Storm Water Pollution Prevention Plan (SWPPP)

Mountain Valley Pipeline Project
Spread 9

Mountain Valley Pipeline, LLC
2200 Energy Drive, Suite 200
Canonsburg, PA 15317

Stormwater Pollution Prevention Plan (SWPPP)

In compliance with:

Project Specific Standards and Specifications, including
Applicable Portions of the General VPDES Permit for Discharges of Stormwater
From Construction Activities, Permit No. VAR10
Virginia Stormwater Management Program (VSMP)

Mountain Valley Pipeline

SWPPP Coordinator:

Brian M. Clauto
(Name)

(Signature)

Sr. Environmental Coordinator
(Title)

EQT Corporation
(Company)

724-873-3465
(Phone #)

Delegation of Authority to SWPPP Coordinator:

Robert J. Cooper, SVP-MVP
Construction and Engineering
(Name of Person(s) or Position(s))

(Signature)

Mountain Valley Pipeline, LLC
(Company)

2200 Energy Drive, Suite 200
Canonsburg, PA 15317
(Address)

412-395-3361
(Phone #)

CERTIFICATION STATEMENT

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

Signature[1]:	**Date:**
Printed Name: Robert J. Cooper	**Title:** SVP-MVP Construction and Engineering

[1] Certification will be signed by a *responsible corporate officer* or by *a duly authorized representative* of that person. Specific requirements and responsibilities of the responsible corporate officer or duly authorized representative as well as delegate of authority to SWPPP Coordinator are discussed in detail below.

Certification of Stormwater Pollution Prevention Plan Revisions

Amendments, modifications, and updates will be made to the Stormwater Pollution Prevention Plan (SWPPP) whenever there is a change in the design, construction, operation, or maintenance that has a significant effect on the potential discharge of pollutants to surface waters. Revisions may include additional or modified control measures identified in the field during construction. These small field-approved changes will be documented and dated on the construction alignment sheets, site plans, and/or inspection reports. Revisions to the SWPPP narrative will be recorded within Appendix 2 in the format shown below, as necessary:

Signature[1]:		**Date:**
Printed Name:		**Title:**
Revision 1	**Revision Description:**	

Signature[1]:		**Date:**
Printed Name:		**Title:**
Revision 2	**Revision Description:**	

Signature[1]:		**Date:**
Printed Name:		**Title:**
Revision 3	**Revision Description:**	

Signatory Requirements

As stipulated in the Virginia Stormwater Management Act, the Virginia Erosion and Sediment Control Law, and associated regulations, where applicable; all reports, including SWPPPs, and other information requested by the State Water Control Board (Board) or DEQ will be signed by the following person or by a duly authorized representative of that person:

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

A person is a duly authorized representative only if:

- The authorization is made in writing by a responsible corporate officer
- The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for DETI (a duly authorized representative may thus be either a named individual or any individual occupying a named position); and
- The signed and dated written authorization is included in the SWPPP. A copy must be provided to DEQ, if requested.

Changes to authorization If a duly authorized person is no longer accurate because a different individual or position has responsibility for the overall operation of the construction activity, a new authorization satisfying the duly authorized person requirements will be submitted to DEQ prior to or together with any reports or information to be signed by an authorized representative.

Certification: Any person signing a document will make the following certification:

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

Delegation of Authority to SWPPP Coordinator

All reports required by the Virginia Stormwater Management Act, the Virginia Erosion and Sediment Control Law, and associated regulations, where applicable, including SWPPPs, and other information request by the Board or DEQ will be signed by a responsible corporate officer or by a duly authorized representative of that person. A person is a duly authorized representative only if:

- The authorization is made in writing by the responsible corporate officer;
- The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plan manager, operator of a well or well field, superintendent, position of equivalent responsibility, or an individual or a position having overall responsibility for environmental matters for the operator. (A duly authorized representative may thus be either named individual or any individual occupying a named position); and
- The signed and dated written authorization is included within the SWPPP.

If a duly authorized representative is no longer accurate because a different individual or position has responsibility for the overall operation of the construction activity, a new authorization satisfying the above requirements will be submitted to DEQ prior to or together with any reports or information to be signed by an authorized representative.

Mountain Valley Pipeline, Spread 9
Virginia Department of Environmental Quality

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Document	Approval/Revision Date*	Location On-Site*
MVP Specific Annual Standards & Specifications	June 20, 2017	
Joint Permit Application & Nationwide Permit 12	December 26, 2017	
FERC Documents	October 13, 2017	
George Washington-Jefferson National Forest	December 28, 2017	
Spread 9 Approved Plans		

***** Table to be updated by SWPPP Coordinator when information becomes available.

IV. Appendices

Appendix 1—General VPDES Permit for Discharges of Stormwater from Construction Activities
Appendix 2—Record of Land Disturbance and SWPPP Modifications (Major Revisions)
Appendix 3—Record of Site Inspections
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Appendix 8—Record of SWPPP Availability
Appendix 9—Spill Prevention Controls and Countermeasure Plan (SPCC)
Appendix 10—Miscellaneous *[Maps, Impaired Waters Fact Sheets, Time-of-Year Restriction Table, Soils Map Units and Descriptions Table, etc.]*

Stormwater Pollution Prevention Plan (SWPPP)

Mountain Valley Pipeline – Spread 9

I Introduction

The Mountain Valley Pipeline (Project) installation will extend from the existing Equitrans, L.P. transmission system and other natural gas facilities in Wetzel County, West Virginia to Transcontinental Gas Pipe Line Company, LLC's (Transco) Zone 5 Compressor Station 165 in Pittsylvania County, Virginia. In addition to the pipeline, the Project will include approximately 171,600 horsepower (hp) of compression at three compressor stations currently planned along the route, as well as measurement, regulation, and other ancillary facilities required for the safe and reliable operation of the pipeline. The pipeline is designed to transport up to 2.0 billion dekatherms per day of natural gas. A project location map is provided in Appendix 10.

Portions of Spread 9 are located in Giles, Craig, Montgomery, and Roanoke Counties and portions of the work will be conducted in the Jefferson National Forest (JNF). The Limits of Disturbance (LOD) for the pipeline construction corridor generally will be 125 feet wide, although the LOD will be narrower where necessary to minimize impacts to sensitive resources. Fifty feet will be maintained as the permanent right of way (ROW) unless otherwise noted. This area is required to provide a safe non-congested work area. The additional temporary right-of-way will be necessary for the safe travel of construction and maintenance vehicles and equipment as well as stockpiling any additional material that may be encountered during trenching. At a majority of the wetland and stream crossings, the LOD has been reduced to 75 feet in an effort to reduce adverse impacts to these aquatic resources.

Permanent and temporary access roads are necessary to construct and maintain the project. The authorized LOD for access roads is typically 40 feet. However, the actual road width and area of disturbance typically be less than the 40-foot LOD depicted on the approved Plan Drawings.

Additional Temporary Workspaces (ATWS) are also incorporated within the LOD to provide areas for vehicle parking, material storage, turning radius along access roads, staging areas, and support areas for stream and wetland crossings. MVP will employ special construction techniques where the slopes typically exceed 20 percent throughout the Giles County, which may also be required in expanded workspace areas.

Additional ancillary aboveground facilities will ultimately include pig launcher and receiver sites at the beginning and end of the pipeline and meter station, along with mainline valve (MLV) sites within the pipeline permanent ROW. There will be an interconnect station for receipt or delivery with other pipelines which is located in Spread 11 and covered under a separate SWPPP. Permanent above ground facilities for this station (Transco) will be addressed under a separate plan.

A) Site Access

Field investigations have identified the availability of both public and private roads that will be sufficient in providing access to most work areas for the pipeline installation. In most instances, existing access roads would only be for temporary use in the support of the construction phase of the project. Once

construction is complete, the use and ownership of the temporary access roads will be returned to the private landowner. Permanent access roads are necessary for safe operation and maintenance of the pipeline. Through landowner agreements, MVP will continue use of these private roads during operation of the pipeline facilities. Following construction, MVP will return both temporary and permanent roads to pre-existing conditions unless otherwise noted in the approved plans.

The attached Erosion and Sediment Control Plans Construction Sheets (Appendix 7) identify both the permanent and temporary access roads as either being "Maintained" or "Graded and Maintained". A "Maintained" access road will only require crushed stone placement and appropriate smoothing if rutting or roadway degradation occurs. The sheet flow along the "Maintained" roadways will be controlled using existing drainage infrastructure. Additional BMPs will be installed as necessary to prevent any off-site movement of sediments during construction use. A "Graded and Maintained" roadway may require temporary widening, minor grading, and/or crushed stone placement to maintain the existing road surface. The sheet flow along these roadways will be controlled with drainage channels, broad based dips, and waterbars per the approved ESC plans. Additional BMPs will be installed as necessary to prevent any off-site movement of sediments.

New access roads are proposed in limited areas. Streams, wetlands, or other aquatic features along the existing access roads will be crossed according to the appropriate detail on the project plan drawings. Culverts to be replaced or constructed were sized using the Rational Formula for a 24-hr 10-year storm and Manning's Equation. In areas with unexpected drainage, culverts will be appropriately sized and installed to meet or exceed the requirements in the Virginia Erosion and Sediment Control Management Handbook Third edition 1992.

B) Applicability of General VPDES Permit for Discharges of Stormwater from Construction Activities

Discharges of uncontaminated stormwater associated with the construction of natural gas transmission pipelines and certain associated facilities are not subject to a permitting requirement under the Clean Water Act, 33 U.S.C. § 1342(l)(2); 40 C.F.R. § 122.26(a)(2), or State Water Control Law, 9VAC25-870-380.A.2. For this reason, the Project will not be covered by the General VPDES Permit for Discharges of Stormwater from Construction Activities, 9VAC25-880-70 (General Permit).

Nevertheless, the State Water Control Law provides that projects covered under annual standards and specifications should be "consistent with" the General Permit, including its requirements for a SWPPP. Va. Code § 62.1-44.15:31. Accordingly, this Plan has been prepared to be consistent with all relevant and applicable conditions of the General Permit. Relevant provisions of the General Permit are cited in this Plan where appropriate and are thereby incorporated by reference. A complete list of the incorporated provisions of the General Permit can be found in Appendix 1.

C) Plan Purpose

The Stormwater Pollution Prevention Plan (SWPPP) is referred to as the "Plan." The purpose of the Plan is to:

1. Identify potential sources of pollution that may reasonably be expected to affect the quality of stormwater discharges from the construction site, and,

2. To describe and ensure the implementation of practices that will be used to reduce pollutants in stormwater discharges from the construction site and to assure compliance with the applicable conditions of the General Permit.

Implementation of the components of this SWPPP are required as a condition of the Project Specific Standards and Specifications (PSS&S). Prior to any earth disturbing activities, the Erosion and Sediment Control Plans and Stormwater Management Plans must be approved by DEQ. References to the PSS&S in this SWPPP refer to the version that was approved by DEQ on June 20, 2017, and any subsequently approved revisions thereto.

II Plan Requirements

A) General Requirements

1) Incorporation of DEQ-Approved Project Design Plans

It was required that MVP submit Erosion and Sediment Control Plans (ESC Plans) to DEQ for review and approval prior to commencing any land disturbing activities. To be approved, the plans must be consistent with the PSS&S, state requirements for erosion and sediment control (including Virginia Erosion and Sediment Control Handbook, Third Edition), and applicable requirements the General Permit. These DEQ approved plans are referred to in the SWPPP as the "Project Design Plans". The SWPPP requirements of the General Permit are satisfied by incorporating by reference the Project Design Plans developed for this construction activity, *provided that they meet or exceed the requirements of Part II.A. of the General Permit*. Relevant excerpts from the approved Project Design Plans are included in Appendix 7 of this SWPPP.

2) Plan Administration

The Plan shall be certified in accordance with the applicable conditions of the General Permit (the certification statement is presented in the beginning of this Plan). Copies of the Plan shall be kept on-site and be made available to the Department, or other regulatory agencies having authority, upon request. The Plan must also be available to all operators identified as having responsibilities to carry out provisions contained in the Plan.

The Plan must be made available to the agencies listed in the Section II.D.2 of the General Permit at the time of on-site inspections. The Plan must be maintained on-site when no personnel are present – if no such location exists on-site, notice of the SWPPP's location must be posted in accordance with the Section II.C of the General Permit. Furthermore, a sign or some form of notice must be posted near the entrance of the construction site (Section II.C.). Additionally, the Plan must be made available to the public either electronically or by hard copy per Section II.D.3 of the General Permit. A Record of SWPPP Availability is enclosed within Appendix 8.

3) Plan Updates & Modifications

The Plan shall be amended whenever there is a change in design, construction, operation, or maintenance of the construction site that has a significant effect on the potential for the discharge of pollutants to surface waters and that has not been addressed in the normal implementation of the Plan. The Plan shall also be updated whenever it is found to be ineffective in meeting the applicable requirements of the General Permit. If approval by DEQ is necessary for the control measure, revisions shall be completed no later than seven calendar days following approval. Procedures and information on major and minor modifications are described in detail in the PSS&S and can be found in Appendices 3 and 7 of the SWPPP.

Modifications to the Plan as well as dates of major land disturbance, stabilization, and activity will be noted within the "Record of Land Disturbance and SWPPP Modifications" document found within Appendix 2. If modification or amended activities cannot be adequately described within Appendix 2, additional documentation will be included within the Plan.

4) Safety and Environmental Awareness Program

DEQ must be provided written or electronic notification at least 10 business days prior to pre-construction conferences and Safety and Environmental Awareness Program (SEAP) training. SEAP will be presented by MVP staff to DEQ staff during each spread's pre-construction meeting and subsequently to all visitors, agency representatives, contractors, and company staff before entering the Project work limits.

B) Specific Requirements

1) Stormwater Pollution Prevention Plan Contents

Many of the applicable items required by the General Permit (Part II A., Appendix 1) can be found in the Project Design Plans, which are incorporated by reference into this Plan. A summary of the required elements is provided in Table 1, with a reference to the sheet number in the design plans where the required element can be located.

Table 1. Site Description Elements
Please refer to the referenced location (i.e. Plan Sheet #) in the Project Design Plans or as referenced elsewhere.

General Permit Part II A.1…	***REQUIRED ELEMENT***	***Location*** [1] ***Approved Spread 9 Plan***
c.	A copy of the VPDES Construction General Permit.	See Appendix 1
d.	Description of construction activity.	NARRATIVE 1 OF 4
e.	A legible site plan, to include the following:	-
e.(1)	Directions of stormwater flow and approximate slopes anticipated after major grading activities.	SHEETS #13.03ES – 13.90ES
e.(2)	Limits of land disturbance including steep slopes and natural buffers around surface waters that will not be disturbed.	SHEETS #13.03ES – 13.90ES
e.(3)	Location of major structural and nonstructural control measures.	SHEETS #13.03ES – 13.90ES
e.(4)	Locations of surface waters.	See Exhibit 3B, Appendix 10
e.(5)	Locations where concentrated stormwater is discharged.	SHEETS #13.03ES – 13.90ES
e.(6)	Locations of support activities, when applicable and when required by DEQ (vehicle washing areas, storage areas, concrete wash out areas, fueling areas, sanitary waste facilities, etc.)	See onsite map
e.(7)	The location of the on-site rain gauge or methodology established in consultation with DEQ.	See Appendix 4 (Inspection Forms)
-	***ADDITIONAL INFORMATION***	-
	A legible general location map	See Appendix 10
	Description of construction sequence of soil disturbing activities.	NARRATIVE 4 OF 4
	Record of dates when major grading activities occur.	See Appendix 2
	Receiving and impaired waters information.	See Sect. II.B.6 & 7 below
	Description of other potential pollution sources, including vehicle fueling, chemical storage areas, sanitary waste facilities, construction debris, litter, etc.	See Sect. 5 below & Appendix 9

[1] *[Attach to this Plan any required elements that are not found in the design plans.]*

2) Controls and Measures

The General Permit requires the use of various types of controls and measures that are implemented to control pollutants in stormwater discharges from the project site. The General Permit conditions specifically require the implementation of erosion and sediment control practices (both structural and non-structural), stormwater management practices, and specific other controls to reduce the discharge of pollutants. All E&S and SWM/BMP controls employed in this project were selected to meet and/or exceed state and local requirements and are detailed in the Project Design Plans.

3) Project Design Plans (Excerpts of Erosion and Sediment Control Plans)

The Project Design Plans for this project contain detailed information regarding erosion and sediment controls used in this project. Specifically, E&S control measures can be found on the Project Design Plans; Sheets #13.03ES – 13.90ES (also located within Appendix 7). The Project Design Plans, PSS&S, and General Permit include conditions which are detailed below.

General stabilization and structural controls will be used in sediment and erosion control practices to divert stormwater flows away from exposed areas, convey runoff, prevent sediments from moving off-site, and reduce the erosive forces of runoff waters.

a. Limits of Clearing

Clearing limits will be staked and visibly flagged prior to construction. Adjacent sensitive areas and no-access roads will be demarcated by signage and/or orange construction fence.

b. Construction Access Establishment

The majority of access to the site will be via existing roads. Construction entrances will be installed on site access roads to remove sediment prior to exiting the site. Construction entrances will follow VESCH STD & SPEC 3.02. In instances where there are private residential driveways along the access roads, the construction entrance has been moved past the residential driveways. This was done to prevent the residents from driving over the construction entrances.

c. Erosion and Sediment Control Installation

The Project Design Plans utilize several best management practices (BMPs) throughout the Project area to prevent sediment from leaving the site. As depicted on the plans, controls will be placed along the boundaries of sensitive areas, at stream and wetland crossings, downslope of all stockpiles, and where the potential for off-site sediment transport exists. The BMPs to be used throughout this project include:

- Safety Fence (VESCH STD & SPEC 3.01)
- Construction Entrance (VESCH STD & SPEC 3.02)
- Sediment Barriers (VESCH STD & SPEC 3.04, 3.05, 3.06, and 3.27)
- Belted Silt Retention Fence (see detail MVP-ES9)
- Compost Filter Sock (see detail MVP-ES3).
- Super Silt Fence (see detail MVP-ES9.2-.2A)
- Clean Water Diversions (see detail MVP-ES50-50.1)
- Temporary Diversion Dike (VESCH STD & SPEC 3.09)
- Temporary & Permanent Slope Breakers/Temporary Right-of-Way Diversion (VESCH STD & SPEC 3.11)

- Temporary Stream Crossing (Equipment Crossing) (VESCH STD & SPEC 3.24)
- Dewatering Structure (VESCH STD & SPEC 3.26)
- Rock Check Dam (VESCH STD & SPEC 3.20)
- Outlet Protection (VESCH STD & SPEC 3.18)
- Soil Stabilization Blankets & Matting (VESCH STD & SPEC 3.36), as well as hydraulically applied soil stabilization blankets and matting such as Earthguard, Flexterra, or equivalent (see details MVP-ES40 and MVP-ES40.1)
- Vegetative Streambank Stabilization (VESCH STD & SPEC 3.22)
- Trench Plugs/Breakers (see detail MVP-20)
- Pumped Water Filter Bag (see detail MVP-ES2)

d. Instream BMPs

Procedures for stream crossings include:

i. Minimize clearing and grubbing of vegetation adjacent to streams as noted on approved plans;
ii. Only that area which is required for pipeline installation shall be disturbed within the proposed LOD or right-of-way at stream crossings;
iii. Locating staging areas 50 feet away from the stream where possible;
iv. Storing chemicals, storing equipment, washing equipment, or refueling equipment must be done in areas that are greater than 100 feet away from stream;
v. Spoil placement and BMPs will be monitored at all times during stream crossing procedures; once work within a stream area is started, it will be conducted continuously to completion, emphasis will be placed on minimizing time of disturbance;
vi. Spoils from stream crossings must be placed at least 10 feet from the water's edge; and
vii. Construction equipment will not be allowed in the stream channel when excavation can be done from either side of a temporary crossing while working at the stream crossing.

The following sections describe stream crossing techniques that may be used during pipeline relocation/installation activities. Refer to the detail sheets and approved Project Standards and Specifications for additional information.

e. Dry Crossing Techniques

These techniques will be used to perform pipeline work in a relatively dry working condition and include pump around, flume pipe, and cofferdam (Porta-dam) crossing methods. The deciding factors selecting the crossing technique for a given crossing are stream size, flow, and water depth. Horizontal Directional Drilling and conventional boring are also techniques that are utilized in specific areas of the project. E&S control measures will be installed prior to any earth disturbance and refurbished if necessary immediately after disturbance of the waterbody. Further details on procedures for the installation and maintenance of crossing methods can be

found within Section C-2 (Waters of the United States – Wetland and Waterbody Crossing Methods) of the PSS&S.

f. Protect Slopes

MVP will employ special construction techniques within areas considered as steep slope conditions as discussed in Section 1.3 of the PSS&S.

