or residential use have been certified as free of invasive species and soil pests, unless otherwise approved by the landowner;
- determining the need for and ensuring that erosion controls are properly installed, as necessary, to prevent sediment flow into wetlands, waterbodies, sensitive areas, and onto roads;
- inspecting and ensuring the maintenance of temporary erosion control measures at least:
    - on a daily basis in areas of active construction or equipment operation;
    - on a weekly basis in areas with no construction or equipment operation; and
    - within 24 hours of each 0.5 inch of rainfall.
- ensuring the repair of all ineffective temporary erosion control measures within 24 hours of identification;
- keeping records of compliance or non-compliance with conditions of environmental regulatory permits and approvals, including activities that could result in decertification of organic farms; and
- identifying areas that will require special attention to ensure stabilization and restoration success.

Where appropriate for local resource needs, the role of EIs may be filled by agricultural or horticultural specialists.

11.2 DOCUMENTATION

In accordance with the Plan, Atlantic and DETI will maintain post-construction records of activities performed and will submit quarterly activity reports to the FERC. Reports will document any issues that arise during revegetation, including those identified by the landowner or land managing agency, and corrective actions taken for at least two years following construction. Reports will identify by milepost:

- method of application, application rate, and type of fertilizer, pH modifier, 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 subsurface drainage repairs or improvements made during restoration; and
- problem areas, such areas where vegetation did not establish or erosion occurred, and how they were addressed.

12.0 REFERENCES

Federal Energy Regulatory Commission. 2013a. Upland Erosion Control, Revegetation, and Maintenance Plan. Available online at: http://www.ferc.gov/industries/gas/enviro/plan.pdf.

Federal Energy Regulatory Commission. 2013b. Wetland and Waterbody Construction and Mitigation Procedures. Available online at: http://www.ferc.gov/industries/gas/enviro/procedures.pdf.

Glennon, Robert. 2015. Personal communication with Herbert Pirela of Environmental Resources Management, Inc. Private Lands Biologist.

Glennon, Robert. 2017. Personal communication with Herbert Pirela of Environmental Resources Management, Inc. Private Lands Biologist.

North Carolina Department of Environment and Natural Resources. 2009. North Carolina Erosion and Sediment Control Planning and Design Manual. Available online at: http://portal.ncdenr.org/web/lr/576. Accessed June 2015.

Roundstone Native Seed. 2015. Jeremy Hamlington, personal communication with Herbert Pirela of Environmental Resources Management, Inc. Horticulturist.

Roundstone Native Seed. 2017. Jeremy Hamlington, personal communication with Herbert Pirela of Environmental Resources Management, Inc. Horticulturist.

Virginia Department of Environmental Quality. 1992. Virginia Erosion and Sediment Control Handbook. Available online at: http://www.deq.virginia.gov/Programs/Water/StormwaterManagement/Publications/ESCHandbook.aspx. Accessed June 2015

West Virginia Department of Environmental Protection, Office of Oil and Gas. 2012. West Virginia Erosion and Sediment Control Field Manual. Available online at: http://www.dep.wv.gov/oil-and-gas/Documents/Erosion%20Manual%2004.pdf. Accessed June 2015.

ATLANTIC COAST PIPELINE, LLC
ATLANTIC COAST PIPELINE

and

DOMINION TRANSMISSION, INC.
SUPPLY HEADER PROJECT

Restoration and Rehabilitation Plan

Appendix A
Recommended Seed Mix Prescriptions and Soil Amendments

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

and

DOMINION TRANSMISSION, INC.
SUPPLY HEADER PROJECT
Docket No. CP15-555-000

Recommended Seed Mix Prescriptions and Soil Amendments

Rev 8

Prepared by

ERM

February 2018

TABLE OF CONTENTS

LIST OF TABLES

LIST OF ATTACHMENTS

LIST OF ACRONYMS AND ABBREVIATIONS

ACP	Atlantic Coast Pipeline
GWNF	George Washington National Forest
MNF	Monongahela National Forest
NPS	National Park Service
NRCS	Natural Resources Conservation Service
SHP	Supply Header Project
USFS	U.S. Forest Service
VDEQ	Virginia Department of Environmental Quality
WMA	Wildlife Management Area

ATLANTIC COAST PIPELINE – Docket Nos. CP15-554-000 & CP15-554-001
SUPPLY HEADER PROJECT – Docket No. CP15-555-000

1.0 INTRODUCTION

This appendix compiles seed mix prescriptions and soil amendment recommendations provided by Federal and State/Commonwealth agencies, and subject matter experts consulted for the restoration and rehabilitation of the proposed Atlantic Coast Pipeline (ACP) and Supply Header Project (SHP). The recommendations are summarized by county in Attachment A and discussed below.

2.0 ATLANTIC COAST PIPELINE

2.1 WEST VIRGINIA

2.1.1 Harrison, Lewis, Randolph, and Upshur Counties

The following seed mixtures and application rates, seeding dates, soil amendments recommendations, and planting recommendations are for Harrison, Lewis, Randolph, and Upshur counties in West Virginia. These recommendations are based on the collection of correspondences and discussions with Federal and State agencies, including communication with Greg Stone (Natural Resources Conservation Service [NRCS] Acting State Resource Conservationist) and Jeff Griffith (NRCS Conservationist). The tables and lists below provide the specific recommendations for these counties. No specific recommendations were made in these counties regarding tackifiers, mulching, or anchoring of mulch or seed.

Recommended Seed Mixes and Application Rates

TABLE 2.1.1-1

Seed Mix WVHLRU01: Recommended Cool Season Seed Mixture

Seed Mixture	Potentially Suitable Land Use	Common Species Name [a]	Seed Application Rate (lbs/acre/PLS)[b]
1	Pasture or Hay	Orchardgrass	10
		Ladino Clover	2
		Red Clover	3
		Redtop	3
2	Pasture	**Kentucky Bluegrass**	20
		Ladino Clover	2
		Red Clover	3
		Redtop	3
3	Pasture or Hay	Orchardgrass	20
		Redtop	5
		Birdsfoot Trefoil	10

[a] Species in bold are more wildlife-friendly; species in italics are suitable for use in filter strips.
[b] lbs/acre/PLS = pounds per acre of pure live seed

Recommended Seeding Dates

TABLE 2.1.1-2

Harrison, Lewis, Randolph, and Upshur Counties, West Virginia Recommended Seeding Dates for Permanent Cover

Seeding Dates	Suitability
March 1 to April 15	Best seeding period
August 1 to October 1	Best seeding period
December 1 to March 1	Good seeding period (dormant seeding)
April 15 to August 1	High risk (moisture stress likely)
October 1 to December 1	High risk (potential freeze damage to young seedlings)

Recommended Soil Amendments and Application Rates

TABLE 2.1.1-3

Harrison, Lewis, Randolph, and Upshur Counties, West Virginia Recommended Soil Amendments and Application Rates

Soil Amendment Type	Application Rate
Lime	3 tons per acre
Fertilizer [a]	400 pounds per acre

[a] Fertilizer with a 10-20-20 ratio of nitrogen, phosphorus, and potassium is recommended.

Planting Recommendations

- Certified seed is preferred.
- Use proper inoculants prior to seeding for all legumes.
- Amend soil fertility and pH levels to satisfy the needs of the plant species.
- For unprepared seedbeds or seeding outside the optimum timeframes:
    - Add 50 percent more seed to the specified application rate, particularly during the periods of April 15 – August 1, and October 1 – March 1.
    - Double the seed application rate and consider planting an annual small grain like wheat (2 bushels [120 pounds] per acre) to act as a nurse crop.

2.1.2 Pocahontas County

The following seed mixtures, application rates, and soil amendment recommendations are for Pocahontas County, West Virginia. The recommendations are based on correspondence and discussions with Iden Gunther (NRCS Conservationist) and Susan Davis (West Virginia Department of Natural Resources). Seed Mix WVPO01 provides seeding recommendations for disturbed areas from the NRCS Critical Area Planting Standard that is commonly used with a high success rate in the County.

Recommended Seed Mixes and Application Rates

TABLE 2.1.2-1

Seed Mix WVPO01: Recommended Cool or Warm Seed Mixes for Pocahontas County, West Virginia

Seed Mixture	Species / Mixture [a]	Seeding Application Rate (lbs/acre/PLS)[b]	Soil Drainage Preference	pH Range
1	Crownvetch	10 – 15	Well – Moderately Well	5.0 – 7.5
	Perennial Ryegrass	20		
2	**KY Bluegrass**	20	Well – Moderately Well	5.5 – 7.5
	Redtop	3		
	Ladino Clover or	2		
	Birdsfoot Trefoil	10		
3	**Timothy**	8	Well - Poorly	5.5 – 7.5
	Birdsfoot Trefoil	8		
4	***Orchardgrass***	10	Well – Moderately Well	5.5 – 7.5
	Ladino Clover	2		
	Redtop	3		
5	***Orchardgrass***	10	Well – Moderately Well	5.5 – 7.5
	Ladino Clover	2		
5	**Birdsfoot Trefoil**	10	Well – Moderately Well	5.5 – 7.5
	Redtop	5		
	Orchardgrass	20		

Source: WVDEP, 2012.

[a] Species in bold are more wildlife-friendly; species in italics are suitable for use in filter strips.

[b] lbs/acre/PLS = pounds per acre of pure live seed

Recommended Soil Amendments and Application Rates

TABLE 2.1.2-2

Recommended Lime and Fertilizer Application

pH of Soil [a]	Lime Application Rate (tons/acre)[b]	Fertilizer Application Rate (10-20-20 or equivalent) (lbs/acre)
> 6.0	2	500
5.0 to 6.0	3	
< 5.0	4	

Source: WVDEP, 2012.

[a] The pH can be determined with a portable pH testing kit or by sending the soil samples to a soil testing laboratory. When four tons of lime per acre is applied it must be incorporated into the soil by disking, backblading, or tracking up and down the slope.

[b] lbs/acre/PLS = pounds per acre of pure live seed

Recommended Mulch Material and Application Rates

TABLE 2.1.2-3

Recommended Mulch Material Rates and Uses

Material	Minimum Rates Per Acre	Coverage	Remarks
Hay or Straw	2-3 Tons (100 – 150 Bales)	75% - 90%	Subject to wind blowing or washing unless tied down
Wood Fiber, Pulp Fiber, Wood-Cellulose, Recirculated Paper	1,000 – 1,500 lbs	Cover all disturbed areas	Hydroseeding

Source: WVDEP, 2012.

Chemical Mulches, Soil Binders, and Tackifiers Recommendations

- Determine mulch-type and its appropriate application rate;
- A wide range of synthetic tackifiers (e.g., spray-on materials) are marketed to stabilize and protect the seeds and soil surfaces. These tackifiers are mixed with water and seed mixtures, and sprayed over the mulch and soils. They may be used alone in some cases as temporary stabilizers, or in conjunction with fiber mulch, straw or hay; and
- Chemical tackifiers, when used alone, do not have the capability to insulate the soil or retain soil moisture as effectively as organic mulches such wood fiber, straw, or hay.

Mulch Anchoring

- Depending on field conditions, mulch anchoring (e.g., mechanical methods or netting) may become necessary due to environmental conditions, including heavy winds or rapid water runoff (e.g., rain or snowmelt).
- Mechanical Anchoring
  - Apply mulch and pull a mulch anchoring tool over the mulch. When a disk is used, set the disk straight and pull across the slope. Mulch material should be tucked into the soil about three inches.
- Mulch Netting
  - Follow manufacturer's recommendations when positioning and stapling mulch netting into the soil.

2.1.3 Federal Lands

Monongahela National Forest – Pocahontas County

Seeding

Atlantic consulted with the U.S. Forest Service (USFS) and other agencies to identify appropriate seed mixes and horticultural practices for use during restoration. Based on discussions with the Monongahela National Forest (MNF) and the George Washington National

Forest (GWNF) to date, a variety of seed mixes are provided, including native and pollinator-friendly species, and seeding techniques appropriate to the various conditions expected to be found along the pipeline route.

Atlantic will perform seeding of permanent vegetation during the Fall or Spring of the year in which 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 optimal time frames, 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 mixes tailored for the MNF and GWNF for temporary and permanent erosion control and special site conditions and habitats, are provided below:

- Seed will be Virginia- or West Virginia- certified seed (bag tags attached; seed certification will meet each State's standards for their certified seed classification), or alternative seed sourced from approved distributors.

- All leguminous seed will 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 will be manually applied at double the manufacturer's rate. Inoculant will be mixed with legume seed prior to mixing with other seeds. For hydroseeding a minimum of five times the dry seeding rate of inoculant will be used.

- When using native seed, local ecotypes will be used as 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 will occur promptly after construction halts, either temporarily or permanently. Erosion control seed mixes will 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 a 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 will be doubled when hydroseeding.

Temporary Erosion Control Seed Mixes

Table 2.1.3-1 provides a summary of seed mixtures and application rates by slope class recommended to be used in disturbed areas on National Forest Service (NFS) lands for temporary erosion control under the following conditions:

- where erosion control is needed outside of normal seeding seasons;
- concurrent with permanent mechanical erosion control; and
- prior to permanent seeding, where such follow-up is appropriate.

TABLE 2.1.3-1

Seed Mix FS01: Recommended Seed Mixes for Temporary Erosion Control by Slope Class

Seed Mix/Slope Class	Common Species Name [a]	Scientific Name	Number of Seeds (seeds/feet^2) [b]	Seeding Application Rate (lbs/acre/PLS) [c]
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] Temporary erosion control species. The FS also recommended German/Foxtail Millet (*Seteria italic*) as a temporary species.

[b] Seeds per square feet.

[c] lbs/acre/PLS = pounds per acre of pure live seed.

Permanent Erosion Control Seed Mix

Table 2.1.3-2 provides a summary of seed mixtures and application rates that are recommended to be used in disturbed areas on USFS 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 2.1.3-2

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*	10.33	1.000
Grasses	Indian Grass	*Sorghastrum nutans*	32.14	8.000
	Purple Top	*Tridens flavus*	53.37	5.000
	Upland Bentgrass	*Agrostis perennans*	22.96	0.125
	Canada Wild Rye	*Elymus canadensis*	10.47	4.000
	Deer Tongue Grass	*Panicum clandestinum*	32.14	4.000
	Virginia Wild Rye	*Elymus virginicum*	9.18	4.000
	Switchgrass	*Panicum virgatum*	11.89	2.000
Forbs	Spiked Blazing Star	*Liatris spicata*	2.18	0.500
	New England Aster	*Aster novae-angliae*	6.89	0.250
	False Sunflower	*Heliopsis helianthoides*	3.62	1.500
	Showy Ticktrefoil	*Desmodium canadense*	2.48	1.500
	Slender Lespedeza	*Lespedeza virginica*	2.01	0.500
	Slender Mountain Mint	*Pycnanthemum tenuifolium*	17.22	0.125
	Bergamot	*Monarda fistulosa*	14.35	0.500
	American Senna	*Senna hebecarpa*	0.76	1.500
	Partridge Pea	*Cassia fasciculata*	1.72	1.000
	Blackeyed Susan	*Rudbeckia hirta*	18.37	0.500

Source: USFS, 2016; Roundstone, 2017.

[a] Seeds per square feet.

[b] lbs/acre/PLS = pounds per acre of pure live seed.

Special Site Conditions Seed Mixes (Native Species for Wildlife Pollinators)

Seed mixes FS03 – for Dry Uplands or Highlands (Table 2.1.3-3), FS04 – for Riparian Habitat Areas (Table 2.1.3-4), FS05 – for Wetland Habitat Areas (Table 2.1.3-5), and FS06 for Dry Low pH Habitat Areas (Table 2.1.3-6) are provided below, and are to be applied as permanent vegetation in areas where drill-seeding is feasible (e.g., in areas where slopes are less than 50 percent).

TABLE 2.1.3-3

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]
Grasses	Indian Grass	*Sorghastrum nutans*	16.07	4.000
	Switchgrass	*Panicum virgatum*	11.89	2.000
	Virginia Wild Rye	*Elymus virginicus*	13.77	6.000
Forbs	Blackeyed Susan	*Rudbeckia hirta*	9.18	0.250
	Common Milkweed	*Asclepias syriaca*	0.28	0.250
	False Sunflower	*Heliopsis helianthoides*	1.81	0.750
	Panicled Leaf Ticktrefoil	*Desmodium paniculatum*	0.83	0.500
	Partridge Pea	*Cassia fasciculata*	0.86	0.500
	Showy Ticktrefoil	*Desmodium canadense*	0.83	0.500
	Slender Mountain Mint	*Pycnanthemum tenuifolium*	17.22	0.125
	Bergamot	*Monarda fistulosa*	7.17	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. "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.

TABLE 2.1.3-4

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]
Grasses	Upland Bentgrass	*Agrostis perennans*	11.48	0.063
	Big Bluestem	*Andropogon gerardii*	16.53	5.000
	Virginia Wild Rye	*Elymus virginicus*	11.48	5.000
Forbs	Boneset	*Eupatorium perfoliatum*	11.48	0.250
	Sneezeweed	*Helenium autumnale*	11.48	0.250
	Joe-Pye Weed	*Eupatorium fistulosum*	17.22	0.375
	Wild Senna	*Senna marilandica*	0.30	0.500
	New York Ironweed	*Vernonia noveboracensis*	0.86	0.125
	Partridge Pea	*Cassia fasciculata*	0.86	0.500
	Spotted Joe-Pye Weed	*Eupatorium maculatum*	4.02	0.125
	Swamp Milkweed	*Asclepias incarnata*	0.40	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.

TABLE 2.1.3-5

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
Grasses	Bottlebrush Grass	*Elymus hystrix*	0.86	0.500
	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
	Tussock Sedge	*Carex stricta*	10.33	0.250
	Wool Grass	*Scirpus cyperinus*	51.65	0.250
Forbs	Blue False Indigo	*Baptisia australis*	0.30	0.500
	Canada Anemone	*Anemone canadensis*	0.18	0.063
	Canadian Burnet	*Sanguisorba canadensis*	0.29	0.063
	Great Blue Lobelia	*Lobelia siphilitica*	11.48	0.063
	New York Ironweed	*Vernonia noveboracensis*	1.72	0.250
	Spotted Joe-Pye Weed	*Eupatorium maculatum*	8.03	0.250
	Swamp Milkweed	*Asclepias incarnata*	0.40	0.250
	American Senna	*Senna hebecarpa*	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 2.1.3-6

Seed Mix FS06: Recommended Seed Mix for Dry Acidic Habitat Areas [a]

Type	Common Species Name	Scientific Name	Number of Seeds (seeds/fee^{t2}) [b]	Seeding Application Rate (lbs/acre/PLS) [c]
	Purple Top	*Tridens flavus*	53.37	5.000
Grasses	Splitbeard Bluestem	*Andropogon ternarius*	9.92	2.000
	Wood Oats	*Chasmanthium sessiliflorum*	1.95	1.000
Forbs	Virginia Spiderwort	*Tradescantia virginiana*	1.04	0.313
	Common Blackberry	*Rubus allegheniensis*	1.13	0.188
	Tall Goldenrod	*Solidago canadensis*	6.03	0.375
	Indian Hemp	*Apocynum cannabinum*	5.02	0.438
	White Avens	*Geum canadense*	4.59	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.

[b] Seeds per square feet.

[c] lbs/acre/PLS = pounds per acre of pure live seed.

Seeding Methods

To enhance germination, the seed mixes for special site conditions will be drill-seeded. On slopes exceeding 40 percent, drill seeding is not feasible, nor are such seed mixes intended to function as erosion control. On slopes exceeding 40 percent, erosion control seed mixes will be applied by hydroseeding or broadcast seeding at double the recommended seeding rate.

Seeding may be conducted with the use of a seed drill, a mechanical broadcast seeder, or by hydroseeding. 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 will be used in lieu of drilling in areas with slopes greater than 40 percent. Atlantic will consult with FS staff regarding seeding methods in problematic areas such as extremely rocky areas or slopes exceeding 40 percent.

Broadcast seeding may also 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. Some seed, for example, that of pollinator species which should not be seeded too deeply, may be broadcast on top of flexterra (or similar material), based on recommendations from seed suppliers.

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 slopes greater than 50 percent or in areas inaccessible to drill or planting equipment, where site conditions require seed adherence to the 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 FS requirements.

2.1.4 **State Lands**

Seneca State Forest – Pocahontas County

Table 2.1.4-1 provides a summary of seed mixture and application rates to be used in all newly disturbed areas in the Seneca State Forest lands. In addition, all newly disturbed areas will be limed (3 tons per acre), fertilized (400 pounds per acre of 19-19-19), and mulched (straw) as recommended by the West Virginia Department of Natural Resources.

TABLE 2.1.4-1

Seed Mix WVSEN: Recommended Herbaceous Seed Mix [a]

Common Name	Scientific Name	Seed Mix Rate (lbs/acre/PLS)[b]
Red Clover	*Trifolium pratense*	3.0
Ladino White Clover	*Trifolium repens*	5.0
Orchard Grass	*Dactylis glomerata*	2.0
Annual Rye Grass or Wheat	*Lolium multiflorum or Triticum aestivum*	50.0
Total	—	**60.0**

Source: WVDNR, 2017.

[a] Add to the recommended herbaceous seed mix a wild forbs mix: Mix P-MUDW01 (see Table 2.15-2) or P-MUMP02 (see Table 2.15-4) for Mountain Physiographic Region.

[b] lbs/acre/PLS = pounds per acre of pure live seed

2.1.5 Recommended Native Grasses and Pollinators Seed Mixtures, Application Rates, and Non-Native Cover Crop by Physiographical Region

Recommended Seed Mixtures by Geographical Region (Mountain Physiographic Region) and Drainage Class

The following seed mixtures are for the mountain and upland areas of West Virginia. These recommendations are based on discussions with Roundstone Native Seed and Robert Glennon, private lands biologist from the Conservation Management Institute, Virginia Tech and NRCS, and the Xerces Society.

West Virginia Excessively to Moderately Well Drained Sites

TABLE 2.1.5-1

Seed Mix P-MUDW01: Recommended Mountain Physiographic Region
Grass Seed Mix and Application Rates for Excessively to Moderately Well Drained Sites in West Virginia

Common Name	Scientific Name	Height (feet)	Sun Exposure	Seed Mix Rate (lbs/acre/PLS)[b]
Little Bluestem	*Schizachyrium scoparium*	2 - 4	Full Sun	0.250
Virginia Wild Rye	*Elymus virginicus*	2 - 4	Full Sun	0.250
Tall Dropseed	*Sporobolus compositus*	2 - 3	Full Sun	0.050
Purple Top	*Tridens flavus*	3 - 5	Part Shade	0.058
Indian Grass	*Sorghastrum nutans*	3 - 6	Full Sun	0.167
Switchgrass	*Panicum virgatum*	3 - 7	Full Sun	0.183
Fall Panicum	*Panicum anceps*	2 - 4	Part Shade	0.042
Total	—	—	—	**1.0**

Sources: Roundstone Native Seed, 2015; Glennon, 2015.

[a] Recommended seeding application rate is 8 to 18 pounds per acre.

[b] lbs/acre/PLS = pounds per acre of pure live seed

TABLE 2.1.5-2

Seed Mix P-MUDW01: Recommended Mountain Physiographic Region
Forb Seed Mix and Application Rates for Excessively to Moderately Well Drained Sites in West Virginia

Common Name	Scientific Name	Color	Bloom Period	Seed Application Rate (lbs/acre/PLS)[a]
Lance Leaved Coreopsis	*Coreopsis lanceolata*	Yellow	Spring, Summer	0.385
Smooth Beardtongue	*Penstemon digitalis*	White	Spring	0.146
Common Milkweed	*Asclepias syriaca*	Pink	Spring, Summer	0.128
Goat's Rue	*Tephrosia virginiana*	White/Pink	Spring, Summer	0.128
Partridge Pea	*Cassia fasciculata*	Yellow	Summer	0.745
Slender Mountain Mint	*Pycnanthemum tenuifolium*	White	Summer	0.069
Early Goldenrod	*Solidago juncea*	Yellow	Summer	0.086
Bergamot	*Monarda fistulosa*	Lavender	Summer	0.103
Spiked Blazing Star	*Liatris spicata*	Pink	Summer	0.343
Sneezeweed	*Helenium autumnale*	Yellow	Summer, Fall	0.128
Gray Goldenrod	*Solidago nemoralis*	Yellow	Fall	0.086
Iron Weed	*Vernonia altissima*	Purple	Summer, Fall	0.343
Tall Coreopsis	*Coreopsis tripteris*	Yellow	Summer, Fall	0.051
Total	—	—	—	**2.74**

Sources: Roundstone Native Seed, 2015; Glennon, 2015.
[b] lbs/acre/PLS = pounds per acre of pure live seed

West Virginia Somewhat Poorly to Very Poorly Drained Sites

TABLE 2.1.5-3

Seed Mix P-MUMP02: Recommended Mountain Physiographic Region
Grass Seed Mix and Application Rate for Somewhat Poorly to Very Poorly Drained Sites in West Virginia

Common Name	Scientific Name	Height (feet)	Sun Exposure	Seed Mix Rate (lbs/acre/PLS)[b]
Switchgrass	*Panicum virgatum*	3 - 7	Full Sun	0.233
Red Top Panicum	*Panicum rigidulum*	2 - 4	Full Sun	0.017
Fowl Manna Grass	*Glyceria striata*	3 - 5	Part Shade	0.008
Virginia Wild Rye	*Elymus virginicus*	2 - 4	Full Sun	0.217
Canada Wild Rye	*Elymus canadensis*	2 - 5	Part Shade	0.167
Deer Tongue Grass	*Panicum clandestinum*	2 - 4	Full Sun	0.058
Big Bluestem	*Andropogon gerardii*	4 - 10	Full Sun	0.167
Frank's Sedge	*Carex frankii*	1 - 2	Part Shade	0.042
Fox Sedge	*Carex vulpinoidea*	2 - 3	Part Shade	0.025
Fall Panicum	*Panicum anceps*	2 - 4	Part Shade	0.067
Total	—	–	—	**1.0**

Sources: Roundstone Native Seed, 2015; Glennon, 2015.
[a] Recommended seeding application rate is 8 to 18 pounds per acre.
[b] lbs/acre/PLS = pounds per acre of pure live seed

TABLE 2.1.5-4

Seed Mix P-MUMP02: Recommended Mountain Physiographic Region
Forb Seed Mix Application Rate for Somewhat Poorly to Very Poorly Drained Sites in West Virginia

Common Name	Scientific Name	Color	Bloom Period	Seed Application Rate (lbs/acre/PLS)[a]
Ohio Spiderwort	*Tradescantia ohiensis*	Blue	Spring, Summer	0.167
Smooth Beardtongue	*Penstemon digitalis*	White	Spring	0.083
Butterfly Milkweed	*Asclepias tuberosa*	Orange	Spring, Summer	0.083
Blackeyed Susan	*Rudbeckia hirta*	Yellow	Spring, Summer	0.134
Wild Senna	*Senna marilandica*	Yellow	Summer	0.668
Hoary Mountain Mint	*Pycnanthemum incanum*	White	Summer	0.033
Lupine	*Lupinus perennis*	Blue	Summer	0.501
Bergamot	*Monarda fistulosa*	Lavender	Summer	0.083
Boneset	*Eupatorium perfoliatum*	White	Summer	0.083
Joe-Pye Weed	*Eupatorium fistulosum*	Pink	Summer, Fall	0.125
Showy Tickseed	*Bidens aristosa*	Yellow	Summer, Fall	0.501
Sneezeweed	*Helenium autumnale*	Yellow	Summer, Fall	0.125
Rough Goldenrod	*Solidago rugosa*	Yellow	Fall	0.083
Total	—	—	—	**2.67**

Sources: Roundstone Native Seed, 2015; Glennon, 2015.
[a] lbs/acre/PLS = pounds per acre of pure live seed

Recommended Non-Native Temporary Cover Crop Species and Non-Native Grass Cover Mix for Inclusion with Pollinator Mixtures

In areas where the erosion potential is high (e.g., steep slope areas) and/or sites that require stabilization within 30 days of disturbance, non-native temporary cover species in seed mixture P-NNTC, as shown in Table 2.1.5-5, should be used. In areas where erosion is likely to occur on steep slopes prior to the germination of native grasses and forbs, non-native grass mixture P-NNGC should be used in combination with the forb mixtures that are prescribed for non-steep slope areas within the Mountain Physiographic Region of West Virginia. Table 2.1.5-6 provides the specific non-native grass species to be included with the native forb seed mix in these areas.