The Project Design Plans show the placement of steep slope erosion controls on all slopes greater than 30-percent. These slopes will be stabilized with steep slope soil stabilization blankets and matting techniques in accordance with VESCH STD & SPEC 3.36. In addition to VESCH STD & SPEC 3.36, MVP may utilize hydraulically applied soil stabilization blankets and matting (i.e., Earthguard, Flexterra or equivalent) as an alternative to rolled erosion and sediment control blanket material. Information regarding the hydraulically applied blankets is provided in details MVP-ES40 and MVP-ES40.1.

Permanent and temporary ROW Diversions/Waterbars are depicted on the plans and are placed along the pipeline following the spacing specified in PSS&S detail MVP-17. ROW Diversions/Waterbars are intended to reduce runoff velocity and divert water off the construction ROW to prevent slope erosion. Permanent waterbar cross slopes will not exceed 5% and will have end treatments to ensure non-erosive velocities and discharge as sheetflow.

g. Convey Stormwater in a Non-Erosive Manner

Stormwater from the site will be managed as needed to satisfy the 9VAC25-870-66 water quantity requirements. Details pertaining to stormwater runoff considerations, stormwater BMP designs, and associated calculations are provided in Sections 4.0 and 5.0 of the PSS&S.

h. Control Other Pollutants

Sediment removed from BMPs will either be spread in a protected area to dry and then recycled as fill material or disposed of at an approved waste disposal site. Used water filter bags will be disposed of at an authorized waste facility. The contractor will not illegally bury, dump, or discharge building material or wastes at the site.

i. Control Dewatering

The pipeline trench will be cleared of debris and dewatered prior to lowering in pipe or equipment. Water from dewatering operations will be filtered through an approved filter bag that will comply with manufacturer's recommendations for inspection and maintenance, passed through a DEQ standard dewatering structure, and discharged in a manner that does not result in accelerated erosion or adversely affect off-site property. Trench dewatering will be conducted through a filter bag (see detail MVP-ES2) and placed within a dewatering structure in accordance with VESCH STD & SPEC 3.26. Pumped Water Filter Bags should be replaced as

often as necessary to maintain function and prevent a failure of the filter bag. Dewatering activity will be monitored at all times the activity is ongoing.

Pumps used in the dewatering activity will be placed in a secondary containment measure to prevent spills of fuel or oil to the ground surface in accordance with the SPCC Plan. Dewatering structures will be constructed in a stabilized area away from waterbodies and wetlands and sized according to the intended use. Discharge will be monitored and controlled to prevent erosion and sedimentation from occurring to adjacent areas as well as to prevent over pumping of the dewatering structure. The discharge will be directed away from any waterbody, wetland or other sensitive environmental resources. The discharge activity will be monitored during the activity to ensure that the discharge is thoroughly filtered and no erosion or sedimentation occurs at the discharge point.

j. Maintain BMPs

Temporary and permanent E&S control BMPs shall be maintained and repaired as needed to assure continued performance of their intended function. Maintenance and repair shall be conducted in accordance with the corresponding VESCH Standards and Specifications as well as the approved PSS&S.

Inspection of all E&S control BMPs within disturbed areas will be performed as specified in Section 2.0 within the PSS&S and at a frequency of at least once every four business days.

Repairs or maintenance shall be performed as soon as practicable, as specified in the PSS&S. All public and private roads adjacent to a construction entrance must be inspected and cleaned of debris that originated from the construction site.

k. Manage the Project

A copy of the ESC Plans and appropriate inspection/maintenance logs are to be kept on site at all times during active construction.

The project will be generally maintained in accordance with the following:

i. Coordination with Utilities – Notify VA One Call by calling 811 or 1-800-552-7001 at least 3 days prior to construction.
ii. Inspection and Monitoring – E&SC BMPs will be inspected as discussed in the previous section. Temporary and permanent E&S BMPs will be maintained and repaired as needed.
iii. Reporting – The E&S plan holder will notify the VA DEQ of any spill/discharge of pollutants as required by applicable law (see Table 2 below).
iv. Equipment Maintenance – Maintenance of equipment will be performed using accepted practices (i.e. plastic mats, drip pans, etc.)

4) Stormwater Management Plan

Stormwater management plans ensure the implementation and maintenance of post-development stormwater management controls to minimize pollutants in stormwater discharges from the site after final stabilization. Stormwater management controls that mitigate changes to pre-development runoff characteristics assist in protecting and maintaining the physical and biological characteristics of receiving streams and wetlands. Therefore, SWPPPs must include an approved stormwater management plan for new construction activities, a stormwater management plan compliant with the requirements of 9VAC25-870-93 through 9VAC25-870-99 of the VSMP Regulation for existing construction activities, or a stormwater management plan prepared in accordance with department-approved PSS&S and applicable amendments.

The Project Design Plans contain detailed information regarding stormwater management for this project. Specifically, elements required by 9VAC25-870 can be found in the approved plan set.

5) Pollution Prevention Plan

The following Pollution Prevention Plan (Table 2) addresses potential pollution-generating activities that could affect the quality of stormwater discharges from construction and related support activities. Specific locations of potential pollutants can be found on the updated project design plans or as referenced elsewhere. The person responsible for implementing the pollution prevention plan is the Lead Environmental Inspector. All necessary personnel must be familiar with pollution prevention practices and procedures.

Further detail regarding the plan for storing oil as a part of construction to prevent a discharge into navigable waters or adjoining shorelines can be found in Appendix 9: Spill Prevention Control and Countermeasure Plan (SPCC).

Note: Section 3.1.3 within the SPCC states, “In areas where hazardous materials are required to be stored or used within a wetland, the Contractor shall prepare and submit for approval a secondary containment plan before working in the wetland area.” Contrary to the SPCC, in an effort to further reduce the unlikely possibility of an unauthorized discharge, the PSS&S states that no refueling, hazardous materials storage, equipment maintenance, or equipment parking will take place within 100 feet of the waterbody or wetland crossing. If pumps are being used within the waterbody or wetland crossing, small quantities of fuel in Gerry cans may be stored on site with the pump in a secondary spill containment device, otherwise fuel may not be stored within waterbody and wetland crossings.

Table 2. Pollution Prevention Plan

Prevention - Minimizing- Containing - Cleanup – Reporting Any discharge/spill must be reported to the appropriate authorities immediately, but no later than 24 hours, if it meets or exceeds the applicable reportable threshold for the spilled material. Any Fish Kills must be reported. Reporting information regarding specific substances can be found below.		
Potential Pollution Generating Activities:		***Prevention/Response Quick Reference Chart***
Hazardous Materials	Fuels, Hydraulic Oils and Vehicle Maintenance	Vehicle refueling and maintenance operations will be conducted at a dedicated location away from surface waters. Secondary containment (berms), readily available spill kits and cover will be provided where appropriate. For additional information, see Section 5.b below.
	Soaps, Solvents, Detergents & Wash Water	Chemicals will be safely stored in sealed containers when not in use. Clean-up and disposal will be done in a manner to prevent contact with stormwater, utilizing tarps, buckets, and proper disposal techniques. For additional information, see Section 5.c below.
	Hazardous or Toxic Chemicals	Chemicals will be stored in sealed containers in a safe location. Likely chemicals on site include: asphalt sealants, adhesives, concrete admixtures, fertilizers, pressurized gasses, and landscape materials. For additional information, see Section 5.c below.
	Fertilizers	Fertilizers will be applied per manufactures recommendations and not during rainfall events. For additional information, see section 5.c below.
	Sanitary Wastes	On site portable lavatories must be located away from surface waters and storm drains. Any spills must be cleaned according to federal, state and local regulations. For additional information, see section 5.d below.
	Welding Byproducts	All welding byproducts, including welding rods and gasses, will be handled and disposed of according to the manufacturers' recommendations.
Non-Stormwater Discharges *(Examples listed in Sect 2. B. 10)*	Wash Water without Soaps	Wash water will be directed to sediment basins or traps, using filtration devices such as filter bags or sand filters, or similarly effective controls.
	Site Excavation Dewatering	Must pass through a sediment trapping device and be released onto a stabilized surface. Conveyance channels must be stabilized.
	Hydrostatic Testing	All hydrostatic testing releases will be to uplands and will comply with monitoring and effluent limits requirements specified in DEQ General Permit No. VAG83 (9VAC25-12-80). Releases that inadvertently flow into surface waters must be documented and notice provided to DEQ in accordance with VAG83.
	Utility Flushing	Energy from clean water releases must be appropriately dissipated in a stabilized area. For additional information, see Section 5.f below.
Managing Waste	Concrete Waste & Wash Water	Per MVP-ES18 within the PSS&S, a suitable impervious geomembrane liner shall be placed at the location of the concrete washout with compost filter socks staked around the circumference of the liner so as to form a ring with the ends of the sock located at the upslope corner. Under no circumstances may wash water from concrete delivery vehicles be allowed to enter any surface water.
	Solid Waste	All solid waste and debris must be deposited in dumpsters and kept out of surface waters.
Other		

The following points serve as a reference; for additional information regarding reporting oil discharges/spills, refer to Appendix 9: SPCC.

a. Spills

Releases of sewage, industrial waste, other wastes, any noxious or deleterious substance or hazardous substance that are equal to or exceed the reportable quantity established under applicable federal or state law (40 CFR Part 110, 40 CFR Part 117, 40 CFR Part 302, or Va. Code §62.1-44.34:19), will be reported to the Department in accordance with Part III G. of the General Permit immediately upon discovery of the discharge, but no later than 24 hours after discovery. A reportable quantity of oil is defined by the EPA as a discharge to surface waters that causes a film, sheen, or discoloration of the surface of the water or adjoining shoreline or that causes sludge upon or emulsion deposits beneath the surface of the water or on adjacent shorelines. Reports will be made to the following:

1) **Virginia DEQ Central Office**
   Phone: (804) 698-4000
   For reports outside normal working hours, leave a message.

2) **Virginia Department of Emergency Management**
   Emergency Operations Center (EOC)
   Phone: 1-(800) 468-8892
   Report in case of emergency.

Notification of any spills must be reported immediately to MVP's EI/LEI, construction spread PM and MVP's Environmental Coordinator. Notification to appropriate agencies will be made by MVP's environmental coordinator. Materials and equipment necessary for oil or chemical spill cleanup will be kept in the temporary material storage trailer onsite. Equipment will include, but not be limited to, brooms, dust pans, mops, rags, gloves, goggles, universal absorbents, sand, saw dust, and plastic and metal trash containers.

All oil or other chemical spills will be cleaned up immediately upon discovery. Spills of oil that cause a film, sheen, or discoloration or sludge or emulsion as described above will be reported to the National Response Center at 1-800-424-8802. If reaching the National Response Center is not practicable, the spill will be reported to the U.S. Coast Guard or EPA Predesignated On-Scene Coordinator for the geographic area where the spill occurs. Spills of oil from a facility of more than 1,000 gallons of oil in a single discharge or spills of oil from a facility of more than 42 gallons of oil in each of two discharges occurring within any twelve-month period must also be reported to the EPA Regional Administrator within 60 days from the time the facility becomes subject to 40 C.F.R. §112.4.

In the event of a hazardous spill or release contact: 9-1-1

Spills of hazardous substances equal to or above the reportable quantity for the substance within any 24-hour period will be reported to the appropriate federal agency, as soon as the

Lead Environmental Inspector has knowledge of the discharge, pursuant to procedures at 33 C.F.R. §153.203. Any personnel with knowledge of such a discharge shall immediately notify the Lead Environmental Inspector to allow for this reporting to occur.

Releases of hazardous substances equal to or above the reportable quantity for the substance within any 24-hour period will be reported immediately to the National Response Center at 1-800-424-8802 as soon as the Lead Environmental Inspector has knowledge of any release. Any personnel with knowledge of such a release shall immediately notify the Lead Environmental Inspector, MVP's construction spread PM and Environmental Coordinator. The MVP Environmental Coordinator will make all notifications to the appropriate agencies.

Other primary points of contact:

1) Brian Clauto – Senior Environmental Coordinator – EQT Corporation
Phone: (724) 873-3465 (o) or (412) 295-4184 (c)

2) MVP Personnel(s)* _____
Phone: _____

3) FERC Inspector(s)* _____
Phone: _____

4) DEQ Inspector(s)* _____
Phone: _____

***Contact information to be inserted by SWPPP Coordinator when information available.

b. Fuels and Oils

(i) The State Code of Virginia §62.1-44.34:19 states;
A. Any person discharging or causing or permitting a discharge of oil into or upon state waters, lands, or storm drain systems within the Commonwealth or discharging or causing or permitting a discharge of oil which may reasonably be expected to enter state waters, lands, or storm drain systems within the Commonwealth, and any operator of any facility, vehicle or vessel from which there is a discharge of oil into state waters, lands, or storm drain systems, or from which there is a discharge of oil which may reasonably be expected to enter state waters, lands, or storm drain systems, shall, immediately upon learning of the discharge, notify the Board, the director or coordinator of emergency services appointed pursuant to § 44-146.19 for the political subdivision in which the discharge occurs and any other political subdivision reasonably expected to be affected by the discharge, and appropriate federal authorities of such discharge. Notice will be deemed to have been given under this section for any discharge of oil to state lands in amounts less than twenty-five gallons if the recordkeeping requirements of subsection C of § 62.1-44.34:19. 2 have been met and the oil has been cleaned up in accordance with the requirements of this article.

B. Observations and data gathered as a result of the monthly and quarterly inspection activities required by § 62.1-44.34:15. 1 (1) (d) shall be maintained on site pursuant to § 62.1-44.34:19. 2, and compiled into a summary, on a form developed by the Board, such summary to be submitted to the Board annually on a schedule established by the Board. Should any such observations or data indicate the presence of petroleum hydrocarbons in ground water, the results shall be reported immediately to the Board and to the local director or coordinator of emergency services appointed pursuant to § 44-146.19.

(ii) Any on-site storage tanks will have a means of secondary containment.

(iii) All vehicles on site will be monitored for leaks and receive regular preventive maintenance to reduce the chance of leakage.

(iv) Petroleum products will be stored in labeled, sealed containers.

(v) Spill kits will be included with all fueling sources and maintenance activities.

c. Hazardous Substances and Toxic Chemicals

(i) Spills or releases of hazardous substances that exceed the reportable quantity threshold must be reported as stated above in Section II.B.5.a. The EPA lists reportable quantity thresholds under 40 CFR part 117 and 40 CFR part 302.

(ii) All paint containers and curing compounds will be tightly sealed and stored when not required for use. Excess paint will not be discharged to the storm sewers, but will be properly disposed according to the manufacturer's instructions. Spray guns will be cleaned on a removable tarp.

(iii) Chemicals used on-site will be kept in small quantities and stored in closed containers under cover and kept out of direct contact with stormwater. As with fuels and oils, any inadvertent spills will be cleaned up immediately and disposed of according to federal, state, and local regulations.

(iv) Fertilizers will be applied only in the minimum amounts recommended by the manufacturer.

(v) Fertilizers will be worked into the soil to limit exposure to stormwater.

(vi) Fertilizers will be stored under cover and partially used bags will be transferred to a sealable bin to avoid spills.

d. Sanitary Waste

Portable lavatories will be located on-site and serviced on a regular basis by a contractor. They will be located in upland areas away from direct contact with surface waters. Any

spills occurring during maintenance servicing will be cleaned up immediately, including any contaminated soils, and disposed of according to all federal, state, and local regulations.

e. Concrete

(i) Concrete trucks will not be allowed to wash out or discharge surplus concrete or drum wash water on the site, except in a specially designated concrete washout area which contains a geomembrane and compost filter socks around the circumference. Refer to MVP-ES18 within the PSS&S for further information.

(ii) Form release oil will be applied over a pallet covered with an absorbent material to collect excess fluid. The absorbent material will be replaced and disposed of properly when saturated.

f. Water Testing

When testing/cleaning of water supply lines, any uncontaminated discharge from the tested pipe will be collected and conveyed to a completed stormwater pipe system for ultimate discharge into a sedimentation basin or SWM/BMP facility or conveyed as sheet flow onto a stabilized area as necessary.

g. Spill Reporting Forms and Guidelines for oil discharges/spills can be found in Appendix 9 – SPCC.

6) Receiving Waters

The receiving waters for Spread 9 are Craig Creek-Trout Creek (020802011001), North Fork Roanoke River-Dry Run (030101010201), North Fork Roanoke River-Wilson Creek (030101010202), North Fork Roanoke River-Bradshaw Creek (030101010203), Roanoke River-Sawmill Hallow (030101010301), Lower Sinking Creek (050500020302), Upper Sinking Creek (050500020303), New River-Little Stony Creek (050500020304). The locations of each can be found on USGS Quad maps and National Wetlands Inventory (NWI) maps within Appendix 10. The receiving waters for this project are impaired for nitrogen, phosphorous, or sediment and trigger additional requirements outlined in Part 1.B.4 of the General Permit. These additional requirements are met or exceeded by the criteria implemented in the Plans and PSS&S. Factsheets for waters identified as impaired by other pollutants in the 2014 § 305(b)/303(d) Water Quality Assessment Integrated Report (along with any associated documentation) can be found in Appendix 10.

7) Total Maximum Daily Load (TMDL) Limitations & Impaired Waters

There are TMDL and impaired water classifications for sediment and nutrients in Spread 9. The Upper James River Watershed has TMDLs for Total Nitrogen (TN), Total Phosphorous (TP) and Total Suspended Solids (TSS). The Roanoke River watershed has a TMDL for TSS. MVP

has reviewed federal, state and local regulations applicable to the six (6) counties within the Project for impaired waterbodies that have an established Total Maximum Daily Loads (TMDL) for certain pollutants. The pollutants of potential concern are nutrients including nitrogen and phosphorous (during post-construction), and sediment (during construction and post-construction).

8) Maintenance

Maintenance of the erosion and sediment controls and the stormwater management/BMP facilities incorporated into this project must be maintained on a regular basis to assure their continued effectiveness. This includes repairs to all erosion and sediment controls, including cleanout of all BMPs and stormwater management facilities at the required intervals. Critical areas, as described in more detail within Section II.C 1 – 6, pose additional installation and maintenance requirements which relate to landslide susceptible areas, steep slopes, and areas along the Project containing varying soil properties and erodibility factors. Those controls found to be ineffective during routine inspections (as described in the following section) shall be repaired before the next anticipated storm event or as soon as practicable. A more detailed description of the maintenance procedures is contained in the project design plans, General Details Set Narrative pages 1-4, and is incorporated in this Plan for reference.

9) Inspections

The Project will have one Lead Environmental Inspector (LEI) and at least one Environmental Inspector (EI) per construction spread. Inspection staff requirements will be determined by MVP based on the construction activities being undertaken and accessibility to the active areas while providing appropriate coverage to maintain environmental compliance. The LEI and EI will be required to be knowledgeable of environmental permit compliance requirements, be experienced in ESC and SWM BMP installation, operation and maintenance requirements, Project permit conditions and experienced with the FERC's Plan and Procedures. The LEI/EI will review the implementation of the Standards and Specifications and any applicable environmental permits, resolve apparent conflicts between permits and the PSS&S, and coordinate with the Construction Supervisor about additional measures which may be needed to address erosion and sedimentation. The LEI will also keep a daily log of activity documenting Project activities related to environmental permit compliance and corrective measures implemented, site visitors (i.e. non-project staff), waterbody and wetland crossing activity logs, and ESC installation and maintenance activities. The Lead Environmental Inspector, Environmental Inspector, Qualified Personnel and delegation of authority will be identified and appropriate contact information will be included in the SWPPP prior to or during the preconstruction meeting.

The Environmental inspection staff's responsibilities include:

- Ensuring compliance with the requirements of PSS&S;
- Ensuring compliance with all other federal and state permitting conditions relating to environmental compliance related to ESC, SWM, NWP12, VMRC and 401WQC;

- Ensuring compliance with the FERC's Plan and Procedures, the environmental conditions of the FERC's Certificate of Public Convenience and Necessity, the environmental mitigation measures proposed by MVP in the application submitted to FERC, and other environmental permits and approvals issued to MVP;
- Verifying that the limits of authorized construction work areas and locations of access roads are properly marked before clearing activities commence;
- Verifying the location of drainage and irrigation systems;
- Identifying stabilization needs in all areas;
- Locating dewatering structures and slope breakers to ensure they will not direct runoff into waterbodies or wetlands, known cultural resource sites or sensitive species habitat;
- Verifying that trench dewatering activities do not result in the deposition of sand, silt, and/or sediment near the point of discharge into a wetland or waterbody. If such deposition is discovered, the dewatering activity shall be stopped and the design of the discharge shall be changed to prevent reoccurrence;
- Testing subsoil and topsoil in agricultural and residential areas as necessary to measure compaction and determine the need for corrective action;
- Advising the Inspector when conditions (such as wet weather) make it advisable to restrict construction activities;
- Ensuring restoration of contours and topsoil;
- Approving imported soils for use in agricultural and residential areas;
- Ensuring that temporary erosion controls are properly installed, inspected and maintained;
- Inspecting temporary ESC measures and SWM BMPs:
    - Immediately following initial installation;
    - At least once every four business days
- Ensuring compliance with any more stringent plan requirements during construction activities within the Total Maximum Daily Loads (TMDL) watersheds of impaired waters located in Montgomery, Roanoke and Franklin Counties.
- Ensuring the repair of all ineffective temporary ESC measures within 24 hours of identification, or as soon as conditions allow if compliance with this time frame would result in greater environmental impacts;
- Keeping records of compliance with the environmental conditions, and the mitigation measures required by Federal or state environmental permits during active construction and restoration; and
- Establishing a program to monitor the success of restoration. Implementation of this program may be transferred to the company's operating section upon completion of construction and restoration activities.
- Daily monitoring and recording rainfall data for at least one on site rain gauge per spread.