TABLE 2.1.5-5

Seed Mix P-NNTC: Recommended Mountain Physiographic Region
Non-Native Temporary Cover Crop Species for Steep Slope Areas in West Virginia

Common Name	Scientific Name	Height (Inches)	Sun Exposure	Seeding Application Rate (lbs/acre/PLS)[a]	Seed Mix Planting Season
Brown Top Millet	*Panicum ramosum*	3 - 3.5	Full sun	5.0	Summer
Spring Oats	*Avena sativa*	2 – 2.5	Full sun	30.0	Spring and Fall
Annual Rye Grass	*Lolium multiflorum*	2 – 2.5	Part shade	6.0	Fall and Winter
Total	—	—	—	41.0	—

Source: Roundstone Native Seed, 2015.
[a] lbs/acre/PLS = pounds per acre of pure live seed

TABLE 2.1.5-6

Seed Mix P-NNGC: Recommended Mountain Physiographic Region
Non-Native Grass Cover Mix for Steep Slope Areas in West Virginia [a]

Common Name	Scientific Name	Height (Inches)	Sun Exposure	Seed Mix Rate (lbs/acre/PLS)[b]
Fescue	*Festuca arundinacea*	2 - 3	Part Shade	0.300
Timothy	*Phleum pratense*	2 - 4	Part Shade	0.100
Orchard Grass	*Dactylis glomerata*	2 - 3	Part Shade	0.100
Red Top	*Agrostis alba*	2 - 3	Full Sun	0.020
Ladino Clover	*Trifolium repens*	1 - 1.5	Part Shade	0.040
Annual Rye Grass	*Lolium multiflorum*	2 - 2.5	Part Shade	0.170
Creeping Red Fescue	*Festuca rubra*	1 - 2	Full Sun	0.250
Kentucky Bluegrass	*Poa pratensis*	1-2	Full Sun	0.020
Total	—	—	—	**1.0**

Source: Roundstone Native Seed, 2015.

[a] Recommended seeding application rate is 30 to 50 pounds per acre.

[b] lbs/acre/PLS = pounds per acre of pure live seed

2.2 VIRGINIA

2.2.1 Augusta, Brunswick, Buckingham, Cumberland, Highland, Bath, Nelson, Nottoway, and Prince Edward Counties

The following erosion control prevention, forage species seed mixtures, and recommended soil amendments are for the Mountain and Piedmont Physiographic Regions of Virginia, which include Augusta, Brunswick, Buckingham, Cumberland, Highland, Nelson, Nottoway, and Prince Edward Counties. These recommendations are based on the U.S. Department of Agriculture-NRCS Virginia Plant Establishment Guide (Jones, et. al., 2014), which was recommended by Federal and Commonwealth agency contacts, including Charles Ivins (NRCS Conservationist), Charles Simmons (NRCS Conservationist), Davie Wade Harris (NRCS Conservationist), Jeffray Jones (State Biologist), J.B. Daniel (NRCS Conservationist), and Derek Hancock (NRCS Conservationist).

Recommended Grass Seed Mixtures, Species, Application Rates, and Planting Dates

Seed Mix VABCHNP01 (Table 2.2.1-1) provides a cool season species list mixture for erosion prevention, while Seed Mix VABCHNP02 (Table 2.2.1-2) provides cool and warm season species mixtures for forage.

TABLE 2.2.1-3

Recommended Soil Amendments

Type	Application Rate
Lime	2 tons/acre
Fertilizer 10-10-10	1,000 lbs/acre

TABLE 2.2.1-1

Seed Mix VABCHNP01: Recommended Cool Season Erosion Prevention Species and Seed Mixtures

Seeding Mix	Common Species Name	Virginia Native	Seeding Rate (lbs/acre/PLS)[a] B:broadcast; D:drill (4-9" row)	Plant Depth (inches)	Mountain/Valley/Northern Piedmont		Southern Piedmont	
					Best Dates	Possible Dates	Best Dates	Possible Dates
	Average Last Frost				May 1		Apr 15	
Perennial Grass								
1	Canada wild rye (Elymus canadensis), Virginia wild rye (Elymus virginicus), and Common milkweed (Asclepias syriaca) (use in high velocity and highly erosive situations		B: 60	¼-½	Aug 15-Sep 10; Mar 15-Apr 10	Aug 1-Sep 30; Mar 1-Apr 30	Sep 1-Sep 20; Mar 1-Apr 1	Aug 25-Nov 1; Feb 15-Apr 15
2	Switchgrass and Common milkweed (Asclepias syriaca)	√	D:10; B:15	¼	Mar 15-Jun 30		Mar 1-Jun15	
Mixtures								
3	Canada wild rye and Virginia wild rye + Virginia lespedeza (Lespedeza virginica), + hairy lespedeza (Lespedeza hirta) + Common milkweed (Asclepias syriaca)		B:40+3	¼	Aug 15-Sep 10; Mar 15-Apr 10	Aug 1-Sep 30; Mar 1-Apr 30	Sep 1-Sep 20; Mar 1-Apr 1	Aug 25-Nov 1; Feb 15-Apr 15
4	Canada wild rye + Virginia wild rye + Virginia lespedeza + hairy lespedeza + Common milkweed (Asclepias syriaca)		B:40+6	¼	Aug 15-Sep 10; Mar 15-Apr 10	Aug 1-Sep 30; Mar 1-Apr 30	Sep 1-Sep 20; Mar 1-Apr 1	Aug 25-Nov 1; Feb 15-Apr 15
5	Canada wild rye + Virginia wild rye + Virginia, + hairy lespedeza (Lespedeza hirta) + Common milkweed (Asclepias syriaca)		B:40+10; D:30+8	¼	Mar 1-Apr 15	Mar 1-Apr 15	Feb 15-Apr 1	Feb 15-Apr 1
6	Canada wild rye + Virginia wild rye + Redtop + Common milkweed (Asclepias syriaca)		D/B: 40+10	¼-½	Jul 25-Sep 1; Mar 20-Apr 20	Jul 15-Sep 15; Mar 1-May 15	Aug 25-Sep 15	Aug 25-Oct 25; Feb 15-Mar 31
7	Switchgrass + Red Fescue + Partridge Pea + Common milkweed (Asclepias syriaca)		D/B: 10+15+4	¼	Mar 15-April 30	Mar 15-Jun 30	Mar 1-Apr 15	Feb 15-May 31
8	Switchgrass + Indiangrass + Big Bluestem + Common milkweed (Asclepias syriaca)		D/B: 5 each	¼	Mar 15-Jun 30	Mar 15-Jun 30	Mar 1-Jun 15	Mar 1-Jun 15

TABLE 2.2.1-1

Seed Mix VABCHNP01: Recommended Cool Season Erosion Prevention Species and Seed Mixtures

Seeding Mix	Common Species Name	Virginia Native	Seeding Rate (lbs/acre/PLS)[a] B:broadcast; D:drill (4-9" row)	Plant Depth (inches)	Mountain/Valley/Northern Piedmont		Southern Piedmont	
					Best Dates	Possible Dates	Best Dates	Possible Dates
9	Canada wild rye + Virginia wild rye + Redtop + Virginia lespedeza and hairy lespedeza + Common milkweed (Asclepias syriaca)		D/B: 60+6+10	¼-½	Jul 25-Sep 1; Mar 20-Apr 20	Jul 15-Sep 15; Mar 1-May 15	Aug 25-Sep 15	Aug 25-Oct 25; Feb 15-Mar 31
10	Switchgrass + Deer tongue + Partridge Pea + Common milkweed (Asclepias syriaca)	√	D/B: 8+8+4	¼	Mar 15-April 30	Mar 15-Jun 30	Mar 1-Apr 15	Feb 15-May 31
11	Perennial Ryegrass + Redtop + Common milkweed (Asclepias syriaca)		D:5+2; B:7+3	½-¾	Mar 1-Apr 15	Aug 1-Sep 15	Feb 15-April 1	Aug 15-Oct 1

Source: Jones, et. al., 2014

[a] lbs/acre/PLS = pounds per acre of pure live seed

Note: The Virginia Plant Establishment Guide (Jones, et. al., 2014) provides acceptable seed mixtures and/or plant species rates, seeding dates, and other information that may be needed in the planning of practices and development of specifications for individual sites.

TABLE 2.2.1-2

Seed Mix VABCHNP02: Recommended Cool and Warm Season Forage Species and Seed Mixtures

Seeding Mix	Common Species Name	Virginia Native	Seeding Rate (lbs/acre/PLS) B:broadcast; D:drill (4-9" row)	Plant Depth (inches)	Mountain/Valley/Northern Piedmont [a]		Southern Piedmont	
					Best Dates	Possible Dates	Best Dates	Possible Dates
	Average Last Frost				May 1		Apr 15	
Perennial Grasses [j]								
103	Big Bluestem [b]	√	B:10-12; D:8-10	¼	Mar 15-Jun 30	Mar 15-Jun 30	Mar 1-Jun 15	Mar 1-Jun 15
104	Bluegrass		B:10-15; D:8-12 4-5 in mixtures	¼	Aug 15-Sep 1; Mar 15-Apr 1	Aug 1-Sep 15; Mar 1-Apr 15	Seed in mixtures Mar 1- Apr 1; Aug 15 - Oct 1	Seed in mixtures Mar 1- Apr 1; Aug 15 - Oct 1
105	Eastern Gamagrass [c] (use non-stratified seed for winter planting and stratified seed for spring plantings)	√	R:8-10	1- 1.5	Nov 15-Feb 15; May 1-May30	Nov 15- Feb 15: May 1-Jun 30	Nov 25-Jan 31; Apr 20- May 15	Nov 25-Jan 31; Apr 15 - Jun 10
106	Indiangrass [b]	√	B:10-12; D:8-10	¼	Mar 15-Jun 30	Mar 15-Jun 30	Mar 1-Jun 15	Mar 1-Jun 15
107	Orchardgrass [d]		B:12-15; D:8-12	¼-½	Aug 20-Sep 10; Mar 15-Apr 1	Aug 15-Oct 1; Mar 1-Apr 15	Aug 25-Sep 15; Mar 1-Apr 1	Aug 25-Oct 25; Mar 1-Apr 15
109	Perennial Ryegrass [d]		D: 12-15 B:20-25; 6-10 in mixtures	¼-½	Aug 20-Sep 10; Mar 15-Apr 1	Aug 15-Sep 25; Mar 1-Apr 15	Not well adapted	Aug 25-Oct 1; Feb 25-April 1
110	Prairiegrass		D:20-25; B:30-35 10-15 in mixtures	¼-½	Aug 15 - Sep 15; Mar 15-Apr 15	Aug 15-Oct 15; Mar 1-Apr 30	Sep 1 - Oct 1; Mar 1-Mar 20	Aug 15-Oct 25; Feb 20-Apr 15
111	Switchgrass [b]	√	B:8-10; D:6-8	¼	Mar 15-Jun 30	Mar 15-Jun 30	Mar 1-Jun 15	Mar 1-Jun 15
112	Tall Fescue		B:20-25; D:15-20	¼-½	Aug 15-Sep 10; Mar 15-Apr 15	Aug 1-Sep 30; Mar 1-Apr 30	Sep 1-Sep 30; Mar 1-Apr 1	Aug 25-Nov 1; Feb 25-Apr 15
113	Timothy		B:10-12; D: 8-10	¼-½	Aug 15-Sep 10; Mar 15-Apr 1	Aug 15-Oct 1; Mar 1-Apr 15	Not well adapted	Not well adapted
Mixtures [j]								
114	Orchardgrass + Alfalfa [e]		B:5+20; D:3+15	¼-½	Aug 15-Sep 1; Mar 15-Apr 1	Aug 1-Sep 15; Mar 1-Apr15	Aug 25-Sep 15; Mar 1-Mar 20	Aug 25-Oct 15; Feb 25-Apr 1
115	Orchardgrass with 1 or more of the following: Ladino Clover Red Clover Annual Lespedeza		B: 10-12; D:8-10 1-2 4-6 10-12	¼-½	Aug 20-Sep 10; Mar 15-Apr 1	Aug 15-Oct 1; Mar 1-Apr 15	Aug 25-Sep 15; Mar 1-Mar 20	Aug 25-Oct 15; Feb 25-Apr 1

TABLE 2.2.1-2

Seed Mix VABCHNP02: Recommended Cool and Warm Season Forage Species and Seed Mixtures

Seeding Mix	Common Species Name	Virginia Native	Seeding Rate (lbs/acre/PLS) B:broadcast; D:drill (4-9" row)	Plant Depth (inches)	Mountain/Valley/Northern Piedmont [a]		Southern Piedmont	
					Best Dates	Possible Dates	Best Dates	Possible Dates
116	Orchardgrass and		B: 10-12; D:8-10	¼-½	Aug 20-Sep 10;	Aug 15-Oct 1;	Aug 25-Sep 15;	Aug 25-Oct 15;
	Timothy		B: 4; D:2		Mar 15-Apr 1	Mar 1-Apr 15	Mar 1-Mar 20	Feb 25-Apr 1
	with 1 or more of the following:		1-2					
	Ladino Clover Red Clover		4-6					
	Annual Lespedeza		10-12					
117	Tall Fescue with 1 or more of the following: Ladino Clover Red Clover Annual Lespedeza		B:20-25; D:15-20 1-2 4-6 10-12	¼-½	Aug 15- Oct 1; Mar 1-Apr 15	Aug 15- Oct 1; Mar 1-Apr 15	Aug 25 - Oct 15; Feb 20-Apr 1	Aug 25 - Oct 15; Feb 20-Apr 1
118	Prairiegrass with 1 or more of the following: Red Clover Alfalfa [e]		B:20-25; D:15-20; 4-6 15	¼-½	Aug 15 - Sep 15; Mar 10-Apr 10	Aug 1-Sep 20; Mar 1-Apr 15	Aug 25 - Sep 15; Mar 1-Mar 20	Aug 15-Oct 15; Feb 25-Apr 1
Annual Grasses [j]								
119	Crabgrass [f]		B:6-8; D:4-6	¼	May 15-May 31	May 1-Jun 30	May 1-May 31	Apr 15-Jun 30
120	Barley		B:140; D:120	1 – 1.5	Aug 15-Sep 15	Aug 10-Sep 30	Aug 25-Sep 15	Aug 15-Sep 30
121	Millet, Pearl		B:30-40; D:15-20	½ - 1	May 15-May 31	May 1-Jun 30	May 1-May 31	Apr 25-Jun 30
122	Millet, German Foxtail, Japanese		B:20-30;D:15-20	¼	May 15-May 31	May 1-Jun 30	May 1-May 31	May 1-Jun 30
123	Oats, Winter [g]		B:80-96; D:65-80	1 – 1.5	Aug 15-Sep 10	Aug 10-Sep 15; Feb 1-Mar 1	Sep 1-Sep 15	Aug 25-Oct 1; Feb 1-Mar 1
124	Oats, Spring		B:80-96; D:65-80	1 – 1.5	Mar 15-Apr 1	Mar 15-Apr 10	Mar 5-Mar 20	Mar 5-Apr 1
125	Rye		B:120-150; D:90-110	1 – 1.5	Aug 15-Aug 31	Aug 15-Oct 25	Aug 25-Sep 15	Aug 20-Oct 31
126	Ryegrass		B:30-40; D:20-30	¼-½	Aug 15-Sep 10	Aug 10-Sep 30	Aug 25-Sep 15	Aug 20-Oct 31
127	Teff [g, h]		B: 6-8; D 5-6	1/8	Jun 1-Jun 15	May 15 - Jul 1	May 20-Jun 10	May 1 - Jul 1
128	Wheat		B:150; D: 120	1 – 1.5	Aug 15-Aug 31	Aug 15-Oct 25	Aug 25-Sep 15	Aug 20-Oct 31
129	Small grain Mix (2 Grains)		Reduce each selection by 50%	1 – 1.5	See dates for small grains.	See dates for small grains.	See dates for small grains.	See dates for small grains.
130	Small grain mixed with annual ryegrass		Reduce Small grain 25% & ryegrass 50%	½ - 1	See dates for grains and ryegrass.		See dates for grains and ryegrass.	
131	Sorghum-Sudangrass		B:30-40; D:20-30	½ - 1	May 15-May 31	May 1-Jun 30	May 1- May 31	Apr 25-Jun 30
132	Sorghum, Forage		B: 15-20; R:5-10	1 – 1 ½	May 15-May 31	May 1 – Jun 30	May 1–May 31	Apr 25 – Jun 30
133	Sudangrass		B:30-35; D:15-20	½ - 1	May 15 -May 31	May 1 – Jun 30	May 1–May 31	Apr 25 – Jun 30
134	Triticale		B:140-180; D: 120-140	1 – 1.5	Aug 15-Aug 31	Aug 15-Oct 25	Aug 25-Sep 15	Aug 20-Oct 31
Perennial Legumes [j]								

TABLE 2.2.1-2

Seed Mix VABCHNP02: Recommended Cool and Warm Season Forage Species and Seed Mixtures

Seeding Mix	Common Species Name	Virginia Native	Seeding Rate (lbs/acre/PLS) B:broadcast; D:drill (4-9" row)	Plant Depth (inches)	Mountain/Valley/Northern Piedmont [a]		Southern Piedmont	
					Best Dates	Possible Dates	Best Dates	Possible Dates
135	Alfalfa [e]		B:20-25; D:15-20	¼	Aug 25-Sep 15; Mar 20–Apr 7	Aug 15-Sep 25; Mar 15-Apr 15	Sep 1-Sep 15; Mar 10-Mar 20	Aug 25-Oct 1; Mar 5-Apr 5
136	Alfalfa (no-till seeding into grass)		D:10-12	¼ - ½	Mar 20–Apr 7	Mar 15-Apr 15	Mar 10-Mar 20	Mar 5-Apr 5
137	Birdsfoot Trefoil (no-till into suppressed grass sod)		D:6-8	¼	Aug 15-Sep 1	Aug1-Sep 15	Not adapted	Not adapted
138	Birdsfoot Trefoil (frost seed onto pasture)		B: 8-10	0	Feb 1-Mar 1	Jan 25-Mar 10	Not adapted	Not adapted
139	Ladino or White Clover (no-till into suppressed grass sod)		D:1-2	¼	Aug 20-Sep 10; Mar 15-Apr 1	Aug 15-Sep 25; Mar 1-Apr 15	Aug 25-Sep 15; Mar 1-Mar 20	Aug 25-Oct 15; Feb 25-Apr 1
140	Ladino or White clover (frost seed onto pasture)		B:1-2	0	Feb 1-Mar 1	Jan 25-Mar 10	Jan 25-Feb 15	Jan 20-Mar 1
141	Red Clover (no-till into suppressed grass sod)		D:4-6	¼ - ½	Aug 20-Sep 10; Mar 15-Apr 1	Aug 15-Sep 25; Mar 1-Apr 15	Aug 25-Sep 15; Mar 1-Mar 20	Aug 25-Oct 15; Feb 25-Apr 1
142	Red Clover (frost seed onto pasture)		B:4-6	0	Feb 1-Mar 1	Jan 25-Mar 10	Jan 25-Feb 15	Jan 20-Mar 1
Annual Legumes [j]								
143	Crimson Clover w/Ryegrass or small grain		B:20; D:15 & reduce small grain by 1/3	¼ - ½	Aug 15-Sep 10	Aug 10-Sep 30	Aug 25-Sep 15	Aug 20-Oct 15
144	Lespedeza, Kobe (Southeast VA) (frost seeded onto pastures)		B:10-15	0	Not adapted	Not adapted	Not well adapted	Not well adapted
145	Lespedeza, Korean (frost seeded onto pastures)		B:10-15	0	Feb 1-Mar 1	Feb 1-Mar 15	Jan 25-Mar 1	Jan 25-Mar 10
146	Hairy Vetch w/ small grain		B: 15; D 10 & reduce small grain by 50%	½ - 1 ½	Aug 15-Aug 31	Aug 15-Sep 15	Aug 25-Sep 15	Aug 20-Oct 1

TABLE 2.2.1-2

Seed Mix VABCHNP02: Recommended Cool and Warm Season Forage Species and Seed Mixtures

Seeding Mix	Common Species Name	Virginia Native	Seeding Rate (lbs/acre/PLS) B:broadcast; D:drill (4-9" row)	Plant Depth (inches)	Mountain/Valley/Northern Piedmont [a]		Southern Piedmont	
					Best Dates	Possible Dates	Best Dates	Possible Dates
Other Species [j]								
147	Chicory (in mixture w/grass & legume)		B: 3-4 D: 1-2	¼ - ½	Apr 15-May5	Apr 1-May 15	Sep 1-Sep 15	Sep 1-Oct 10
148	Brassicas [i] (sow 1-2 of the following in a 50% rate mix of summer or winter annual grasses in late spring or late summer respectively) Rape Kale Turnip Turnip X Rape Radish		B: 2-3 D: 1-2	¼ - ½	May 1 - Jun 30 Aug 1 - Sep 1	May 1 - Jun 30 Aug 1 - Sep 1	Apr 20 - Jun 20 Aug 1 - Sep 10	Apr 20 - Jun 20 Aug 1 - Sep 10

Source: Jones, et. al., 2014

[a] The northern piedmont planting dates may be on the opposite end of the planting range compared to the mountains and valley in Southwest VA.

[b] Native warm season grass planting date will vary within the planting window depending on dormancy of seed and expected annual grass/weed competition in the field.

[c] Eastern Gama grass can be planted with a corn planter (30" row) or with a drill on approximately 15" row centers (by blocking every other seed tube).

[d] This species tends to be a short lived perennial when planted and managed in monocultures in the piedmont and eastern regions of VA; it seems does better in the mountain and valley regions of the state especially when managed with rotational stocking in a mixed stand with other grasses and legumes.

[e] Fall planted alfalfa should not be no-tilled; alfalfa should be planted in spring 30 days prior to last killing frost and in fall 30-60 days before first killing fros.t

[f] Planting too deep is a common cause of stand failure.

[g] It is generally not recommended to plant oats in the fall west of the Blue Ridge because they will winter kill, however they are sometimes planted late summer and grazed in the fall and early winter.

[h] Not recommended for no-till planting, needs a clean firm seedbed to ensure establishment.

[i] Brassicas are not recommended in a monoculture, they are low in fiber and have highly digestible protein and can cause problems with rumen function; they should be planted mixed with summer or winter annuals to avoid problems (50 percent seeding rate of brassicas and 50 percent annuals).

[j] Add to the mixture or use Canada wild rye (*Elymus canadensis*) and/or Virginia wild rye (*Elymus virginicus*) where possible and practicable.

Mulching

The NRCS Conservation Practice Standard - Mulching (Code 484) (NRCS, 2014) provides a general recommendation for mulching in Virginia. Mulching materials should consist of natural/artificial materials that can provide a certain depth/thickness and durability to achieve adequate cover. Mulch should be applied evenly and, if necessary, anchored into the soil. As a minimum, apply manufactured mulches in accordance with the manufacturer's specifications. The Mulch Specifications table (Table 2.2.1-4) provides some general guidelines when using certain mulches.

TABLE 2.2.1-4

Mulch Specifications

Mulch Type	Suggested Cover
Cereal Grain/Grass Hay	70% Ground Cover
Wood Products (Wood Chips, Bark)	≤ 2-inch thickness
Gravel / Other Inorganic Materials	0.75 to 2-inch diameter / 2-inch thickness

Mulch should be applied to provide adequate protection from erosion, yet allow light and moisture to penetrate into the seedbed. Typical mulching provides 70 percent cover (approximately 2,000 pounds of straw per acre) with the appropriate erosion control measure to hold the seed and straw in place during establishment, depending on slope (NRCS Code 342) (NRCS, 2011). There are several types of mulches that can be used to conserve soil moisture, promote plant growth, and reduce erosion; however, there are also mulches that can have the reverse affect. Consider potential benefit or detrimental effects of mulching to the impacted and surrounding areas.

An operation and maintenance plan should clearly document:

- Purpose of mulch and type;
- Percent cover and/or thickness of mulch material;
- Timing of application;
- Site preparation; and
- Method of anchoring (i.e., netting, tackifiers, etc.).

Recommended Perennial Grasses and Pollinator Seed mixtures, Species, and Rates for Mountainous and Piedmont Regions

The following seed mixtures are for the Mountainous and Piedmont Regions of Virginia. These recommendations are based on discussions and information provided by Robert Glennon, private lands biologist from the Conservation Management Institute, Virginia Tech and NRCS, and the Xerces Society.

TABLE 2.2.1-5

Seed Mix P-VABCHNP01: Recommended Mountain and Piedmont Physiographic Regions
Grass Seed Mix and Application Rates for Excessively to Moderately Well Drained Sites in Virginia

Common Name	Scientific Name	Cultivar or Germplasm	Drilled Seeding Rate [a] (weight of pure live seed (PLS) per acre)	Seeds per Square Foot
Little Bluestem	*Schizachyrium scoparium*	Piedmont (NC) or Suther Germplasm (NC)	8 ounces	3
Broomsedge	*Andropogon virginicus*	—	8 ounces	3
Purple Top	*Tridens flavus*	North Carolina or Kentucky Ecotype	3 ounces	3
Common milkweed	*Asclepias syriaca*	—	3 ounces	0.210
Total	—	—	22 ounces	9.210

Source: Glennon, 2017; Roundstone Native Seed, 2017.

[a] If the broadcast method is more feasible, increase the perennial grasses in the mixture by 50 percent.

TABLE 2.2.1-6

Seed Mix P-VABCHNP01: Recommended Mountain and Piedmont Physiographic Regions
Forb Seed Mix and Application Rates for Excessively to Moderately Well Drained Sites in Virginia

Common Name [a]	Scientific Name	Flowering Season	Drilled Seeding Rate [b] (ounces/acre - weight of pure live seed (PLS) per acre)	Seeds per Square Foot
Showy Tickseed	*Bidens aristosa*	Late Summer	11	3
Pea, Partridge (A)	*Chamaecrista fasciculata*	Mid-Summer	32	3
Susan, Black-eyed (B)	*Rudbeckia hirta*	Early Summer	2	3
Bergamot, Spotted (P)	*Monarda punctata*	Summer	2	3
Bergamot, Wild (P)	*Monarda fistulosa*	Summer	2	3
Beardtongue, Eastern Smooth (P)	*Penstemon laevigatus*	Late Spring	7	3
Penstemon, Talus Slope (P)	*Penstemon digitalis*	Late Spring	5	3
Slender Mountain Mint (P)	*Pycnanthemum tenuifolium*	Late Summer	1	3
New England Aster	*Aster novae-angliae*	Late Summer	2	3
Total	**—**	**—**	**64.0 ounces/acre (4.0 lbs/acre)**	**27**

Source: Glennon, 2017; Roundstone Native Seed, 2017.

[a] Forb types include (A) for annual flowers, (B) for biennial flowers, and (P) for perennial flowers.

[b] If the broadcast method is more feasible, increase the perennial grasses in the mixture by 50 percent.

TABLE 2.2.1-7

Seed Mix P-VABCHNP02: Recommended Mountain and Piedmont Physiographic Regions
Grass Seed Mix and Application Rates for Somewhat Poorly to Very Poorly Drained Sites in Virginia

Common Name	Scientific Name	Cultivar or Germplasm	Drilled Seeding Rate [a] (weight of pure live seed (PLS) per acre)	Seeds per Square Foot
Beaked Panicum	*Panicum anceps*	SC or MD Ecotype	4 ounces	3
Redtop Panicum	*Panicum rigidulum*	NC Ecotype	3 ounces	3
Slender Rush	*Juncus tenuis*	—	1 ounce	3
Total	—	—	8 ounces	9

Source: Glennon, 2015; Roundstone Native Seed, 2017.

[a] If the broadcast method is more feasible, increase the perennial grasses in the mixture by 50 percent.

TABLE 2.2.1-8

Seed Mix P-VABCHNP02: Recommended Mountain and Piedmont Physiographic Regions
Forb Seed Mix and Application Rates Somewhat Poorly to Very Poorly Drained Sites in Virginia

Common Name [a]	Scientific Name	Flowering Season	Drilled Seeding Rate [b] (ounces/acre - weight of pure live seed (PLS) per acre	Seeds per Square Foot
New England Aster	*Symphyotrichum puniceum*	Fall	3	3
Bergamot, Wild (P)	*Monarda fistulosa*	Summer	1	3
Ironweed, New York (P)	*Vernonia novaboracensis*	Late Summer	7	3
Rough-stemmed goldenrod	*Solidago rugosa*	Late Summer	3	3
Joe Pye Weed, Spotted (P)	*Eutrochium fistulosus*	Late Summer	2	3
Pea, Partridge (A)	*Chamaecrista fasciculata*	Mid-Summer	32	3
Rosemallow (P)	*Hibiscus moscheutos*	Summer	2	3
Showy Tickseed	*Bidens aristosa*	Late Summer	11	3
Total	—	—	**61.0 ounces/ acre (3.8 lbs/acre)**	**24**

Source: Glennon, 2017; Roundstone Native Seed, 2017.

[a] Forb types include (A) for annual flowers, (B) for biennial flowers, and (P) for perennial flowers. Add New York Aster (Symphyotrichum novi-belgii) and narrow- leaf mountain mint (Pycnanthemum tenuifolium) to seed mix in coastal plain sites

[b] If the broadcast method is more feasible, increase the perennial grasses in the mixture by 50 percent.

2.2.2 Federal Lands

George Washington National Forest – Augusta, Bath, and Highland Counties

Use the same recommended seed mixtures and seeding methods as indicted in Section 2.1.3 for the MNF.

2.2.3 State Lands

James River Wildlife Management Area – Nelson County

The following seed mixtures and application rates recommendations are for the James River WWA in Nelson County, Virginia. The recommendations are based on correspondence and discussions with Virginia Department of Game and Inland Fisheries regional specialist staff (Amy Ewing, environmental services biologist/FWIS Manager, Virginia Department of Game and Inland Fisheries). These seed mixes are considered suitable for planting of the ACP pipeline. The specialist staff is supportive of the use of native vegetation mixes that stabilize the corridor while providing food and cover for a variety of wildlife.

James River Wildlife Management Area (WMA) Excessively to Moderately Well Drained – Partially Shade Sites

TABLE 2.2.3-1

Seed Mix VJRWMA01: Recommended Grass Seed Mix and Application Rates for Excessively to Moderately Well Drained – Partially Shade Sites [a]

Common Name	Scientific Name	Seed Mix Rate (lbs/acre/PLS)[b]
Autumn bentgrass	*Agrostis perennans*	0.012
Canada Wild Rye	*Elymus canadensis*	0.083
Virginia Wild Rye	*Elymus virginicus*	0.208
Creeping Red Fescue	*Festuca rubra*	0.167
Purple Top	*Tridens flavus*	0.083
Upland Bentgrass	*Agrostis perennans*	0.005
Little Bluestem	*Schizachyrium scoparium*	0.208
Broomsedge	*Andropogon virginicus*	0.033
Beaked Panicum	*Panicum anceps*	0.167
Nimblewill	*Muhlenbergia schreberii*	0.033
Total	—	**1.0**

Source: Recommendations provided by the Virginia Department of Game and Inland Forest.
a Recommended seeding application rate is 6.3 to 9.0 pounds per acre.
b lbs/acre/PLS = pounds per acre of pure live seed

James River WMA Excessively to Moderately Well Drained – Wildlife Sites

TABLE 2.2.3-2

Seed Mix VJRWMA02: Recommended Grass Seed Mix and Application Rates for Excessively to Moderately Well Drained – Wildlife Sites [a]

Common Name	Scientific Name	Seed Mix Rate (lbs/acre/PLS)[b]
Big Bluestem	*Andropogon gerardii*	0.070
Indian Grass	*Sorghastrum nutans*	0.070
Little Bluestem	*Schizachyrium scoparium*	0.141
Switchgrass (Blackwell)	*Panicum virgatum*	0.070
Canada Wild Rye	*Elymus canadensis*	0.106
Tall Dropseed	*Sporobolus compositus*	0.070
Purple Top	*Tridens flavus*	0.035
Plains Coreopsis	*Coreopsis tinctoria*	0.019
Violet lespedeza	*Lespedeza frutescen*	0.057
Blackeyed Susan	*Rudbeckia hirta*	0.033
Virginia lespedeza	*Lespedeza virginica*	0.077
Partridge Pea	*Cassia fasciculata*	0.120
Browneyed Susan	*Rudbeckia triloba*	0.025
Maximilian Sunflower	*Helianthus maximiliani*	0.060
Roundhead Lespedeza	*Lespedeza capitata*	0.033
New England Aster	*Aster novae-angliae*	0.012
Total	—	1.0

Source: Recommendations provided by the Virginia Department of Game and Inland Forest.
a Recommended seeding application rate is 6.3 to 9.0 pounds per acre.
b lbs/acre/PLS = pounds per acre of pure live seed.

James River WMA Steep Slope Stabilization Sites

TABLE 2.2.3-3

Seed Mix VJRWMA03: Recommended Grass Seed Mixes and Application Rates for Steep Slopes Stabilization – Sites

Common Name	Scientific Name	Seed Mix Rate (lbs/acre/PLS)[b]
Seed Mix [a]		
Creeping Red Fescue	*Festuca rubra*	0.050
Virginia Wild Rye	*Elymus virginicus*	0.083
Fall Panicum	*Panicum anceps*	0.083
Side Oats Grama	*Bouteloua curtipendula*	0.083
Big Bluestem	*Andropogon gerardii*	0.083
Indian Grass	*Sorghastrum nutans*	0.083
Purple Top	*Tridens flavus*	0.033
Switchgrass	*Panicum virgatum*	0.083
Little Bluestem	*Schizachyrium scoparium*	0.083
Virginia lespedeza	*Lespedeza virginica*	0.025
Lance Leaved Coreopsis	*Coreopsis lanceolata*	0.042
Blackeyed Susan	*Rudbeckia hirta*	0.008
Partridge Pea	*Cassia fasciculata*	0.058
Violet lespedeza	*(Lespedeza frutescens*	0.033
False Sunflower	*Heliopsis helianthoides*	0.042
Showy Tickseed	*Bidens aristosa*	0.042
Maximilian Sunflower	*Helianthus maximiliani*	0.042
Iron Weed	*Vernonia altissima*	0.025
Common Milkweed	*Asclepias syriaca*	0.021
Hairy Mountain Mint	*Pycnanthemum pilosum*	0.003
Gray Goldenrod	*Solidago nemoralis*	0.013
Total	—	1.0
Common Name		Seed Application Rate (lbs/acre/PLS)[b]
Seed Mix		
Buckwheat[c]		15-20
Millet		5-7
Korean lespedeza		5-7
Perennial Ryegrass		5-8
Blackwell switchgrass		3-4

Source: Recommendations provided by the Virginia Department of Game and Inland Forest.

[a] Recommended seeding application rate is 7.4 to 10.7 pounds per acre.

[b] lbs/acre/PLS = pounds per acre of pure live seed.

[c] Buckwheat is somewhat frost sensitive and deepening on the planting date, increase the application rate Korean lespedeza to compensate and decrease or remove the application of buckwheat.

2.2.4 Dinwiddie, Greensville, and Southampton Counties, and Chesapeake and Suffolk Cities (Coastal Plain Region)

The following seed mixtures, site preparation, seeding techniques, and amendments recommendations are for Dinwiddie, Greensville, Suffolk, Southampton, and Chesapeake Counties. These recommendations are based on information provided by Mr. Robert Glennon. NRCS Conservationists in these counties referred to Mr. Robert Glennon's recommendations.

Recommended Grass Seed Mixtures, Application Rates, and Planting Dates

Seeding species, cultivars, rates, and planting dates are contained in the table below. The materials identified as "common" do not require a specific cultivar for successful establishment and performance. Nurse crops must be sown at the same time as the perennial cover species to ensure that the site will have quick cover. The temporary cover specifications are intended for use when the site will not be sown to a perennial cover immediately after construction and a temporary cover is needed until the seed can be sown during the proper seeding season.

TABLE 2.2.4-1

Seed Mix VACSDGS01: Recommended Cool and Warm Season Species, Cultivars, Seeding Rates, Seeding Dates, and Temporary Cover

Species	Cultivars	Seeding Application Rate (lbs/acre)	Seeding Dates
Wild rye and lespedeza			
Canada wild rye (Elymus canadensis), and Virginia wild rye (Elymus virginicus)	—	60 pounds broadcast	September 1 – October 31; February 1 – March 31
Canada wild rye and Virginia wild rye Tall Fescue + Virginia lespedeza (Lespedeza virginica), + hairy lespedeza (Lespedeza hirta)	—	40 pounds broadcast	September 1 – October 31; February 1 – March 31
Bermudagrass and Japanese Lespedeza			
Bermudagrass	Common Cheyenne II Pasto Rico Ranchero Frio	10-12 pounds broadcast; 8-10 pounds drilled	April 1 – June 10
Japanese Lespedeza	Kobe	10-12 pounds broadcast or drilled	April 1 – June 10
Nurse Crops (Sow with the Perennial Seed Mixtures for Quick Cover)			
Oats	Common	25-30 pounds broadcast; 20-25 drilled	September 1 – November 15; February 1 – April 20
Rye	Common	35-50 broadcast; 25-40 drilled	September 1 – November 15; February 1 – April 20
Wheat	Common	40-50 broadcast; 30-40 drilled	September 1 – November 15; February 1 – April 20
Millet (Browntop, German, Italian, Foxtail, Proso)	Common	10-15 broadcast; 7-10 drilled	April 20 – August 1
Temporary Crops (Sow on Areas that will not be Seeded Immediately)			
Oats	Common	80-95 broadcast; 65-80 drilled	September 1 – November 15; February 1 – April 20
Rye	Common	120 broadcast; 100 drilled	September 1 – November 15; February 1 – April 20
Wheat	Common	120 broadcast; 100 drilled	September 1 – November 15; February 1 – April 20
Millet (Browntop, German, Italian, Foxtail, Proso	Common	20-30 broadcast; 15-20 drilled	April 20 – August 31

Note: Seeding Rates in Bulk Pounds per Acre – Non-Native Seed Must Have a minimum Germination and Purity to be Sold.

Site Preparation

The soils on the Coastal Plain of Virginia in Dinwiddie, Greensville, Suffolk, and Southampton counties typically have sandy topsoil but have a heavy clay subsoil close to the soil surface. The sandy topsoil must be kept separate during construction to prevent mixing with the subsoil, which will ensure easy till-ability and compaction and allow seeds to sow without

restriction. To ensure optimum conditions in the soil for germination and early growth for soils sown to non-native species, the species should be tested, limed, and fertilized according to the soil test recommendations.

Seeding Technique

Seed may be established by broadcasting on a firm seedbed and packing the seed, or by drilling the seed into a firm seedbed and packing the seed. Drilled seed of the perennial seed grass species, legumes, and annual millets should only be placed at a depth of ¼ inch. The nurse crops and temporary cover species oats, rye, and wheat may be broadcast but will perform best if drilled at a one-inch depth.

Mulching

To ensure that the seed will remain in place through germination and growth, seedlings must be mulched. Synthetic or processed mulch must be applied and anchored according to the manufacturer's recommendations. Straw (seed stalks of small grains – usually wheat) may be used as mulch at a rate of 75 to 100 pounds per acre (1.5 to 2.5 tons per acre). The mulch must be anchored with a sprayed on product or netting applied according to the manufacturer's recommendations. It should be noted that hay must not be used as mulch, as hay typically contains weeds that would negatively impact the restoration of the area.

Recommended Perennial Grasses and Pollinator Seed Mixtures, Species, and Application Rates for the Coastal Plain Region

The following seed mixtures are for the Coastal Plain Region of Virginia. These recommendations are based on discussions and information provided by Robert Glennon.

TABLE 2.2.4-2

Seed Mix P-VACSDGS01: Recommended Coastal Plain Physiographic Region Grass Mixture for Excessively to Moderately Well Drained Sites In Virginia

Common Name	Scientific Name	Cultivar or Germplasm	Drilled Seeding Rate [a] (weight of pure live seed (PLS) per acre)	Seeds per Square Foot
Little Bluestem	*Schizachyrium scoparium*	Piedmont (NC) or Suther Germplasm (NC)	8 ounces	3
Splitbeard Bluestem	*Andropogon ternarius*	Virginia Ecotype	8 ounces	3
Common milkweed	*Asclepias syriaca*	—	3 ounces	0.21
Total	—	—	19 ounces	6.21

Source: Glennon, 2017; Roundstone Native Seed, 2017.

[a] If the broadcast method is more feasible, increase the perennial grasses in the mixture by 50 percent.

TABLE 2.2.4-3

Seed Mix P-VACSDGS01: Recommended Coastal Plain Physiographic Region
Forb Seed Mix and Application Rates for Excessively to Moderately Well Drained Sites in Virginia

Common Name [a]	Scientific Name	Flowering Season	Drilled Seeding Rate [b] (ounces/acre - weight of pure live seed (PLS) per acre)	Seeds per Square Foot
Mountain Mint, Narrowleaf (P)	*Pycnanthemum tenuifolium*	Late Summer	1	3
Showy Tickseed	*Bidens aristosa*	Late Summer	11	3
Pea, Partridge (A)	*Chamaecrista fasciculata*	Mid-Summer	32	3
Susan, Black-eyed (B)	*Rudbeckia hirta*	Early Summer	2	3
Bergamot, Spotted (P)	*Monarda punctata*	Summer	2	3
Beardtongue, Eastern Smooth (P)	*Penstemon laevigatus*	Late Spring	7	3
Penstemon, Talus Slope (P)	*Penstemon digitalis*	Late Spring	5	3
Bergamot, Wild (P)	*Monarda fistulosa*	Summer	2	3
Total	—	—	**65.0 ounces/acre (4.4 lbs/acre)**	**24**

Source: Glennon, 2017; Roundstone Native Seed, 2017.

[a] Forb types include (A) for annual flowers, (B) for biennial flowers, and (P) for perennial flowers.

[b] If the broadcast method is more feasible, increase the perennial grasses in the mixture by 50 percent.

TABLE 2.2.4-4

Seed Mix P-VACSDGS02: Recommended Coastal Plain Physiographic Region
Grass Seed Mix and Application Rates for Somewhat Poorly to Very Poorly Drained Sites in Virginia

Common Name	Scientific Name	Cultivar or Germplasm	Drilled Seeding Rate [a] (weight of pure live seed (PLS) per acre)	Seeds per Square Foot
Panicum, Beaked	*Panicum anceps*	SC or MD Ecotype	4 ounces	3
Panicum, Redtop	*Panicum rigidulum*	NC Ecotype	3 ounces	3
Total	—	—	7 ounces	6

Source: Glennon, 2017
; Roundstone Native Seed, 2017.

[a] If the broadcast method is more feasible, increase the perennial grasses in the mixture by 50 percent.

TABLE 2.2.4-5

Seed Mix P-VACSDGS02: Recommended Coastal Plain Physiographic Region
Forb Seed Mix Seed and Application Rate Mix for Somewhat Poorly to Very Poorly Drained Sites in Virginia

Common Name [a]	Scientific Name	Flowering Season	Drilled Seeding Rate [b] (ounces/acre - weight of pure live seed (PLS) per acre)	Seeds per Square Foot
New England Aster	*Aster novae-angliae*	Fall	3	3
Sneezeweed, Common (P)	*Helenium autumnale*	Fall	2	3
Showy Tickseed	*Bidens aristosa*	Late Summer	11	3
New York Ironweed (P)	*Vernonia nova boracensis*	Late Summer	7	3
Goldenrod, Wrinkleleaf (P)	*Solidago rugosa*	Late Summer	2	3
Joe Pye Weed, Spotted (P)	*Eutrochium fistulosus*	Late Summer	2	3
Partridge Pea (A)	*Chamaecrista fasciculata*	Mid-Summer	32	3
Rosemallow (P)	*Hibiscus moscheutos*	Summer	2	3
Narrowleaf Sunflower (P)	*Helianthus angustifolius*	Late Summer	4	3
Total	—	—	**65.0 ounces/acre (4.1 lbs/acre**	**27**

Source: Glennon, 2015; Roundstone Native Seed, 2017.

[a] Forb types include (A) for annual flowers, (B) for biennial flowers, and (P) for perennial flowers.

[b] If the broadcast method is more feasible, increase the perennial grasses in the mixture by 50 percent.

2.2.5 Shrub Planting

At the request of the Virginia Department of Environmental Quality (VDEQ), woody shrub seed mixes will be added to the above recommended grasses and forb mixes in forested areas crossed by the pipeline in Virginia, to promote the development of brush/shrub species as described in Section 4.1of the Virginia ACP Stormwater Quality Compliance Methodology. The objective of introducing woody shrub species seed mixtures during restoration is to accelerate the recolonization of shrub-scrub species that is expected to occur naturally along the pipeline rights-of -way.

Based on consultations with subject matter experts and commercial seed vendors, a selection of woody vegetation seed mixtures is proposed for each of the physiographic regions crossed by the pipeline in Virginia – mountain, piedmont and coastal plain. Each palette is composed of a mixture of woody shrub species commonly found in each specific region of Virginia. The proposed woody shrub species seed mixtures are presented in the Tables 2.2.5-1 to 2.2.5-3. The exact composition of woody shrub species seed applied may vary from the recommended in the tables, based on seed availability at the time of construction. The woody shrub species proposed compositions are based on applying the mixtures at a rate of one pound of pure live seed (PLS) per acre. Applying the woody shrub species at one pound PLS per acre is equivalent to 5.5 to 12.5 percent of the herbaceous seed mixture rates, aligning closely with the VDEQ recommended application off 3 to 10 percent.

TABLE 2.2.5-1

Seed Mix VDEQ1: Recommended Mountain Physiographic Region Shrub Seed Mix and Application Rates

Common Name	Scientific Name	Wetland Indicator Status [a]	Percentage (%)	Seeding Rate (lbs/acre/PLS)
Buttonbush	*Cephalanthus occidentalis*	OBL	2	0.020
Gray dogwood	*Cornus racemosa*	FAC	10	0.100
Witchhazel	*Hamamelis virginiana*	FACU	15	0.150
Spicebush	*Lindera benzoin*	FAC	10	0.100
Black chokeberry	*Photinia melanocarpa*	FAC	10	0.100
Chokecherry	*Prunus virginiana*	FACU	10	0.100
Staghorn sumac	*Rhus typhina*	UPL	25	0.250
Arrowwood	*Viburnum dentatum*	FAC	10	0.100
Blackhaw	*Viburnum prunifolium*	FACU	8	0.080
Total	—	—	**100**	**1.0**

Source: Glennon, 2018; Ernst Conservation Seeds, 2018.

[a] FAC = facultative (occurs in wetlands and non-wetlands); FACU = facultative upland (usually occurs in non-wetlands, but may occur in wetlands); UPL = upland (almost never occur in wetlands); OBL – obligate wetland (almost always occurs in wetlands) .

TABLE 2.2.5-2

Seed Mix VDEQ2: Recommended Piedmont Physiographic Region Shrub Seed Mix and Application Rates

Common Name	Scientific Name	Wetland Indicator Status [a]	Percentage (%)	Seeding Rate (lbs/acre/PLS)
Buttonbush	*Cephalanthus occidentalis*	OBL	3	0.030
Silky dogwood	*Cornus amomum*	FACW	5	0.050
Witchhazel	*Hamamelis virginiana*	FACU	15	0.150
Spicebush	*Lindera benzoin*	FAC	10	0.100
Black chokeberry	*Photinia melanocarpa*	FAC	4	0.040
Smooth sumac	*Rhus glabra*	UPL	25	0.250
Elderberry	*Sambucus nigra*	FAC	3	0.030
Arrowwood	*Viburnum dentatum*	FAC	20	0.200
Whithe rod	*Viburnum nudum*	OBL	5	0.050
Blackhaw	*Viburnum prunifolium*	FACU	10	0.100
Total	—	—	**100**	**1.0**

Source: Glennon, 2018; Ernst Conservation Seeds, 2018.

[a] FAC = facultative (occurs in wetlands and non-wetlands); FACU = facultative upland (usually occurs in non-wetlands, but may occur in wetlands); UPL = upland (almost never occur in wetlands); OBL – obligate wetland (almost always occurs in wetlands); FACW = facultative wetland (usually occurs in wetlands, but may occur in non-wetlands).

TABLE 2.2.5-3

Seed Mix VDEQ3: Recommended Coastal Plain Physiographic Region Shrub Seed Mix and Application Rates

Common Name	Scientific Name	Wetland Indicator Status [a]	Percentage (%)	Drilled Seeding Rate (lbs/acre/PLS)
Hercules' club	*Aralia spinosa*	FAC	15	0.150
Buttonbush	*Cephalanthus occidentalis*	OBL	5	0.050
Silky dogwood	*Cornus amomum*	FACW	5	0.050
Witchhazel	*Hamamelis virginiana*	FACU	8	0.080
Spicebush	*Lindera benzoin*	FACW	10	0.100
Smooth sumac	*Rhus glabra*	UPL	25	0.250
Elderberry	*Sambucus nigra*	FACW	2	0.020
Arrowwood	*Viburnum dentatum*	FAC	15	0.150
Whithe rod	*Viburnum nudum*	FACW	5	0.050
Blackhaw	*Viburnum prunifolium*	FACU	10	0.100
Total	—	—	**100**	**1.0**

Source: Glennon, 2018; Ernst Conservation Seeds, 2018.

[a] FAC = facultative (occurs in wetlands and non-wetlands); FACU = facultative upland (usually occurs in non-wetlands, but may occur in wetlands); UPL = upland (almost never occur in wetlands); OBL – obligate wetland (almost always occurs in wetlands); FACW = facultative wetland (usually occurs in wetlands, but may occur in non-wetlands).

2.3 NORTH CAROLINA

2.3.1 Northampton County

The following recommendations of seed mixtures, rates, planting dates, and amendments are for Northampton County, North Carolina. The recommendation is from Paul Boone (NRCS District Conservationist).

Recommended Grass Seed Mixtures, Application Rates, Planting Dates, and Amendments

TABLE 2.3.1-1

Seed Mix NCNO01: Recommended Cool Season Seed Mixture

Common Species Name [a]	Seed Application Rate (lbs/acre/PLS)[b]	Planting Date
Spring (February - March) and Fall (September - November) Seeding		
Tall Fescue mixed with any of the following grains:	60	Feb - Nov
Wheat	60	Oct 25 - Nov 15
Oats and Barley	60	Sept 1 - Oct 15
Rye	60	Sept 15 - Nov 1
Korean Lespedeza	20	March - May
Sercia Lespedeza	20	Oct - May

[a] Recommendations provided by the Northampton County NRCS office District Conservationist.
[b] lbs/acre/PLS = pounds per acre of pure live seed
Note: Apply small grain mulch at 2 tons/acre or check with the NRCS office for alternatives mulches.