MVP will provide weekly e-reporting to the VA DEQ linear projects inbox LinearProjects@deq.gov, which will then be directed to the appropriate VA DEQ representatives and/or applicable regional office. Inspection reports will be submitted based on MVP's construction spread break basis and identified as such. MVP intends to utilize four (4) construction spreads for Project construction activities in the Commonwealth. Weekly reports

will be submitted the week following the inspections and will include the weekly inspection report per spread as well as the post-rainfall event inspections that occur during the reporting week. The reports shall include the following:

- Inspection reports;
- Pictures;
- Complaint logs and complaint responses; and
- Other compliance documents.

The name, phone number, and qualifications of the qualified personnel conducting inspections required by the General Permit can be found in the Record of Inspector Certification document within Appendix 5.

If, as a result of the inspection, the site conditions and/or control measures are found to have changed, the Plan shall be updated within a period of 7 calendar days. If control measures need to be modified to assure effectiveness or if additional measures are determined to be necessary, implementation shall be completed prior to the next anticipated storm event or as soon as practicable. The operator shall implement any corrective action(s) identified as a result of an inspection as soon as practicable but no later than 7 days after discovery or a longer period as approved by DEQ.

A report summarizing the inspections and the subsequent maintenance activities must be completed and maintained as part of the Plan. The inspection forms are included in Appendix 3. Required elements include major observations (including information on control measure performance and incidents of non-compliance), and information on the inspecting personnel. If an inspection does not identify any incidents of non-compliance, then the certification statement contained in the inspection form will apply. The inspection report(s) and any actions taken in accordance with Part II must be retained by the operator as part of the SWPPP for at least three years from the date the project is complete.

The Project will have a FERC third-party inspector as required. This inspector will have peer status with all other activity inspectors and shall have the authority to stop activities that violate the environmental conditions of the FERC certificate or other authorizations and order corrective action once approval has been granted by the MVP Project Manager.

C) Critical Areas and Components

Critical areas throughout the project will be treated as described below.
Note: Not all critical areas described within this section and corresponding sections of the appendices exist within Spread 9.

1) Soil Segregation and Stabilization

a. <u>Topsoil Segregation</u>

Topsoil will be segregated in all approved areas of the Project including pastureland, upland forested areas, residential areas, meadowlands, wetlands without standing water or saturated soil, areas requested by the landowner, or where directed by the Environmental Inspector. The topsoil will be stored separately from trench subsoil and replaced on top of the subgrade during final grading in preparation of restoration.

Topsoil will be stored along the edge of the temporary LOD, maintaining a 10-foot setback from both waterbody and wetland boundaries. In non-saturated/non-standing water wetland areas, the top 12 inches of wetland soil will be segregated from the trench line during trenching activities to be used during restoration.

Topsoil will be stripped from the full ROW as required by DEQ. During construction, topsoil storage piles shall be stabilized or protected with sediment trapping measures. Within deep soil at least 12 inches of topsoil will be segregated. Where soils are shallow, every effort will be made to segregate the entire topsoil layer. In residential areas, topsoil replacement (i.e. importation of topsoil) is an acceptable alternative to topsoil segregation. Topsoil may not be used to fill sandbags or to pad the piping.

For further details on topsoil segregation, management, and replacement, Section 2.4.1 in the PSS&S and detail MVP-ES46.1 through MVP-ES 46.3 provide additional guidance.

After final grading of replaced topsoil occurs throughout Project areas, soil stabilization should occur within 7 days after grade is achieved. If portions of the Project area will not be restored to final grade, but expected to remain dormant for longer than 14 days, the area should be stabilized within 7 days. Further details on soil stabilization are provided below.

b. Temporary and Permanent Stabilization

i. Temporary Stabilization

Per the VESCH STD and SPEC 3.31 and the General Construction Sequence #11 in the Mountain Valley Pipeline Plan of Development, Temporary Stabilization needs to be applied for any of the following conditions:

- When a denuded area remains idle for more than 7 days;
- When an acceptable final grade cannot be achieved (e.g., during winter or early spring construction;
- When permanent seeding cannot be applied due to adverse soil and weather conditions.

ESC measures will be monitored and maintained until conditions improve and final cleanup can be completed in the next recommended planting window.

- Variance included within Plan Set
  a) MVP proposed to utilize the VESCH standard 3.31 Temporary Seeding mix during project activities with the addition of Browntop millet (*Panicum Ramosum*) to match the temporary seed mix required by the United States Forest Service (USFS) for use on Jefferson National Forest Lands.

b) The temporary seeding proposed for use on the project are presented in PSS&S Appendix A, MVP typical construction detail MVP-ES11.10 and included in the general details.

ii. Permanent Stabilization

Per the VESCH STD and SPEC 3.32, all disturbed soils will be stabilized within 7 days of final grading, weather and soil conditions permitting. Permanent vegetation shall not be considered established until a ground cover is achieved that is uniform, mature enough to survive and will inhibit erosion. Reseeding will be performed until this is accomplished. For permanent stabilization, the recommended seed application rate will be doubled to ensure adequate final stabilization of the appropriate species.

c. Immediate Stabilization

The following need to be immediately stabilized per the Minimum Standards and Specifications of the Virginia Erosion and Sediment Control Handbook and Virginia Regulations 9VAC25-840 Erosion and Sediment Control Regulations:

- Slopes greater than 33%
- Earthen structures such as dams, dikes and diversions
- Water Bars
- The bed and banks of a watercourse after work within the watercourse is complete
- Sediment traps and basins
- Areas disturbed during the removal of the erosion controls (per the ESC Narrative)
- Areas that will be dormant for more than one year (per the General Construction Sequence)

i. Stream Bank Stabilization

a. Permanent stabilization shall occur immediately upon installation, backfilling, and grading at each stream crossing;
b. Stream banks will be restored by vegetative stabilization (VESCH STD & SPEC 3.22) where site conditions warrant, or by riprap (VESCH STD & SPEC 3.19) where bank slopes are 3h:1v or steeper;
c. Soil Stabilization Blankets & Matting needs to be installed per the VESCH STD & SPEC 3.36, as well as hydraulically applied soil stabilization blankets and matting such as Earthguard, Flexterra, or equivalent (see details MVP-ES40 and MVP-ES40.1);
d. Vegetative Streambank Stabilization (VESCH STD & SPEC 3.22).

ii. Wetlands

The success of wetland revegetation will be monitored in accordance with the Federal Energy Regulatory Commission (FERC) Plan and Procedures as well as any other applicable requirements from the U.S. Army Corp of Engineers. Restoration and post construction monitoring will need to follow the requirements outlined by FERC.

Additionally, all Right-of-Ways (ROW) will be restored to pre-development conditions per the Erosion and Sediment Control Narrative.

d. Mulching

Following seed application, mulch will be applied immediately. Mulch shall be used in conjunction with temporary seeding operations as specified in VESCH STD and Spec 3.31. Mulch can consist of straw, erosion control fabric, or some functional equivalent. Mulch will be free of noxious weeds. Hay shall not be used as mulch. Mulch and related materials need to be applied in accordance with VESCH STD 3.35.

i. Mulch will be spread uniformly over the area to cover at least 75 percent of the ground surface at a rate of 2 tons/acre of straw or its equivalent as required by the United States Forest Service
ii. If wood chips are used as mulch, the application rate will not exceed 6 tons/acre and the equivalent of 12 lbs./acre available nitrogen per ton will be added per VESCH Table 3.35-A
iii. Application of liquid mulch binders and tackifiers may be used in place of mechanical crimping/anchoring
    a. Heaviest application will occur on crest of ridges and steep slope areas (including spoil piles) to prevent mulch displacement
    b. Mulch application will be monitored and function throughout the Project duration
    c. If mulch coverage is determined to be sparse due to wind or other factors, reapplication will be conducted as needed
iv. Mulch will be anchored to minimize loss by wind and water
    a. When anchoring by mechanical means, a mulch-anchoring tool will be used to properly crimp the mulch to a depth of 2 to 3 inches
    b. When anchoring with liquid mulch binders, rates recommended by the manufacturer will be used
    c. Liquid mulch binders will not be used within 100 feet of wetlands or water bodies
v. Compost Filter Socks
    a. Following determination that the site has achieved vegetative stabilization, the compost filter sock will be "opened" and the mulch contained within will be spread within the limits of disturbance per the Construction Sequence.

e. Installation and Seed Mixes

i. Seedbed Preparation
    a. If tilling cannot be accomplished, one of the following steps must be done per the MVP PSS&S:
        - Adding of lime and fertilizer (per VESCH Table 3.31-A requirements)
        - Disking the top 4-6 inches of the soil
        - Soil roughening
    b. When hydro seeding is to be used, the seedbed will be scarified to facilitate lodging and germination of the seed
    c. Unless site-specific recommendations are received from the land owners or land management agencies, MVP will incorporate 4,000 lbs./acre of pulverized agricultural grade lime and 1,000 lbs./acre of 10-20-10 fertilizer into the soil

d. Soil pH modifier and fertilizer will be incorporated into the top two (2) inches of soil as soon as possible after application
e. Other fertilizer formulations, including slow-release sources of nitrogen (preferred from a water quality standpoint), may be used provided they can supply the same amounts and proportions of plant nutrients)
f. PCB-free hydro seed will be used if available

ii. Installation of Saplings
a. If saplings are required to be planted within the temporary ROW areas, this will be conducted in accordance with Section 2.9.6 – Bare Root Seeding Sapling and Shrub Planting (see Appendix A – STD & SPEC: Plates 3.37-4, 3.38-8, and 3.38-9) unless otherwise specified by applicable permit conditions. See also MVP-ES47 for bare root sapling and shrub planting details.

iii. Erosion Control Fabric
a. Jute thatching or bonded fiber blankets, at a minimum, will be installed on waterbody banks at the time of final bank re-contouring
b. The erosion control fabric will be anchored with staples or other appropriate devices
c. Fiber matrix or polyacrylamide based erosion control products (see details MVP-ES40 and MVP-ES40-1) may be substituted for erosion control blanket in agricultural areas

iv. Bare Root Sapling and Shrub Planting
a. Planting of bare-root saplings and shrubs will occur within select areas of the Project (see details MVP-ES11.8 and MVP-ES11.9). The purpose of these plantings is to establish target native tree species comparable to the region, site characteristics (e.g., topography; soil characteristics; adjacent vegetation), and adjacent forest composition in order to encourage the timely reestablishment of habitat removed during Project construction.

v. General Seed Mixes
a. Seed mixes are summarized in details MVP-ES11.1 through 11.5. In areas where a specific mitigation seed mix is not required, the contractor will implement VESCH STD & SPEC 3.32 Table 3.32-C (Site Specific Seeding Mixtures for Appalachian/Mountain Area).

vi. Seeding Rates
a. These will be based on pure live seed and used within 12 months of seed testing.
b. Seed will be uniformly applied using a broadcast seeder, drill, culti-packer seeder or hydroseeder.
c. When dry seeding, the seeding depth should be ¼ to ½ inch. Twice the supplier's recommended rate of inoculant will be used on dry seeding, five times the recommended rate if hydroseeded.

d. During hydroseeding, it is recommended to add 50% more seed to the tank if a machinery breakdown occurs (If the breakdown exceeds two (2) hours, a full rate of new seed may be necessary).
e. Asphalt binders will not be used when hydroseeding near wetlands or water bodies
f. The upland seed mix should not be applied within wetlands boundaries.
g. Seeding and mulching in cultivated cropland will conform to the adjacent off ROW area unless otherwise requested by the landowner in writing.
h. For temporary and permanent stabilization measures, the recommended seed application rate will be doubled to ensure adequate stabilization.

vii. Seeding of Permanent Vegetation
a. Seeding will be performed within the recommended seeding dates in the VESCH. If seeding cannot be done within those dates, appropriate temporary erosion control measures will be used and seeding of permanent vegetation will be performed at the beginning of the next recommended seeding season
b. Permanent seed may be applied out of the recommended window in addition to temporary seeding; however, the contractor must be prepared to return during the next recommended seeding window to reseed any areas that did not develop adequate permanent cover. Lawns may be seeded on a schedule established with the landowner.

viii. Seed Mixes for National Forest Lands
a. Provided in details MVP-ES12.1 through 12.4

ix. Low-Maintenance Seed Mix
a. VESCH STD & SPEC 3.32 Table 3.32-C will be the default unless otherwise specified in the applicable permit conditions, mitigation specifications or landowner agreements
b. Certified seed will be used whenever possible, and will be applied to the ROW within 12 months of the testing date
c. Legume seed will be treated with an inoculant specific to the species

For additional details, please refer to Appendix C of the PSS&S, which provides guidelines for seed mixes and erosion control seeding techniques to be used in reclamation and restoration of disturbed soils associated with pipeline installations and repairs/maintenance on the Monongahela and George Washington-Jefferson National Forests.

2) Waters of the United States

To minimize impacts to waterbody and wetland crossings, they will be treated as separate construction entities, except during clearing activities. Additionally, efforts will be made to cross these areas during low flow conditions. The Environmental Inspector for each specified waterbody crossing will maintain a copy of the SWPPP which will document crossing details. At each wetland/waterbody crossing, a PVC pipe (or equivalent) will be stationed containing the permit,

approvals, and wetland crossing details/plans. Once grubbing and grading starts at a waterbody or wetland crossing it will be actively conducted for consecutive days until the crossing is completed and the work area restored. Crossings will be constructed as close to perpendicular to the axis of the waterbody channel as engineering and routing conditions permit. If the pipeline parallels a waterbody, at least 15 feet of undisturbed vegetation will be maintained between the waterbody and the right-of-way, if possible, except at the crossing location. Where waterbodies meander or have multiple channels, the pipeline will be routed to minimize the number of waterbody crossings. A more detailed overview of crossing procedures for both wetlands and waterbodies is described below.

Staging areas for waterbody and wetland crossings will be located outside the buffer areas and will be the minimum necessary to stage the waterbody or wetland crossing. No refueling, hazardous materials storage, equipment maintenance, or equipment parking will take place within 100 feet of the waterbody or wetland crossing. If pumps are being used within the waterbody or wetland crossing, small quantities of fuel in Gerry cans may be stored on site within a spill containment device, otherwise fuel may not be stored within waterbody and wetland crossings. Equipment and vehicles will not be washed in any waterways. The LEI/EI will specify additional stabilization measures as needed to prevent equipment from rutting within waterbody and wetland crossings.

a. Wetland Crossings

Wetland crossings will be constructed using standard trench-and-backfill methods. Heavy equipment working in wetlands will utilize equipment mats or other suitable methods, such as timber rip rap, to minimize soil disturbance and compaction. Clearing activities within wetland areas will be restricted to the 75-foot temporary construction LOD. Trees located within 15 feet of the pipeline with roots that could compromise the integrity of the pipeline coating may be selectively cut and removed from the permanent ROW.

b. Waterbody Crossings

Per MS-13, when a live waterbody must be crossed by construction vehicles more than twice in a 6-month period, a temporary stream crossing of non-erodible material must be provided. The principal methods of crossing waterbodies in the Commonwealth will be open-cut dry-ditch. These methods include Flume Pipe Crossing, Cofferdam Crossing, and Dam and Pump. Though these serve as the principal methods of crossing waterbodies, Stony Creek will be crossed via conventional boring methods. In this event, the crossing will be conducted in accordance with details of all federal and state permitting requirements.

Although generalized construction sequences are provided in Section 2.0 for stream and wetland crossings, and a generalized list of procedures that will be followed at stream crossings is provided in Section 3.3 of the PSS&S, procedures of special emphasis are discussed in more detail below. The methods described below will be employed unless incompatible or more stringent requirements are imposed by the U.S. Army Corps of Engineers (USACE), DEQ, Virginia Marine Resources Commission (VMRC), or other appropriate federal or state authority.

c. Crossing Methods

i. Flume Pipe Crossing

If a flume crossing is planned, the flume to carry the stream flow across the ditch may be installed during the grubbing/grading phase. Trench excavation, pipeline installation, backfilling, and stabilization processes will be completed within a 72-hour period from flume installation to stabilization of the stream bank. The flume crossing method requires implementation of the following steps:

a. Install flume pipe after blasting (if necessary), but before trenching;
b. Use sand bag or sand bag/plastic sheeting diversion structure or equivalent to develop an effective seal and to divert stream flow through the flume pipe (some modifications to the stream bottom may be required to achieve an effective seal);
c. Properly align flume pipe to prevent bank erosion and streambed scour;
d. Do not remove flume pipe during trenching, pipe laying, or backfilling activities, or initial streambed restoration efforts; and
e. Remove all flume pipes and dams that are not also part of the equipment bridge as soon as final cleanup of the streambed and bank are complete.

ii. Cofferdam

This procedure may be used for crossing channels 10 feet or wider, and involves constructing a cofferdam within the construction ROW (using cofferdam products) and enclosing approximately 60% of the streambed into a semi-circle.

a. The cofferdam shall seal tightly to the streambed to minimize water from entering the construction area.
i. Utilize saddle bags filled with clean pea gravel or sand for pipe weights within waterbody or wetland crossings to ensure negative buoyancy.
b. Pumps will be needed to dewater within the cofferdam excavation area.
c. All earth disturbances will occur in the dry area behind the cofferdam.
d. Once the pipe is installed, the excavated area will be backfilled and stabilized.
e. Sediment barriers within the waterline should be in good working order before the cofferdam is removed.
f. Stabilization will be with either rip rap or vegetation.
g. The cofferdam is then set up from the opposite bank, extending far enough to include the tie-in point in the mid-stream area.
h. Clean up and restoration of the excavated area follows the same procedures listed above.

iii. Dam and Pump

Dam and Pump method may be used without prior approval for crossings of waterbodies where pumps can adequately transfer streamflow volumes around the work area, and there are no concerns about sensitive species passage. Implementation of the dam-and-pump crossing method must meet the following performance criteria:

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

iv. Equipment Bridges

For crossings of all state-designated fisheries as well as waterbodies with sensitive species concerns, all construction equipment will cross the waterbody on an equipment bridge. Only clearing equipment may cross waterbodies before installation of equipment bridges. The number of such crossings of each waterbody will be limited to one per piece of equipment.

For crossings of waterbodies greater than 10 feet in width, use of equipment operating in the waterbody will be limited to that needed to construct the crossing. All other construction equipment must cross on an equipment bridge. Equipment bridges will be used at all stream crossings. No fill or temporary culverts will be used to facilitate equipment bridges.

Soil will not be used to construct or stabilize equipment bridges, rather they will be constructed using one of the following methods:

- Equipment pads and culverts
- Flexi-float portable bridge(s)

Each equipment bridge will be designed and maintained to withstand and pass the highest flow that would occur while the bridge is in place and prevent soil from entering the waterbody. Equipment bridges will be removed following completion of restoration of the ROW unless it is authorized to remain as a permanent bridge. If there will be more than 30 days between final cleanup and the beginning of permanent seeding and reasonable alternative access to the right-of-way is available, equipment bridges will be removed as soon as possible after final cleanup.

v. Temporary Road Crossings

Temporary road crossings, consisting of bridges of timber mats and flume(s), will be installed to cross minor or intermediate streams. Timber mats shall be used to cross smaller streams where the span of the mat will stretch from bank to bank. Clean rock fill and flumed crossings will be utilized where it is not feasible to utilize timber mats. As an alternative, portable bridges may be used instead for small crossings. Equipment will not be allowed to ford flowing streams during construction activities. Temporary road crossings of streams must maintain adequate flow downstream.

All crossings of waterbodies (including minor water bodies, state designated fisheries, and waterbodies with sensitive species of concern) will be crossed with timber mats or temporary bridging (i.e. Bailey Bridges). A complete listing of the water body crossings is included on sheet 12.35ES of the Erosion and Sediment Control Plan and further details on the sequence of construction through waterbody crossings is described in more detail below.

d. Clearing

Waterbody and wetland crossings will be clearly marked in the field prior to the start of tree clearing activities. Care will be taken during clearing operations not to deposit mud in open water, and to minimize rutting of the right-of-way. All woody debris will be removed from within the waterbody or wetland crossing for disposal. Vegetation will be cut off at ground level, leaving existing root systems in place, and removed from the wetland for disposal. Timber riprap may be employed to stabilize the equipment work area provided all timber is obtained from within the approved construction work area. All timber riprap must be installed to facilitate removal upon completion of construction. Any disturbed soil will be mulched before the clearing crew leaves the waterbody or wetland crossing. The LOD at wetland crossings has been reduced from 125 feet to 75 feet to minimize impacts. Clearing activities within wetland areas will be restricted to the 75-foot temporary construction LOD.

Before grading begins and as grubbing progresses, sediment barriers (staked bales or silt fence, compost filter socks, etc.) will be installed across the construction area at the edge of the water or the edge of the wetland, and along the sides of the construction work area as needed to prevent the flow of spoil into the waterbody or wetland. Stump removal, topsoil segregation, and excavation would be limited to the area immediately over the trench line within the 50-foot permanent ROW easement per NWP12 Regional Condition 3.b.iii, FERC PROCEDURES and Project's FERC Certificate conditions. Trees located within 15 feet of the pipeline with roots that could compromise the integrity of the pipeline coating may be selectively cut and removed from the permanent ROW. A limited amount of stump removal and grading may be conducted within the permanent ROW easement in wetlands to ensure a safe working environment. In wetlands, very little grading is expected, as topography is generally flat and low-lying. Temporary ROW diversions (interceptor diversions) will be installed at the ends of the waterbody or wetland crossing.

e. Sediment Barriers

Sediment barriers will be installed across the entire construction right-of-way at all waterbody crossings. Sediment barriers will be properly maintained throughout construction and reinstalled as necessary (such as after backfilling of the trench) until replaced by permanent stormwater management controls or restoration of adjacent upland areas is complete. Where waterbodies are adjacent to the construction right-of-way, sediment barriers will be installed along the edge of the construction right-of-way as necessary to contain spoil and sediment within the ROW. Trench plugs will be used at all non-flumed waterbody crossings to prevent diversion of water into upland

portions of the pipeline trench and to keep any accumulated trench water out of the waterbody. Trench plugs will be of sufficient size to withstand upslope water pressure.

Final grading will begin promptly after backfilling is completed. If final grade is reached on any portion of the site, vegetation will be applied within 7 days to prevent erosion. Disturbed areas will be restored to pre-construction contours, and in wetlands, the original topsoil will be applied preserving the native seed bank which will enable restoration with native plant species. Sediment barriers at the edge of the wetland or edge of the water will be repaired or replaced as necessary. Permanent ROW diversions (interceptor diversions) will be installed at the edge of the 50-foot buffer area or base of the slope nearest the waterbody and wetland. All materials used to stabilize the equipment work area will be removed (e.g. timber riprap or timber mats). If soil and weather conditions prevent final grade to be established (e.g. if the permit specified a winter construction window), a temporary approximate grade will be established. ESC measures will be restored or replaced as needed, and temporary stabilization will be applied.

f. Restoration

Restoration will begin immediately after final grade is established. Stream banks will be restored by vegetative stabilization (VESCH STD & SPEC 3.22) where site conditions warrant. At stream crossings, woody stem vegetation reestablishment will be limited to the temporary right of way which will be about 12.5 feet on either side of the permanent ROW. Vegetative stabilization generally includes planting a perennial conservation seed mix from VESCH STD & SPEC 3.32 Table 3.32-B. If grubbing has not been extensive, then native shrub and tree species are expected to sprout and regenerate naturally. Seed will be applied before mulch is applied to the area. Rock, soil from outside the wetland, tree stumps, or brush riprap will not be used to stabilize the right-of-way in wetlands. A sediment barrier will be maintained at the edge of the water until revegetation is successful. Wetlands will be seeded in accordance with VESCH STD & SPEC 3.31 Table 3.31-B and mulched with clean straw. A sediment barrier will be maintained around the restored area until revegetation is successful. The buffers will be restored using the procedures for upland areas. For all affected forested wetlands, restoration activities will be conducted in accordance with the Project's approved permit conditions and mitigation requirements.

i. Restoration per FERC Procedures

a) Use clean gravel or native cobbles for the upper 1 foot of trench backfill in all waterbodies that contain cold-water fisheries.
b) For open-cut crossings, stabilize waterbody banks immediately and install temporary sediment barriers within 24 hours of completing instream construction activities. For dry-ditch crossings, complete streambed and bank stabilization before returning flow to the waterbody channel.
c) Return all waterbody banks to preconstruction contours or to a stable angle of repose as approved by the Environmental Inspector.
d) Install erosion control fabric or a functional equivalent on waterbody banks at the time of final bank recontouring. Do not use synthetic monofilament mesh/netted erosion control materials in areas designated as sensitive wildlife habitat unless

the product is specifically designed to minimize harm to wildlife. Anchor erosion control fabric with staples or other appropriate devices.

e) Application of riprap for bank stabilization must comply with COE, or its delegated agency, permit terms and conditions.
f) Unless otherwise specified by state permit, limit the use of riprap to areas where flow conditions preclude effective vegetative stabilization techniques such as seeding and erosion control fabric.
g) Revegetate disturbed riparian areas with native species of conservation grasses, legumes, and woody species, similar in density to adjacent undisturbed lands.

g. Post-Construction Maintenance

i. No routine vegetation mowing or clearing will be conducted over the full width of the permanent ROW. However, to facilitate periodic corrosion/leak surveys, a corridor centered on the pipeline and up to 10 feet wide may be cleared at a frequency necessary to maintain the 10-foot corridor in an herbaceous state. In addition, trees that are located within 15 feet of the pipeline that have roots that could compromise the integrity of the pipeline coating may be cut and removed from the permanent right-of-way
ii. Native herbaceous and woody shrub species are allowed to reestablish in the wetland ROW
iii. Do not use herbicides or pesticides in or within 100 feet of a waterbody except as allowed by the appropriate land management or state agency
iv. Time of Year Restrictions (TOYR) specified in section VII.A.5 of the Plan (April 15 – August 1 of any year) apply to routine mowing and clearing of riparian areas
v. Monitor and record the success of wetland revegetation annually until wetland revegetation is successful.
vi. Wetland revegetation shall be considered successful if all of the following criteria are satisfied:
    a) the affected wetland satisfies the current federal definition for a wetland (i.e., soils, hydrology, and vegetation);
    b) vegetation is at least 80 percent of either the cover documented for the wetland prior to construction, or at least 80 percent of the cover in adjacent wetland areas that were not disturbed by construction;
    c) if natural rather than active revegetation was used, the plant species composition is consistent with early successional wetland plant communities in the affected ecoregion; and
    d) invasive species and noxious weeds are absent, unless they are abundant in adjacent areas that were not disturbed by construction.

vii. Within 3 years after construction, a report will be filed with the Secretary of FERC identifying the status of the wetland revegetation efforts and documenting success. The requirement to file wetland restoration reports with the Secretary does not apply to projects constructed under the automatic authorization, prior notice, or advance notice provisions in the FERC's regulations.
    a) For any wetland where revegetation is not successful at the end of 3 years after construction, develop and implement (in consultation with a professional wetland

ecologist) a remedial revegetation plan to actively revegetate wetlands. Continue revegetation efforts and file a report annually documenting progress in these wetlands until wetland revegetation is successful.

viii. Per the Nationwide Permit of the Army Corps of Engineers Section 23 part (c)
   a) Compensatory mitigation at a minimum one-for-one ratio will be required for all wetland losses that exceed 1/10-acre and require pre-construction notification, unless the district engineer determines in writing that either some other form of mitigation would be more environmentally appropriate or the adverse effects of the proposed activity are minimal, and provides a project-specific waiver of this requirement. For wetland losses of 1/10-acre or less that require pre-construction notification, the district engineer may determine on a case-by-case basis that compensatory mitigation is required to ensure that the activity results in minimal adverse effects on the aquatic environment. Compensatory mitigation projects provided to offset losses of aquatic resources must comply with the applicable provisions of 33 CFR part 332.

ix. Temporary Seeding
   a) Unsaturated wetlands will be temporarily seeded in accordance with Typical Construction Detail MVP-ES11.4 (Appendix B) and mulched with clean straw (where required), then allowed to revegetate with native seedbank present in the segregated topsoil.
   b) A sediment barrier will be maintained around the restored area until revegetation is successful.

x. For wetlands that are saturated or have standing water present, use these guidelines as reference:
   a) Topsoil segregation will be conducted to the extent practicable
   b) Following installation of the pipeline, the trench will be backfilled using native wetland soils and restored to preexisting conditions.
   c) No soil or rock will be imported for use during backfilling of the trench.
   d) Temporary seed will be applied to wetland areas to temporarily stabilize the area while the native wetland seedbank reestablishes the area with native vegetation.
   e) No seeding should be conducted in areas of standing water. The riparian buffers will be restored using the procedures discussed above for upland areas.
   f) Installation of Saplings: If saplings are required to be planted within the temporary ROW areas, this will be conducted in accordance with Section 2.9.6 – Bare Root Seeding Sapling and Shrub Planting (see Appendix A – STD & SPEC: Plates 3.37-4, 3.38-8, and 3.38-9) unless otherwise specified by applicable permit conditions.

In addition to the above mentioned details, the reference materials relevant to wetlands and waterbodies along the Project are outlined below:

- Joint Permit Application (JPA) & Nationwide Permit 12 (NWP)—Approved December 26, 2017
   - Hydrostatic Testing Plan – Attachment B Section 4.0

- Time of Year Restrictions – Attachment E Section 3.0
- Project Construction Narratives – Attachment H-2 Section 2.0
- Temporary Impact Restoration Narrative – Attachment H-2 Section 3.0
- List of impacts with stream designation (Class V & VI) – Attachment H-2 Table 2.2
- Plan views of all impacts—Attachment H-3
- List of VMRC impacts with TOYR – Attachment H-5 Table 1
- VMRC Crossing plan views and cross sections—Attachment H-5

3) Karst Terrain

Portions of the alignment are underlain by karst terrain, an environmentally sensitive landscape characterized by the presence of sinkholes, caverns, irregular pinnacled bedrock surface, and springs.

The nature of karst features to act as a conduit to the subterranean environment creates a distinct risk for groundwater contamination. Any known discharges (including, but not limited to, stormwater, sediment, pollutants, or hydrostatic testing water) to a karst feature should be reported to the MVP Karst Specialist(s) immediately. Contact information for the Karst Specialists assigned by MVP are listed in Appendix 4 of the SWPPP.

a. Guidance for Construction in Karst Terrain

Guidance and requirements for identifying and mitigating karst features and the associated potential hazards before and during construction of the project is provided in the PSS&S through the following appendices:

Appendix H: Karst Hazard Assessment
Appendix L: Karst Mitigation Plan

Karst features located within the secondary karst buffer (minimum ¼-mile) and construction easement (minimum 150-feet) of the proposed MVP alignment are summarized in Table 2 of the Karst Hazard Assessment, including description of the feature, potential impacts, and recommendations. For map sheets and location information on these features, see Figures 1 – 3 in Appendix A in the Karst Hazard Assessment.

b. Karst Terrain Specialists and Inspections

Where karst features occur in the limits of disturbance, Karst Specialists (KS) will be deployed to complete inspections prior to tree clearing or land disturbance, as well as during construction. Requirements for karst terrain inspections by the "KS team" area defined in Section 2.0 of the Karst Mitigation Plan, which also states that two or more KS will be available to conduct multiple inspections in karst terrain where construction crews may be working at different locations simultaneously.

c. Identifying Potential Karst Features

If observed in the LOD, the following may be indications of a karst feature, and should be inspected and documented by the Karst Specialist:

i. Soil subsidence
ii. Rock collapse
iii. Sediment filling
iv. Sinking streams or notable surface water infiltration
v. Spring / seep / flooding
vi. Cave or void space

Additional guidance for identification of suspected karst features can be found in the Karst Mitigation Plan: 3.0 Management of Newly Identified Karst Features.

d. Measures to Avoid Impacts

The required measures to avoid impacts to the karst aquifer and environment are outlined in the Karst Mitigation Plan. Per Section 4.4, the following general guidelines shall be adhered to for construction activity in karst terrain:

i. Equipment shall not be parked or left idling for extended periods of time (more than 12 hours), or refueled or serviced within 100 feet of any karst feature.

ii. Equipment refueling will not be performed within flagged or marked buffer areas of streambeds, sinkholes, fissures, or areas draining into these or other karst features, except by hand-carried cans (5-gallon maximum capacity) when necessary.

iii. Equipment servicing and maintenance areas will be sited outside of flagged or marked buffer areas of streambeds, sinkholes, fissures, or areas draining into these or other karst features.

iv. Equipment washing operations shall be located outside of the karst buffer area

v. Hazardous materials, chemicals, fuels, lubricating oils, and petroleum products shall not be stored within 100 feet of any karst feature.

vi. All equipment shall be checked by a construction inspector daily for leaks prior to beginning work in karst areas. If leaks or damaged/defective equipment are discovered, containment will be deployed immediately and the equipment repaired or removed.

e. Reportable Spills

If a reportable spill (as defined in 40 CFR Part 302) occurs within a karst feature or water body, refer to Section 3.1.3 of the MVP Spill Prevention, Control and Countermeasure (SPCC) Plan for required action and response.

4) Acid Soils

Areas of acid soils are known to occur within portions of the Project area in Virginia. In order to identify and mitigate potential impacts should these soils be encountered, an Acid Forming Materials (AFM) Identification and Testing Work Plan was developed for implementation during Project activities. The AFM Plan is provided in Appendix G of the PSS&S, under the Acid Forming Materials Mitigation Plan Standards and Specifications for Virginia.

Section 4.0 of the Mitigation Plan outlines the overall mitigation strategy, as well as the responsibilities of the Environmental Inspector (EI), who is tasked with identifying and evaluating risk in areas of potential AFM.

The Environmental Inspector must be familiar with the Mitigation Plan requirements, and be equipped to coordinate mitigation measures in the field, should AFM's be encountered. Field Testing methods to be used by the Environmental Inspector to identify AFM's are described in Section 3.0 of the Mitigation Plan.

Refer to Figures 1 – 3 of the Mitigation Plan for locations and descriptions of AFM's within the project alignment

5) Jefferson National Forest

The Project intersects the George Washington-Jefferson Forest in 2 locations within Spread 9. The E&S plan sheets that depict areas within the GWJNF include: 13.27-13.31. To reduce the effects of the project on natural resources, requirements were developed in the GWJNF Land and Resource Management Plan, also known as the "Forest Plan".

The Plan of Development Appendices C, D F, G, K, M, and T were developed to minimize any potential impacts to water quality. Along with these components, the project will also follow the FERC Waterbody and Wetland Construction and Mitigation Procedures, FERC Upland Erosion Control, Revegetation, and Maintenance Plan, and the Best Management Practices for the state of Virginia. The Project will be implemented in accordance with the Final Record of Decision, Jefferson Forest Plan, and Plan of Development.

The recommended seed mixtures and application methods for temporary and final stabilization utilized throughout the project are included within Appendix C of the MVP Standards and Specifications for Virginia. This area possesses diverse landscapes and microclimates; therefore, it is critical to deploy the appropriate seed mixtures. When using native seed, the most local ecotype that is available will be utilized in the following order of preference:

- From within state
- From the mountain regions of the adjoining state
- From within 100 miles, as long as it is within the Appalachian mountain ecosystem.

6) Time of Year Restrictions and Endangered and Threatened Species

If the below indicated species is present within the waterbody or adjacent area, no in-stream construction activities will be conducted during the following time windows unless written approval is received from the appropriate federal or state agency:

a) Coldwater Fisheries – March 1 through June 30;
b) Coolwater and Warmwater Fisheries – April 15 through July 15;
c) Natural Trout Streams;
    i. October 1 through March 31 (Brown Trout and Brook Trout)
    ii. March 15 through May 15 (Rainbow Trout)
d) Stockable Trout Streams – There is no time of year restrictions (TOYR) for stockable trout, however, as required by the VDGIF, VDGIF regional offices will be consulted before constructing in stockable trout streams;
e) Roanoke Log Perch – March 15 through June 30
f) Orangefin Madtom – March 15 through May 31;
g) Atlantic Pigtoe and James Spinymussel – May 15 through July 31;
h) Green Floater and Yellow Lampmussel – April 15 through June 15 and August 15 through September 30.

Refer to Appendix 10 for the Time of Year Restriction Table which identifies all stream crossings and correlating TOYR and endangered and threatened species (if applicable) within the Project area.

REFERENCES

Bailey, Tom; Bailey, Whitney; Connolly, Stephanie; Seagline, Steffany: *Suggested Seed Mixes for Pipeline Right-of-Ways and Associated Disturbances on the Monongahela and George Washington-Jefferson National Forests,* 2016. Data retrieved from https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd543867.pdf

Bailey, Tom; Bailey, Whitney; Connolly, Stephanie; Seagline, Steffany*: Suggested Seeding Techniques for Pipeline Right-of-Ways and Associated Disturbances on the Monongahela and George Washington-Jefferson National Forests,* 2016. Data retrieved from https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd543867.pdf

Federal Energy Regulatory Commission, Office of Energy Projects, 2013. *Upland Erosion Control, Revegetation, and Maintenance Plan.*

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Virginia Department of Conservation and Recreation. *Virginia Erosion and Sediment Control Handbook.* Third Edition, 1992.

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APPENDIX 1

Storm Water Construction General Permit No. VAR10

General VPDES Permit for Discharges of Stormwater from Construction Activities
General Permit No.: VAR10

As Mentioned on page 5 of the SWPPP, discharges of uncontaminated stormwater associated with the construction of natural gas transmission pipelines and certain associated facilities are not subject to a permitting requirement under the Clean Water Act, 33 U.S.C. § 1342(l)(2); 40 C.F.R. § 122.26(a)(2), or State Water Control Law, 9VAC25-870-380.A.2. For this reason, the Project will not be covered by the General VPDES Permit for Discharges of Stormwater from Construction Activities, 9VAC25-880-70 (General Permit).

Nevertheless, the State Water Control Law provides that projects covered under annual standards and specifications should be "consistent with" the General Permit, including its requirements for a SWPPP. Va. Code § 62.1-44.15:31. Accordingly, this Plan has been prepared to implement all relevant and applicable conditions of the General Permit. Relevant provisions of the General Permit are cited in this Plan where appropriate and are thereby incorporated by reference. The following is a complete list of incorporated provisions of the General Permit.

General Permit Part I, Sections B, C, D, E, & G
General Permit Part II Sections A1. d & e, A.2 –G
General Permit Part III Sections A-J, K.2-.4 L, & N-W

COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY

General Permit No.: VAR10

Effective Date: July 1, 2014

Expiration Date: June 30, 2019

GENERAL VPDES PERMIT FOR DISCHARGES OF STORMWATER FROM CONSTRUCTION ACTIVITIES

AUTHORIZATION TO DISCHARGE UNDER THE VIRGINIA STORMWATER MANAGEMENT PROGRAM AND THE VIRGINIA STORMWATER MANAGEMENT ACT

In compliance with the provisions of the Clean Water Act, as amended, and pursuant to the Virginia Stormwater Management Act and regulations adopted pursuant thereto, operators of construction activities are authorized to discharge to surface waters within the boundaries of the Commonwealth of Virginia, except those specifically named in State Water Control Board regulations that prohibit such discharges.

The authorized discharge shall be in accordance with this cover page, Part I - Discharge Authorization and Special Conditions, Part II - Stormwater Pollution Prevention Plan, and Part III - Conditions Applicable to All VPDES Permits as set forth herein.

PART I

DISCHARGE AUTHORIZATION AND SPECIAL CONDITIONS

A. Coverage under this general permit.

1. During the period beginning with the date of coverage under this general permit and lasting until the general permit's expiration date, the operator is authorized to discharge stormwater from construction activities.

2. This general permit also authorizes stormwater discharges from support activities (e.g., concrete or asphalt batch plants, equipment staging yards, material storage areas, excavated material disposal areas, borrow areas) located on-site or off-site provided that:

   a. The support activity is directly related to the construction activity that is required to have general permit coverage for discharges of stormwater from construction activities;

   b. The support activity is not a commercial operation, nor does it serve multiple unrelated construction activities by different operators;

   c. The support activity does not operate beyond the completion of the last construction activity it supports;

   d. The support activity is identified in the registration statement at the time of general permit coverage;

   e. Appropriate control measures are identified in a stormwater pollution prevention plan and implemented to address the discharges from the support activity areas; and

   f. All applicable state, federal, and local approvals are obtained for the support activity.

B. Limitations on coverage.

1. Post-construction discharges. This general permit does not authorize stormwater discharges that originate from the site after construction activities have been completed and the site, including any support activity sites covered under the general permit registration, has undergone final stabilization. Post-construction industrial stormwater discharges may need to be covered by a separate VPDES permit.

2. Discharges mixed with nonstormwater. This general permit does not authorize discharges that are mixed with sources of nonstormwater, other than those discharges that are identified in Part I E (Authorized nonstormwater discharges) and are in compliance with this general permit.

3. Discharges covered by another state permit. This general permit does not authorize discharges of stormwater from construction activities that have been covered under an individual permit or required to obtain coverage under an alternative general permit.