TABLE 2.3.1-2

Seed Mix NCNO02: Recommended Warm Season Seed Mixture

Common Species Name [a]	Seed Application Rate (lbs/acre/PLS)	Planting Date
Temporary Cover		
Brown Top Miller	30-40	May 5 – July 5
Japanese Millet	25	May 5 – July 5
Permanent Cover		
Pensacola Bahia	25	March 15 – June 15
Pensacola Bahia mixed with any of the following:	20	March - May
Annual Lespedeza	20	March - May
Kolb Lespedeza	20	March - May
Common Lespedeza	20	March - May
Korean Lespedeza	20	March - May
Bermuda Grass (Hulled)	8-10	April - July
Bermuda Grass		
Hulled Bermunda (up June)	6-10	April – July
Unhulled Bermuda	15-18	January - March

[a] Recommendations provided by the Northampton County NRCS office District Conservationist.

TABLE 2.3.1-3

Recommended Soil Amendments

Type	Application Rate
Lime	2 tons/acre
Fertilizer 10-10-10	1,000 lbs/acre

2.3.2 Halifax and Wilson Counties

The following seed mixture, planting dates, and cover crop recommendations are primarily for Wilson County, but are also applicable for Halifax County. The recommendation is from David Little (NRCS District Conservationist).

Recommended Grass Seed Mixtures, Application Rates, Planting Dates, and Cover Crops

TABLE 2.3.2-1

Seed Mix NCHW01: Recommended Cool Season Seed Mixture

Common Species Name [a]	Seed Application Rate (lbs/acre/PLS) [b]	Planting Date
Tall Fescue and White Clover	30-50	Sept 1 – Sept 30 (Coastal Plain)
Cover Crop [a]		
Buckwheat	80	Late Winter-Spring
Oats	180	Late Winter-Spring
Rye	120-180	Late Winter-Spring
Ryegrass	30-40	Late Winter-Spring
Oats and Ryegrass	90	Late Winter-Spring
Oats and Korean Lespedeza	20	Late Winter-Spring
Browntop Miller	30-40	Summer
Rye	120-180	Late Summer/Early Winter
Ryegrass	30-40	Late Summer/Early Winter
Oats (Before Oct 1)	120-180	Late Summer/Early Winter
Barley (Before Oct 15)	120-180	Late Summer/Early Winter
Wheat (After Oct 1)	120-180	Late Summer/Early Winter
Rye and Ryegrass mixture	60 Rye + 20 Ryegrass	Late Summer/Early Winter
Little barley	75-80	Late Summer/Early Winter

[a] Temporary cover vegetation is desirable to minimize erosion and pollution and permanent vegetation cannot be established due to seasons of the year, and where a temporary seeding is needed to control erosion and water pollution prior to the establishment of finished grade or perennial vegetation. The temporary measures should be coordinated with the permanent erosion control measures planned, to assure economical and effective control.

[b] lbs/acre/PLS = pounds per acre of pure live seed

2.3.3 Nash and Johnston Counties

The following species and cover crop seeding application rates, planting dates, and amendments recommendations are for Nash and Johnston counties. The seed mixture recommendations are from correspondence with Patrick Evans (NRCS District Conservationist Nash County) and Brian Loaholt (NRCS District Conservationist). Seed Mix NCNJ01 provides seeding specifications for conservation work.

Recommended Grass Seeding Species, Application Rates, Planting Dates, Cover Crops, and Amendments

TABLE 2.3.3-1

Seed Mix NCNJ01: Recommended Cool Season Grass Seed Mixture

Common Species Name [a]	Seed Application Rate (lbs/acre/PLS)[b]	Planting Date
Tall Fescue	30-40	Sept 1 – Sept 30 (Coastal Plain)
Sorghum (Cover crop) [c]	60-120	—

[a] Recommendations provided by the Nash County NRCS office District Conservationist.

[b] lbs/acre/PLS = pounds per acre of pure live seed

[c] Temporary cover vegetation is desirable to minimize erosion and pollution and permanent vegetation cannot be established due to seasons of the year, and where a temporary seeding is needed to control erosion and water pollution prior to the establishment of finished grade or perennial vegetation. The temporary measures should be coordinated with the permanent erosion control measures planned, to assure economical and effective control.

Notes: Mulch seeded area with small grain straw. Spread evenly over the area at the rate of 1-2 tons/acre. Apply mulch so that about 25 percent of the ground is visible.

TABLE 2.3.3-2

Recommended Lime and Fertilizer Application

Type	Application Rate
Lime	2 tons/acre
Fertilizer - 10-10-10	500 - 700 lbs/acre

2.3.4 Sampson County

The following recommendations for seed mixtures, rates, planting dates, and amendments are for Sampson County. The recommendations are based on correspondence with Gavin Thompson (NRCS District Conservationist) and Susan Davis (West Virginia Department of Natural Resources). Seed Mixes NCSA01 and NCSA02 are NRCS recommended cool and warm season mixtures for disturbed areas. No pollinator species specific to the County were recommended by the Conservationist.

Recommended Grass Seed Mixtures, Application Rates, and Planting Dates

TABLE 2.3.4-1

Seed Mix NCSA01: Recommended Cool Season Seed Mixture

Common Species Name [a]	Seeding Application Rate (lbs/acre/PLS)[b]	Planting Date
Tall Fescue or	40-50	Sept - March
Bermudagrass (hull attached)	15	January - March

[a] Recommendations provided by the Sampson County NRCS office District Conservationist. Used Tall Fescue to seed wet spots along the pipeline.

[b] lbs/acre/PLS = pounds per acre of pure live seed

TABLE 2.3.4-2

Seed Mix NCSA02: Recommended Warm Season Seed Mixture

Common Species Name	Seeding Application Rate (lbs/acre/PLS)	Planting Date
Bermudagrass (hull removed)	8-10	April – August

[a] Recommendations provided by the Sampson County NRCS office District Conservationist.
[b] lbs/acre/PLS = pounds per acre of pure live seed

Recommended Lime and Fertilizer Application

Where soils are relatively uniform and amendments can be incorporated, use appropriate lime and fertilize according to a soils test. In the absence of a soil test, use the recommended lime and fertilizers application rates in the table below.

TABLE 2.3.4-3

Recommended Lime and Fertilizer Application

Type	Application Rate
Lime (dolomite)	1-2 tons/acre
Fertilizer 10-10-10	500 - 800 lbs/acre [a]

Notes: Any seeding should also be mulched with small grain straw or equivalent at a rate of 1 to 2 tons per acre. When mulching, be sure to eave approximately 25 percent of the ground exposed to allow light to penetrate. Mulch should be anchored to prevent loss.

Planting Recommendations

Where conventional equipment is used for planting, seed shall be applied uniformly with cultipacker-seeders, drills, seeders or other mechanical seeders. Any equipment that will apply seed uniformly is acceptable. Seeding may be done by hand where it is not practical or feasible to use equipment.

Mulching Recommendations

- Mulching is essential on all sites, especially steep, erosive sites where plant establishment may be expected to be difficult.
- Use of dry, unchopped, and unweathered small grain straw or hay-free-seeds (from completing plant species). Spread at the rate of 1-2 tons per acre depending upon the site and season.
- Apply mulch uniformly so that about 25 percent of the ground surface is visible.
- Anchor mulch immediately after placement to minimize loss by water and/or wind.

2.3.5 Cumberland County

The following recommended seed mixture, rates, planting dates, cover crop, and amendments are for Cumberland County. The recommendations are from correspondence with Renessa Brown (NRCS District Conservationist). No pollinator species recommendations specific to the County were provided.

Recommended Seed Mixtures, Application Rates, and Planting Dates

TABLE 2.3.5-1

Seed Mix NCCU01: Recommended Cool and Warm Season Seed Mixture

Common Species Name [a]	Seeding Application Rate (lbs/acre/PLS)[b]	Planting Date
Common or Hybrid Bernudagrass (hull removed or scarified)	5-7 (drill) 6-8 (broadcast)	April 1 – May 15 (best); April 1 – June 7 (possible)
Cover Crop [c]		
Buckwheat	80	Late Winter-Spring
Oats	180	Late Winter-Spring
Rye	120-180	Late Winter-Spring
Ryegrass	30-40	Late Winter-Spring
Oats and Ryegrass	20 and 90	Late Winter-Spring
Oats and Korean Lespedeza	20 and 90	Late Winter-Spring
Browntop Miller	30-40	Summer
Rye	120-180	Late Summer/Early Winter
Ryegrass	30-40	Late Summer/Early Winter
Oats (Before Oct 1)	180	Late Summer/Early Winter
Barley (Before Oct 15)	120-180	Late Summer/Early Winter
Wheat (After Oct 1)	120-180	Late Summer/Early Winter
Rye and Ryegrass mixture	60 Rye + 20 Ryegrass	Late Summer/Early Winter
Little barley	75-80	Late Summer/Early Winter

[a] Recommendations provided by the Cumberland County NRCS office District Conservationist.

[b] lbs/acre/PLS = pounds per acre of pure live seed

[c] Select from the following table a quick growing grass with high seedling vigor that is suited to the area, When temporary vegetation is desirable to minimize erosion and pollution and permanent vegetation cannot be established due to seasons of the year, and where a temporary seeding is needed to control erosion and water pollution prior to the establishment of finished grade or perennial vegetation. The temporary measures should be coordinated with the permanent erosion control measures planned, to assure economical and effective control.

TABLE 2.3.5-2

Recommended Lime and Fertilizer Application

Planting	Fertilizer Analysis	Fertilizer Rate (lbs/acre)	Lime Rate (lbs/acre)
Perennial Grasses with or without Legumes, Fertilizer no incorporated	10-10-10	10 lbs / 1,000 sq. ft.	46 lbs / 1,000 sq. ft.
Temporary Cover, Fertilizer not incorporated	10-10-10	12 – 16 lbs / 1,000 sq. ft.	92 lbs / 1,000 sq. ft.

TABLE 2.3.5-3

Recommended Mulch Material Rates and Uses

Material	Minimum Rates Per Acre	Coverage	Remarks
Dry unchopped, unweathered small grain straw or hay-free-seeds (of competing plants)	1 – 2 tons/acre	75% (25% of ground is visible)	Evenly spread mulch over the area by hand or blower-type spreading equipment
burlap and pine boughs	—	100%	Secure in place if flowing water is involved
Jute matting	—	100%	May be used in the place of mulch or sod; has the strength to withstand water flow. It is an accepted practice to sow half the seed before placing the matting. Sow the remaining half after the matting is laid.
Barnyard manure and bedding	—	75% (25% of ground is visible)	Do not apply within 50 feet of surface waters
Wood fiber (excelsior)	—	—	Available as mulch material to be blown on after seeding or as a matting to be stapled on steep slopes, waterways, etc.

Source: WVDEP, 2012

Planting Recommendations

Mulching should be specified to reduce damage from water run-off and improve moisture conditions for seedlings. Temporary vegetation can be satisfactorily established without the use of mulch.

2.3.6 Robeson County

The following seed mixture, rates, and planting date recommendations are for Robeson County. The recommendation comes from Jeremy Ruston (NRCS District Conservationist).

Recommended Grass Seed Mixtures

TABLE 2.3.6-1

Seed Mix NCRO01: Recommended Warm Season Seed Mixture

Common Species Name [a]	Seeding Rate (lbs/acre/PLS)[b]	Planting Date
Switchgrass (Carthage or Cave-In-Rock cultivars)	1	April 1 – May 15
Little Bluestem	1.5	April 1 – May 15
Indian Grass	1	April 1 – May 15

[a] Recommendations provided by the Roberson County NRCS office District Conservationist.
[b] lbs/acre/PLS = pounds per acre of pure live seed

Recommended Pollinator Seed Mixtures

TABLE 2.3.6-2

Seed Mix P-NCRO01: Recommended Pollinator Seed Mixture

Common Name	Scientific Name	Bloom Period	Sun	Soil	Seeding Application Seed Rate (lbs/acre/PLS)[a]
Lanceleaf coreopsis	*Coreopsis lanceolata*	April – June	Full – Shade	Dry – Moist	0.3
Wrinkleleaf goldenrod	*Solidago rugosa*	Late Summer	Full to Partial shade	Moist	
Purple coneflower	*Echinacea purpurea*	April – September	Full to Partial shade	Dry	

Source: Recommendations provided by the Roberson County NRCS office District Conservationist.
[a] lbs/acre/PLS = pounds per acre of pure live seed

Recommended Native Grass and Pollinator Seed Mixtures, Application Rates, and Non-Native Cover Crop by Physiographical Region (Coastal Plain)

The following seed mixtures are for the Coastal Plan Region. These recommendations are from discussions with Roundstone Native Seed and Robert Glennon.

Recommended Seed Mixtures by Geographical Region (Coastal Plain) and Drainage Class

TABLE 2.3.7-1

Seed Mix P-CPDW01: Recommended Coastal Plain Physiographic Region
Grass Seed Mix and Application Rates for Excessively to Moderately Well Drained Sites in North Carolina [a]

Common Name	Scientific Name	Height (Inches)	Sun Exposure	Seed Mix Rate (lbs/acre/PLS)[b]
Little Bluestem	*Schizachyrium scoparium*	2- 4	Full Sun	0.250
Virginia Wild Rye	*Elymus virginicus*	2 - 4	Full Sun	0.250
Tall Dropseed	*Sporobolus compositus*	2 - 3	Full Sun	0.050
Purple Top	*Tridens flavus*	3 - 5	Part Shade	0.058
Indian Grass	*Sorghastrum nutans*	3 - 6	Full Sun	0.167
Switchgrass	*Panicum virgatum*	3 - 7	Full Sun	0.183
Fall Panicum	*Panicum anceps*	2 - 4	Part Shade	0.042
Total	—	—	—	**1.0**

Sources: Roundstone Native Seed, 2017; Glennon, 2017.
[a] Recommended seeding application rate is 8 to 18 pounds per acre.
[b] lbs/acre/PLS = pounds per acre of pure live seed

TABLE 2.3.7-2

Seed Mix P-CPDW01: Recommended Coastal Plain Physiographic Region
Forb Seed Mix and Application Rates for Excessively to Moderately Well Drained Sites in North Carolina

Common Name	Scientific Name	Color	Bloom Period	Seed Application Rate (lbs/acre/PLS)[b]
Lance Leaved Coreopsis	*Coreopsis lanceolata*	Yellow	Spring, Summer	0.266
Spotted Beebalm	*Monarda punctata*	Pink	Spring, Summer	0.124
Common Milkweed	*Asclepias syriaca*	Pink	Spring, Summer	0.107
Smooth Beardtongue	*Penstemon digitalis*	White	Spring	0.107
Bergamot	*Monarda fistulosa*	Lavender	Summer	0.124
Partridge Pea	*Cassia fasciculata*	Yellow	Summer	0.621
Spiked Blazing Star	*Liatris spicata*	Pink	Summer	0.222
Lupine	*Lupinus perennis*	Blue	Summer	0.497
Early Goldenrod	*Solidago juncea*	Yellow	Summer	0.160
Starry Silphium	*Silphium asteriscus*	Yellow	Summer, Fall	0.178
Iron Weed	*Vernonia altissima*	Purple	Summer, Fall	0.222
Sneezeweed	*Helenium autumnale*	Yellow	Summer, Fall	0.124
Hairy Mountain Mint	*Pycnanthemum pilosum*	White	Summer, Fall	0.089
Total	—	—	—	**2.84**

Sources: Roundstone Native Seed, 2017; Glennon, 2017.
[a] lbs/acre/PLS = pounds per acre of pure live seed

TABLE 2.3.7-3

Seed Mix P-CPDW02: Recommended Coastal Plain Physiographic Region
Grass Seed Mix and Application Rates for Somewhat Poorly to Very Poorly Drained Sites in North Carolina [a]

Common Name	Scientific Name	Height (Inches)	Sun Exposure	Seed Mix Rate (lbs/acre/PLS)[b]
Switchgrass	*Panicum virgatum*	3 - 7	Full Sun	0.233
Red Top Panicum	*Panicum rigidulum*	2 - 4	Full Sun	0.017
Fowl Manna Grass	*Glyceria striata*	3 - 5	Part Shade	0.008
Virginia Wild Rye	*Elymus virginicus*	2 - 4	Full Sun	0.217
Deer Tongue Grass	*Panicum clandestinum*	2 - 4	Full Sun	0.058
Big Bluestem	*Andropogon gerardii*	4 - 10	Full Sun	0.167
Frank's Sedge	*Carex frankii*	1 - 2	Part Shade	0.042
Fox Sedge	*Carex vulpinoidea*	2 - 3	Part Shade	0.025
Fall Panicum	*Panicum anceps*	2 - 4	Part Shade	0.067
Total	—	—	—	**0.83**

Sources: Roundstone Native Seed, 2017; Glennon, 2017.
[a] Recommended seeding application rate is 8 to 18 pounds per acre.
[b] lbs/acre/PLS = pounds per acre of pure live seed

TABLE 2.3.7-4

Seed Mix P-CPDW02: Recommended Coastal Plain Physiographic Region
Forb Seed Mix and Application Rates for Somewhat Poorly to Very Poorly Drained Sites in North Carolina

Common Name	Scientific Name	Color	Bloom Period	Seed Application Rate (lbs/acre/PLS)[a]
Smooth Beardtongue	*Penstemon digitalis*	White	Spring	0.169
Butterfly Milkweed	*Asclepias tuberosa*	Orange	Spring, Summer	0.056
Ohio Spiderwort	*Tradescantia ohiensis*	Blue	Spring, Summer	0.084
Blackeyed Susan	*Rudbeckia hirta*	Yellow	Spring, Summer	0.180
Spiked Blazing Star	*Liatris spicata*	Pink	Summer	0.264
Hoary Mountain Mint	*Pycnanthemum incanum*	White	Summer	0.034
Early Goldenrod	*Solidago juncea*	Yellow	Summer	0.113
Bergamot	*Monarda fistulosa*	Lavender	Summer	0.169
Showy Tickseed	*Bidens aristosa*	Yellow	Summer, Fall	0.366
Starry Silphium	*Silphium asteriscus*	Yellow	Summer, Fall	0.113
Narrow-Leaved Sunflower	*Helianthus angustifolius*	Yellow	Summer, Fall	0.113
Joe-Pye Weed	*Eupatorium fistulosum*	Pink	Summer, Fall	0.141
Total	—	—	—	**1.80**

Sources: Roundstone Native Seed, 2017; Glennon, 2017.
[a] lbs/acre/PLS = pounds per acre of pure live seed

Recommended Non-native Temporary Cover Crop Species and Non-native Grass Cover

Use of non-native temporary cover species (P-NNTC) on all plantings where erosion potential is high or where the site must be vegetated within 30 days is recommended. Furthermore, use the non-native grass mixes (P-NNGC) with the forb mixes where slope is steep for native species to germinate and where erosion potential is high.

TABLE 2.3.7-5

Seed Mix P-NNTC: Recommended Non-native Temporary Cover Crop Species

Common Name	Scientific Name	Height (Inches)	Sun Exposure	Seeding Application Rate (lbs/acre/PLS)[a]
For Summer Use in Native Mixes				
Brown Top Millet	*Panicum ramosum*	3 - 3.5	Full sun	5.0
For Spring and Fall Use in Native Mixes				
Spring Oats	*Avena sativa*	2 – 2.5	Full sun	30.0
For Fall and Winter Use in Native Mixes				
Annual Rye Grass	*Lolium multiflorum*	2 – 2.5	Part shade	6.0
Total	—	—	—	41.0

Source: Roundstone Native Seed, 2015.
[a] lbs/acre/PLS = pounds per acre of pure live seed

TABLE 2.3.7-6

Seed Mix P-NNGC: Recommended Non-native Grass Cover Mix [a]

Common Name	Scientific Name	Height (Inches)	Sun Exposure	Seed Mix Rate (lbs/acre/PLS)[b]
Fescue	*Festuca arundinacea*	2 - 3	Part Shade	0.300
Timothy	*Phleum pratense*	2 - 4	Part Shade	0.100
Orchard Grass	*Dactylis glomerata*	2 - 3	Part Shade	0.100
Red Top	*Agrostis alba*	2 - 3	Full Sun	0.020
Ladino Clover	*Trifolium repens*	1 - 1.5	Part Shade	0.040
Annual Rye Grass	*Lolium multiflorum*	2 - 2.5	Part Shade	0.170
Creeping Red Fescue	*Festuca rubra*	1 - 2	Full Sun	0.250
Kentucky Bluegrass	*Poa pratensis*	1-2	Full Sun	0.020
Total	—	—	—	**1.0**

Source: Roundstone Native Seed, 2015.
[a] Recommended seeding application rate is 30 to 50 pounds per acre.
[b] lbs/acre/PLS = pounds per acre of pure live seed

3.0 SUPPLY HEADER PROJECT

3.1 WEST VIRGINIA

3.1.1 Wetzel and Tyler Counties

The following recommended seed mixtures, rates, and amendments are primarily for Tyler County but also include a portion of Wetzel County, West Virginia. The recommendation is from correspondence with Dustin Adkins (NRCS District Conservationist). The recommendation is for the area starting at Mile 23 (estimated portion in Tyler County) through Mockingbird Hill (Wetzel County). No pollinator species specific to the County were recommended by the Conservationist.

Recommended Seed Mixtures, Application Rates, Planting Dates, and Amendments

TABLE 3.1.1-1

Seed Mix WVWE01: Recommended Cool Season Seed Mixture

Seed Mixture	Common Species Name	Seed Rate (lbs/acre/PLS)[a]
1	Orchard Grass	8
	Ladino Clover	2
2	White Clover	2
	Orchardgrass	5
	Kentucky Bluegrass	5
3	Red Clover	4
	Alsike Clover	2
	Orchardgrass	4

[a] lbs/acre/PLS = pounds per acre of pure live seed

TABLE 3.1.1-2

Recommended Seeding Dates for Permanent Cover

Planting Dates	Suitability
March 1 to April 15	Best seeding periods.
August 1 to October 1	
December 1 to March 1	Good seeding period. Dormant seeding.
April 15 to August 1	**HIGH RISK** – moisture stress likely.
October 1 to December 1	**HIGH RISK** – freeze damage to young seedlings.

Source: WVDEP, 2012

TABLE 3.1.1-3

Recommended Lime and Fertilizer Application for Permanent Seeding

pH of Soil	Lime (tons/ acre)	Fertilizer (10-20-20 or equivalent) (lbs/acre)
> 6.0	2	500
5.0 to 6.0	3	
< 5.0	4	

Recommended Lime and Fertilizer Application

Lime should be applied to all permanent seedlings. Once pH is known, use the information in the above Table to determine the amount (tons) of lime to use onsite. For the best results, apply the lime and fertilizer at the time of the seedbed preparation. The recommended lime and fertilizer application for temporary seeding in the absence of a soil test is provided in the below table.

TABLE 3.1.1-4

Recommended Lime and Fertilizer Application for Temporary Seeding (Absent of a Soil Test)

Species	Nitrogen (N) (lbs/acre)	Phosphorus (P_2O_5) (lbs/acre)	Potassium (K_2O) (lbs/acre)	Recommendations (per acre)
Cool Season Grass	40	80	80	400 lbs 10-20-20
Cool Season Grass & Legume	30	60	60	300 lbs 10-20-20
Temporary Cover	40	40	40	200 lbs 19-19-19

Source: WVDEP, 2012

3.1.2 State Lands

Lewis Wetzel Wildlife Management Area – Wetzel County

The following seed mixtures, application rates, and soil amendments recommendations are for the Lewis Wetzel WMA in Wetzel County, West Virginia. The recommendations are based on correspondence and discussions with the West Virginia Department of Natural Resources (Steve Rauch, District Wildlife Biologist), which recommended the use of the seed mixtures and soil amendments discussed in the West Virginia Enhancing Wildlife Habitat on Oil and Gas Infrastructure booklet (West Virginia Department of Natural Resources, 2015).

Recommended Seed Mixtures and Application Rates

The following planting recommendations are intended to enhance early successional stage habitat found along access roads and pipelines.

TABLE 3.1.2-1

Seed Mix WVLWWMA01: Recommended Grass Seed Mixes and Application Rates

Common Species Name	Scientific Name	Seeding Application Rate (lbs/acre/PLS)[a]
Perennial, Cool Season Seed Mix [b]		
Ladino White Clover [c]	*Trifolium repens*	4
Mammoth Red Clover [c]	*Trifolium pratense*	5
Forage Clover	*Cichorium intybus*	2
Winter Wheat [d]	*Triticum aestivum*	50
Perennial, Cool Season, Slopes Seed Mix [e]		
Ladino White Clover [c]	*Trifolium repens*	8
Red Clover [c]	*Trifolium pratense*	5
Birdsfoot Trefoil [c]	*Lotus corniculatus*	8
Orchardgrass	*Dactylis glomerata*	15
Winter Wheat [d]	*Triticum aestivum*	50

Source: WVDNR, 2015

[a] lbs/acre/PLS = pounds per acre of pure live seed

[b] Ideal for use in areas where the landscape is generally flat and where the objective is to have vegetative cover for pollinator species and wildlife habitat for turkey/grouse broods, and forage for deer

[b] Herbaceous legumes must be treated with the appropriate inoculant before seeding.

[d] Autumn planting: September 1 through October 15 or substitute annual rye. Spring planting: substitute oats at the same rate between February 15 and March 15, and retain the other species as listed.

[e] Ideal for sloped areas, as grasses are typically added to cool season mixes to provide habitat and erosion control measures.

Recommended Lime and Fertilizer Application

Application of soil amendments should be based on soil test recommendations. In the absence of a soil test, fertilizer and lime should be applied at the rates shown in Table 3.1.2-2.

TABLE 3.1.2-2

Recommended Lime and Fertilizer Application

Type	Application Rate
Lime	3 tons/acre
Fertilizer - 10-20-20	600 lbs/acre

Source: WVDNR, 2015

3.1.3 Doddridge and Harrison Counties

The following recommended seed mixtures, planting dates, and amendments are for Doddridge and Harrison counties. These recommendations are based on the collection of correspondences with federal and state agencies, including Greg Stone (NRCS Acting State Resource Conservationist), Jeff Griffith (NRCS District Conservationist). No pollinator species specific to the County were recommended by the Conservationists.