4. Impaired waters and TMDL limitation. Discharges of stormwater from construction activities to surface waters identified as impaired in the 2012 § 305(b)/303(d) Water Quality Assessment Integrated Report or for which a TMDL wasteload allocation has been established and approved prior to the term of this general permit for (i) sediment or a sediment-related parameter (i.e., total suspended solids or turbidity) or (ii) nutrients (i.e., nitrogen or phosphorus) are not eligible for coverage under this general permit unless the operator develops, implements, and maintains a SWPPP that minimizes the pollutants of concern and, when applicable, is consistent with the assumptions and requirements of the approved TMDL wasteload allocations. In addition, the operator shall implement the following items:

a. The impaired water(s), approved TMDL(s), and pollutant(s) of concern, when applicable, shall be identified in the SWPPP;

b. Permanent or temporary soil stabilization shall be applied to denuded areas within seven days after final grade is reached on any portion of the site;

c. Nutrients shall be applied in accordance with manufacturer's recommendations or an approved nutrient management plan and shall not be applied during rainfall events; and

d. The applicable SWPPP inspection requirements specified in Part II F 2 shall be amended as follows:

(1) Inspections shall be conducted at a frequency of (i) at least once every four business days or (ii) at least once every five business days and no later than 48 hours following a measurable storm event. In the event that a measurable storm event occurs when there are more than 48 hours between business days, the inspection shall be conducted on the next business day; and

(2) Representative inspections used by utility line installation, pipeline construction, or other similar linear construction activities shall inspect all outfalls discharging to surface waters identified as impaired or for which a TMDL wasteload allocation has been established and approved prior to the term of this general permit.

5. Exceptional waters limitation. Discharges of stormwater from construction activities not previously covered under the general permit issued in 2009 to exceptional waters identified in 9VAC25-260-30 A 3 c are not eligible for coverage under this general permit unless the operator implements the following:

a. The exceptional water(s) shall be identified in the SWPPP;

b. Permanent or temporary soil stabilization shall be applied to denuded areas within seven days after final grade is reached on any portion of the site;

c. Nutrients shall be applied in accordance with manufacturer's recommendations or an approved nutrient management plan and shall not be applied during rainfall events; and

d. The applicable SWPPP inspection requirements specified in Part II F 2 shall be amended as follows:

(1) Inspections shall be conducted at a frequency of (i) at least once every four business days or (ii) at least once every five business days and no later than 48 hours following a measurable storm event. In the event that a measurable storm event occurs when there are more than 48 hours between business days, the inspection shall be conducted on the next business day; and

(2) Representative inspections used by utility line installation, pipeline construction, or other similar linear construction activities shall inspect all outfalls discharging to exceptional waters.

6. There shall be no discharge of floating solids or visible foam in other than trace amounts.

C. Commingled discharges. Discharges authorized by this general permit may be commingled with other sources of stormwater that are not required to be covered under a state permit, so long as the commingled discharge is in compliance with this general permit. Discharges authorized by a separate state or VPDES permit may be commingled with discharges authorized by this general permit so long as all such discharges comply with all applicable state and VPDES permit requirements.

D. Prohibition of nonstormwater discharges. Except as provided in Parts I A 2, I C, and I E, all discharges covered by this general permit shall be composed entirely of stormwater associated with construction activities. All other discharges including the following are prohibited:

1. Wastewater from washout of concrete;

2. Wastewater from the washout and cleanout of stucco, paint, form release oils, curing compounds, and other construction materials;

3. Fuels, oils, or other pollutants used in vehicle and equipment operation and maintenance;

4. Oils, toxic substances, or hazardous substances from spills or other releases; and

5. Soaps, solvents, or detergents used in equipment and vehicle washing.

E. Authorized nonstormwater discharges. The following nonstormwater discharges from construction activities are authorized by this general permit when discharged in compliance with this general permit:

1. Discharges from firefighting activities;

2. Fire hydrant flushings;

3. Waters used to wash vehicles or equipment where soaps, solvents, or detergents have not been used and the wash water has been filtered, settled, or similarly treated prior to discharge;

4. Water used to control dust that has been filtered, settled, or similarly treated prior to discharge;

5. Potable water sources, including uncontaminated waterline flushings;

6. Routine external building wash down where soaps, solvents or detergents have not been used and the wash water has been filtered, settled, or similarly treated prior to discharge;

7. Pavement wash waters where spills or leaks of toxic or hazardous materials have not occurred (or where all spilled or leaked material has been removed prior to washing); where soaps, solvents, or detergents have not been used; and where the wash water has been filtered, settled, or similarly treated prior to discharge;

8. Uncontaminated air conditioning or compressor condensate;

9. Uncontaminated ground water or spring water;

10. Foundation or footing drains where flows are not contaminated with process materials such as solvents;

11. Uncontaminated excavation dewatering, including dewatering of trenches and excavations that have been filtered, settled, or similarly treated prior to discharge; and

12. Landscape irrigation.

F. Termination of general permit coverage.

1. The operator of the construction activity shall submit a notice of termination in accordance with 9VAC25-880-60 to the VSMP authority after one or more of the following conditions have been met:

a. Necessary permanent control measures included in the SWPPP for the site are in place and functioning effectively and final stabilization has been achieved on all portions of the site for which the operator is responsible. When applicable, long term responsibility and maintenance requirements shall be recorded in the local land records prior to the submission of a notice of termination;

b. Another operator has assumed control over all areas of the site that have not been finally stabilized and obtained coverage for the ongoing discharge;

c. Coverage under an alternative VPDES or state permit has been obtained; or

d. For residential construction only, temporary soil stabilization has been completed and the residence has been transferred to the homeowner.

2. The notice of termination should be submitted no later than 30 days after one of the above conditions in subdivision 1 of this subsection is met. Authorization to discharge terminates at midnight on the date that the notice of termination is submitted for the conditions set forth in subdivisions 1 b through 1 d of this subsection. Termination of authorizations to discharge for the conditions set forth in subdivision 1 a of this subsection shall be effective upon notification from the department that the provisions of subdivision 1 a of this subsection have been met or 60 days after submittal of the notice of termination, whichever occurs first.

3. The notice of termination shall be signed in accordance with Part III K of this general permit.

G. Water quality protection.

1. The operator must select, install, implement and maintain control measures as identified in the SWPPP at the construction site that minimize pollutants in the discharge as necessary to ensure that the operator's discharge does not cause or contribute to an excursion above any applicable water quality standard.

2. If it is determined by the department that the operator's discharges are causing, have reasonable potential to cause, or are contributing to an excursion above any applicable water quality standard, the department, in consultation with the VSMP authority, may take appropriate enforcement action and require the operator to:

a. Modify or implement additional control measures in accordance with Part II B to adequately address the identified water quality concerns;

b. Submit valid and verifiable data and information that are representative of ambient conditions and indicate that the receiving water is attaining water quality standards; or

c. Submit an individual permit application in accordance with 9VAC25-870-410 B 3.

All written responses required under this chapter must include a signed certification consistent with Part III K.

PART II

STORMWATER POLLUTION PREVENTION PLAN

A stormwater pollution prevention plan (SWPPP) shall be developed prior to the submission of a registration statement and implemented for the construction activity, including any support activity, covered by this general permit. SWPPPs shall be prepared in accordance with good engineering practices. Construction activities that are part of a larger common plan of development or sale and disturb less than one acre may utilize a SWPPP template provided by the department and need not provide a separate stormwater management plan if one has been prepared and implemented for the larger common plan of development or sale.

The SWPPP requirements of this general permit may be fulfilled by incorporating by reference other plans such as a spill prevention control and countermeasure (SPCC) plan developed for the site under § 311 of the federal Clean Water Act or best management practices (BMP) programs otherwise required for the facility provided that the incorporated plan meets or exceeds the SWPPP requirements of Part II A. All plans incorporated by reference into the SWPPP become enforceable under this general permit. If a plan incorporated by reference does not contain all of the required elements of the SWPPP, the operator must develop the missing elements and include them in the SWPPP.

Any operator that was authorized to discharge under the general permit issued in 2009, and that intends to continue coverage under this general permit, shall update its stormwater pollution prevention plan to comply with the requirements of this general permit no later than 60 days after the date of coverage under this general permit.

A. Stormwater pollution prevention plan contents. The SWPPP shall include the following items:

1. General information.

    a. A signed copy of the registration statement, if required, for coverage under the general VPDES permit for discharges of stormwater from construction activities;

    b. Upon receipt, a copy of the notice of coverage under the general VPDES permit for discharges of stormwater from construction activities (i.e., notice of coverage letter);

    c. Upon receipt, a copy of the general VPDES permit for discharges of stormwater from construction activities;

    d. A narrative description of the nature of the construction activity, including the function of the project (e.g., low density residential, shopping mall, highway, etc.);

    e. A legible site plan identifying:

        (1) Directions of stormwater flow and approximate slopes anticipated after major grading activities;

        (2) Limits of land disturbance including steep slopes and natural buffers around surface waters that will not be disturbed;

        (3) Locations of major structural and nonstructural control measures, including sediment basins and traps, perimeter dikes, sediment barriers, and other measures intended to filter, settle, or similarly treat sediment, that will be installed between disturbed areas and the undisturbed vegetated areas in order to increase sediment removal and maximize stormwater infiltration;

        (4) Locations of surface waters;

(5) Locations where concentrated stormwater is discharged;

(6) Locations of support activities, when applicable and when required by the VSMP authority, including but not limited to (i) areas where equipment and vehicle washing, wheel wash water, and other wash water is to occur; (ii) storage areas for chemicals such as acids, fuels, fertilizers, and other lawn care chemicals; (iii) concrete wash out areas; (iv) vehicle fueling and maintenance areas; (v) sanitary waste facilities, including those temporarily placed on the construction site; and (vi) construction waste storage; and

(7) When applicable, the location of the on-site rain gauge or the methodology established in consultation with the VSMP authority used to identify measurable storm events for inspection purposes.

2. Erosion and sediment control plan.

a. An erosion and sediment control plan approved by the VESCP authority as authorized under the Erosion and Sediment Control Regulations (9VAC25-840), an "agreement in lieu of a plan" as defined in 9VAC25-840-10 from the VESCP authority, or an erosion and sediment control plan prepared in accordance with annual standards and specifications approved by the department. Any operator proposing a new stormwater discharge from construction activities that is not required to obtain erosion and sediment control plan approval from a VESCP authority or does not adopt department-approved annual standards and specifications shall submit the erosion and sediment control plan to the department for review and approval.

b. All erosion and sediment control plans shall include a statement describing the maintenance responsibilities required for the erosion and sediment controls used.

c. A properly implemented approved erosion and sediment control plan, "agreement in lieu of a plan," or erosion and sediment control plan prepared in accordance with department-approved annual standards and specifications, adequately:

(1) Controls the volume and velocity of stormwater runoff within the site to minimize soil erosion;

(2) Controls stormwater discharges, including peak flow rates and total stormwater volume, to minimize erosion at outlets and to minimize downstream channel and stream bank erosion;

(3) Minimizes the amount of soil exposed during the construction activity;

(4) Minimizes the disturbance of steep slopes;

(5) Minimizes sediment discharges from the site in a manner that addresses (i) the amount, frequency, intensity, and duration of precipitation; (ii) the nature of resulting stormwater runoff; and (iii) soil characteristics, including the range of soil particle sizes present on the site;

(6) Provides and maintains natural buffers around surface waters, directs stormwater to vegetated areas to increase sediment removal, and maximizes stormwater infiltration, unless infeasible;

(7) Minimizes soil compaction and, unless infeasible, preserves topsoil;

(8) Ensures that stabilization of disturbed areas will be initiated immediately whenever any clearing, grading, excavating, or other land-disturbing activities have permanently ceased on any portion of the site, or temporarily ceased on any portion of the site and will not resume for a period exceeding 14 days; and

(9) Utilizes outlet structures that withdraw stormwater from the surface (i.e., above the permanent pool or wet storage water surface elevation), unless infeasible, when discharging from sediment basins or sediment traps.

3. Stormwater management plan.

a. New construction activities. A stormwater management plan approved by the VSMP authority as authorized under the Virginia Stormwater Management Program (VSMP) Regulation (9VAC25-870), or an "agreement in lieu of a stormwater management plan" as defined in 9VAC25-870-10 from the VSMP authority, or a stormwater management plan prepared in accordance with annual standards and specifications approved by the department. Any operator proposing a new stormwater discharge from construction activities that is not required to obtain stormwater management plan approval from a VSMP authority or does not adopt department-approved annual standards and specifications shall submit the stormwater management plan to the department for review and approval.

b. Existing construction activities. Any operator that was authorized to discharge under the general permit issued in 2009, and that intends to continue coverage under this general permit, shall ensure compliance with the requirements of 9VAC25-870-93 through 9VAC25-870-99 of the VSMP Regulation, including but not limited to the water quality and quantity requirements. The SWPPP shall include a description of, and all necessary calculations supporting, all post-construction stormwater management measures that will be installed prior to the completion of the construction process to control pollutants in stormwater discharges after construction operations have been completed. Structural measures should be placed on upland soils to the degree possible. Such measures must be designed and installed in accordance with applicable VESCP authority, VSMP authority, state, and federal requirements, and any necessary permits must be obtained.

4. Pollution prevention plan. A pollution prevention plan that addresses potential pollutant-generating activities that may reasonably be expected to affect the quality of stormwater discharges from the construction activity, including any support activity. The pollution prevention plan shall:

a. Identify the potential pollutant-generating activities and the pollutant that is expected to be exposed to stormwater;

b. Describe the location where the potential pollutant-generating activities will occur, or if identified on the site plan, reference the site plan;

c. Identify all nonstormwater discharges, as authorized in Part I E of this general permit, that are or will be commingled with stormwater discharges from the construction activity, including any applicable support activity;

d. Identify the person responsible for implementing the pollution prevention practice or practices for each pollutant-generating activity (if other than the person listed as the qualified personnel);

e. Describe the pollution prevention practices and procedures that will be implemented to:

(1) Prevent and respond to leaks, spills, and other releases including (i) procedures for expeditiously stopping, containing, and cleaning up spills, leaks, and other releases; and (ii) procedures for reporting leaks, spills, and other releases in accordance with Part III G;

(2) Prevent the discharge of spilled and leaked fuels and chemicals from vehicle fueling and maintenance activities (e.g., providing secondary containment such as spill berms, decks, spill containment pallets, providing cover where appropriate, and having spill kits readily available);

(3) Prevent the discharge of soaps, solvents, detergents, and wash water from construction materials, including the clean-up of stucco, paint, form release oils, and curing compounds (e.g., providing (i) cover (e.g., plastic sheeting or temporary roofs) to prevent contact with stormwater; (ii) collection and proper disposal in a manner to prevent contact with stormwater; and (iii) a similarly effective means designed to prevent discharge of these pollutants);

(4) Minimize the discharge of pollutants from vehicle and equipment washing, wheel wash water, and other types of washing (e.g., locating activities away from surface waters and stormwater inlets or conveyance and directing wash waters to sediment basins or traps, using filtration devices such as filter bags or sand filters, or using similarly effective controls);

(5) Direct concrete wash water into a leak-proof container or leak-proof settling basin. The container or basin shall be designed so that no overflows can occur due to inadequate sizing or precipitation. Hardened concrete wastes shall be removed and disposed of in a manner consistent with the handling of other construction wastes. Liquid concrete wastes shall be removed and disposed of in a manner consistent with the handling of other construction wash waters and shall not be discharged to surface waters;

(6) Minimize the discharge of pollutants from storage, handling, and disposal of construction products, materials, and wastes including (i) building products such as asphalt sealants, copper flashing, roofing materials, adhesives, and concrete admixtures; (ii) pesticides, herbicides, insecticides, fertilizers, and landscape materials; and (iii) construction and domestic wastes such as packaging materials, scrap construction materials, masonry products, timber, pipe and electrical cuttings, plastics, Styrofoam, concrete, and other trash or building materials;

(7) Prevent the discharge of fuels, oils, and other petroleum products, hazardous or toxic wastes, and sanitary wastes; and

(8) Address any other discharge from the potential pollutant-generating activities not addressed above; and

f. Describe procedures for providing pollution prevention awareness of all applicable wastes, including any wash water, disposal practices, and applicable disposal locations of such wastes, to personnel in order to comply with the conditions of this general permit. The operator shall implement the procedures described in the SWPPP.

5. SWPPP requirements for discharges to impaired waters, surface waters with an applicable TMDL wasteload allocation established and approved prior to the term of this general permit, and exceptional waters. The SWPPP shall:

a. Identify the impaired water(s), approved TMDL(s), pollutant(s) of concern, and exceptional waters identified in 9VAC25-260-30 A 3 c, when applicable;

b. Provide clear direction that:

(1) Permanent or temporary soil stabilization shall be applied to denuded areas within seven days after final grade is reached on any portion of the site;

(2) Nutrients shall be applied in accordance with manufacturer's recommendations or an approved nutrient management plan and shall not be applied during rainfall events; and

(3) A modified inspection schedule shall be implemented in accordance with Part I B 4 or Part I B 5.

6. Qualified personnel. The name, phone number, and qualifications of the qualified personnel conducting inspections required by this general permit.

7. Delegation of authority. The individuals or positions with delegated authority, in accordance with Part III K, to sign inspection reports or modify the SWPPP.

8. SWPPP signature. The SWPPP shall be signed and dated in accordance with Part III K.

B. SWPPP amendments, modification, and updates.

1. The operator shall amend the SWPPP whenever there is a change in the design, construction, operation, or maintenance that has a significant effect on the discharge of pollutants to surface waters and that has not been previously addressed in the SWPPP.

2. The SWPPP must be amended if, during inspections or investigations by the operator's qualified personnel, or by local, state, or federal officials, it is determined that the existing control measures are ineffective in minimizing pollutants in discharges from the construction activity. Revisions to the SWPPP shall include additional or modified control measures designed and implemented to correct problems identified. If approval by the VESCP authority, VSMP authority, or department is necessary for the control measure, revisions to the SWPPP shall be completed no later than seven calendar days following approval. Implementation of these additional or modified control measures must be accomplished as described in Part II G.

3. The SWPPP must clearly identify the contractor(s) that will implement and maintain each control measure identified in the SWPPP. The SWPPP shall be amended to identify any new contractor that will implement and maintain a control measure.

4. The operator shall update the SWPPP no later than seven days following any modification to its implementation. All modifications or updates to the SWPPP shall be noted and shall include the following items:

    a. A record of dates when:

        (1) Major grading activities occur;

        (2) Construction activities temporarily or permanently cease on a portion of the site; and

        (3) Stabilization measures are initiated;

    b. Documentation of replaced or modified controls where periodic inspections or other information have indicated that the controls have been used inappropriately or incorrectly and where modified as soon as possible;

    c. Areas that have reached final stabilization and where no further SWPPP or inspection requirements apply;

    d. All properties that are no longer under the legal control of the operator and the dates on which the operator no longer had legal control over each property;

    e. The date of any prohibited discharges, the discharge volume released, and what actions were taken to minimize the impact of the release;

    f. Measures taken to prevent the reoccurrence of any prohibited discharge; and

    g. Measures taken to address any evidence identified as a result of an inspection required under Part II F.

5. Amendments, modifications, or updates to the SWPPP shall be signed in accordance with Part III K.

C. Public Notification. Upon commencement of land disturbance, the operator shall post conspicuously a copy of the notice of coverage letter near the main entrance of the construction activity. For linear projects, the operator shall post the notice of coverage letter at a publicly accessible location near an active part of the construction project (e.g., where a pipeline crosses a public road). The operator shall maintain the posted information until termination of general permit coverage as specified in Part I F.

D. SWPPP availability.

1. Operators with day-to-day operational control over SWPPP implementation shall have a copy of the SWPPP available at a central location on-site for use by those identified as having responsibilities under the SWPPP whenever they are on the construction site.

2. The operator shall make the SWPPP and all amendments, modifications, and updates available upon request to the department, the VSMP authority, the EPA, the VESCP authority, local government officials, or the operator of a municipal separate storm sewer system receiving discharges from the construction activity. If an on-site location is unavailable to store the SWPPP when no personnel are present, notice of the SWPPP's location must be posted near the main entrance of the construction site.

3. The operator shall make the SWPPP available for public review in an electronic format or in hard copy. Information for public access to the SWPPP shall be posted and maintained in accordance with Part II C. If not provided electronically, public access to the SWPPP may be arranged upon request at a time and at a publicly accessible location convenient to the operator or his designee but shall be no less than once per month and shall be during normal business hours. Information not required to be contained within the SWPPP by this general permit is not required to be released.

E. SWPPP implementation. The operator shall implement the SWPPP and subsequent amendments, modifications, and updates from commencement of land disturbance until termination of general permit coverage as specified in Part I F.

1. All control measures must be properly maintained in effective operating condition in accordance with good engineering practices and, where applicable, manufacturer specifications. If a site inspection required by Part II F identifies a control measure that is not operating effectively, corrective action(s) shall be completed as soon as practicable, but no later than seven days after discovery or a longer period as established by the VSMP authority, to maintain the continued effectiveness of the control measures.

2. If site inspections required by Part II F identify an existing control measure that needs to be modified or if an additional control measure is necessary for any reason, implementation shall be completed prior to the next anticipated measurable storm event. If implementation prior to the next anticipated measurable storm event is impracticable, then alternative control measures shall be implemented as soon as practicable, but no later than seven days after discovery or a longer period as established by the VSMP authority.

F. SWPPP Inspections.

1. Personnel responsible for on-site and off-site inspections. Inspections required by this general permit shall be conducted by the qualified personnel identified by the operator in the SWPPP. The operator is responsible for insuring that the qualified personnel conduct the inspection.

2. Inspection schedule.

    a. Inspections shall be conducted at a frequency of:

(1) At least once every five business days; or

(2) At least once every 10 business days and no later than 48 hours following a measurable storm event. In the event that a measurable storm event occurs when there are more than 48 hours between business days, the inspection shall be conducted no later than the next business day.

b. Where areas have been temporarily stabilized or land-disturbing activities will be suspended due to continuous frozen ground conditions and stormwater discharges are unlikely, the inspection frequency may be reduced to once per month. If weather conditions (such as above freezing temperatures or rain or snow events) make discharges likely, the operator shall immediately resume the regular inspection frequency.

c. Representative inspections may be utilized for utility line installation, pipeline construction, or other similar linear construction activities provided that:

(1) Temporary or permanent soil stabilization has been installed and vehicle access may compromise the temporary or permanent soil stabilization and potentially cause additional land disturbance increasing the potential for erosion;

(2) Inspections occur on the same frequency as other construction activities;

(3) Control measures are inspected along the construction site 0.25 miles above and below each access point (i.e., where a roadway, undisturbed right-of-way, or other similar feature intersects the construction activity and access does not compromise temporary or permanent soil stabilization); and

(4) Inspection locations are provided in the report required by Part II F.

3. Inspection requirements.

a. As part of the inspection, the qualified personnel shall:

(1) Record the date and time of the inspection and when applicable the date and rainfall amount of the last measurable storm event;

(2) Record the information and a description of any discharges occurring at the time of the inspection;

(3) Record any land-disturbing activities that have occurred outside of the approved erosion and sediment control plan;

(4) Inspect the following for installation in accordance with the approved erosion and sediment control plan, identification of any maintenance needs, and evaluation of effectiveness in minimizing sediment discharge, including whether the control has been inappropriately or incorrectly used:

(a) All perimeter erosion and sediment controls, such as silt fence;

(b) Soil stockpiles, when applicable, and borrow areas for stabilization or sediment trapping measures;

(c) Completed earthen structures, such as dams, dikes, ditches, and diversions for stabilization;

(d) Cut and fill slopes;

(e) Sediment basins and traps, sediment barriers, and other measures installed to control sediment discharge from stormwater;

(f) Temporary or permanent channel, flume, or other slope drain structures installed to convey concentrated runoff down cut and fill slopes;

(g) Storm inlets that have been made operational to ensure that sediment laden stormwater does not enter without first being filtered or similarly treated; and

(h) Construction vehicle access routes that intersect or access paved roads for minimizing sediment tracking;

(5) Inspect areas that have reached final grade or that will remain dormant for more than 14 days for initiation of stabilization activities;

(6) Inspect areas that have reached final grade or that will remain dormant for more than 14 days for completion of stabilization activities within seven days of reaching grade or stopping work;

(7) Inspect for evidence that the approved erosion and sediment control plan, "agreement in lieu of a plan," or erosion and sediment control plan prepared in accordance with department-approved annual standards and specifications has not been properly implemented. This includes but is not limited to:

(a) Concentrated flows of stormwater in conveyances such as rills, rivulets or channels that have not been filtered, settled, or similarly treated prior to discharge, or evidence thereof;

(b) Sediment laden or turbid flows of stormwater that have not been filtered or settled to remove sediments prior to discharge;

(c) Sediment deposition in areas that drain to unprotected stormwater inlets or catch basins that discharge to surface waters. Inlets and catch basins with failing sediments controls due to improper installation, lack of maintenance, or inadequate design are considered unprotected;

(d) Sediment deposition on any property (including public and private streets) outside of the construction activity covered by this general permit;

(e) Required stabilization has not been initiated or completed on portions of the site;

(f) Sediment basins without adequate wet or dry storage volume or sediment basins that allow the discharge of stormwater from below the surface of the wet storage portion of the basin;

(g) Sediment traps without adequate wet or dry storage or sediment traps that allow the discharge of stormwater from below the surface of the wet storage portion of the trap; and

(h) Land disturbance outside of the approved area to be disturbed;

(8) Inspect pollutant generating activities identified in the pollution prevention plan for the proper implementation, maintenance and effectiveness of the procedures and practices;

(9) Identify any pollutant generating activities not identified in the pollution prevention plan; and

(10) Identify and document the presence of any evidence of the discharge of pollutants prohibited by this general permit.

4. Inspection report. Each inspection report shall include the following items:

   a. The date and time of the inspection and when applicable, the date and rainfall amount of the last measurable storm event;

   b. Summarized findings of the inspection;

   c. The location(s) of prohibited discharges;

   d. The location(s) of control measures that require maintenance;

   e. The location(s) of control measures that failed to operate as designed or proved inadequate or inappropriate for a particular location;

   f. The location(s) where any evidence identified under Part II F 3 a (7) exists;

   g. The location(s) where any additional control measure is needed that did not exist at the time of inspection;

   h. A list of corrective actions required (including any changes to the SWPPP that are necessary) as a result of the inspection or to maintain permit compliance;

   i. Documentation of any corrective actions required from a previous inspection that have not been implemented; and

   j. The date and signature of the qualified personnel and the operator or its duly authorized representative.

The inspection report and any actions taken in accordance with Part II must be retained by the operator as part of the SWPPP for at least three years from the date that general permit coverage expires or is terminated. The inspection report shall identify any incidents of noncompliance. Where an inspection report does not identify any incidents of noncompliance, the report shall contain a certification that the construction activity is in compliance with the SWPPP and this general permit. The report shall be signed in accordance with Part III K of this general permit.

G. Corrective actions.

1. The operator shall implement the corrective action(s) identified as a result of an inspection as soon as practicable but no later than seven days after discovery or a longer period as approved by the VSMP authority. If approval of a corrective action by a regulatory authority (e.g., VSMP authority, VESCP authority, or the department) is necessary, additional control measures shall be implemented to minimize pollutants in stormwater discharges until such approvals can be obtained.

2. The operator may be required to remove accumulated sediment deposits located outside of the construction activity covered by this general permit as soon as practicable in order to minimize environmental impacts. The operator shall notify the VSMP authority and the department as well as obtain all applicable federal, state, and local authorizations, approvals, and permits prior to the removal of sediments accumulated in surface waters including wetlands.

PART III

CONDITIONS APPLICABLE TO ALL VPDES PERMITS

NOTE: Discharge monitoring is not required for this general permit. If the operator chooses to monitor stormwater discharges or control measures, the operator must comply with the requirements of subsections A, B, and C, as appropriate.

A. Monitoring.

1. Samples and measurements taken for the purpose of monitoring shall be representative of the monitoring activity.

2. Monitoring shall be conducted according to procedures approved under 40 CFR Part 136 or alternative methods approved by the U.S. Environmental Protection Agency, unless other procedures have been specified in this general permit. Analyses performed according to test procedures approved under 40 CFR Part 136 shall be performed by an environmental laboratory certified under regulations adopted by the Department of General Services (1VAC30-45 or 1VAC30-46).

3. The operator shall periodically calibrate and perform maintenance procedures on all monitoring and analytical instrumentation at intervals that will ensure accuracy of measurements.

B. Records.

1. Monitoring records and reports shall include:

   a. The date, exact place, and time of sampling or measurements;

   b. The individual(s) who performed the sampling or measurements;

   c. The date(s) and time(s) analyses were performed;

   d. The individual(s) who performed the analyses;

   e. The analytical techniques or methods used; and

   f. The results of such analyses.

2. The operator shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this general permit, and records of all data used to complete the registration statement for this general permit, for a period of at least three years from the date of the sample, measurement, report or request for coverage. This period of retention shall be extended automatically during the course of any unresolved litigation regarding the regulated activity or regarding control standards applicable to the operator, or as requested by the board.

C. Reporting monitoring results.

1. The operator shall update the SWPPP to include the results of the monitoring as may be performed in accordance with this general permit, unless another reporting schedule is specified elsewhere in this general permit.

2. Monitoring results shall be reported on a discharge monitoring report (DMR); on forms provided, approved or specified by the department; or in any format provided that the date, location, parameter, method, and result of the monitoring activity are included.

3. If the operator monitors any pollutant specifically addressed by this general permit more frequently than required by this general permit using test procedures approved under 40 CFR Part 136 or using other test procedures approved by the U.S. Environmental Protection Agency or using procedures specified in this general permit, the results of this monitoring shall be included in the calculation and reporting of the data submitted in the DMR or reporting form specified by the department.

4. Calculations for all limitations which require averaging of measurements shall utilize an arithmetic mean unless otherwise specified in this general permit.

D. Duty to provide information. The operator shall furnish, within a reasonable time, any information which the board may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this general permit or to determine compliance with this general permit. The board, department, EPA, or VSMP authority may require the operator to furnish, upon request, such plans, specifications, and other pertinent information as may be necessary to determine the effect of the wastes from his discharge on the quality of surface waters, or such other information as may be necessary to accomplish the purposes of the CWA and the Virginia Stormwater Management Act. The operator shall also furnish to the board, department, EPA, or VSMP authority, upon request, copies of records required to be kept by this general permit.

E. Compliance schedule reports. Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this general permit shall be submitted no later than 14 days following each schedule date.

F. Unauthorized stormwater discharges. Pursuant to § 62.1-44.5 of the Code of Virginia, except in compliance with a state permit issued by the department, it shall be unlawful to cause a stormwater discharge from a construction activity.

G. Reports of unauthorized discharges. Any operator who discharges or causes or allows a discharge of sewage, industrial waste, other wastes or any noxious or deleterious substance or a hazardous substance or oil in an amount equal to or in excess of a reportable quantity established under either 40 CFR Part 110, 40 CFR Part 117, 40 CFR Part 302, or § 62.1-44.34:19 of the Code of Virginia that occurs during a 24-hour period into or upon surface waters or who discharges or causes or allows a discharge that may reasonably be expected to enter surface waters, shall notify the Department of Environmental Quality of the discharge immediately upon discovery of the discharge, but in no case later than within 24 hours after said discovery. A written report of the unauthorized discharge shall be submitted to the department and the VSMP authority within five days of discovery of the discharge. The written report shall contain:

1. A description of the nature and location of the discharge;

2. The cause of the discharge;

3. The date on which the discharge occurred;

4. The length of time that the discharge continued;

5. The volume of the discharge;

6. If the discharge is continuing, how long it is expected to continue;

7. If the discharge is continuing, what the expected total volume of the discharge will be; and

8. Any steps planned or taken to reduce, eliminate and prevent a recurrence of the present discharge or any future discharges not authorized by this general permit.

Discharges reportable to the department and the VSMP authority under the immediate reporting requirements of other regulations are exempted from this requirement.

H. Reports of unusual or extraordinary discharges. If any unusual or extraordinary discharge including a "bypass" or "upset," as defined herein, should occur from a facility and the discharge enters or could be expected to enter surface waters, the operator shall promptly notify, in no case later than within 24 hours, the department and the VSMP authority by telephone after the discovery of the discharge. This notification shall provide all available details of the incident, including any adverse effects on aquatic life and the known number of fish killed. The operator shall reduce the report to writing and shall submit it to the department and the VSMP authority within five days of discovery of the discharge in accordance with Part III I 2. Unusual and extraordinary discharges include but are not limited to any discharge resulting from:

1. Unusual spillage of materials resulting directly or indirectly from processing operations;

2. Breakdown of processing or accessory equipment;

3. Failure or taking out of service of some or all of the facilities; and

4. Flooding or other acts of nature.

I. Reports of noncompliance. The operator shall report any noncompliance which may adversely affect surface waters or may endanger public health.

1. An oral report to the department and the VSMP authority shall be provided within 24 hours from the time the operator becomes aware of the circumstances. The following shall be included as information that shall be reported within 24 hours under this subdivision:

    a. Any unanticipated bypass; and

    b. Any upset that causes a discharge to surface waters.

2. A written report shall be submitted within five days and shall contain:

    a. A description of the noncompliance and its cause;

    b. The period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and

    c. Steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.

    The department may waive the written report on a case-by-case basis for reports of noncompliance under Part III I if the oral report has been received within 24 hours and no adverse impact on surface waters has been reported.

3. The operator shall report all instances of noncompliance not reported under Part III I 1 or 2 in writing as part of the SWPPP. The reports shall contain the information listed in Part III I 2.

NOTE: The reports required in Part III G, H and I shall be made to the department and the VSMP authority. Reports may be made by telephone, email, or by fax. For reports outside normal working hours, leaving a recorded message shall fulfill the immediate reporting requirement. For emergencies, the Virginia Department of Emergency Management maintains a 24-hour telephone service at 1-800-468-8892.

4. Where the operator becomes aware of a failure to submit any relevant facts, or submittal of incorrect information in any report, including a registration statement, to the department or the VSMP authority, the operator shall promptly submit such facts or correct information.

J. Notice of planned changes.

1. The operator shall give notice to the department and the VSMP authority as soon as possible of any planned physical alterations or additions to the permitted facility or activity. Notice is required only when:

   a. The operator plans an alteration or addition to any building, structure, facility, or installation that may meet one of the criteria for determining whether a facility is a new source in 9VAC25-870-420;

   b. The operator plans an alteration or addition that would significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants that are not subject to effluent limitations in this general permit; or

2. The operator shall give advance notice to the department and VSMP authority of any planned changes in the permitted facility or activity, which may result in noncompliance with state permit requirements.

K. Signatory requirements.

1. Registration statement. All registration statements shall be signed as follows:

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

   b. For a partnership or sole proprietorship: by a general partner or the proprietor, respectively; or

   c. For a municipality, state, federal, or other public agency: by either a principal executive officer or ranking elected official. For purposes of this chapter, a principal executive officer of a public agency includes: (i) the chief executive officer of the agency or (ii) a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency.

2. Reports, etc. All reports required by this general permit, including SWPPPs, and other information requested by the board or the department shall be signed by a person described in Part III K 1 or by a duly authorized representative of that person. A person is a duly authorized representative only if:

   a. The authorization is made in writing by a person described in Part III K 1;

   b. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the operator. (A duly authorized

representative may thus be either a named individual or any individual occupying a named position); and

c. The signed and dated written authorization is included in the SWPPP. A copy must be provided to the department and VSMP authority, if requested.

3. Changes to authorization. If an authorization under Part III K 2 is no longer accurate because a different individual or position has responsibility for the overall operation of the construction activity, a new authorization satisfying the requirements of Part III K 2 shall be submitted to the VSMP authority as the administering entity for the board prior to or together with any reports or information to be signed by an authorized representative.

4. Certification. Any person signing a document under Part III K 1 or 2 shall make the following certification:

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

L. Duty to comply. The operator shall comply with all conditions of this general permit. Any state permit noncompliance constitutes a violation of the Virginia Stormwater Management Act and the Clean Water Act, except that noncompliance with certain provisions of this general permit may constitute a violation of the Virginia Stormwater Management Act but not the Clean Water Act. Permit noncompliance is grounds for enforcement action; for state permit termination, revocation and reissuance, or modification; or denial of a state permit renewal application.
The operator shall comply with effluent standards or prohibitions established under § 307(a) of the Clean Water Act for toxic pollutants within the time provided in the regulations that establish these standards or prohibitions or standards for sewage sludge use or disposal, even if this general permit has not yet been modified to incorporate the requirement.

M. Duty to reapply. If the operator wishes to continue an activity regulated by this general permit after the expiration date of this general permit, the operator shall submit a new registration statement at least 90 days before the expiration date of the existing general permit, unless permission for a later date has been granted by the board. The board shall not grant permission for registration statements to be submitted later than the expiration date of the existing general permit.

N. Effect of a state permit. This general permit does not convey any property rights in either real or personal property or any exclusive privileges, nor does it authorize any injury to private property or invasion of personal rights, or any infringement of federal, state or local law or regulations.

O. State law. Nothing in this general permit shall be construed to preclude the institution of any legal action under, or relieve the operator from any responsibilities, liabilities, or penalties established pursuant to any other state law or regulation or under authority preserved by § 510 of the Clean Water Act. Except as provided in general permit conditions on "bypassing" (Part III U) and "upset" (Part III V), nothing in this general permit shall be construed to relieve the operator from civil and criminal penalties for noncompliance.

P. Oil and hazardous substance liability. Nothing in this general permit shall be construed to preclude the institution of any legal action or relieve the operator from any responsibilities, liabilities, or penalties to which the operator is or may be subject under §§ 62.1-44.34:14 through 62.1-44.34:23 of the State Water Control Law or § 311 of the Clean Water Act.

Q. Proper operation and maintenance. The operator shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances), which are installed or used by the operator to achieve compliance with the conditions of this general permit. Proper operation and maintenance also includes effective plant performance, adequate funding, adequate staffing, and adequate laboratory and process controls, including appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems, which are installed by the operator only when the operation is necessary to achieve compliance with the conditions of this general permit.

R. Disposal of solids or sludges. Solids, sludges or other pollutants removed in the course of treatment or management of pollutants shall be disposed of in a manner so as to prevent any pollutant from such materials from entering surface waters and in compliance with all applicable state and federal laws and regulations.

S. Duty to mitigate. The operator shall take all steps to minimize or prevent any discharge in violation of this general permit that has a reasonable likelihood of adversely affecting human health or the environment.

T. Need to halt or reduce activity not a defense. It shall not be a defense for an operator in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this general permit.

U. Bypass.

1. "Bypass," as defined in 9VAC25-870-10, means the intentional diversion of waste streams from any portion of a treatment facility. The operator may allow any bypass to occur that does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to ensure efficient operation. These bypasses are not subject to the provisions of Part III U 2 and 3.

2. Notice.

    a. Anticipated bypass. If the operator knows in advance of the need for a bypass, the operator shall submit prior notice to the department, if possible at least 10 days before the date of the bypass.

    b. Unanticipated bypass. The operator shall submit notice of an unanticipated bypass as required in Part III I.

3. Prohibition of bypass.

    a. Except as provided in Part III U 1, bypass is prohibited, and the board or department may take enforcement action against an operator for bypass unless:

        (1) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage. Severe property damage means substantial physical damage to property, damage to the treatment facilities that causes them to become inoperable, or substantial and permanent loss of natural resources that can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production;

        (2) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass that occurred during normal periods of equipment downtime or preventive maintenance; and

        (3) The operator submitted notices as required under Part III U 2.

b. The department may approve an anticipated bypass, after considering its adverse effects, if the department determines that it will meet the three conditions listed in Part III U 3 a.

V. Upset.

1. An "upset," as defined in 9VAC25-870-10, means an exceptional incident in which there is unintentional and temporary noncompliance with technology-based state permit effluent limitations because of factors beyond the reasonable control of the operator. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.

2. An upset constitutes an affirmative defense to an action brought for noncompliance with technology-based state permit effluent limitations if the requirements of Part III V 4 are met. A determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is not a final administrative action subject to judicial review.

3. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventative maintenance, or careless or improper operation.

4. An operator who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs or other relevant evidence that:

   a. An upset occurred and that the operator can identify the cause(s) of the upset;

   b. The permitted facility was at the time being properly operated;

   c. The operator submitted notice of the upset as required in Part III I; and

   d. The operator complied with any remedial measures required under Part III S.

5. In any enforcement proceeding, the operator seeking to establish the occurrence of an upset has the burden of proof.

W. Inspection and entry. The operator shall allow the department as the board's designee, the VSMP authority, EPA, or an authorized representative of either entity (including an authorized contractor), upon presentation of credentials and other documents as may be required by law to:

1. Enter upon the operator's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this general permit;

2. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this general permit;

3. Inspect and photograph at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this general permit; and

4. Sample or monitor at reasonable times, for the purposes of ensuring state permit compliance or as otherwise authorized by the Clean Water Act or the Virginia Stormwater Management Act, any substances or parameters at any location.

For purposes of this section, the time for inspection shall be deemed reasonable during regular business hours, and whenever the facility is discharging. Nothing contained herein shall make an inspection unreasonable during an emergency.

X. State permit actions. State permits may be modified, revoked and reissued, or terminated for cause. The filing of a request by the operator for a state permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any state permit condition.

Y. Transfer of state permits.

1. State permits are not transferable to any person except after notice to the department. Except as provided in Part III Y 2, a state permit may be transferred by the operator to a new operator only if the state permit has been modified or revoked and reissued, or a minor modification made, to identify the new operator and incorporate such other requirements as may be necessary under the Virginia Stormwater Management Act and the Clean Water Act.

2. As an alternative to transfers under Part III Y 1, this state permit may be automatically transferred to a new operator if:

    a. The current operator notifies the department at least 30 days in advance of the proposed transfer of the title to the facility or property;

    b. The notice includes a written agreement between the existing and new operators containing a specific date for transfer of state permit responsibility, coverage, and liability between them; and

    c. The department does not notify the existing operator and the proposed new operator of its intent to modify or revoke and reissue the state permit. If this notice is not received, the transfer is effective on the date specified in the agreement mentioned in Part III Y 2 b.