Recommended Seed Mixtures and Application Rates

TABLE 3.1.3-1

Seed Mix WVDH01: Recommended Cool Season Seed Mixtures

Seed Mixture	Common Species Name [a]	Seed Application Rate (lbs/acre/PLS)[b]	Suitable Land Use
1	Orchardgrass	10	Pasture or Hay
	Ladino Clover	2	
	Red Clover	3	
	Redtop	3	
2	**Kentucky Bluegrass**	20	Pasture
	Ladino Clover	2	
	Red Clover	3	
	Redtop	3	Pasture or Hay
3	Orchardgrass	20	
	Redtop	5	
	Birdsfoot Trefoil	10	

[a] Species in bold are more wildlife-friendly; species in italics are suitable for use in filter strips.

[b] lbs/acre/PLS = pounds per acre of pure live seed

Recommended Seeding Dates for Permanent Cover and Amendments

TABLE 3.1.3-2

Recommended Seeding Dates for Permanent Cover

Planting Dates	Suitability
March 1 to April 15	Best seeding periods.
August 1 to October 1	
December 1 to March 1	Good seeding period. Dormant seeding.
April 15 to August 1	**HIGH RISK** – moisture stress likely.
October 1 to December 1	**HIGH RISK** – freeze damage to young seedlings.

TABLE 3.1.3-3

Recommended Lime and Fertilizer Application

Type	Application Rate
Lime	3 tons/acre
Fertilizer - 10-20-20	400 lbs/acre

Planting Recommendations

- Certified seed is preferred.
- All legumes should be planted with proper inoculants prior to seeding.
- Soil fertility and pH level will be amended to satisfy the needs of the plant species planned.
- For unprepared seedbeds or seeding outside the optimum timeframes:

- Add 50 percent more seed to the specified rate, particularly during the periods of April 15 – August 1, and October 1 – March 1.
- Double the seeding rate and consider planning an annual small grain like wheat (2 bushels [120 pounds] per acre) to act as a nurse crop.

3.1.4 Recommended Native Grasses and Pollinators Seed Mixtures, Application Rates, and Non-Native Cover Crop by Physiographical Region

Use the same recommended pollinator seed mixtures, non-native temporary cover, and non-native grass cover as indicted in Section 2.1.5 for the ACP in West Virginia.

3.2 PENNSYLVANIA

3.2.1 Westmoreland County

Seed mixtures, rates, and amendments were selected based on appropriate site conditions and recommendations from Christopher Droste (Conservation District) and adapted from the Pennsylvania Department of Environmental Protection Erosion and Sediment Pollution Control Program Manual. No pollinator species specific to the County were recommended by the Conservationist.

Recommended Seed Mixtures and Application Rates

TABLE 3.2.1-1

Seed Mix PAWE01: Recommended Cool Season Seed Mixture

	Seeding Application Rate (lbs/acre/PLS)[b]	
Common Species Name	Most Sites	Adverse Sites
Birdsfoot trefoil [a], plus	6	10
Tall fescue	30	35

[a] For Birdsfoot trefoil use empire variety. For slopes > 33 percent (3H:1V), add perennial rye at 20 lbs/acre. For planting outside March 1 - October 15, use winter oats at 90 lbs/acre and winter rye at 56 lbs/acre.

[b] lbs/acre/PLS = pounds per acre of pure live seed

Recommended Soil Amendments

TABLE 3.2.1-2

Soil Amendment Application Rate Equivalents [a]

Soil Amendment	Per Acre	Per 1,000 Square feet (lbs)	Per 1,000 square Yard (lbs)	Notes
Agricultural lime	7.5 tons	300	3100	Or as per soil test; may not be required in agricultural fields
20-20-20 fertilizer	1,000 lbs	25	210	Or as per soil test; may not be required in agricultural fields

[a] For agricultural or private lands, contractor will use rates above unless otherwise specified by landowner.

TABLE 3.2.1-3

Recommended Mulch Type and Rates

Mulch Type	Per Acre (tons)	Per 1000 Square Feet (lbs)	Per 1000 Square Yard (lbs)	Notes
Straw	3	140	1240	Either wheat or oat straw, free of weeds, not chopped or finely broken
Hay	3	140	1240	Timothy, mixed clover and timothy or other native forage grasses
Wood Chips	4-6	185-275	1650-2500	May prevent germination of grasses and legumes
Hydromulch	1	47	415	See limitations below

Shredded paper hydromulch should not be used in slopes steeper than 5 percent. Wood fiber hydromulch may be applied on steeper slopes provided a tackifier is used. The application rate for any hydromulch should be 2,000 pounds per acre at a minimum.

4.0 REFERENCES

Ernst Conservation Seeds. 2018. Ernst Conservation Seeds Catalog 2016 – 2017. Meadville, Pennsylvania.

Glennon, Robert. 2015. Personal communication with Herbert Pirela of Environmental Resources Management, Inc. Private Lands Biologist.

Glennon, Robert. 2016. Personal communication with Herbert Pirela of Environmental Resources Management, Inc. Private Lands Biologist.

Glennon, Robert. 2017. Personal communication with Herbert Pirela of Environmental Resources Management, Inc. Private Lands Biologist.

Glennon, Robert. 2018. Personal communication with Herbert Pirela of Environmental Resources Management, Inc. Private Lands Biologist.

Jones, J., Glennon, B., Lawrence, C., Faulkner, D., and C. Gordon. 2014. USDA-NRCS Virginia Plant Establishment Guide. Revised 2014.

Natural Resource Conservation Service. 2011. National Conservation Practice Standard - Critical Area Planting, Code 342.

Natural Resource Conservation Service. 2014. Conservation Practice Standard - Mulching, Code 484. Technical Guide Section IV: 484-VA-1.

Roundstone Native Seed. 2015. Jeremy Hamlington, personal communication with Herbert Pirela of Environmental Resources Management, Inc. Horticulturist.

Roundstone Native Seed. 2017. Jeremy Hamlington, personal communication with Herbert Pirela of Environmental Resources Management, Inc. Horticulturist.

U.S. Forest Service (USFS). 2016. Suggested Seed Mixes for Pipeline Rights-of-Way and Associated Disturbances on the Monongahela and George Washington-Jefferson National Forests.

West Virginia Department of Environmental Protection. 2012. West Virginia Erosion and Sediment Control Field Manual. Available online at: http://www.dep.wv.gov/oil-and-gas/Documents/Erosion%20Manual%2004.pdf. Accessed October 2015.

West Virginia Department of Natural Resources. 2015. Enhancing Wildlife Habitat on Oil and Gas Infrastructure. Available online at: http://www.wvdnr.gov/Publications/OilGasAndWildlife.pdf

Attachment A
Summary of Seed Mixes by County for the Atlantic Coast Pipeline and Supply Header Project

ATTACHMENT A

Summary of Seed Mixtures by County for the Atlantic Coast Pipeline and Supply Header Project

Approximate Milepost Range	County and State	Suggested Cool Season Seed Mix Number [a]	Suggested Warm Season Seed Mix Number [a]	Suggested Pollinator Seed Mix Number [a]	Federal, State/Commonwealth, or local Agency/ Subject Matter Expert Contact Information
Atlantic Coast Pipeline					
Spread 1 (AP-1)					
0.0–29.1	Harrison, WV	WVHLRU01	P-MUDW01 or P-MUMP02; P-NNTC or P-NNGC	P-MUDW01 or P-MUMP02; P-NNTC or P-NNGC	District Conservationist - Jeff Griffith (304) 624-9232 ext. 11; jeff.griffith@wv.usda.gov. Private Lands Biologist - Bob Glennon (757) 357-7004, ext. 126; Robert.Glennon@va.usda.gov. Roundstone Native Seed (270) 234-7160.
	Lewis, WV	WVHLRU01	P-MUDW01 or P-MUMP02; P-NNTC or P-NNGC	P-MUDW01 or P-MUMP02; P-NNTC or P-NNGC	District Conservationist - Jeff Griffith (304) 624-9232 ext. 110; jeff.griffith@wv.usda.gov. Private Lands Biologist - Bob Glennon (757) 357-7004, ext. 126; Robert.Glennon@va.usda.gov. Roundstone Native Seed (270) 234-7160.
	Upshur, WV	WVHLRU01	P-MUDW01 or P-MUMP02; P-NNTC or P-NNGC	P-MUDW01 or P-MUMP02; P-NNTC or P-NNGC	Acting State Conservationist - Greg Stone (304) 284-7579; greg.stone@wv.usda.gov. Robert.Glennon@va.usda.gov. Roundstone Native Seed (270) 234-7160.
Spread 2 (AP-1)					
29.1–50.6	Upshur, WV	WVHLRU01	P-MUDW01 or P-MUMP02; P-NNTC or P-NNGC	P-MUDW01 or P-MUMP02; P-NNTC or P-NNGC	Acting State Conservationist - Greg Stone (304) 284-7579; greg.stone@wv.usda.gov,Robert.Glennon@va.usda.gov. Roundstone Native Seed (270) 234-7160.
	Randolph, WV	WVHLRU01	P-MUDW01 or P-MUMP02; P-NNTC or P-NNGC	P-MUDW01 or P-MUMP02; P-NNTC or P-NNGC	District (1) Wildlife Biologist - Steve Rauch (304) 825-6787; Steven.E.Rauch@wv.gov.
Spread 2 A (AP-1)					
50.6-65.3	Randolph, WV	WVHLRU01	P-MUDW01 or P-MUMP02; P-NNTC or P-NNGC	P-MUDW01 or P-MUMP02; P-NNTC or P-NNGC	District (1) Wildlife Biologist - Steve Rauch (304) 825-6787; Steven.E.Rauch@wv.gov
Spread 3 (AP-1)					
65.3-79.2	Randolph, WV	WVHLRU01	P-MUDW01 or P-MUMP02; P-NNTC or P-NNGC	P-MUDW01 or P-MUMP02; P-NNTC or P-NNGC	District (1) Wildlife Biologist - Steve Rauch (304) 825-6787; Steven.E.Rauch@wv.gov
	Pocahontas, WV	WVPO01	WVPO01; P-MUDW01 or MUMP02; P-NNTC or P-NNGC	P-MUDW01 or MUMP02; P-NNTC or P-NNGC	District Conservationist - Iden Gunther (304) 255-9225; idun.guenther@wv.usda.gov. Robert.Glennon@va.usda.gov. Roundstone Native Seed (270) 234-7160.
Spread 3A (AP-1) 79.2-91.3					
	Pocahontas, WV	WVPO01	WVPO01; P-MUDW01 or MUMP02; P-NNTC or P-NNGC	P-MUDW01 or MUMP02; P-NNTC or P-NNGC	District Conservationist - Iden Gunther (304) 255-9225; idun.guenther@wv.usda.gov. Robert.Glennon@va.usda.gov. Roundstone Native Seed (270) 234-7160.

ATTACHMENT A

Summary of Seed Mixtures by County for the Atlantic Coast Pipeline and Supply Header Project

Approximate Milepost Range	County and State	Suggested Cool Season Seed Mix Number [a]	Suggested Warm Season Seed Mix Number [a]	Suggested Pollinator Seed Mix Number [a]	Federal, State/Commonwealth, or local Agency/ Subject Matter Expert Contact Information
	Highland, VA	VABCHNP01	VABCHNP02	P-VABCHNP01 or P-VABCHNP02	District Conservationist - Charles Ivins (540) 248-6218 ext. 122; charles.ivins@va.usda.gov, Private Lands Biologist - Bob Glennon (757) 357-7004, ext. 126; Robert.Glennon@va.usda.gov.
Spread 4 (AP-1)					
91.3–125.9	Highland, VA	VABCHNP01	VABCHNP02	P-VABCHNP01 or P-VABCHNP02	District Conservationist - Charles Ivins (540) 248-6218 ext. 122; charles.ivins@va.usda.gov. Private Lands Biologist - Bob Glennon (757) 357-7004, ext. 126; Robert.Glennon@va.usda.gov.
	Bath, VA	VABCHNP01	VABCHNP02	P-VABCHNP01 or P-VABCHNP02	District Conservationist – Charles Simmons; charles.simmons@va.usda.gov, Private Lands Biologist - Bob Glennon (757) 357-7004, ext. 126; Robert.Glennon@va.usda.gov.
	Augusta, VA	VABCHNP01	VABCHNP02	P-VABCHNP01 or P-VABCHNP02	District Conservationist - Charles Ivins (540) 248-6218 ext. 122; charles.ivins@va.usda.gov. Private Lands Biologist - Bob Glennon (757) 357-7004, ext. 126; Robert.Glennon@va.usda.gov
Spread 5 (AP-1)					
125.9–183.3	Augusta, VA	VABCHNP01	VABCHNP02	P-VABCHNP01 or P-VABCHNP02	District Conservationist - Charles Ivins (540) 248-6218 ext. 122; charles.ivins@va.usda.gov. Private Lands Biologist - Bob Glennon (757) 357-7004, ext. 126; Robert.Glennon@va.usda.gov
	Nelson, VA	VABCHNP01	VABCHNP02	P-VABCHNP01 or P-VABCHNP02	State Biologist - Jeffray Jones (804) 287-1691; Jeffray.Jones@va.usda.gov. Private Lands Biologist - Bob Glennon (757) 357-7004, ext. 126; Robert.Glennon@va.usda.gov
Spread 6 (AP-1)					
183.3–239.6	Nelson, VA	VABCHNP01	VABCHNP02	P-VABCHNP01 or P-VABCHNP02	State Biologist - Jeffray Jones (804) 287-1691; Jeffray.Jones@va.usda.gov. Private Lands Biologist - Bob Glennon (757) 357-7004, ext. 126; Robert.Glennon@va.usda.gov
	Nelson, VA; James River WWA	VJRWMA01; VJRWMA02; or VJRWMA03	VJRWMA01; VJRWMA02; or VJRWMA03		Environmental Services Biologists – Amy Ewing (804) 367-2211; Amy.Ewing@dgif.virginia.gov
	Buckingham, VA	VABCHNP01	VABCHNP02	P-VABCHNP01 or P-VABCHNP02	District Conservationist - David Harris (434) 983-4757 x 101; david.harris@va.usda.gov. Private Lands Biologist - Bob Glennon (757) 357-7004, ext. 126; Robert.Glennon@va.usda.gov
	Cumberland. VA	VABCHNP01	VABCHNP02	P-VABCHNP01 or P-VABCHNP02	District Conservationist - David Harris (434) 983-4757 x 101; david.harris@va.usda.gov. Private Lands Biologist - Bob Glennon (757) 357-7004, ext. 126; Robert.Glennon@va.usda.gov
	Prince Edward, VA	VABCHNP01	VABCHNP02	P-VABCHNP01 or P-VABCHNP02	District Conservationist - J.B. Daniel (434) 392-4171; j.b.daniel@va.usda.gov. Private Lands Biologist - Bob Glennon (757) 357-7004, ext. 126; Robert.Glennon@va.usda.gov
	Nottoway, VA	VABCHNP01	VABCHNP02	P-VABCHNP01 or P-VABCHNP02	Private Lands Biologist - Bob Glennon (757) 357-7004, ext. 126; Robert.Glennon@va.usda.gov

ATTACHMENT A

Summary of Seed Mixtures by County for the Atlantic Coast Pipeline and Supply Header Project

Approximate Milepost Range	County and State	Suggested Cool Season Seed Mix Number [a]	Suggested Warm Season Seed Mix Number [a]	Suggested Pollinator Seed Mix Number [a]	Federal, State/Commonwealth, or local Agency/ Subject Matter Expert Contact Information
Spread 7 (AP-1)					
239.6–300.1	Nottoway, VA	VABCHNP01	VABCHNP02	P-VABCHNP01 or P-VABCHNP02	Private Lands Biologist - Bob Glennon (757) 357-7004, ext. 126; Robert.Glennon@va.usda.gov
	Dinwiddie, VA	VACSDGS01	VACSDGS01	P-VACSDGS01 or P-VACSDGS02	Private Lands Biologist - Bob Glennon (757) 357-7004, ext. 126; Robert.Glennon@va.usda.gov
	Brunswick, VA	VABCHNP01	VABCHNP02	P-VABCHNP01 or P-VABCHNP02	Private Lands Biologist - Bob Glennon (757) 357-7004, ext. 126; Robert.Glennon@va.usda.gov
	Greensville, VA	VACSDGS01	VACSDGS01	P-VACSDGS01 or P-VACSDGS02	Private Lands Biologist - Bob Glennon (757) 357-7004, ext. 126; Robert.Glennon@va.usda.gov
	Northampton, NC	NCNO01	NCNO02	P-CPDW01 or P-CPMP02; P-NNTC or P-NNGC	District Conservationist - Paul Boone (252) 534-2591; paul.boone@nc.usda.gov. Private Lands Biologist - Bob Glennon (757) 357-7004, ext. 126; Robert.Glennon@va.usda.gov. Roundstone Native Seed (270) 234-7160.
Spread 8 (AP-2)					
0.0–61.6	Northampton, NC	NCNO01	NCNO02	P-CPDW01 or P-CPMP02; P-NNTC or P-NNGC	District Conservationist - Paul Boone (252) 534-2591; paul.boone@nc.usda.gov. Private Lands Biologist - Bob Glennon (757) 357-7004, ext. 126; Robert.Glennon@va.usda.gov. Roundstone Native Seed (270) 234-7160.
	Halifax, NC	NCHW01	P-CPDW01 or P-CPMP02	P-CPDW01 or P-CPMP02; P-NNTC or P-NNGC	District Conservationist -David Little (252) 237-2711; David.Little@nc.usda.gov. Private Lands Biologist - Bob Glennon (757) 357-7004, ext. 126; Robert.Glennon@va.usda.gov. Roundstone Native Seed (270) 234-7160.
	Nash, NC	NCNJ01	P-CDW01 or P-CPMP02	P-CPDW01 or P-CPMP02; P-NNTC or P-NNGC	District Conservationist - Patrick Evans (252) 459-4116; patrick.evans@nc.usda.gov. Private Lands Biologist - Bob Glennon (757) 357-7004, ext. 126; Robert.Glennon@va.usda.gov. Roundstone Native Seed (270) 234-7160.
Spread 9 (AP-2)					
61.6–61.6	Nash, NC	NCNJ01	P-CPDW01 or P-CPMP02	P-CPDW01 or P-CPMP02; P-NNTC or P-NNGC	District Conservationist - Patrick Evans (252) 459-4116; patrick.evans@nc.usda.gov. Private Lands Biologist - Bob Glennon (757) 357-7004, ext. 126; Roundstone Native Seed (270) 234-7160.
	Wilson, NC	NCHW01	P-CPDW01 or P-CPMP02	P-CPDW01 or P-CPMP02; P-NNTC or P-NNGC	District Conservationist -David Little (252) 237-2711; David.Little@nc.usda.gov. Private Lands Biologist - Bob Glennon (757) 357-7004, ext. 126; Robert.Glennon@va.usda.gov. Roundstone Native Seed (270) 234-7160.
	Johnston, NC	NCNJ01	P-CDW01 or P-CPMP02	P-CPDW01 or P-CPMP02; P-NNTC or P-NNGC	District Conservationist - Brian Loadholt (919) 934-7156; brian.loadholt@nc.usda.gov. Private Lands Biologist - Bob Glennon (757) 357-7004, ext. 126; Robert.Glennon@va.usda.gov. Roundstone Native Seed (270) 234-7160.

ATTACHMENT A

Summary of Seed Mixtures by County for the Atlantic Coast Pipeline and Supply Header Project

Approximate Milepost Range	County and State	Suggested Cool Season Seed Mix Number [a]	Suggested Warm Season Seed Mix Number [a]	Suggested Pollinator Seed Mix Number [a]	Federal, State/Commonwealth, or local Agency/ Subject Matter Expert Contact Information
	Sampson, NC	NCSA01	NCSA02	P-CPDW01 or P-CPMP02; P-NNTC or P-NNGC	District Conservationist - Gavin Thompson (910) 592-7963; gavin.thompson@nc.usda.gov. Private Lands Biologist - Bob Glennon (757) 357-7004, ext. 126; Robert.Glennon@va.usda.gov. Roundstone Native Seed (270) 234-7160.
	Cumberland, NC	NCCU01	NCCU01	P-CPDW01 or P-CPMP02; P-NNTC or P-NNGC	District Conservationist - Renessa Hardy-Brown (910) 484-8479; renessa.brown@nc.usda.gov. Private Lands Biologist - Bob Glennon (757) 357-7004, ext. 126; Robert.Glennon@va.usda.gov. Roundstone Native Seed (270) 234-7160.
Spread 10 (AP-2)					
61.5–183.0	Cumberland, NC	NCCU01	NCCU01	P-CPDW01 or P-CPMP02; P-NNTC or P-NNGC	District Conservationist - Renessa Hardy-Brown (910) 484-8479; renessa.brown@nc.usda.gov. Private Lands Biologist - Bob Glennon (757) 357-7004, ext. 126; Robert.Glennon@va.usda.gov. Roundstone Native Seed (270) 234-7160.
	Robeson, NC	P-CPDW01 or P-CPMP02	NCRO01	P-CPDW01, P-CPMP02, or P-NCRO01; P-NNTC or P-NNGC	District Conservationist - Jeremy Roston (910) 739-5478; jeremy.roston@usda.gov. Private Lands Biologist - Bob Glennon (757) 357-7004, ext. 126; Robert.Glennon@va.usda.gov. Roundstone Native Seed (270) 234-7160.
Spread 11 (AP-3)					
0.0–83.0	Northampton, NC	NCNO01	NCNO02	P-CPDW01 or P-CPMP02; P-NNTC or P-NNGC	District Conservationist - Paul Boone (252) 534-2591; paul.boone@nc.usda.gov. Private Lands Biologist - Bob Glennon (757) 357-7004, ext. 126; Robert.Glennon@va.usda.gov. Roundstone Native Seed (270) 234-7160.
	Greensville, VA	VACSDGS01	VACSDGS01	P-VACSDGS01 or P-VACSDGS02	Private Lands Biologist - Bob Glennon (757) 357-7004, ext. 126; Robert.Glennon@va.usda.gov
	Southampton, VA	VACSDGS01	VACSDGS01	P-VACSDGS01 or P-VACSDGS02	Private Lands Biologist - Bob Glennon (757) 357-7004, ext. 126; Robert.Glennon@va.usda.gov
	Suffolk, VA	VACSDGS01	VACSDGS01	P-VACSDGS01 or P-VACSDGS02	Private Lands Biologist - Bob Glennon (757) 357-7004, ext. 126; Robert.Glennon@va.usda.gov
Spread 12 (AP-4; AP-5)					
0.0–0.4; 0.0-1.1	Brunswick, VA	VABCHNP01	VABCHNP02	P-VABCHNP01 or P-VABCHNP02	District Conservationist - Davie Wade Harris (434) 848-2145 ext. 102; davie.harris@va.usda.gov
	Greensville, VA	VACSDGS01	VACSDGS01	P-VACSDGS01 or P-VACSDGS02	Private Lands Biologist - Bob Glennon (757) 357-7004, ext. 126; Robert.Glennon@va.usda.gov

ATTACHMENT A

Summary of Seed Mixtures by County for the Atlantic Coast Pipeline and Supply Header Project

Approximate Milepost Range	County and State	Suggested Cool Season Seed Mix Number [a]	Suggested Warm Season Seed Mix Number [a]	Suggested Pollinator Seed Mix Number [a]	Federal, State/Commonwealth, or local Agency/ Subject Matter Expert Contact Information
Supply Header Project					
Spread 13 (TL-635)					
0.0–33.6	Wetzel, WV	WVWE01	P-MUDW01 or P-MUMP02; P-NNTC or P-NNGC	P-MUDW01 or P-MUMP02; P-NNTC or P-NNGC	District Conservationist - Dustin Adkins (304) 758-2173; dustin.adkins@wv.usda.gov. Private Lands Biologist - Bob Glennon (757) 357-7004, ext. 126; Robert.Glennon@va.usda.gov. Roundstone Native Seed (270) 234-7160.
	Wetzel, WV; Lewis Wetzel WMA	WVLWWMA01			District Wildlife Biologist - Steve Rauch (304)825-6787; steven.e.rauch@wv.gov
	Doddridge, WV	WVDH01	P-MUDW01 or P-MUMP02; P-NNTC or P-NNGC	P-MUDW01 or P-MUMP02; P-NNTC or P-NNGC	Acting State Conservationist - Greg Stone (304) 284-7579; greg.stone@wv.usda.gov. Private Lands Biologist - Bob Glennon (757) 357-7004, ext. 126; Robert.Glennon@va.usda.gov. Roundstone Native Seed (270) 234-7160.
	Tyler, WV	WVWE01	P-MUDW01 or P-MUMP02; P-NNTC or P-NNGC	P-MUDW01 or P-MUMP02; P-NNTC or P-NNGC	District Conservationist - Dustin Adkins (304) 758-2173; dustin.adkins@wv.usda.gov. Private Lands Biologist - Bob Glennon (757) 357-7004, ext. 126; Robert.Glennon@va.usda.gov. Roundstone Native Seed (270) 234-7160.
	Harrison, WV	WVDH01	P-MUDW01 or P-MUMP02; P-NNTC or P-NNGC	P-MUDW01 or P-MUMP02; P-NNTC or P-NNGC	Acting State Conservationist - Greg Stone (304) 284-7579; greg.stone@wv.usda.gov. Private Lands Biologist - Bob Glennon (757) 357-7004, ext. 126; Robert.Glennon@va.usda.gov. Roundstone Native Seed (270) 234-7160.
Spread 14 (TL-636)					
0.0–3.9	Westmoreland, PA	PAWE01	None Recommended	None Recommended	Westmoreland Conservation District, Christopher Droste, Senior Erosion Control Specialist (724) 837-5271; chris@wcdpa.com.

[a] Tables describing each seed mix are located within the text of Appendix A.