3. For ongoing construction activity involving a change of operator, the new operator shall accept and maintain the existing SWPPP, or prepare and implement a new SWPPP prior to taking over operations at the site.

Z. Severability. The provisions of this general permit are severable, and if any provision of this general permit or the application of any provision of this state permit to any circumstance, is held invalid, the application of such provision to other circumstances and the remainder of this general permit shall not be affected thereby.

DEFINITIONS

"Business day" means Monday through Friday excluding state holidays.

"Commencement of land disturbance" means the initial disturbance of soils associated with clearing, grading, or excavating activities or other construction activities (e.g., stockpiling of fill material).

"Construction site" means the land where any land-disturbing activity is physically located or conducted, including any adjacent land used or preserved in connection with the land-disturbing activity.

"Final stabilization" means that one of the following situations has occurred:

1. All soil disturbing activities at the site have been completed and a permanent vegetative cover has been established on denuded areas not otherwise permanently stabilized. Permanent vegetation shall not be considered established until a ground cover is achieved that is uniform (e.g., evenly distributed), mature enough to survive, and will inhibit erosion.

2. For individual lots in residential construction, final stabilization can occur by either:

    a. The homebuilder completing final stabilization as specified in subdivision 1 of this definition; or

    b. The homebuilder establishing temporary soil stabilization, including perimeter controls for an individual lot prior to occupation of the home by the homeowner, and informing the homeowner of the need for, and benefits of, final stabilization.

3. For construction projects on land used for agricultural purposes, final stabilization may be accomplished by returning the disturbed land to its preconstruction agricultural use. Areas disturbed that were not previously used for agricultural activities, such as buffer strips immediately adjacent to surface waters, and areas that are not being returned to their preconstruction agricultural use must meet the final stabilization criteria specified in subdivision 1 or 2 of this definition.

"Immediately" means as soon as practicable, but no later than the end of the next business day, following the day when the land-disturbing activities have temporarily or permanently ceased. In the context of this general permit, "immediately" is used to define the deadline for initiating stabilization measures.

"Impaired waters" means surface waters identified as impaired on the 2012 § 305(b)/303(d) Water Quality Assessment Integrated Report.

"Infeasible" means not technologically possible or not economically practicable and achievable in light of best industry practices.

"Initiation of stabilization activities" means:

1. Prepping the soil for vegetative or nonvegetative stabilization;

2. Applying mulch or other nonvegetative product to the exposed area;

3. Seeding or planting the exposed area;

4. Starting any of the above activities on a portion of the area to be stabilized, but not on the entire area; or

5. Finalizing arrangements to have the stabilization product fully installed in compliance with the applicable deadline for completing stabilization.

This list is not exhaustive.

"Measurable storm event" means a rainfall event producing 0.25 inches of rain or greater over 24 hours.

"Stabilized" means land that has been treated to withstand normal exposure to natural forces without incurring erosion damage.

APPENDIX 2

Record of Land Disturbance

& SWPPP Modifications (Major Revisions)

Major Revisions

Major revisions that exit the permitted LOD will be submitted to VADEQ for review and approval prior to implementation of the change. Major revisions include (but are not limited to) the following:

- **Reroutes;**
- **Proposed access road additions; and**
- **Proposed additional temporary workspace (ATWS) areas**

The revision log documenting redline changes as well as the redline markup of ESC/SWM drawings will be located in each construction spread permit mailbox.

Certification of Stormwater Pollution Prevention Plan Revisions

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

Signature[1]:	**Date:**
Printed Name:	**Title:**
Revision ____	**Revision Description:**

Signature[1]:	**Date:**
Printed Name:	**Title:**
Revision _____	**Revision Description:**

Signature[1]:	**Date:**
Printed Name:	**Title:**
Revision _____	**Revision Description:**

Signature[1]:	**Date:**
Printed Name:	**Title:**
Revision _____	**Revision Description:**

Signature[1]:	**Date:**
Printed Name:	**Title:**
Revision _____	**Revision Description:**

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Revision _____	**Revision Description:**

Signature[1]:	**Date:**
Printed Name:	**Title:**
Revision _____	**Revision Description:**

Signature[1]:	**Date:**
Printed Name:	**Title:**
Revision _____	**Revision Description:**

Signature[1]:	**Date:**
Printed Name:	**Title:**
Revision _____	**Revision Description:**

[1] Certification will be signed by a *responsible corporate officer* or by *a duly authorized representative* of that person. Specific requirements and responsibilities of the responsible corporate officer or duly authorized representative as well as delegate of authority to SWPPP Coordinator are discussed in detail in below.

APPENDIX 3

Record of Site Inspections

Visual Site Inspection Report

Project Name		**AFE**		**Spread**	
Contractor				**Report #**	
Inspector	Tara Killen			**Date/Time**	1/9/2018 4:49 PM

Permit #		**Inspection Type**		**Station Begin**			
State		**Inspection Area**		**Station End**			
County		**Ground**				**Temperature (ºF)**	
Municipality		**Weather**				**Rain Gauge (in)**	
GPS Location				**Rain Accumulation Time (days)**			

1. Are the approved (stamped) E&S Plan and PCSM Plan present on site?	
2. Are there activities occurring outside of the limits of disturbance shown on the plan drawings? (If yes, notify the MVP Environmental Permitting Coordinator and explain in comments.)	
3. Is Construction sequence outlined in the construction notes of the E&S plan set or PCSM plan set being followed? (If No, notify MVP Environmental Permitting Coordinator and explain in comments.)	

4. E&S BMPs (List BMPs and note if installed and maintained as per the plan. If corrective action is needed, a picture is required.)

E&S BMPs	Compliance Level	Corrective Action	Corrective Time Frame

5. Site Conditions

Is an unauthorized discharge (such as sediment, gravel, oil, HDD fluid, etc.) occurring to waters, wetlands, or beyond defined limits of disturbance resulting from earth disturbance activity or ineffective BMP? If yes, take a photo and immediately contact MVP Environmental Permitting Coordinator.	
Have inactive disturbed areas (stockpiles, final grade) been stabilized per state requirements?	
Are slopes 3:1 and greater stabilized with appropriate BMPs as per E&S plans?	
Has a new slip/slide been observed? (If yes, complete Slide Report Form)	

AFE		Date/Time	1/9/2018 4:49 PM	Report #	

6. PCSM BMPs (List BMPs and note if installed and maintained as per the plan. If corrective action is needed, a picture is required.)

PCSM BMPs	Compliance Level	Corrective Action	Corrective Time Frame

7. Identify all remedial measures that have been taken since the previous inspection was conducted.

Comments (Reference above questions as appropriate.)

Note: It is a condition of National Pollutant Discharge Elimination System and Erosion and Sediment permits that a maintenance program be conducted to provide for the operation and maintenance of all BMPs to be inspected on a weekly basis and after each stormwater event. Please list in the space provided comments to note if repairs or replacement are needed or have been made for BMPs as a result of the inspection. Failure to conduct the required inspection may result in permit suspension or the imposition of civil penalties. If supplemental monitoring is required as part of a permit condition this form may be used to meet those monitoring requirements.

AFE		Date/Time	1/9/2018 4:49 PM	Report #	

Pictures

Insert image here		Insert image here	
GPS Location		**GPS Location**	
Description		**Description**	
Insert image here		Insert image here	
GPS Location		**GPS Location**	
Description		**Description**	
Insert image here		Insert image here	
GPS Location		**GPS Location**	
Description		**Description**	

APPENDIX 4

Record of Contractor Certification

Contractor Certification

Contractors noted below have been trained in pollution prevention practices and are familiar with the procedures and information contained within this SWPPP.

Site: <u>Mountain Valley Pipeline Project</u>

SWPPP Measure	Company Name	Contact Name	Business Address	Phone Number
General Contractor				
Contractor Superintendent*				
E&S Controls				
Portable Toilets				
Trash Containers				
Concrete				
Karst Specialist 1				
Karst Specialist 2				
			*The contractor superintendent shall act as the Emergency Coordinator for the Contractor, per Section 5.2.1 of the SPCC Plan	

APPENDIX 5

Record of Inspector Certification

Mountain Valley Pipeline
Project Environmental Inspector
VADEQ Certifications Summary 3/23/18

		VADEQ Certifications		
Personnel	Company	VADEQ - ESC Inspector ID	VADEQ - SWM Inspector ID	Responsible Land Disturber ID
Tracy Hilbun	MVP-Contractor	DIN0848	DIN0848	-
Casey Lee McGaha	MVP-Contractor	DIN0847	DIN0847	-
Doug Davenport	MVP-Contractor	ESIN0835	SWIN1263	RLD07711
Randy Thomas Clark	MVP-Contractor	ESIN0856	-	RLD08559
Richard Kim McLeroy	MVP-Contractor	ESIN0857	conditional certification *	RLD08782
Dennis Lamar Evans	MVP-Contractor	ESIN0864	-	RLD08775
Patrick Davis	MVP-Contractor	conditional certification *	-	RLD08783
Charles Robertson	MVP-Contractor	ESIN0809	conditional certification *	RLD08075
Rayla Marical	MVP-Contractor	DIN0856	DIN0856	-
Frank Weaver	MVP-Contractor	conditional certification *	conditional certification *	-
Brian Clauto	EQT	conditional certification *	conditional certification *	-
Tim Bowen	MVP-Contractor	conditional certification *	conditional certification *	-
Garrett Barclay	MVP-Contractor	conditional certification *	conditional certification *	-
Bradley Ingram	MVP-Contractor	conditional certification *	conditional certification *	-
David Burkhart	MVP-Contractor	conditional certification *	-	-
Kyle Eubanks	MVP-Contractor	conditional certification *	-	-
Gavin Sherburne	Precision Pipeline	conditional certification *	-	-
Jason Stromburg	Precision Pipeline	conditional certification *	-	-
James L. Pierce	MVP-Contractor	conditional certification *	-	-
Mike Ruchti	MVP-Contractor	conditional certification *	conditional certification *	-
Tara Killen	MVP-Contractor	conditional certification *	conditional certification *	-

* Conditional certification indicates individual has attended the required VADEQ ESC or SWM Inspector certification training sessions.

APPENDIX 6

Temporary BMP Location Tracking Table

Minor field-approved revisions that do not increase the LOD or that will increase the effectiveness of ESC and SWM BMPs will be 'red-lined' on a set of plans that will remain on site for the duration of the Project to allow MVP and VADEQ to ensure compliance with the approved plan and applicable regulatory requirements. MVP will maintain a log documenting all red-lined per construction spread. The log will be presented to the VADEQ Inspector during project inspections for signoff. Minor redline revisions include (but are not limited to) the following:

- Adjustment of BMP orientation to ensure proper function and protection of the adjacent resource;
- Implementation of additional measures to meet changing site conditions or to address areas of potential concern;
- Adjusting the location of pipeline centerline within the permitted LOD;
- Adjusting/lengthening the Temporary Stone Construction Entrance to address weather conditions; and
- Additional reduction of LOD where necessary.

Temporary BMP Location Tracking

Each time a temporary BMP (concrete washout, porta-john, dumpsters, fuel storage, etc.) is relocated on site, the current location should be listed on this document.
*BMP locations may also be tracked on a site map/plan located with SWPPP

BMP (type)	Location	Date Moved

APPENDIX 7

Plan Sheet Excerpts

APPENDIX 8

Record of SWPPP Availability

Access to the most up-to-date version of this SWPPP can be access at the following site:
WEBSITE TBD

For further questions regarding the SWPPP, please refer to the VADEQ site:
WEBSITE TBD

Record of SWPPP Availability

Site: Mountain Valley Pipeline Project

Date Requested	Requested By	Location of Viewing	Date of Viewing	Comments	Initials

APPENDIX 9

Spill Prevention Control and Countermeasure Plan (SPCC)

Spill Prevention, Control, and Countermeasure (SPCC) Plan
and
Unanticipated Discovery of Contamination Plan
for Construction Activities in Virginia

Submitted By:

Mountain Valley Pipeline, LLC
555 Southpointe Boulevard, Suite 200
Canonsburg, PA 15317

By means of this certification , this Plan has been prepared in accordance with good engineering practice, including consideration of applicable industry standards, and with the requirements of 40 CFR §112.3(d)

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Acronyms and Abbreviations

A	acceptable
ABACT	anti-degradation best available combination of technologies
BMP	best management practice
CFR	Code of Federal Regulations
DEQ	Virginia Department of Environmental Quality
EC	Emergency Coordinator
EPA	U.S. Environmental Protection Agency
MVP	Mountain Valley Pipeline, LLC
ESCP	Erosion and Sediment Control Plan
HDD	Horizontally Directional Drilling
ID	Identification
PCB	Polychlorinated Biphenyl
Plan	Preparedness, Prevention, and Contingency and Spill Prevention Control and Countermeasures Plan
PPC	Preparedness, Prevention, and Contingency
PPE	Personal Protective Equipment
Ppm	parts per million
Project	MVP Pipeline Project
ROW	right-of-way
SDS	Safety Data Sheet
SOP	standard operation procedure
SPCC	Spill Prevention Control and Countermeasures
SPRP	Spill Prevention and Response Plan
U	unacceptable

1.0 OVERVIEW

Mountain Valley Pipeline, LLC (MVP), a joint venture between EQT Midstream Partners, LP and affiliates of NextEra Energy, Inc.; Con Edison Gas Midstream LLC; WGL Holdings, Inc.; and RGC Midstream, LLC (collectively referred to as MVP), is seeking a Certificate of Public Convenience and Necessity (Certificate) from the Federal Energy Regulatory Commission (FERC) pursuant to Section 7(c) of the Natural Gas Act authorizing it to construct and operate the proposed Mountain Valley Pipeline Project (Project) located in 17 counties in West Virginia and Virginia. MVP plans to construct an approximately 303-mile, 42-inch-diameter natural gas pipeline to provide timely, cost-effective access to the growing demand for natural gas for use by local distribution companies, industrial users, and power generation in the Mid-Atlantic and southeastern markets, as well as potential markets in the Appalachian region. Construction is anticipated to begin in 2017 and conclude in the fourth quarter of 2018. Construction on National Forest System lands will occur in 2018.

The proposed pipeline will extend from the existing Equitrans, L.P. transmission system and other natural gas facilities in Wetzel County, West Virginia to Transcontinental Gas Pipe Line Company, LLC's (Transco) Zone 5 compressor station 165 in Pittsylvania County, Virginia. In addition to the pipeline, the Project will include approximately 171,600 horsepower of compression at three compressor stations currently planned along the route, as well as measurement, regulation, and other ancillary facilities required for the safe and reliable operation of the pipeline. The pipeline is designed to transport up to 2.0 million dekatherms per day of natural gas.

A 3.5-mile long segment of the Project will cross portions of the Jefferson National Forest (JNF) in Monroe County in southern West Virginia and in Giles, Craig, and Montgomery counties in southwestern Virginia. The JNF is managed by the U.S. Forest Service (USFS) of the U.S. Department of Agriculture. Another 60-foot segment of the Project will cross the Weston and Gauley Bridge Turnpike Trail (Weston and Gauley Turnpike) in Braxton County, West Virginia, which is administered by the U.S. Army Corps of Engineers (USACE). Approval to cross land managed by two or more federal agencies is the responsibility of the U.S. Department of the Interior, Bureau of Land Management (BLM) through issuance of a right-of-way grant. Project-wide construction environmental compliance will be the responsibility of the FERC. The USFS and USACE will also ensure compliance across lands managed or administered by those agencies. Because the majority of federal lands crossed are managed by the USFS, this plan focuses on the JNF, noting any additional or different requirements that are specific to the crossing of the Weston and Gauley Turnpike.

The USFS will be responsible for enforcement of the terms and conditions of the BLM's right-of-way grant on National Forest System lands during the term of the right-of-way grant for the Project. Compliance will be monitored on the JNF portion of this Project by the USFS Project Manager and the Authorized Officer's designated compliance monitors. USFS will have stop-work authority per terms outlined in the BLM right-of-way grant. USFS will also have stop-work authority if unsafe work conditions are encountered during construction.

The FERC will utilize a third-party Compliance Inspection Contractor (CIC) contracted to MVP to act on behalf of the agency to provide Project-wide construction oversight and monitor compliance. The CIC will inspect and monitor preconstruction and construction activities and enforce requirements related to the National Historic Preservation Act (NHPA), the Endangered Species Act (ESA), and other applicable laws and regulations. The Project will adhere to all federal, state, and local permits. The CIC will coordinate with the USFS Project Manager and designated compliance monitors.

The Project has potential to impact sensitive environmental resources and, as a result, environmental protection measures have been developed to minimize potential impacts on these resources and will be applied, as applicable, to the Project.

2.0 WASTE MANAGEMENT

This waste management section provides an overview and checklist to be used before each phase of construction begins at each spread. Each job might require different chemicals and equipment with different fuel requirements that must be documented, accounted for, and contained. Also included at the end of this section are the Weekly Hazardous Materials and Waste Inspection Log for weekly inspection of hazardous materials and waste.

2.1 Material and Waste Inventory

Prior to each phase of construction at each spread, the material and waste inventory must be completed. The inventory must be provided in the Tables 2-1 to 2-4 below and will, depending on the specific circumstances of the planned construction activity, include the following:

- Nutrients, such as fertilizers and sanitary wastes;
- Solid waste, such as scrap metals, masonry products, and other raw construction materials and debris;
- Construction chemicals, such as paints, soils additives, and acids for cleaning;
- Petroleum products, such as fuels and lubricants; and
- Other materials, including concrete wash from mixers and explosives.

The list must include oils and fuels, commercial chemicals, hazardous and nonhazardous wastes, and incompatible materials to be used or stored on site during construction.

TABLE 2-1
List of Oil and Fuel to be Used or Stored On-Site During Construction

Type	Quantity	Containment Method	Location
Notes: A Safety Data Sheet (SDS) for all hazardous substances listed in the above tables shall be provided by the contractor. All containers shall have secondary containment.			

TABLE 2-2
List of Commercial Chemicals to be Used or Stored On-Site during Construction

Type	Quantity	Containment Method	Location

Notes:
A SDS for all hazardous substances listed in the above tables shall be provided by the contractor. All containers shall have secondary containment.

TABLE 2-3
List of Hazardous and Nonhazardous Wastes to be Used or Stored On-Site during Construction

Type	Quantity	Containment Method	Location

Notes:
A SDS for all hazardous substances listed in the above tables shall be provided by the contractor. All containers shall have secondary containment.

TABLE 2-4
List of Incompatible Materials to be Used or Stored On-Site during Construction

Type	Quantity	Containment Method	Location

Notes:
A SDS for all hazardous substances listed in the above tables shall be provided by the contractor. All containers shall have secondary containment.

Incompatible materials shall be stored in separate areas in accordance with nationally recognized standards. Incompatible materials shall not be consecutively placed into a container or tank. Additionally, sources of ignition are prohibited in hazardous materials and wastes areas.

The Contractor shall identify and list all sources of potential large spills, including tank overflow, rupture, or leakage. SPCC information must be included for all containers greater than 55 gallons with a cumulative capacity of 1,320 gallons or greater that contain oil, including petroleum, fuel oil, sludge, oil refuse, and oil mixed with waste, as required in Code of Federal Regulations, Title 40, Part 112 (40 CFR Part 112). The Contractor shall list large spill sources in **Table 2-5A**. Additional sources of large spills can be listed in **Table 2-5B**. Additional tables shall be provided as needed.

TABLE 2-5A
List of Large Spill Sources

Product	Total Quantity Storage Size, Type		Potential Direction of Flow	Maximum Rate of Flow	Structures or Equipment to Contain Spills	Location of Use
	Present	Location				
Note: All containers shall have secondary containment.						

TABLE 2-5B
List of Large Spill Sources

Product	Total Quantity Storage Size, Type		Potential Direction of Flow	Maximum Rate of Flow	Structures or Equipment to Contain Spills	Location of Use
	Present	Location				
Note: All containers shall have secondary containment.						

2.2 Hazardous Materials and Waste Inspections

The Contractor shall inspect weekly hazardous materials and waste and associated storage areas. These weekly inspections shall document the condition of the hazardous materials and waste and the associated storage containers. The Contractor shall file all inspection records with the Chief Inspector and Environmental Inspector on a weekly basis. The weekly inspection form is at the end of this section and is titled *Weekly Hazardous Materials and Waste Inspection Log*.

Weekly Hazardous Materials and Waste Inspection Log

For each item listed below, the Contractor shall indicate whether existing conditions are acceptable (A) or unacceptable (U). Resolution of all unacceptable conditions must be documented. Contractor shall inspect all storage facilities on a regular basis, but not less than weekly. Contractor shall file all inspection records with the Chief Inspector and Environmental Inspector on a weekly basis.