Document Accession #: 20201120-5243 Filed Date: 11/20/2020

ATLANTIC COAST PIPELINE, LLC
ATLANTIC COAST PIPELINE

and

DOMINION TRANSMISSION, INC.
SUPPLY HEADER PROJECT

Restoration and Rehabilitation Plan

Appendix B
Major Soil Drainage and Slope Classes Crossed by the Projects

APPENDIX B

Atlantic Coast Pipeline and Supply Header Project
Major Soil Drainage and Slope Classes Crossed by the Projects

Project /State or Commonwealth/County	Drainage Class [a]	Crossing Length (miles)		
		Total	0-15% [b]	>16% [b]
ATLANTIC COASTAL PIPELINE				
West Virginia				
Harrison	Excessively to Moderately Well Drained	1.0	0.2	0.8
	Somewhat Poorly to Very Poorly Drained	0.1	<0.1	<0.1
	Total	1.1	0.3	0.8
Lewis	Excessively to Moderately Well Drained	19.8	6.9	12.9
	Null [b/]	0.1	<0.1	0.1
	Total	19.9	6.9	13.0
Upshur	Excessively to Moderately Well Drained	21.5	8.8	12.7
	Somewhat Poorly to Very Poorly Drained	0.6	0.6	<0.1
	Null	0.1	0.1	<0.1
	Total	22.2	9.5	12.7
Randolph	Excessively to Moderately Well Drained	28.6	12.3	16.3
	Somewhat Poorly to Very Poorly Drained	0.3	0.3	0.00
	Null	1.9	1.4	0.5
	Total	30.8	14.0	16.8
Pocahontas	Excessively to Moderately Well Drained	23.4	8.4	15.0
	Somewhat Poorly to Very Poorly Drained	0.8	0.8	<0.1
	Null	<0.1	<0.1	0.00
	Total	24.3	9.3	15.0
Virginia				
Highland	Excessively to Moderately Well Drained	10.5	3.0	7.5
	Somewhat Poorly to Very Poorly Drained	0.1	0.1	0.0
	Null	<0.1	<0.1	0.0
	Total	10.6	3.1	7.5
Bath	Excessively to Moderately Well Drained	20.4	9.6	10.8
	Somewhat Poorly to Very Poorly Drained	1.2	1.2	0.00
	Null	<0.1	<0.1	<0.1
	Total	21.6	10.8	10.8
Augusta	Excessively to Moderately Well Drained	50.4	35.5	14.9
	Somewhat Poorly to Very Poorly Drained	1.9	1.9	<0.1
	Null	2.0	1.1	0.9
	Total	54.3	38.5	15.8
Nelson	Excessively to Moderately Well Drained	26.9	10.3	16.7
	Somewhat Poorly to Very Poorly Drained	0.3	0.3	<0.1
	Null	<0.1	<0.1	0.0
	Total	27.3	10.6	16.7
Buckingham	Excessively to Moderately Well Drained	22.8	20.0	2.7
	Somewhat Poorly to Very Poorly Drained	4.9	4.6	0.3
	Null	<0.1	<0.1	0.0
	Total	27.7	24.7	3.0
Cumberland	Excessively to Moderately Well Drained	8.5	7.8	0.7
	Somewhat Poorly to Very Poorly Drained	0.5	0.5	0.0
	Null	<0.1	<0.1	0.0
	Total	9.1	8.4	0.7

APPENDIX B (cont'd)

Atlantic Coast Pipeline and Supply Header Project
Major Soil Drainage and Slope Classes Crossed by the Projects

Project /State or Commonwealth/County	Drainage Class [a]	Crossing Length (miles)		
		Total	0-15% [b]	>16% [b]
Prince Edward	Excessively to Moderately Well Drained	5.0	4.1	0.9
	Somewhat Poorly to Very Poorly Drained	0.2	0.2	<0.1
	Null	<0.1	<0.1	0.0
	Total	5.2	4.3	0.9
Nottoway	Excessively to Moderately Well Drained	21.1	19.1	2.0
	Somewhat Poorly to Very Poorly Drained	2.3	2.2	0.1
	Null	<0.1	<0.1	0.0
	Total	23.4	21.3	2.1
Dinwiddie	Excessively to Moderately Well Drained	11.0	10.9	0.1
	Somewhat Poorly to Very Poorly Drained	0.8	0.8	0.0
	Total	11.8	11.7	0.1
Brunswick	Excessively to Moderately Well Drained	21.4	21.2	0.2
	Somewhat Poorly to Very Poorly Drained	1.6	1.6	<0.1
	Total	23.0	22.8	0.2
Greensville	Excessively to Moderately Well Drained	11.4	11.1	0.3
	Somewhat Poorly to Very Poorly Drained	7.1	7.1	0.0
	Null	0.1	0.1	0.0
	Total	18.6	18.3	0.3
Southampton	Excessively to Moderately Well Drained	16.1	16.0	<0.1
	Somewhat Poorly to Very Poorly Drained	10.0	10.0	0.0
	Null	<0.1	<0.1	0.0
	Total	26.1	26.1	<0.1
City of Suffolk	Excessively to Moderately Well Drained	16.2	15.8	0.4
	Somewhat Poorly to Very Poorly Drained	16.4	16.3	0.1
	Null	0.6	0.6	0.0
	Total	33.2	32.7	0.5
City of Chesapeake	Excessively to Moderately Well Drained	0.6	0.6	0.0
	Somewhat Poorly to Very Poorly Drained	9.0	9.0	0.0
	Null	1.7	1.7	0.0
	Total	11.3	11.3	0.0
North Carolina				
Northampton	Excessively to Moderately Well Drained	17.8	17.6	0.2
	Somewhat Poorly to Very Poorly Drained	4.2	4.2	<0.1
	Null	0.1	0.1	0.0
	Total	22.1	21.9	0.2
Halifax	Excessively to Moderately Well Drained	16.8	16.6	0.2
	Somewhat Poorly to Very Poorly Drained	7.5	7.5	<0.1
	Null	0.0	0.0	0.0
	Total	24.3	24.1	0.2
Nash	Excessively to Moderately Well Drained	20.1	19.9	0.2
	Somewhat Poorly to Very Poorly Drained	11.8	11.8	0.0
	Null	<0.1	<0.1	0.0
	Total	31.9	31.7	0.2
Wilson	Excessively to Moderately Well Drained	6.5	6.5	0.0
	Somewhat Poorly to Very Poorly Drained	5.4	5.4	<0.1
	Total	11.9	11.9	<0.1

APPENDIX B (cont'd)

Atlantic Coast Pipeline and Supply Header Project
Major Soil Drainage and Slope Classes Crossed by the Projects

Project /State or Commonwealth/County	Drainage Class [a]	Crossing Length (miles)		
		Total	0-15% [b]	>16% [b]
Johnston	Excessively to Moderately Well Drained	19.0	19.0	<0.1
	Somewhat Poorly to Very Poorly Drained	19.1	19.1	0.0
	Null	<0.1	<0.1	0.0
	Total	38.1	38.1	<0.1
Sampson	Excessively to Moderately Well Drained	4.7	4.7	0.0
	Somewhat Poorly to Very Poorly Drained	3.1	3.1	0.0
	Total	7.8	7.8	0.0
Cumberland	Excessively to Moderately Well Drained	16.8	16.7	0.1
	Somewhat Poorly to Very Poorly Drained	22.7	22.7	0.0
	Null	0.1	0.1	0.0
	Total	39.6	39.5	0.1
Robeson	Excessively to Moderately Well Drained	9.4	9.4	0.0
	Somewhat Poorly to Very Poorly Drained	13.1	13.1	0.0
	Total	22.5	22.5	0.0
TOTAL		**599.7**	**482.1**	**117.6**
SUPPLY HEADER PROJECT				
Pennsylvania				
Westmoreland	Excessively to Moderately Well Drained	3.8	2.2	1.6
	Somewhat Poorly to Very Poorly Drained	0.1	0.1	0.0
	Total	3.9	2.3	1.6
West Virginia				
Harrison	Excessively to Moderately Well Drained	0.3	0.2	0.1
	Somewhat Poorly to Very Poorly Drained	0.3	0.1	0.2
	Total	0.6	0.3	0.3
Doddridge	Excessively to Moderately Well Drained	22.1	4.2	17.9
	Null	0.1	0.1	<0.1
	Total	22.2	4.3	17.9
Tyler	Excessively to Moderately Well Drained	0.8	0.1	0.7
	Total	0.8	0.1	0.7
Wetzel	Excessively to Moderately Well Drained	10.0	1.2	8.8
	Total	10.0	1.2	8.8
TOTAL		**37.5**	**8.2**	**29.3**
GRAND TOTAL		**637.2**	**490.3**	**146.9**

[a] Null = soil map units with no assigned drainage class.

[b] Slope was determined using available digital elevation model raster data and running the slope analysis tool in ArcGIS: ArcMap. The drainage classes were determined using the SSURGO database.

ATLANTIC COAST PIPELINE, LLC
ATLANTIC COAST PIPELINE

and

DOMINION TRANSMISSION, INC.
SUPPLY HEADER PROJECT

Restoration and Rehabilitation Plan

Appendix C
Recommended Seed Mixes by Milepost

APPENDIX C

Recommended Seed Mixes by Milepost

Pipeline Facility	Physiographic Province	Federal/State or Commonwealth Land	State	County	Potential Pollinator Habitat Parcel[a]	From MP	To MP	Miles Crossed	Recommended Seed Mix[b]
ATLANTIC COASTAL PIPELINE									
AP-1	Mountain		West Virginia	Harrison		0.00	1.10	1.05	WVHLRU01
AP-1	Mountain		West Virginia	Lewis		1.10	21.37	19.69	WVHLRU01
AP-1	Mountain		West Virginia	Upshur		21.37	43.92	21.90	WVHLRU01
AP-1	Mountain		West Virginia	Randolph		43.92	66.64	29.83	WVHLRU01
AP-1	Mountain		West Virginia	Pocahontas		66.64	73.09	9.19	WVPO01
AP-1	Mountain	MNF	West Virginia	Pocahontas		73.09	73.63	0.75	FS01, FS02, FS03, FS04, FS05, or FS06
AP-1	Mountain		West Virginia	Pocahontas		73.63	76.87	5.13	WVPO01
AP-1	Mountain	Seneca State Forest	West Virginia	Pocahontas		76.87	79.18	3.30	WVSEN
AP-1	Mountain		West Virginia	Pocahontas		79.18	79.42	0.34	WVPO01
AP-1	Mountain	Seneca State Forest	West Virginia	Pocahontas		79.42	80.45	1.47	WVSEN
AP-1	Mountain	MNF	West Virginia	Pocahontas		80.45	80.65	0.29	FS01, FS02, FS03, FS04, FS05, or FS06
AP-1	Mountain		West Virginia	Pocahontas		80.65	80.71	0.08	WVPO01
AP-1	Mountain	MNF	West Virginia	Pocahontas		80.71	80.87	0.22	FS01, FS02, FS03, FS04, FS05, or FS06
AP-1	Mountain		West Virginia	Pocahontas		80.87	81.22	0.50	WVPO01
AP-1	Mountain	MNF	West Virginia	Pocahontas		81.22	83.92	3.85	FS01, FS02, FS03, FS04, FS05, or FS06
AP-1	Mountain	MNF	Virginia	Highland		83.92	83.92	0.00	FS01, FS02, FS03, FS04, FS05, or FS06
AP-1	Mountain	GWNF	Virginia	Highland		83.92	86.87	4.01	FS01, FS02, FS03, FS04, FS05, or FS06
AP-1	Mountain		Virginia	Highland		86.87	91.61	6.83	VABCHNP01 or VABCHNP02, VDEQ1[c]
AP-1	Mountain		Virginia	Bath		91.61	93.74	3.19	VABCHNP01 or VABCHNP02, VDEQ1[c]
AP-1	Mountain	GWNF	Virginia	Bath		93.74	94.26	0.75	FS01, FS02, FS03, FS04, FS05, or FS06
AP-1	Mountain		Virginia	Bath		94.26	96.08	2.55	VABCHNP01 or VABCHNP02, VDEQ1[c]
AP-1	Mountain	GWNF	Virginia	Bath		96.08	96.34	0.36	FS01, FS02, FS03, FS04, FS05, or FS06
AP-1	Mountain		Virginia	Bath		96.34	96.48	0.19	VABCHNP01 or VABCHNP02, VDEQ1[c]
AP-1	Mountain	GWNF	Virginia	Bath		96.48	96.62	0.21	FS01, FS02, FS03, FS04, FS05, or FS06
AP-1	Mountain		Virginia	Bath		96.62	96.77	0.22	VABCHNP01 or VABCHNP02, VDEQ1[c]
AP-1	Mountain	GWNF	Virginia	Bath		96.77	97.21	0.64	FS01, FS02, FS03, FS04, FS05, or FS06
AP-1	Mountain		Virginia	Bath		97.21	98.26	1.57	VABCHNP01 or VABCHNP02, VDEQ1[c]
AP-1	Mountain	GWNF	Virginia	Bath		98.26	99.00	1.37	FS01, FS02, FS03, FS04, FS05, or FS06
AP-1	Mountain		Virginia	Bath		99.00	99.29	0.47	VABCHNP01 or VABCHNP02, VDEQ1[c]
AP-1	Mountain	GWNF	Virginia	Bath		99.29	99.65	0.51	FS01, FS02, FS03, FS04, FS05, or FS06
AP-1	Mountain		Virginia	Bath		99.65	105.91	9.19	VABCHNP01 or VABCHNP02, VDEQ1[c]

APPENDIX C

Recommended Seed Mixes by Milepost

Pipeline Facility	Physiographic Province	Federal/State or Commonwealth Land	State	County	Potential Pollinator Habitat Parcel[a]	From MP	To MP	Miles Crossed	Recommended Seed Mix[b]
AP-1	Mountain	GWNF	Virginia	Bath		105.91	106.07	0.23	FS01, FS02, FS03, FS04, FS05, or FS06
AP-1	Mountain		Virginia	Bath		106.07	106.78	1.04	VABCHNP01 or VABCHNP02, VDEQ1[c]
AP-1	Mountain		Virginia	Augusta		106.78	112.99	9.53	VABCHNP01 or VABCHNP02, VDEQ1[c]
AP-1	Mountain	GWNF	Virginia	Augusta		112.99	113.05	0.12	FS01, FS02, FS03, FS04, FS05, or FS06
AP-1	Mountain		Virginia	Augusta		113.05	115.81	3.79	VABCHNP01 or VABCHNP02, VDEQ1[c]
AP-1	Mountain	GWNF	Virginia	Augusta		115.81	116.16	0.36	FS01, FS02, FS03, FS04, FS05, or FS06
AP-1	Mountain		Virginia	Augusta		116.16	116.40	0.25	VABCHNP01 or VABCHNP02, VDEQ1[c]
AP-1	Mountain	GWNF	Virginia	Augusta		116.40	116.46	0.07	FS01, FS02, FS03, FS04, FS05, or FS06
AP-1	Mountain		Virginia	Augusta		116.46	116.75	0.29	VABCHNP01 or VABCHNP02, VDEQ1[c]
AP-1	Mountain	GWNF	Virginia	Augusta		116.75	120.57	3.78	FS01, FS02, FS03, FS04, FS05, or FS06
AP-1	Mountain		Virginia	Augusta		120.57	121.06	0.48	VABCHNP01 or VABCHNP02, VDEQ1[c]
AP-1	Mountain	GWNF	Virginia	Augusta		121.06	123.21	2.12	FS01, FS02, FS03, FS04, FS05, or FS06
AP-1	Mountain		Virginia	Augusta		123.21	154.00	30.19	VABCHNP01 or VABCHNP02, VDEQ1[c]
AP-1	Mountain	GWNF	Virginia	Augusta		154.00	155.13	1.15	FS01, FS02, FS03, FS04, FS05, or FS06
AP-1	Mountain		Virginia	Augusta		155.13	158.01	3.16	VABCHNP01 or VABCHNP02, VDEQ1[c]
AP-1	Mountain	GWNF	Virginia	Augusta		158.01	158.17	0.17	FS01, FS02, FS03, FS04, FS05, or FS06
AP-1	Mountain	Blue Ridge Parkway	Virginia	Augusta		158.17	158.25	0.07	NA[d]
AP-1	Mountain	Blue Ridge Parkway	Virginia	Nelson		158.25	158.27	0.03	NA[d]
AP-1	Mountain		Virginia	Nelson		158.27	183.32	25.76	VABCHNP01 or VABCHNP02, VDEQ1[c]
AP-1	Piedmont	James River (WMA)	Virginia	Nelson		183.32	184.33	1.05	VJRWMA01, VJRWMA02, or VJRWMA03
AP-1	Piedmont		Virginia	Nelson		184.33	184.45	0.13	VABCHNP01 or VABCHNP02, VDEQ2[c]
AP-1	Piedmont	James River (WMA)	Virginia	Nelson		184.45	184.47	0.03	VJRWMA01, VJRWMA02, or VJRWMA03
AP-1	Piedmont		Virginia	Nelson		184.47	184.49	0.02	VABCHNP01 or VABCHNP02, VDEQ2[c]
AP-1	Piedmont	James River (WMA)	Virginia	Nelson		184.49	184.51	0.03	VJRWMA01, VJRWMA02, or VJRWMA03
AP-1	Piedmont		Virginia	Nelson		184.51	184.54	0.03	VABCHNP01 or VABCHNP02, VDEQ2[c]
AP-1	Piedmont	James River (WMA)	Virginia	Nelson		184.54	184.65	0.13	VJRWMA01, VJRWMA02, or VJRWMA03
AP-1	Piedmont		Virginia	Nelson		184.65	184.69	0.04	VABCHNP01 or VABCHNP02, VDEQ2[c]
AP-1	Piedmont		Virginia	Buckingham		184.69	186.13	1.57	VABCHNP01 or VABCHNP02, VDEQ2[c]
AP-1	Piedmont		Virginia	Buckingham	09-001-A002.AR	186.13	186.43	0.32	P-VABCHNP01 or P-VABCHNP02

APPENDIX C

Recommended Seed Mixes by Milepost

Pipeline Facility	Physiographic Province	Federal/State or Commonwealth Land	State	County	Potential Pollinator Habitat Parcel[a]	From MP	To MP	Miles Crossed	Recommended Seed Mix[b]
AP-1	Piedmont		Virginia	Buckingham		186.43	187.38	0.98	VABCHNP01 or VABCHNP02 VDEQ2[c]
AP-1	Piedmont		Virginia	Buckingham	09-005	187.38	189.73	2.37	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Buckingham	09-012	189.73	189.88	0.16	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Buckingham	09-015	189.88	190.05	0.18	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Buckingham	09-016	190.05	190.20	0.15	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Buckingham	09-018	190.20	190.34	0.15	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Buckingham		190.34	190.54	0.21	VABCHNP01 or VABCHNP02, VDEQ2[c]
AP-1	Piedmont		Virginia	Buckingham	09-021	190.54	190.89	0.37	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Buckingham		190.89	190.93	0.05	VABCHNP01 or VABCHNP02, VDEQ2[c d]
AP-1	Piedmont		Virginia	Buckingham	09-024	190.93	191.35	0.39	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Buckingham		191.35	191.41	0.05	VABCHNP01 or VABCHNP02, VDEQ2[d]
AP-1	Piedmont		Virginia	Buckingham	09-028-A001	191.41	191.82	0.38	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Buckingham	09-029	191.82	192.06	0.22	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Buckingham		192.06	192.47	0.41	VABCHNP01 or VABCHNP02, VDEQ2[c]
AP-1	Piedmont		Virginia	Buckingham	09-039	192.47	192.57	0.10	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Buckingham	09-040	192.57	192.75	0.19	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Buckingham	09-040-A001	192.75	193.14	0.38	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Buckingham	09-040	193.14	193.41	0.28	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Buckingham	09-040-A002	193.41	193.54	0.13	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Buckingham		193.54	193.60	0.07	VABCHNP01 or VABCHNP02, VDEQ2[c]
AP-1	Piedmont		Virginia	Buckingham	09-040	193.60	194.95	1.35	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Buckingham	09-045.AR	194.95	195.59	0.64	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Buckingham		195.59	198.55	2.95	VABCHNP01 or VABCHNP02, VDEQ2[c]
AP-1	Piedmont		Virginia	Buckingham	09-059	198.55	199.14	0.59	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Buckingham		199.14	199.95	0.82	VABCHNP01 or VABCHNP02, VDEQ2[c]
AP-1	Piedmont		Virginia	Buckingham	09-066	199.95	200.11	0.16	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Buckingham		200.11	200.66	0.56	VABCHNP01 or VABCHNP02, VDEQ2[c]
AP-1	Piedmont		Virginia	Buckingham	09-070	200.66	200.80	0.14	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Buckingham	09-072	200.80	201.08	0.29	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Buckingham		201.08	202.34	1.26	VABCHNP01 or VABCHNP02, VDEQ2[c]
AP-1	Piedmont		Virginia	Buckingham	09-079	202.34	202.55	0.21	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Buckingham	09-080	202.55	202.97	0.42	P-VABCHNP01 or P-VABCHNP02

APPENDIX C

Recommended Seed Mixes by Milepost

Pipeline Facility	Physiographic Province	Federal/State or Commonwealth Land	State	County	Potential Pollinator Habitat Parcel[a]	From MP	To MP	Miles Crossed	Recommended Seed Mix[b]
AP-1	Piedmont		Virginia	Buckingham	09-081	202.97	203.52	0.55	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Buckingham		203.52	203.70	0.19	VABCHNP01 or VABCHNP02, VDEQ2[c]
AP-1	Piedmont		Virginia	Buckingham	09-083	203.70	204.01	0.32	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Buckingham		204.01	205.08	1.14	VABCHNP01 or VABCHNP02, VDEQ2[c]
AP-1	Piedmont		Virginia	Buckingham	09-094	205.08	205.34	0.27	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Buckingham	09-098	205.34	205.55	0.21	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Buckingham	09-100	205.55	205.69	0.14	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Buckingham		205.69	205.74	0.06	VABCHNP01 or VABCHNP02, VDEQ2[c]
AP-1	Piedmont		Virginia	Buckingham	09-100	205.74	206.00	0.26	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Buckingham	09-103	206.00	206.30	0.30	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Buckingham		206.30	206.32	0.03	VABCHNP01 or VABCHNP02, VDEQ2[c]
AP-1	Piedmont		Virginia	Buckingham	09-103	206.32	206.44	0.13	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Buckingham	09-105	206.44	206.56	0.12	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Buckingham	09-106	206.56	206.75	0.19	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Buckingham	09-108	206.75	206.85	0.10	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Buckingham		206.85	206.92	0.08	VABCHNP01 or VABCHNP02, VDEQ2[c]
AP-1	Piedmont		Virginia	Buckingham	09-109	206.92	207.51	0.59	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Buckingham	09-110	207.51	207.77	0.26	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Buckingham	09-111	207.77	207.89	0.12	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Buckingham	09-113	207.89	208.12	0.23	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Buckingham		208.12	208.77	0.68	VABCHNP01 or VABCHNP02, VDEQ2[c]
AP-1	Piedmont		Virginia	Buckingham	09-119	208.77	208.94	0.18	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Buckingham	09-120.AR	208.94	209.09	0.16	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Buckingham		209.09	209.25	0.17	VABCHNP01 or VABCHNP02, VDEQ2[c]
AP-1	Piedmont		Virginia	Buckingham	09-123	209.25	209.43	0.20	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Buckingham		209.43	209.88	0.46	VABCHNP01 or VABCHNP02, VDEQ2[c]
AP-1	Piedmont		Virginia	Buckingham	09-125-A001	209.88	210.11	0.24	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Buckingham	09-128	210.11	210.65	0.56	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Buckingham		210.65	210.69	0.03	VABCHNP01 or VABCHNP02, VDEQ2[c]
AP-1	Piedmont		Virginia	Buckingham	09-129	210.69	211.37	0.69	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Buckingham	09-129.5	211.37	211.78	0.41	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Buckingham	10-001	211.78	211.81	0.03	P-VABCHNP01 or P-VABCHNP02

APPENDIX C

Recommended Seed Mixes by Milepost

Pipeline Facility	Physiographic Province	Federal/State or Commonwealth Land	State	County	Potential Pollinator Habitat Parcel[a]	From MP	To MP	Miles Crossed	Recommended Seed Mix[b]
AP-1	Piedmont		Virginia	Cumberland	10-001	211.81	212.40	0.59	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Cumberland	10-006	212.40	212.65	0.26	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Cumberland		212.65	212.66	0.01	VABCHNP01 or VABCHNP02, VDEQ2[c]
AP-1	Piedmont		Virginia	Cumberland	10-007	212.66	212.92	0.26	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Cumberland	10-009	212.92	213.11	0.19	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Cumberland		213.11	213.87	0.76	VABCHNP01 or VABCHNP02, VDEQ2[c]
AP-1	Piedmont		Virginia	Cumberland	10-015	213.87	214.09	0.23	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Cumberland		214.09	214.28	0.19	VABCHNP01 or VABCHNP02, VDEQ2[c]
AP-1	Piedmont		Virginia	Cumberland	10-019	214.28	214.69	0.41	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Cumberland		214.69	214.89	0.20	VABCHNP01 or VABCHNP02, VDEQ2[c]
AP-1	Piedmont		Virginia	Cumberland	10-022.5	214.89	214.99	0.11	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Cumberland	10-023	214.99	215.35	0.36	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Cumberland	10-024	215.35	215.83	0.48	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Cumberland		215.83	215.84	0.01	VABCHNP01 or VABCHNP02, VDEQ2[c]
AP-1	Piedmont		Virginia	Cumberland	10-034	215.84	216.01	0.18	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Cumberland	10-037	216.01	216.30	0.29	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Cumberland	10-038	216.30	216.53	0.23	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Cumberland		216.53	216.56	0.04	VABCHNP01 or VABCHNP02, VDEQ2[c]
AP-1	Piedmont		Virginia	Cumberland	10-040	216.56	216.77	0.22	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Cumberland		216.77	216.91	0.16	VABCHNP01 or VABCHNP02, VDEQ2[c d]
AP-1	Piedmont		Virginia	Cumberland	10-044	216.91	217.22	0.30	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Cumberland	10-054	217.22	217.44	0.22	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Cumberland		217.44	217.49	0.06	VABCHNP01 or VABCHNP02, VDEQ2[c]
AP-1	Piedmont		Virginia	Cumberland	10-054	217.49	217.58	0.10	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Cumberland		217.58	217.79	0.20	VABCHNP01 or VABCHNP02, VDEQ2[c]
AP-1	Piedmont		Virginia	Cumberland	10-057.1	217.79	217.91	0.12	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Cumberland		217.91	218.11	0.20	VABCHNP01 or VABCHNP02, VDEQ2[c]
AP-1	Piedmont		Virginia	Cumberland	10-059	218.11	218.43	0.32	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Cumberland	10-060	218.43	218.57	0.15	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Cumberland	10-061	218.57	219.22	0.65	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Cumberland		219.22	219.46	0.24	VABCHNP01 or VABCHNP02, VDEQ2[c]
AP-1	Piedmont		Virginia	Cumberland	10-063	219.46	219.88	0.42	P-VABCHNP01 or P-VABCHNP02

APPENDIX C

Recommended Seed Mixes by Milepost

Pipeline Facility	Physiographic Province	Federal/State or Commonwealth Land	State	County	Potential Pollinator Habitat Parcel[a]	From MP	To MP	Miles Crossed	Recommended Seed Mix[b]
AP-1	Piedmont		Virginia	Cumberland		219.88	220.76	0.90	VABCHNP01 or VABCHNP02, VDEQ2[c]
AP-1	Piedmont		Virginia	Prince Edward		220.76	220.77	0.01	VABCHNP01 or VABCHNP02, VDEQ2[c]
AP-1	Piedmont		Virginia	Prince Edward	11-001	220.77	221.14	0.39	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Prince Edward	11-001.5	221.14	221.23	0.09	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Prince Edward	11-016	221.23	221.36	0.14	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Prince Edward		221.36	221.46	0.10	VABCHNP01 or VABCHNP02, VDEQ2[c]
AP-1	Piedmont		Virginia	Prince Edward	11-021.AR	221.46	221.93	0.50	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Prince Edward	11-024	221.93	222.17	0.23	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Prince Edward		222.17	223.39	1.22	VABCHNP01 or VABCHNP02, VDEQ2[c d]
AP-1	Piedmont		Virginia	Prince Edward	11-051	223.39	223.63	0.24	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Prince Edward		223.63	224.94	1.33	VABCHNP01 or VABCHNP02, VDEQ2[c]
AP-1	Piedmont		Virginia	Prince Edward	11-065	224.94	225.13	0.19	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Prince Edward	11-064	225.13	225.33	0.20	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Prince Edward	11-068	225.33	225.52	0.19	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Prince Edward		225.52	225.66	0.14	VABCHNP01 or VABCHNP02, VDEQ2[c]
AP-1	Piedmont		Virginia	Prince Edward	12-001	225.66	225.87	0.21	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Nottoway	12-001	225.87	226.40	0.53	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Nottoway		226.40	226.41	0.01	VABCHNP01 or VABCHNP02, VDEQ2[c]
AP-1	Piedmont		Virginia	Nottoway	12-001	226.41	226.61	0.20	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Nottoway	12-002	226.61	227.00	0.39	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Nottoway		227.00	227.32	0.32	VABCHNP01 or VABCHNP02, VDEQ2[c]
AP-1	Piedmont		Virginia	Nottoway	12-004	227.32	227.68	0.37	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Nottoway	12-005	227.68	227.73	0.05	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Nottoway	12-006	227.73	228.24	0.52	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Nottoway		228.24	228.68	0.44	VABCHNP01 or VABCHNP02, VDEQ2[c]
AP-1	Piedmont		Virginia	Nottoway	12-010	228.68	229.22	0.54	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Nottoway	12-012	229.22	230.19	0.98	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Nottoway		230.19	230.58	0.39	VABCHNP01 or VABCHNP02, VDEQ2[c]
AP-1	Piedmont		Virginia	Nottoway	12-015	230.58	230.81	0.23	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Nottoway	12-016	230.81	230.97	0.16	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Nottoway	12-017	230.97	231.50	0.54	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Nottoway		231.50	231.59	0.08	VABCHNP01 or VABCHNP02, VDEQ2[c]

APPENDIX C

Recommended Seed Mixes by Milepost

Pipeline Facility	Physiographic Province	Federal/State or Commonwealth Land	State	County	Potential Pollinator Habitat Parcel[a]	From MP	To MP	Miles Crossed	Recommended Seed Mix[b]
AP-1	Piedmont		Virginia	Nottoway	12-020	231.59	231.79	0.21	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Nottoway		231.79	232.30	0.52	VABCHNP01 or VABCHNP02, VDEQ2[c]
AP-1	Piedmont		Virginia	Nottoway	12-024	232.30	232.45	0.16	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Nottoway	12-026	232.45	232.64	0.19	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Nottoway		232.64	233.53	0.89	VABCHNP01 or VABCHNP02, VDEQ2[c]
AP-1	Piedmont		Virginia	Nottoway	12-028	233.53	233.85	0.32	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Nottoway		233.85	234.17	0.32	VABCHNP01 or VABCHNP02, VDEQ2[c]
AP-1	Piedmont		Virginia	Nottoway	12-030	234.17	234.21	0.04	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Nottoway		234.21	234.26	0.04	VABCHNP01 or VABCHNP02, VDEQ2[c]
AP-1	Piedmont		Virginia	Nottoway	12-030	234.26	234.27	0.02	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Nottoway	12-032	234.27	234.52	0.25	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Nottoway		234.52	234.76	0.25	VABCHNP01 or VABCHNP02, VDEQ2[c]
AP-1	Piedmont		Virginia	Nottoway	12-036	234.76	235.02	0.26	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Nottoway	12-038	235.02	235.36	0.34	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Nottoway		235.36	236.14	0.77	VABCHNP01 or VABCHNP02, VDEQ2[c]
AP-1	Piedmont		Virginia	Nottoway	12-044.5	236.14	236.36	0.23	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Nottoway	12-045	236.36	236.72	0.36	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Nottoway	12-047	236.72	236.79	0.07	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Nottoway		236.79	237.22	0.43	VABCHNP01 or VABCHNP02, VDEQ2[c]
AP-1	Piedmont		Virginia	Nottoway	12-052	237.22	237.30	0.08	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Nottoway	12-054	237.30	237.55	0.25	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Nottoway		237.55	237.78	0.23	VABCHNP01 or VABCHNP02, VDEQ2[c]
AP-1	Piedmont		Virginia	Nottoway	12-058	237.78	238.05	0.28	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Nottoway	12-061	238.05	238.63	0.58	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Nottoway		238.63	238.65	0.02	VABCHNP01 or VABCHNP02, VDEQ2[c]
AP-1	Piedmont		Virginia	Nottoway	12-063	238.65	239.12	0.48	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Nottoway		239.12	239.18	0.06	VABCHNP01 or VABCHNP02, VDEQ2[c]
AP-1	Piedmont		Virginia	Nottoway	12-065	239.18	239.59	0.42	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Nottoway		239.59	239.65	0.06	VABCHNP01 or VABCHNP02, VDEQ2[c]
AP-1	Piedmont		Virginia	Nottoway	12-068	239.65	240.41	0.76	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Nottoway	12-070	240.41	240.60	0.20	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Nottoway		240.60	240.73	0.13	VABCHNP01 or VABCHNP02, VDEQ2[c]

APPENDIX C

Recommended Seed Mixes by Milepost

Pipeline Facility	Physiographic Province	Federal/State or Commonwealth Land	State	County	Potential Pollinator Habitat Parcel[a]	From MP	To MP	Miles Crossed	Recommended Seed Mix[b]
AP-1	Piedmont		Virginia	Nottoway	12-072	240.73	240.96	0.24	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Nottoway	12-073	240.96	241.18	0.22	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Nottoway	12-075	241.18	241.45	0.28	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Nottoway		241.45	241.91	0.49	VABCHNP01 or VABCHNP02, VDEQ2[c]
AP-1	Piedmont		Virginia	Nottoway	12-085	241.91	242.01	0.11	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Nottoway	12-086	242.01	242.13	0.11	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Nottoway		242.13	242.43	0.31	VABCHNP01 or VABCHNP02, VDEQ2[c]
AP-1	Piedmont		Virginia	Nottoway	12-091.5	242.43	242.64	0.21	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Nottoway	12-091	242.64	242.90	0.27	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Nottoway		242.90	245.16	2.31	VABCHNP01 or VABCHNP02, VDEQ2[c]
AP-1	Piedmont		Virginia	Nottoway	12-099	245.16	245.69	0.53	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Nottoway	12-100	245.69	245.80	0.12	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Nottoway		245.80	245.84	0.04	VABCHNP01 or VABCHNP02, VDEQ2[c]
AP-1	Piedmont		Virginia	Nottoway	12-100	245.84	246.11	0.28	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Nottoway	12-102	246.11	246.65	0.54	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Nottoway	12-103	246.65	246.90	0.26	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Nottoway		246.90	247.15	0.26	VABCHNP01 or VABCHNP02, VDEQ2[c]
AP-1	Piedmont		Virginia	Nottoway	12-110	247.15	247.31	0.16	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Nottoway		247.31	247.35	0.04	VABCHNP01 or VABCHNP02, VDEQ2[c]
AP-1	Piedmont		Virginia	Nottoway	12-113	247.35	247.91	0.56	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Nottoway		247.91	248.17	0.26	VABCHNP01 or VABCHNP02, VDEQ2[c]
AP-1	Piedmont		Virginia	Nottoway	12-113	248.17	248.37	0.20	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Nottoway	12-116	248.37	248.59	0.23	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Nottoway	12-117	248.59	249.02	0.42	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Nottoway		249.02	249.03	0.01	VABCHNP01 or VABCHNP02, VDEQ2[c]
AP-1	Coastal Plain		Virginia	Dinwiddie		249.03	251.56	2.53	VACSDGS01, VDEQ3[c]
AP-1	Coastal Plain		Virginia	Dinwiddie	13-011	251.56	251.66	0.10	P-VACSDGS01 or P-VACSDGS02
AP-1	Coastal Plain		Virginia	Dinwiddie		251.66	251.71	0.05	VACSDGS01, VDEQ3[c]
AP-1	Coastal Plain		Virginia	Dinwiddie	13-013	251.71	252.30	0.59	P-VACSDGS01 or P-VACSDGS02
AP-1	Coastal Plain		Virginia	Dinwiddie		252.30	253.55	1.25	VACSDGS01, VDEQ3[c]
AP-1	Coastal Plain		Virginia	Dinwiddie	13-014-A001	253.55	254.00	0.45	P-VACSDGS01 or P-VACSDGS02
AP-1	Coastal Plain		Virginia	Dinwiddie		254.00	254.30	0.33	VACSDGS01, VDEQ3[c]

APPENDIX C

Recommended Seed Mixes by Milepost

Pipeline Facility	Physiographic Province	Federal/State or Commonwealth Land	State	County	Potential Pollinator Habitat Parcel[a]	From MP	To MP	Miles Crossed	Recommended Seed Mix[b]
AP-1	Coastal Plain		Virginia	Dinwiddie	13-019-A001	254.30	254.57	0.28	P-VACSDGS01 or P-VACSDGS02
AP-1	Coastal Plain		Virginia	Dinwiddie		254.57	254.67	0.11	VACSDGS01, VDEQ3[c]
AP-1	Coastal Plain		Virginia	Dinwiddie	13-019-A004	254.67	255.14	0.50	P-VACSDGS01 or P-VACSDGS02
AP-1	Coastal Plain		Virginia	Dinwiddie		255.14	258.89	3.64	VACSDGS01, VDEQ3[c]
AP-1	Coastal Plain		Virginia	Dinwiddie	13-036-A001	258.89	259.28	0.37	P-VACSDGS01 or P-VACSDGS02
AP-1	Coastal Plain		Virginia	Dinwiddie	13-038	259.28	259.61	0.33	P-VACSDGS01 or P-VACSDGS02
AP-1	Coastal Plain		Virginia	Dinwiddie		259.61	259.66	0.05	VACSDGS01, VDEQ3[c]
AP-1	Coastal Plain		Virginia	Dinwiddie	13-039	259.66	260.01	0.34	P-VACSDGS01 or P-VACSDGS02
AP-1	Coastal Plain		Virginia	Dinwiddie	13-041	260.01	260.70	0.69	P-VACSDGS01 or P-VACSDGS02
AP-1	Coastal Plain		Virginia	Dinwiddie		260.70	260.71	0.01	VACSDGS01, VDEQ3[c]
AP-1	Piedmont		Virginia	Brunswick		260.71	260.97	0.26	VABCHNP01 or VABCHNP02, VDEQ2[c]
AP-1	Piedmont		Virginia	Brunswick	14-003	260.97	261.26	0.29	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Brunswick		261.26	261.46	0.20	VABCHNP01 or VABCHNP02, VDEQ2[c]
AP-1	Piedmont		Virginia	Brunswick	14-005	261.46	261.92	0.47	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Brunswick	14-006	261.92	262.27	0.34	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Brunswick	14-007	262.27	262.35	0.08	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Brunswick	14-008	262.35	262.54	0.20	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Brunswick	14-009	262.54	262.83	0.29	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Brunswick		262.83	262.89	0.06	VABCHNP01 or VABCHNP02, VDEQ2[c]
AP-1	Piedmont		Virginia	Brunswick	14-012	262.89	263.16	0.28	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Brunswick	14-013	263.16	263.49	0.34	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Brunswick		263.49	263.51	0.03	VABCHNP01 or VABCHNP02, VDEQ2[c]
AP-1	Piedmont		Virginia	Brunswick	14-013	263.51	263.90	0.39	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Brunswick		263.90	264.58	0.67	VABCHNP01 or VABCHNP02, VDEQ2[c]
AP-1	Piedmont		Virginia	Brunswick	14-020	264.58	264.99	0.42	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Brunswick		264.99	265.02	0.03	VABCHNP01 or VABCHNP02, VDEQ2[c]
AP-1	Piedmont		Virginia	Brunswick	14-020	265.02	265.15	0.14	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Brunswick	14-020-A002	265.15	265.41	0.26	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Brunswick		265.41	265.45	0.05	VABCHNP01 or VABCHNP02, VDEQ2[c]
AP-1	Piedmont		Virginia	Brunswick	14-024	265.45	266.05	0.60	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Brunswick	14-024-A001	266.05	266.45	0.40	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Brunswick	14-024-A002	266.45	266.57	0.12	P-VABCHNP01 or P-VABCHNP02

APPENDIX C

Recommended Seed Mixes by Milepost

Pipeline Facility	Physiographic Province	Federal/State or Commonwealth Land	State	County	Potential Pollinator Habitat Parcel[a]	From MP	To MP	Miles Crossed	Recommended Seed Mix[b]
AP-1	Piedmont		Virginia	Brunswick		266.57	266.83	0.26	VABCHNP01 or VABCHNP02, VDEQ2[c]
AP-1	Piedmont		Virginia	Brunswick	14-024-A004	266.83	266.91	0.08	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Brunswick		266.91	266.99	0.08	VABCHNP01 or VABCHNP02, VDEQ2[c]
AP-1	Piedmont		Virginia	Brunswick	14-024-A004	266.99	267.69	0.66	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Brunswick		267.69	267.71	0.02	VABCHNP01 or VABCHNP02, VDEQ2[c]
AP-1	Piedmont		Virginia	Brunswick	14-024-A004	267.71	267.91	0.19	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Brunswick		267.91	269.91	2.00	VABCHNP01 or VABCHNP02, VDEQ2[c]
AP-1	Piedmont		Virginia	Brunswick	14-024-A015	269.91	270.16	0.26	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Brunswick		270.16	270.20	0.05	VABCHNP01 or VABCHNP02, VDEQ2[c]
AP-1	Piedmont		Virginia	Brunswick	14-024-A015	270.20	270.38	0.18	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Brunswick		270.38	271.51	1.14	VABCHNP01 or VABCHNP02, VDEQ2[c]
AP-1	Piedmont		Virginia	Brunswick	14-024-A024	271.51	271.62	0.12	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Brunswick	14-024-A025	271.62	271.92	0.31	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Brunswick		271.92	272.00	0.08	VABCHNP01 or VABCHNP02, VDEQ2[c]
AP-1	Piedmont		Virginia	Brunswick	14-024-A027	272.00	273.01	1.01	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Brunswick		273.01	273.05	0.05	VABCHNP01 or VABCHNP02, VDEQ2[c]
AP-1	Piedmont		Virginia	Brunswick	14-050	273.05	273.48	0.44	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Brunswick	14-054	273.48	274.07	0.59	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Brunswick		274.07	275.69	1.62	VABCHNP01 or VABCHNP02, VDEQ2[c]
AP-1	Piedmont		Virginia	Brunswick	14-053-A012	275.69	275.92	0.24	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Brunswick	14-053-A011	275.92	276.11	0.19	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Brunswick		276.11	276.14	0.04	VABCHNP01 or VABCHNP02, VDEQ2[c]
AP-1	Piedmont		Virginia	Brunswick	14-053-A014	276.14	276.20	0.07	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Brunswick	14-053-A015	276.20	276.43	0.23	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Brunswick		276.43	276.51	0.08	VABCHNP01 or VABCHNP02, VDEQ2[c]
AP-1	Piedmont		Virginia	Brunswick	14-053-A018	276.51	276.83	0.32	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Brunswick	14-053-A019	276.83	277.18	0.35	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Brunswick		277.18	277.41	0.23	VABCHNP01 or VABCHNP02, VDEQ2[c]
AP-1	Piedmont		Virginia	Brunswick	14-053-A021	277.41	277.61	0.21	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Brunswick	14-053-A023	277.61	277.78	0.19	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Brunswick		277.78	277.89	0.10	VABCHNP01 or VABCHNP02, VDEQ2[c]
AP-1	Piedmont		Virginia	Brunswick	14-053-A026	277.89	278.37	0.48	P-VABCHNP01 or P-VABCHNP02

APPENDIX C

Recommended Seed Mixes by Milepost

Pipeline Facility	Physiographic Province	Federal/State or Commonwealth Land	State	County	Potential Pollinator Habitat Parcel[a]	From MP	To MP	Miles Crossed	Recommended Seed Mix[b]
AP-1	Piedmont		Virginia	Brunswick		278.37	278.56	0.19	VABCHNP01 or VABCHNP02, VDEQ2[c]
AP-1	Piedmont		Virginia	Brunswick	14-053-A030	278.56	278.85	0.28	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Brunswick		278.85	280.73	1.90	VABCHNP01 or VABCHNP02, VDEQ2[c]
AP-1	Piedmont		Virginia	Brunswick	14-111	280.73	280.83	0.11	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Brunswick		280.83	282.46	1.63	VABCHNP01 or VABCHNP02, VDEQ2[c]
AP-1	Piedmont		Virginia	Brunswick	14-098	282.46	282.94	0.49	P-VABCHNP01 or P-VABCHNP02
AP-1	Piedmont		Virginia	Brunswick		282.94	283.03	0.09	VABCHNP01 or VABCHNP02, VDEQ2[c]
AP-1	Coastal Plain		Virginia	Greensville		283.03	284.81	1.79	VACSDGS01, VDEQ3[c]
AP-1	Coastal Plain		Virginia	Greensville	15-012	284.81	285.09	0.28	P-VACSDGS01 or P-VACSDGS02
AP-1	Coastal Plain		Virginia	Greensville		285.09	288.22	3.10	VACSDGS01, VDEQ3[c]
AP-1	Coastal Plain		Virginia	Greensville	15-020	288.22	288.46	0.24	P-VACSDGS01 or P-VACSDGS02
AP-1	Coastal Plain		Virginia	Greensville		288.46	288.56	0.11	VACSDGS01, VDEQ3[c]
AP-1	Coastal Plain		Virginia	Greensville	15-022	288.56	288.75	0.19	P-VACSDGS01 or P-VACSDGS02
AP-1	Coastal Plain		Virginia	Greensville		288.75	300.06	11.61	VACSDGS01, VDEQ3[c]
AP-1	Coastal Plain		North Carolina	Northampton	16-001	300.06	300.23	0.16	P-CPDW01 or P-CPDW02
AP-2	Coastal Plain		North Carolina	Northampton	16-001	0.00	0.76	0.74	P-CPDW01 or P-CPDW02
AP-2	Coastal Plain		North Carolina	Northampton		0.76	9.87	9.21	NCNO01 or NCNO02
AP-2	Coastal Plain		North Carolina	Halifax	17-001	9.87	10.16	0.29	P-CPDW01 or P-CPDW02
AP-2	Coastal Plain		North Carolina	Halifax		10.16	10.63	0.47	NCHW01
AP-2	Coastal Plain		North Carolina	Halifax	17-001	10.63	10.72	0.09	P-CPDW01 or P-CPDW02
AP-2	Coastal Plain		North Carolina	Halifax	17-003	10.72	11.65	0.93	P-CPDW01 or P-CPDW02
AP-2	Coastal Plain		North Carolina	Halifax		11.65	13.95	2.46	NCHW01
AP-2	Coastal Plain		North Carolina	Halifax	17-016	13.95	14.01	0.07	P-CPDW01 or P-CPDW02
AP-2	Coastal Plain		North Carolina	Halifax		14.01	14.07	0.07	NCHW01
AP-2	Coastal Plain		North Carolina	Halifax	17-016	14.07	14.20	0.14	P-CPDW01 or P-CPDW02
AP-2	Coastal Plain		North Carolina	Halifax	17-017	14.20	14.36	0.17	P-CPDW01 or P-CPDW02
AP-2	Coastal Plain		North Carolina	Halifax	17-020	14.36	14.54	0.21	P-CPDW01 or P-CPDW02
AP-2	Coastal Plain		North Carolina	Halifax		14.54	14.66	0.14	NCHW01
AP-2	Coastal Plain		North Carolina	Halifax	17-021	14.66	14.90	0.28	P-CPDW01 or P-CPDW02
AP-2	Coastal Plain		North Carolina	Halifax		14.90	14.95	0.04	NCHW01
AP-2	Coastal Plain		North Carolina	Halifax	17-023	14.95	15.31	0.42	P-CPDW01 or P-CPDW02
AP-2	Coastal Plain		North Carolina	Halifax		15.31	18.17	2.92	NCHW01

APPENDIX C

Recommended Seed Mixes by Milepost

Pipeline Facility	Physiographic Province	Federal/State or Commonwealth Land	State	County	Potential Pollinator Habitat Parcel[a]	From MP	To MP	Miles Crossed	Recommended Seed Mix[b]
AP-2	Coastal Plain		North Carolina	Halifax	17-035	18.17	18.52	0.36	P-CPDW01 or P-CPDW02
AP-2	Coastal Plain		North Carolina	Halifax		18.52	19.16	0.64	NCHW01
AP-2	Coastal Plain		North Carolina	Halifax	17-038	19.16	19.57	0.42	P-CPDW01 or P-CPDW02
AP-2	Coastal Plain		North Carolina	Halifax	17-039	19.57	20.24	0.67	P-CPDW01 or P-CPDW02
AP-2	Coastal Plain		North Carolina	Halifax		20.24	22.26	2.02	NCHW01
AP-2	Coastal Plain		North Carolina	Halifax	17-050	22.26	22.50	0.24	P-CPDW01 or P-CPDW02
AP-2	Coastal Plain		North Carolina	Halifax		22.50	22.51	0.01	NCHW01
AP-2	Coastal Plain		North Carolina	Halifax	17-050	22.51	23.12	0.61	P-CPDW01 or P-CPDW02
AP-2	Coastal Plain		North Carolina	Halifax		23.12	23.78	0.66	NCHW01
AP-2	Coastal Plain		North Carolina	Halifax	17-060	23.78	24.01	0.24	P-CPDW01 or P-CPDW02
AP-2	Coastal Plain		North Carolina	Halifax	17-062	24.01	24.62	0.60	P-CPDW01 or P-CPDW02
AP-2	Coastal Plain		North Carolina	Halifax		24.62	29.11	4.50	NCHW01
AP-2	Coastal Plain		North Carolina	Halifax	17-095	29.11	29.37	0.26	P-CPDW01 or P-CPDW02
AP-2	Coastal Plain		North Carolina	Halifax	17-096	29.37	30.09	0.72	P-CPDW01 or P-CPDW02
AP-2	Coastal Plain		North Carolina	Halifax		30.09	30.93	0.84	NCHW01
AP-2	Coastal Plain		North Carolina	Halifax	17-102	30.93	31.24	0.31	P-CPDW01 or P-CPDW02
AP-2	Coastal Plain		North Carolina	Halifax	17-103	31.24	31.46	0.22	P-CPDW01 or P-CPDW02
AP-2	Coastal Plain		North Carolina	Halifax		31.46	33.48	2.02	NCHW01
AP-2	Coastal Plain		North Carolina	Halifax	17-110	33.48	33.92	0.44	P-CPDW01 or P-CPDW02
AP-2	Coastal Plain		North Carolina	Halifax		33.92	33.93	0.01	NCHW01
AP-2	Coastal Plain		North Carolina	Nash		33.93	35.21	1.28	NCNJ01
AP-2	Coastal Plain		North Carolina	Nash	18-003-A001	35.21	35.99	0.81	P-CPDW01 or P-CPDW02
AP-2	Coastal Plain		North Carolina	Nash	18-006	35.99	36.44	0.45	P-CPDW01 or P-CPDW02
AP-2	Coastal Plain		North Carolina	Nash		36.44	37.85	1.41	NCNJ01
AP-2	Coastal Plain		North Carolina	Nash	18-015	37.85	37.98	0.13	P-CPDW01 or P-CPDW02
AP-2	Coastal Plain		North Carolina	Nash	18-017	37.98	38.01	0.04	P-CPDW01 or P-CPDW02
AP-2	Coastal Plain		North Carolina	Nash		38.01	38.03	0.02	NCNJ01
AP-2	Coastal Plain		North Carolina	Nash	18-017	38.03	38.17	0.14	P-CPDW01 or P-CPDW02
AP-2	Coastal Plain		North Carolina	Nash		38.17	38.24	0.07	NCNJ01
AP-2	Coastal Plain		North Carolina	Nash	18-020	38.24	38.68	0.45	P-CPDW01 or P-CPDW02
AP-2	Coastal Plain		North Carolina	Nash	18-023	38.68	38.82	0.15	P-CPDW01 or P-CPDW02
AP-2	Coastal Plain		North Carolina	Nash	18-024	38.82	38.95	0.13	P-CPDW01 or P-CPDW02

APPENDIX C

Recommended Seed Mixes by Milepost

Pipeline Facility	Physiographic Province	Federal/State or Commonwealth Land	State	County	Potential Pollinator Habitat Parcel[a]	From MP	To MP	Miles Crossed	Recommended Seed Mix[b]
AP-2	Coastal Plain		North Carolina	Nash	18-025	38.95	39.26	0.31	P-CPDW01 or P-CPDW02
AP-2	Coastal Plain		North Carolina	Nash		39.26	39.54	0.29	NCNJ01
AP-2	Coastal Plain		North Carolina	Nash	18-029	39.54	39.60	0.06	P-CPDW01 or P-CPDW02
AP-2	Coastal Plain		North Carolina	Nash		39.60	39.61	0.01	NCNJ01
AP-2	Coastal Plain		North Carolina	Nash	18-029	39.61	39.64	0.03	P-CPDW01 or P-CPDW02
AP-2	Coastal Plain		North Carolina	Nash		39.64	39.70	0.07	NCNJ01
AP-2	Coastal Plain		North Carolina	Nash	18-029	39.70	39.87	0.18	P-CPDW01 or P-CPDW02
AP-2	Coastal Plain		North Carolina	Nash		39.87	40.58	0.71	NCNJ01
AP-2	Coastal Plain		North Carolina	Nash	18-039	40.58	40.76	0.17	P-CPDW01 or P-CPDW02
AP-2	Coastal Plain		North Carolina	Nash	18-041	40.76	40.79	0.05	P-CPDW01 or P-CPDW02
AP-2	Coastal Plain		North Carolina	Nash		40.79	41.58	0.78	NCNJ01
AP-2	Coastal Plain		North Carolina	Nash	18-047	41.58	41.78	0.20	P-CPDW01 or P-CPDW02
AP-2	Coastal Plain		North Carolina	Nash	18-048	41.78	41.87	0.10	P-CPDW01 or P-CPDW02
AP-2	Coastal Plain		North Carolina	Nash		41.87	42.56	0.70	NCNJ01
AP-2	Coastal Plain		North Carolina	Nash	18-056	42.56	42.71	0.16	P-CPDW01 or P-CPDW02
AP-2	Coastal Plain		North Carolina	Nash	18-058	42.71	43.09	0.38	P-CPDW01 or P-CPDW02
AP-2	Coastal Plain		North Carolina	Nash		43.09	43.71	0.62	NCNJ01
AP-2	Coastal Plain		North Carolina	Nash	18-058-A006	43.71	44.06	0.35	P-CPDW01 or P-CPDW02
AP-2	Coastal Plain		North Carolina	Nash		44.06	44.07	0.01	NCNJ01
AP-2	Coastal Plain		North Carolina	Nash	18-058-A006	44.07	44.27	0.20	P-CPDW01 or P-CPDW02
AP-2	Coastal Plain		North Carolina	Nash		44.27	46.52	2.25	NCNJ01
AP-2	Coastal Plain		North Carolina	Nash	18-083	46.52	46.85	0.33	P-CPDW01 or P-CPDW02
AP-2	Coastal Plain		North Carolina	Nash		46.85	46.86	0.01	NCNJ01
AP-2	Coastal Plain		North Carolina	Nash	18-083	46.86	47.55	0.69	P-CPDW01 or P-CPDW02
AP-2	Coastal Plain		North Carolina	Nash		47.55	58.65	11.15	NCNJ01
AP-2	Coastal Plain		North Carolina	Nash	18-194	58.65	58.72	0.07	P-CPDW01 or P-CPDW02
AP-2	Coastal Plain		North Carolina	Nash		58.72	58.73	0.01	NCNJ01
AP-2	Coastal Plain		North Carolina	Nash	18-194	58.73	59.41	0.67	P-CPDW01 or P-CPDW02
AP-2	Coastal Plain		North Carolina	Nash		59.41	65.84	6.43	NCNJ01
AP-2	Coastal Plain		North Carolina	Wilson		65.84	72.28	6.53	NCHW01
AP-2	Coastal Plain		North Carolina	Wilson	19-044	72.28	72.61	0.33	P-CPDW01 or P-CPDW02
AP-2	Coastal Plain		North Carolina	Wilson		72.61	72.68	0.07	NCHW01

APPENDIX C

Recommended Seed Mixes by Milepost

Pipeline Facility	Physiographic Province	Federal/State or Commonwealth Land	State	County	Potential Pollinator Habitat Parcel[a]	From MP	To MP	Miles Crossed	Recommended Seed Mix[b]
AP-2	Coastal Plain		North Carolina	Wilson	19-047	72.68	73.02	0.34	P-CPDW01 or P-CPDW02
AP-2	Coastal Plain		North Carolina	Wilson		73.02	73.41	0.40	NCHW01
AP-2	Coastal Plain		North Carolina	Wilson	19-051	73.41	73.64	0.22	P-CPDW01 or P-CPDW02
AP-2	Coastal Plain		North Carolina	Wilson	19-054	73.64	73.97	0.36	P-CPDW01 or P-CPDW02
AP-2	Coastal Plain		North Carolina	Wilson		73.97	77.02	3.09	NCHW01
AP-2	Coastal Plain		North Carolina	Wilson	19-083	77.02	77.49	0.47	P-CPDW01 or P-CPDW02
AP-2	Coastal Plain		North Carolina	Wilson		77.49	77.69	0.21	NCHW01
AP-2	Coastal Plain		North Carolina	Wilson	20-001	77.69	77.70	0.01	P-CPDW01 or P-CPDW02
AP-2	Coastal Plain		North Carolina	Johnston	20-001	77.70	77.89	0.19	P-CPDW01 or P-CPDW02
AP-2	Coastal Plain		North Carolina	Johnston		77.89	78.20	0.31	NCNJ01
AP-2	Coastal Plain		North Carolina	Johnston	20-003	78.20	78.24	0.05	P-CPDW01 or P-CPDW02
AP-2	Coastal Plain		North Carolina	Johnston	20-004	78.24	78.31	0.07	P-CPDW01 or P-CPDW02
AP-2	Coastal Plain		North Carolina	Johnston		78.31	78.44	0.13	NCNJ01
AP-2	Coastal Plain		North Carolina	Johnston	20-004	78.44	78.62	0.19	P-CPDW01 or P-CPDW02
AP-2	Coastal Plain		North Carolina	Johnston		78.62	91.07	12.27	NCNJ01
AP-2	Coastal Plain		North Carolina	Johnston	20-117	91.07	91.35	0.28	P-CPDW01 or P-CPDW02
AP-2	Coastal Plain		North Carolina	Johnston		91.35	91.36	0.01	NCNJ01
AP-2	Coastal Plain		North Carolina	Johnston	20-117	91.36	91.69	0.33	P-CPDW01 or P-CPDW02
AP-2	Coastal Plain		North Carolina	Johnston		91.69	91.77	0.09	NCNJ01
AP-2	Coastal Plain		North Carolina	Johnston	20-120	91.77	91.91	0.14	P-CPDW01 or P-CPDW02
AP-2	Coastal Plain		North Carolina	Johnston	20-121	91.91	92.13	0.27	P-CPDW01 or P-CPDW02
AP-2	Coastal Plain		North Carolina	Johnston		92.13	92.18	0.06	NCNJ01
AP-2	Coastal Plain		North Carolina	Johnston	20-121	92.18	92.37	0.25	P-CPDW01 or P-CPDW02
AP-2	Coastal Plain		North Carolina	Johnston		92.37	101.27	9.80	NCNJ01
AP-2	Coastal Plain		North Carolina	Johnston	20-171	101.27	101.49	0.22	P-CPDW01 or P-CPDW02
AP-2	Coastal Plain		North Carolina	Johnston		101.49	102.01	0.53	NCNJ01
AP-2	Coastal Plain		North Carolina	Johnston	20-176	102.01	102.24	0.23	P-CPDW01 or P-CPDW02
AP-2	Coastal Plain		North Carolina	Johnston		102.24	103.22	0.98	NCNJ01
AP-2	Coastal Plain		North Carolina	Johnston	20-191	103.22	103.34	0.12	P-CPDW01 or P-CPDW02
AP-2	Coastal Plain		North Carolina	Johnston	20-193	103.34	103.63	0.31	P-CPDW01 or P-CPDW02
AP-2	Coastal Plain		North Carolina	Johnston		103.63	112.51	8.90	NCNJ01
AP-2	Coastal Plain		North Carolina	Johnston	20-250-A026	112.51	112.60	0.09	P-CPDW01 or P-CPDW02

APPENDIX C

Recommended Seed Mixes by Milepost

Pipeline Facility	Physiographic Province	Federal/State or Commonwealth Land	State	County	Potential Pollinator Habitat Parcel[a]	From MP	To MP	Miles Crossed	Recommended Seed Mix[b]
AP-2	Coastal Plain		North Carolina	Johnston		112.60	112.69	0.17	NCNJ01
AP-2	Coastal Plain		North Carolina	Johnston	20-250-A026	112.69	112.85	0.17	P-CPDW01 or P-CPDW02
AP-2	Coastal Plain		North Carolina	Johnston		112.85	114.92	2.12	NCNJ01
AP-2	Coastal Plain		North Carolina	Sampson		114.92	117.14	2.24	NCSA01 or NCSA02
AP-2	Coastal Plain		North Carolina	Sampson	21-025	117.14	117.56	0.43	P-CPDW01 or P-CPDW02
AP-2	Coastal Plain		North Carolina	Sampson		117.56	117.57	0.01	NCSA01 or NCSA02
AP-2	Coastal Plain		North Carolina	Sampson	21-025	117.57	117.74	0.17	P-CPDW01 or P-CPDW02
AP-2	Coastal Plain		North Carolina	Sampson		117.74	117.75	0.01	NCSA01 or NCSA02
AP-2	Coastal Plain		North Carolina	Sampson	21-025	117.75	118.29	0.54	P-CPDW01 or P-CPDW02
AP-2	Coastal Plain		North Carolina	Sampson		118.29	122.72	4.43	NCSA01 or NCSA02
AP-2	Coastal Plain		North Carolina	Cumberland		122.72	125.99	3.28	NCCU01
AP-2	Coastal Plain		North Carolina	Cumberland	22-022	125.99	126.31	0.32	P-CPDW01 or P-CPDW02
AP-2	Coastal Plain		North Carolina	Cumberland		126.31	126.81	0.51	NCCU01
AP-2	Coastal Plain		North Carolina	Cumberland	22-036	126.81	127.19	0.38	P-CPDW01 or P-CPDW02
AP-2	Coastal Plain		North Carolina	Cumberland	22-038	127.19	127.35	0.16	P-CPDW01 or P-CPDW02
AP-2	Coastal Plain		North Carolina	Cumberland	22-039	127.35	127.71	0.37	P-CPDW01 or P-CPDW02
AP-2	Coastal Plain		North Carolina	Cumberland	22-044	127.71	128.13	0.42	P-CPDW01 or P-CPDW02
AP-2	Coastal Plain		North Carolina	Cumberland		128.13	128.14	0.01	NCCU01
AP-2	Coastal Plain		North Carolina	Cumberland	22-044	128.14	128.29	0.15	P-CPDW01 or P-CPDW02
AP-2	Coastal Plain		North Carolina	Cumberland		128.29	128.31	0.02	NCCU01
AP-2	Coastal Plain		North Carolina	Cumberland	22-044	128.31	128.42	0.11	P-CPDW01 or P-CPDW02
AP-2	Coastal Plain		North Carolina	Cumberland	22-050	128.42	129.04	0.62	P-CPDW01 or P-CPDW02
AP-2	Coastal Plain		North Carolina	Cumberland		129.04	130.17	1.13	NCCU01
AP-2	Coastal Plain		North Carolina	Cumberland	22-064	130.17	130.41	0.25	P-CPDW01 or P-CPDW02
AP-2	Coastal Plain		North Carolina	Cumberland	22-065	130.41	130.55	0.15	P-CPDW01 or P-CPDW02
AP-2	Coastal Plain		North Carolina	Cumberland	22-066	130.55	130.97	0.42	P-CPDW01 or P-CPDW02
AP-2	Coastal Plain		North Carolina	Cumberland		130.97	131.21	0.24	NCCU01
AP-2	Coastal Plain		North Carolina	Cumberland	22-066	131.21	131.30	0.09	P-CPDW01 or P-CPDW02
AP-2	Coastal Plain		North Carolina	Cumberland		131.30	132.22	0.93	NCCU01
AP-2	Coastal Plain		North Carolina	Cumberland	22-077	132.22	132.33	0.11	P-CPDW01 or P-CPDW02
AP-2	Coastal Plain		North Carolina	Cumberland	22-078	132.33	132.40	0.07	P-CPDW01 or P-CPDW02
AP-2	Coastal Plain		North Carolina	Cumberland	22-079	132.40	132.45	0.06	P-CPDW01 or P-CPDW02

APPENDIX C

Recommended Seed Mixes by Milepost

Pipeline Facility	Physiographic Province	Federal/State or Commonwealth Land	State	County	Potential Pollinator Habitat Parcel[a]	From MP	To MP	Miles Crossed	Recommended Seed Mix[b]
AP-2	Coastal Plain		North Carolina	Cumberland		132.45	132.46	0.01	NCCU01
AP-2	Coastal Plain		North Carolina	Cumberland	22-080	132.46	132.84	0.39	P-CPDW01 or P-CPDW02
AP-2	Coastal Plain		North Carolina	Cumberland		132.84	132.85	0.01	NCCU01
AP-2	Coastal Plain		North Carolina	Cumberland	22-083	132.85	133.20	0.36	P-CPDW01 or P-CPDW02
AP-2	Coastal Plain		North Carolina	Cumberland		133.20	133.65	0.48	NCCU01
AP-2	Coastal Plain		North Carolina	Cumberland	22-085-A003	133.65	134.20	0.52	P-CPDW01 or P-CPDW02
AP-2	Coastal Plain		North Carolina	Cumberland		134.20	137.14	3.16	NCCU01
AP-2	Coastal Plain		North Carolina	Cumberland	22-085-A035	137.14	137.51	0.41	P-CPDW01 or P-CPDW02
AP-2	Coastal Plain		North Carolina	Cumberland	22-085-A036	137.51	137.97	0.49	P-CPDW01 or P-CPDW02
AP-2	Coastal Plain		North Carolina	Cumberland		137.97	144.59	7.09	NCCU01
AP-2	Coastal Plain		North Carolina	Cumberland	22-085-A080	144.59	144.71	0.13	P-CPDW01 or P-CPDW02
AP-2	Coastal Plain		North Carolina	Cumberland	22-085-A082	144.71	144.97	0.28	P-CPDW01 or P-CPDW02
AP-2	Coastal Plain		North Carolina	Cumberland		144.97	146.68	1.84	NCCU01
AP-2	Coastal Plain		North Carolina	Cumberland	22-085-A099	146.68	147.02	0.36	P-CPDW01 or P-CPDW02
AP-2	Coastal Plain		North Carolina	Cumberland		147.02	147.05	0.04	NCCU01
AP-2	Coastal Plain		North Carolina	Cumberland	22-085-A099	147.05	147.15	0.10	P-CPDW01 or P-CPDW02
AP-2	Coastal Plain		North Carolina	Cumberland		147.15	147.31	0.18	NCCU01
AP-2	Coastal Plain		North Carolina	Cumberland	22-085-A105	147.31	147.42	0.13	P-CPDW01 or P-CPDW02
AP-2	Coastal Plain		North Carolina	Cumberland	22-085-A106	147.42	147.64	0.24	P-CPDW01 or P-CPDW02
AP-2	Coastal Plain		North Carolina	Cumberland	22-085-A107	147.64	147.90	0.28	P-CPDW01 or P-CPDW02
AP-2	Coastal Plain		North Carolina	Cumberland		147.90	147.94	0.05	NCCU01
AP-2	Coastal Plain		North Carolina	Cumberland	22-085-A109	147.94	148.20	0.28	P-CPDW01 or P-CPDW02
AP-2	Coastal Plain		North Carolina	Cumberland		148.20	149.41	1.31	NCCU01
AP-2	Coastal Plain		North Carolina	Cumberland	22-085-A123	149.41	150.11	0.75	P-CPDW01 or P-CPDW02
AP-2	Coastal Plain		North Carolina	Cumberland		150.11	151.12	1.18	NCCU01
AP-2	Coastal Plain		North Carolina	Cumberland	22-085-A131	151.12	151.57	0.49	P-CPDW01 or P-CPDW02
AP-2	Coastal Plain		North Carolina	Cumberland		151.57	151.60	0.04	NCCU01
AP-2	Coastal Plain		North Carolina	Cumberland	22-085-A131	151.60	152.13	0.61	P-CPDW01 or P-CPDW02
AP-2	Coastal Plain		North Carolina	Cumberland		152.13	152.57	0.48	NCCU01
AP-2	Coastal Plain		North Carolina	Cumberland	22-085-A137	152.57	152.73	0.17	P-CPDW01 or P-CPDW02
AP-2	Coastal Plain		North Carolina	Cumberland	22-085-A136	152.73	153.01	0.33	P-CPDW01 or P-CPDW02
AP-2	Coastal Plain		North Carolina	Cumberland		153.01	153.03	0.02	NCCU01

APPENDIX C

Recommended Seed Mixes by Milepost

Pipeline Facility	Physiographic Province	Federal/State or Commonwealth Land	State	County	Potential Pollinator Habitat Parcel[a]	From MP	To MP	Miles Crossed	Recommended Seed Mix[b]
AP-2	Coastal Plain		North Carolina	Cumberland	22-085-A136	153.03	153.17	0.17	P-CPDW01 or P-CPDW02
AP-2	Coastal Plain		North Carolina	Cumberland	22-085-A141	153.17	153.44	0.30	P-CPDW01 or P-CPDW02
AP-2	Coastal Plain		North Carolina	Cumberland	22-085-A142	153.44	153.60	0.18	P-CPDW01 or P-CPDW02
AP-2	Coastal Plain		North Carolina	Cumberland	22-085-A143	153.60	153.73	0.15	P-CPDW01 or P-CPDW02
AP-2	Coastal Plain		North Carolina	Cumberland		153.73	153.74	0.01	NCCU01
AP-2	Coastal Plain		North Carolina	Cumberland	22-085-A143	153.74	154.17	0.47	P-CPDW01 or P-CPDW02
AP-2	Coastal Plain		North Carolina	Cumberland		154.17	160.45	6.52	NCCU01
AP-2	Coastal Plain		North Carolina	Robeson		160.45	170.21	9.71	NCRO01
AP-2	Coastal Plain		North Carolina	Robeson	24-039	170.21	170.27	0.06	P-CPDW01 or P-CPDW02
AP-2	Coastal Plain		North Carolina	Robeson	24-040	170.27	170.43	0.16	P-CPDW01 or P-CPDW02
AP-2	Coastal Plain		North Carolina	Robeson		170.43	170.44	0.01	NCRO01
AP-2	Coastal Plain		North Carolina	Robeson	24-041	170.44	171.25	0.81	P-CPDW01 or P-CPDW02
AP-2	Coastal Plain		North Carolina	Robeson		171.25	171.26	0.01	NCRO01
AP-2	Coastal Plain		North Carolina	Robeson	24-041	171.26	171.54	0.29	P-CPDW01 or P-CPDW02
AP-2	Coastal Plain		North Carolina	Robeson		171.54	173.36	1.79	NCRO01
AP-2	Coastal Plain		North Carolina	Robeson	24-049	173.36	173.70	0.35	P-CPDW01 or P-CPDW02
AP-2	Coastal Plain		North Carolina	Robeson		173.70	173.71	0.01	NCRO01
AP-2	Coastal Plain		North Carolina	Robeson	24-049	173.71	174.03	0.32	P-CPDW01 or P-CPDW02
AP-2	Coastal Plain		North Carolina	Robeson		174.03	180.36	6.30	NCRO01
AP-2	Coastal Plain		North Carolina	Robeson	24-085	180.36	180.69	0.33	P-CPDW01 or P-CPDW02
AP-2	Coastal Plain		North Carolina	Robeson		180.69	180.70	0.01	NCRO01
AP-2	Coastal Plain		North Carolina	Robeson	24-085	180.70	181.31	0.61	P-CPDW01 or P-CPDW02
AP-2	Coastal Plain		North Carolina	Robeson		181.31	182.95	1.64	NCRO01
AP-3	Coastal Plain		North Carolina	Northampton	16-001	0.00	0.61	0.57	P-CPDW01 or P-CPDW02
AP-3	Coastal Plain		North Carolina	Northampton		0.61	0.72	0.11	NCNO01 or NCNO02
AP-3	Coastal Plain		North Carolina	Northampton	16-050	0.72	1.10	0.39	P-CPDW01 or P-CPDW02
AP-3	Coastal Plain		North Carolina	Northampton		1.10	1.44	0.35	NCNO01 or NCNO02
AP-3	Coastal Plain		North Carolina	Northampton	16-055	1.44	1.69	0.24	P-CPDW01 or P-CPDW02
AP-3	Coastal Plain		North Carolina	Northampton	16-056	1.69	1.95	0.26	P-CPDW01 or P-CPDW02
AP-3	Coastal Plain		North Carolina	Northampton		1.95	12.21	10.33	NCNO01 or NCNO02
AP-3	Coastal Plain		Virginia	Greensville		12.21	12.40	0.20	VACSDGS01, VDEQ3[c]
AP-3	Coastal Plain		Virginia	Southampton		12.40	21.04	8.72	VACSDGS01, VDEQ3[c]

APPENDIX C

Recommended Seed Mixes by Milepost

Pipeline Facility	Physiographic Province	Federal/State or Commonwealth Land	State	County	Potential Pollinator Habitat Parcel[a]	From MP	To MP	Miles Crossed	Recommended Seed Mix[b]
AP-3	Coastal Plain		Virginia	Southampton	25-036-A001	21.04	21.34	0.31	P-VACSDGS01 or P-VACSDGS02
AP-3	Coastal Plain		Virginia	Southampton		21.34	26.84	5.53	VACSDGS01, VDEQ3[c]
AP-3	Coastal Plain		Virginia	Southampton	25-062	26.84	27.39	0.59	P-VACSDGS01 or P-VACSDGS02
AP-3	Coastal Plain		Virginia	Southampton		27.39	28.14	0.75	VACSDGS01, VDEQ3[c]
AP-3	Coastal Plain		Virginia	Southampton	25-065	28.14	28.30	0.15	P-VACSDGS01 or P-VACSDGS02
AP-3	Coastal Plain		Virginia	Southampton		28.30	28.77	0.46	VACSDGS01, VDEQ3[c]
AP-3	Coastal Plain		Virginia	Southampton	25-068	28.77	29.20	0.41	P-VACSDGS01 or P-VACSDGS02
AP-3	Coastal Plain		Virginia	Southampton		29.20	29.25	0.06	VACSDGS01, VDEQ3[c]
AP-3	Coastal Plain		Virginia	Southampton	25-073	29.25	29.51	0.25	P-VACSDGS01 or P-VACSDGS02
AP-3	Coastal Plain		Virginia	Southampton		29.51	33.72	4.19	VACSDGS01, VDEQ3[c]
AP-3	Coastal Plain		Virginia	Southampton	25-089	33.72	33.97	0.26	P-VACSDGS01 or P-VACSDGS02
AP-3	Coastal Plain		Virginia	Southampton		33.97	35.86	1.89	VACSDGS01, VDEQ3[c]
AP-3	Coastal Plain		Virginia	Southampton	25-095	35.86	36.48	0.62	P-VACSDGS01 or P-VACSDGS02
AP-3	Coastal Plain		Virginia	Southampton		36.48	37.11	0.63	VACSDGS01, VDEQ3[c]
AP-3	Coastal Plain		Virginia	Southampton	25-098	37.11	37.47	0.36	P-VACSDGS01 or P-VACSDGS02
AP-3	Coastal Plain		Virginia	Southampton	25-099	37.47	37.80	0.33	P-VACSDGS01 or P-VACSDGS02
AP-3	Coastal Plain		Virginia	Southampton	25-100	37.80	38.10	0.30	P-VACSDGS01 or P-VACSDGS02
AP-3	Coastal Plain		Virginia	Southampton		38.10	38.58	0.48	VACSDGS01, VDEQ3[c]
AP-3	Coastal Plain		Virginia	Suffolk		38.58	39.95	1.35	VACSDGS01, VDEQ3[c]
AP-3	Coastal Plain		Virginia	Suffolk	26-012	39.95	40.60	0.66	P-VACSDGS01 or P-VACSDGS02
AP-3	Coastal Plain		Virginia	Suffolk		40.60	63.62	23.46	VACSDGS01, VDEQ3[c]
AP-3	Coastal Plain		Virginia	Suffolk	26-060-A080	63.62	64.35	0.73	P-VACSDGS01 or P-VACSDGS02
AP-3	Coastal Plain		Virginia	Suffolk		64.35	64.80	0.45	VACSDGS01, VDEQ3[c]
AP-3	Coastal Plain		Virginia	Suffolk	26-060-A082	64.80	65.63	0.83	P-VACSDGS01 or P-VACSDGS02
AP-3	Coastal Plain		Virginia	Suffolk	26-060-A083	65.63	65.88	0.25	P-VACSDGS01 or P-VACSDGS02
AP-3	Coastal Plain		Virginia	Suffolk		65.88	71.40	5.46	VACSDGS01, VDEQ3[c]
AP-3	Coastal Plain		Virginia	Chesapeake		71.40	82.70	11.26	VACSDGS01 VDEQ3[c]
AP-4	Piedmont		Virginia	Brunswick		0.00	0.41	0.41	VABCHNP01 or VABCHNP02, VDEQ2[c]
AP-5	Coastal Plain		Virginia	Greensville		0.00	0.98	0.97	VACSDGS01, VDEQ3[c]

APPENDIX C

Recommended Seed Mixes by Milepost

Pipeline Facility	Physiographic Province	Federal/State or Commonwealth Land	State	County	Potential Pollinator Habitat Parcel[a]	From MP	To MP	Miles Crossed	Recommended Seed Mix[b]
SUPPLY HEADER PROJECT									
TL-635	Mountain		West Virginia	Harrison		0.00	0.65	0.66	WVDH01
TL-635	Mountain		West Virginia	Doddridge		0.65	22.83	21.88	WVDH01
TL-635	Mountain		West Virginia	Tyler		22.83	23.56	0.71	WVWE01
TL-635	Mountain		West Virginia	Wetzel		23.56	23.69	0.14	WVWE01
TL-635	Mountain	Lewis Wetzel WMA	West Virginia	Wetzel		23.69	27.32	3.51	WVLWWMA01
TL-635	Mountain		West Virginia	Wetzel		27.32	27.62	0.30	WVWE01
TL-635	Mountain	Lewis Wetzel WMA	West Virginia	Wetzel		27.62	27.72	0.10	WVLWWMA01
TL-635	Mountain		West Virginia	Wetzel		27.72	33.53	5.65	WVWE01
TL-636	Mountain		Pennsylvania	Westmoreland		0.00	3.87	3.84	PAWE01

[a] If the parcel is not selected for pollinator habitat planting, the recommended grass and shrub mixture will be applied instead.

[b] See Appendix A for details on the recommended mixes.

[c] The recommended additional shrub seed mixture (VDEQ1, VDEQ2, or VDEQ3) will only be applied in areas that were forested prior to construction.

[d] Not Applicable. In this area, the pipeline will be installed using horizontal directional construction techniques.

Document Content(s)