I. STORAGE AREAS FOR FUELS, LUBRICANTS, AND CHEMICALS

General

A/U

- ☐ Construction yard or storage areas secured
- ☐ National Fire Protection Association symbol posted in storage area or at yard entrance
- ☐ Storage areas properly prepared and signed
- ☐ Safety Data Sheets available
- ☐ Hazardous Materials Management Plan and Spill Prevention and Countermeasure Plan available

Hazardous Materials Management

A/U

- ☐ No evidence of spill or leaking materials
- ☐ Incompatible materials separated
- ☐ All containers labeled properly
- ☐ All containers securely closed
- ☐ All containers upright
- ☐ No evidence of container bulging, damage, rust, or corrosion

Secondary Containment Areas

A/U

- ☐ Containment berm intact and capable of holding 110 percent of material stored plus precipitation
- ☐ Lining intact
- ☐ No materials overhanging berms
- ☐ No materials stored on berms
- ☐ No flammable materials used for berms

Compressed Gases

A/U

- ☐ Cylinders labeled with contents
- ☐ Cylinders secured from falling
- ☐ Oxygen stored at least 25 feet away from fuel
- ☐ Cylinders in bulk storage are separated from incompatible materials by fire barriers or by appropriate distance

II. HAZARDOUS WASTE MANAGEMENT

Waste Container Storage

A/U

- ☐ No evidence of spilled or leaking wastes
- ☐ Adequate secondary containment for all wastes
- ☐ Separate containers for each waste watercourse (no piles)
- ☐ Waste area not adjacent to combustibles or compressed gases
- ☐ All containers securely closed
- ☐ Bungs secured tightly
- ☐ Open-top drum hoops secured
- ☐ All containers upright
- ☐ No evidence of container bulging or corrosion
- ☐ No severe damage or rust
- ☐ Containers are compatible with waste (e.g., plastic liner for corrosives, metal liner for solvents)
- ☐ No smoking and general danger and/or warning signs posted

Waste Container Labeling

A/U

- ☐ Containers properly labeled

Name, address, and U.S. Environmental Protection Agency identification (ID) number or ID number of generator listed (Not required if Contractor is an exempt small quantity generator)

- ☐ Accumulation start date listed
- ☐ Storage start date listed
- ☐ Chemical and physical composition of waste listed
- ☐ Hazardous property listed

Nonhazardous Waste Areas

A/U

- ☐ No litter in yard
- ☐ No hazardous wastes or used oil mixed with trash (e.g., contaminated soil, oily rags, diapers, or other oily materials)
- ☐ Empty oil and aerosol containers for disposal are completely emptied

III. EMERGENCY RESPONSE EQUIPMENT

A/U

- ☐ Shovels
- ☐ Absorbent materials (e.g., booms, pads, pillows, socks, "Speedy Dry")
- ☐ Personal protective equipment (e.g., goggles, gloves)
- ☐ Fire-fighting equipment
- ☐ First aid supplies (e.g., medical supplies, squeeze bottle eye wash)
- ☐ Department-of-Transportation-approved containers
- ☐ Plastic sheeting, bags, and ties
- ☐ Communication equipment
- ☐ Bung wrench (non-sparking)

IV. CORRECTIVE ACTIONS TAKEN (Required for all unacceptable conditions)

Enter information here

Date: Contractor Name:

Inspected by (Contractor's Inspector):

Signature:

3.0 SPILL PLAN

This section of the SPCC Plan describes spill preparedness, prevention, and containment. Spill preparedness and prevention training is also discussed in this section.

3.1 Spill and Leak Preparedness and Prevention

3.1.1 Employee Training

Prior to construction, contractors and MVP personnel shall be trained in hazardous waste management procedures that will enable them to respond effectively to emergencies by familiarizing them with emergency procedures, equipment, and communication systems. Personnel who handle, sample, or come in direct contact with oils or hazardous matter shall undergo basic training that stresses the importance of pollution control. Spill prevention control procedures shall be thoroughly explained during the training briefings, which will be conducted by the Contractor Superintendent, the MVP Chief Inspector, and the MVP Environmental Inspector or their designated representative on the job site. The MVP EC shall maintain training verification.

Prior to construction, all Project Chief and Environmental Inspectors shall receive a copy of this SPCC Plan and an approved list of emergency response contractors. Inspectors shall be trained on equipment maintenance, fuel and hazardous material handling, spill prevention procedures, and spill response.

All personnel involved in constructing the proposed facilities shall be aware of the SPCC and the Preparedness, Prevention, and Contingency Plan. Regular training briefings shall be conducted on an as-required basis by the Contractor Superintendent and the MVP Chief Inspector on the job site. These briefings shall include the following:

- Precautionary measures to prevent spills
- Potential sources of spills, including equipment failure and malfunction
- Standard operating procedures (SOPs) in the event of a spill
- Applicable notification requirements
- Equipment, materials, and supplies available for spill clean-up

3.1.2 Security

Hazardous wastes and waste containing polychlorinated biphenyls (PCBs) greater than 50 parts per million (ppm) shall be stored in a secured location (i.e., fenced, locked). Fuel storage areas shall be located to minimize, as much as possible, tampering by unauthorized personnel during nonoperational hours.

3.1.3 Prevention and Preparedness

A discharge from the construction site into waters of the state is unlikely to occur. The construction site shall have on-site spill prevention and control facilities and routinely inspect tank and container storage areas (inspection form: Weekly Hazardous Materials/Waste Inspection Log included Section 2), which will mitigate the potential for oil and hazardous material to be released to soil or surface waters. In areas where hazardous materials are required to be stored or used within a wetland, the Contractor

shall prepare and submit for approval a secondary containment plan before working in the wetland area.

Spill or overfill of petroleum that results in a release to the environment that exceeds 25 gallons or that causes a sheen on nearby surface water must be reported immediately. Generally, minor spills or leaks shall be contained within secondary containment areas. In Virginia, spills or overfills must be reported to the DEQ State Water Control Board within 24 hours in the following cases (Virginia Water Control Law, Article 11, 62.1-44.34:19):

- Spill or overfill of a hazardous substance that results in a release to the environment that equals or exceeds its reportable quantity under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (40 CFR Part 302).
- Oil spills less than 25 gallons to lands that cannot be cleaned up within 24 hours

TABLE 3-1
Areas Where Potential Spills and Leaks Might Occur

Location\Use or Equipment	Quantity/Reportable Quantity	Containment Method	Product
	/		
	/		
	/		
	/		
Note: All containers shall have secondary containment.			

3.1.4 Tanks

The Contractor shall take the following precautions to prevent a spill from occurring within tank storage areas:

- Only those tanks for fuel and material storage that meet MVP's approval shall be operated.
- Single-wall tanks shall be provided with temporary secondary containment that will hold at least 110 percent of the tank capacity of the largest tank inside the containment area.
- Precipitation shall be inspected first for evidence of oil, including a sheen, or other contaminants. If a sheen or other indicators of oil or contamination is present, then the material shall be collected for proper disposal off site. Any precipitation shall be removed from the containment area to maintain the available containment volume at 110 percent of the volume of material stored.
- Only self-supporting tanks constructed of carbon steel or other materials compatible with the contents of each tank shall be used.
- PCB (50 ppm or greater) storage tanks shall be double-walled or have secondary containment that will hold 200 percent of the tank capacity.
- Elevated tanks shall be a maximum of two feet above grade.
- Tank storage shall be located in areas that are at least 100 feet from all waterbodies, wetlands, and designated municipal watershed areas.
- All tanks shall be inspected daily for leaks and deterioration by the Contractor EC or designee. The results of all inspections shall be recorded on the Weekly Hazardous Materials and Waste

Inspection Log (included at the end of Section 2). Copies of the log for unsatisfactory storage area inspections shall be distributed to MVP's EC and the Project Manager. Leaking and/or deteriorated tanks shall be repaired or replaced as soon as the condition is first detected.

- Tanks and secondary containment drains shall remain closed when not in use.
- Vehicle-mounted tanks shall be equipped with flame and/or spark arrestors on all vents to prevent self-ignition.
- Incompatible materials shall not be stored in sequence in tanks prior to decontamination. A list of incompatible materials is listed in Section 2, Waste Management, Table 2-4.
- Tanks used to store hazardous materials shall be decontaminated before they are used at a different construction location if they could contaminate the next material to be placed in the tank. The tanks shall be decontaminated if they are to be returned to a vendor. The tanks shall also be decontaminated if they are being returned to an MVP yard and no immediate specific same service use is scheduled.
- If a tank contains hazardous material, then the MVP EC shall be contacted, and transportation shall follow the steps outlined in MVP's Environmental SOP regarding Waste Transportation.

TABLE 3-2
Tank and Container Storage Exception Areas

Material	Quantity	Containment Method	Location
Note: Exception areas must be approved by the EC.			

3.1.5 Containers

The Contractor shall take the following precautions to prevent a spill from occurring within container storage areas:

- For drum storage, reference MVP's Environmental SOPs; MVP EC shall a copy of the current Environmental SOPs.
- Containers shall remain closed when not in use.
- All containers shall have temporary containment. A list of temporary containment is listed in Section 2, Waste Management, Tables 2-1 through 2-4.
- Small cans of gasoline, diesel, solvents, and other hazardous materials shall be stored within the temporary containment or within secured trailers or vehicles when not in use.
- Incompatible materials shall not be in sequence in containers before decontamination. A list of incompatible materials is included in Section 2, Waste Management, Table 2-4.
- Containers used to store hazardous materials shall be decontaminated before they are used at a different construction location if they could contaminate the next material to be placed in the

container. The containers shall always be decontaminated if they are being returned a MVP yard and no immediate specific same service use is scheduled.

- If a container contains a hazardous material, then transportation shall follow the steps outlined in MVP's Environmental SOPs regarding Waste Transportation.
- No incompatible material shall be stored together in the same containment area.
- Leaking and/or deteriorated containers shall be replaced as soon as the condition is first detected.
- Containers shall be stored in areas that are at least 100 feet from all waterbodies, wetlands, and designated municipal watershed areas, with certain exceptions as approved by the Contractor EC as listed in Table 3-2.
- All container storage and containment areas shall be used to store waste or products according to the guidelines described in MVP's Environmental SOPs regarding Facility Inspections.

3.1.6 Loading and Unloading Areas

The Contractor shall take the precautions listed below to prevent a spill from occurring within loading and unloading areas when those areas are located at the construction site; MVP personnel shall be present during loading and unloading activities:

- Liquids shall be transferred and refueling shall only occur in predesignated and preapproved locations that are at least 100 feet from all waterbodies and wetlands. Exceptions might be approved by the Environmental Inspector if no reasonable alternatives are available and secondary containment is used. Certain exceptions are listed in Table 3-2.
- All loading and unloading areas shall be closely monitored to prevent any leaks and spills.
- The area beneath loading and unloading locations shall be inspected for spills before and after each use.
- All hose connections shall use drip pans at the hose connections while loading and unloading liquids. If a leak or spill occurs, then the loading and unloading operation shall be stopped and the spill shall be contained, cleaned up, and collected before operations continue.
- All tank truck outlets shall be inspected before trucks leave the loading and unloading area to prevent possible leakage from the truck while in transit.
- Each refueling vehicle shall have a sufficient number of shovels, brooms, 10-millimeter polyethylene sheeting, and fire protection equipment to contain a moderate oil and/or fuel spill.
- Any service vehicle used to transport lubricants and fuel shall be equipped with an emergency response kit, and this kit, at a minimum, must include the following:
  - 25 pounds of granular oil absorbent
  - Ten 48-inch x 3-inch oil socks
  - Five 17-inch x 17-inch oil pillows
  - One 10-inch x 4-inch oil boom
  - Twenty 24-inch x 24-inch x 3/8-inch oil mats
  - Garden-size, 6-millimeter polyethylene bags
  - Ten) pair of latex gloves
  - One 55-gallon polyethylene open-head drum

In addition, a smaller chemical response kit shall be available that contains the following:

- One bag of loose chemical pulp
- Two to three (2 to 3) 17-inch x 17-inch chemical pillows
- Two 48-inch x 3-inch chemical socks
- Five 18-inch x 18-inch x 3/8-inch absorbent mats
- Garden-size, 6-millimeter, polyethylene bags
- Ten pair of latex gloves
- One 30-gallon polyethylene open-head drum
- Hazardous waste labels

3.1.7 Concrete Coating Areas for Field Joints

Concrete coating of field joints shall be performed **at least 100 feet from the edge of all waterbodies**. Where topographic conditions and/or work space limitations necessitate applying concrete coating within 100 feet of a watercourse, sufficient containment measures shall be implemented to eliminate the spill of any concrete coating materials into a wetland or watercourse. Containment such as the following (or equivalent as approved by the MVP EC in a secondary containment plan to be submitted by the Contractor) shall be used:

- Concrete coating materials shall be temporarily stored in an earthen berm with a polyethylene lining of 10-millimeter thickness or in a portable containment tray constructed of steel plate measuring a minimum of 4-feet-square by 1–foot-deep.
- Portable-mechanical mixing equipment, if required, shall be operated within a containment area constructed of temporary earthen berms and polyethylene lining a minimum of 10-millimeter thickness.
- Concrete materials in a portable container (such as a 55-gallon drum cut in half or equivalent) shall be mixed within an earthen berm with polyethylene lining of 10- millimeter thickness or within a portable containment tray constructed of steel plate, measuring a minimum of 4-feet-square by 1-foot-deep.

3.1.8 Equipment Inspections

All construction equipment in use on the pipeline right-of-way (ROW) shall be inspected daily. Any leaks shall be repaired immediately or the piece of equipment shall be removed from service, removed from the ROW, and repaired prior to returning to service. All inspections shall be documented on a daily leak report submitted to MVP.

3.1.9 Emergency Equipment

The construction site and/or contractor yard shall have adequate manpower and equipment necessary to divert any spilled material from waterbodies and wetland areas. Emergency equipment shall include, but is not limited to, shovels, backhoes, dozers, front-end loaders, oil-absorbent booms, pillows, socks and/or mats, granular oil absorbent, and chemical absorbent pulp. A list of emergency response equipment and personal protective equipment (PPE) is provided in Section 4.3.

3.1.10 Contractor's Site Map

The Contractor shall prepare a site map before construction begins. At a minimum, the Contractor's site map shall include the following:

- Orientation and scale
- Total land area in square feet
- Access and egress points
- Buildings and/or temporary trailers
- Parking lots
- Adjacent land uses (if business, indicate business name)
- Surrounding roads, storm drains, and waterways (e.g., waterbodies and wetlands)
- Locations of hazardous materials and waste storage
- Underground and aboveground tanks
- Containment or diversion structures (e.g., dikes, berms, retention ponds)
- Shutoff valves and/or circuit breakers
- Location of emergency response materials and equipment
- Location of MSDS and SPCC Plan
- Location of emergency assembly area

3.2 Housekeeping Program

The construction area shall be maintained in a neat and orderly manner. Solid wastes, such as food wrappings, cigarette butts and packets, Styrofoam cups and plates, and similar wastes, shall be disposed of offsite and not in any construction excavation area. Any spills or leaks shall be cleaned up as expeditiously as possible. Trash shall be routinely collected for offsite disposal. Container storage areas shall be maintained in a neat and orderly manner.

4.0 KARST AREA EROSION AND SEDIMENTATION CONTROL

The following discussion outlines erosion and sediment control (ESC) measures to support MVP construction in karst terrain. Karst terrain underlies portions of the proposed MVP route from West Virginia/Virginia State line into Roanoke County, Virginia. Karst terrain is a landscape formed from the dissolution of soluble rocks. It is characterized by underground drainage systems with sinkholes, dolines, and caves.

MVP completed a Karst Hazards Assessment that identifies karst features in the vicinity of the Project. MVP also completed a Karst Mitigation Plan that serves as a guidance document for protecting and mitigating karst features during MVP construction. Karst-specific ESC measures are a critical component for protecting karst features and local water bodies during construction and after land reclamation for post-pipeline installation.

4.1 Regulatory Oversight

Virginia codified a law for protecting caves (the Virginia Cave Protection Act, Code of Virginia Section 10.1-1000 to 1008); there is no corresponding law that specifically protects karst.

The Virginia Department of Conservation and Recreation, a division of the Department of Environmental Quality, includes a Karst Protection Coordinator branch. Coordination with the Karst Protection Coordinator is described in more detail in this plan.

4.2 Objectives

The primary objectives for karst-specific ESC are to prevent erosion, overland flow, and sediment transport to water bodies and karst features during pipeline construction, and to prevent erosion, sedimentation, and flooding problems in karst areas after pipeline construction and land reclamation. The primary means to reduce risks for erosion, sedimentation, and flooding in karst terrain is to restore land surface grades to pre-construction characteristics and not significantly change the volume of surface water that enters a karst feature. This can be accomplished by preventing direct impact to karst features and water bodies during construction, and minimizing to the extent practical land surface alterations after pipeline installation and land reclamation. Enhanced Best Management Practices (BMPs) and construction planning in karst terrain are presented herein to accomplish these objectives.

4.3 Considerations for Surface Water Management and Erosion & Sediment

Unlike typical construction and development activities, the Project will not result in large swaths of impervious land, or large swaths of altered grade. The Project is primarily a relatively narrow linear subsurface construction project that will be regraded to pre-construction characteristics, and revegetated.

To minimize the potential for impacts to a karst feature (e.g., sinkhole, cave opening, etc.,) or a water resource (e.g., well, spring, stream, pond) from pipeline construction in karst areas, industry-standard ESC practices will be supplemented with enhanced BMPs, and implemented by MVP and its contractors, to accomplish the following objectives:

- Minimize the volume of stormwater and other construction-related surface water run-off;
- Minimize the permanent alteration of land surface characteristics and surface runoff patterns (existing drainage patterns and features should be taken into consideration to minimize changes to the rate that water enters the subsurface through a karst feature);
- Promote broad and shallow surface water flow dispersion with suitable spreading or diversion techniques;
- Prevent uncontrolled release of surface water and sediment to a water body or karst feature;
- Prevent artificial routing of storm water to karst features;
- Prevent blockage or filling of karst features;

- Do not construct artificial storm water structures within karst features;
- Prevent disposal of materials into a karst feature that will degrade the quality of water entering the subsurface through karst feature;
- Install double lines of sediment control fencing and straw bales upslope of a water body or karst feature;
- Stock pile excavated material at least 100 feet from a water body so that the material cannot slough back into these areas;
- Monitor ESC and stormwater management structures periodically during construction, and particularly after precipitation events (stormwater and ESC structures include sediment control fencing, straw bales, temporary detention basins, diversion berms, or containerization - clean, repair, and replace structures as necessary);
- Do not discharge hydrostatic test water in karst areas;
- Establish staging areas for the crew, equipment, hazardous materials, chemicals, fuels, lubricating oils, etc., at least 100 feet from a water body or karst feature;
- Install ESC and stormwater management structures surrounding staging areas to prevent run-on to, and then run-off and sediment migration from these sites;
- Store construction waste materials, debris, and excess materials at least 100 feet from a water body or karst features;
- Refuel and maintain construction equipment at least 100 feet from a water body or karst feature;
- Limit the removal of riparian vegetation to only when it is necessary;
- Re-vegetate all disturbed areas as soon as possible after construction using only native plants to reduce soil erosion. Annual species, such as rye or wheat, may initially be planted along with native species in areas subject to immediate soil loss, such as a steep slope, to provide rapid erosion control. Final re-vegetation should use native species only;
- Replace woody riparian vegetation unavoidably lost using native riparian plants to help prevent the spread of invasive plants;
- Where possible and practical, leave a minimum of 100-foot wide natural vegetated buffer area around a water body or karst feature. Plant a vegetative buffer of at least 100 feet around a water body or karst feature if the vegetation was previously cleared;
- Apply fertilizers, herbicides, pesticides, or other chemicals no closer than 100 feet of a water body or karst feature;

- Evaluate the establishment of vegetation after project completion and inspect all sediment control structures at one month intervals for at least 3 months. Retain sediment control structures until site stabilization is achieved;

- Remove and dispose of all debris and excess construction materials properly upon project completion;

- Remove temporary sediment/erosion control structures upon final site stabilization;

- Clay dams or breakers should be included in pipeline installation design and constructed at appropriate intervals along the trench excavation to impede subsurface flow along the trench.

5.0 CONTINGENCY PLAN AND EMERGENCY PROCEDURES

Emergency response procedures have been developed for the project to guide responses to fires, explosions, releases of oils or hazardous waste to the air, land, or waters of the state regardless of the quantity involved in the incident. For unanticipated release of hydrostatic test waters, MVP shall utilize best management practices (BMPs), as described in the Erosion and Sediment Control Plan (E&SCP) as soon as possible after the release.

5.1 Responsibilities of MVP and Contractor Personnel

If notification is given that an evacuation is necessary, all personnel shall evacuate the construction area via the primary evacuation route (site-specific map with evacuation route to be attached for plant projects) and await further instructions from the EC. If direct access to the primary evacuation route is restricted by fire, spill, smoke, or vapor, facility personnel shall evacuate the facility via alternate evacuation routes to the nearest accessible open area.

5.2 First Responder

Any individual who first observes a spill or any other imminent or actual emergency situation shall take the following steps:

1. Assess the situation to determine if the situation poses an immediate threat to human health or the environment.
2. Identify hazardous substances involved, if any.
3. Report the emergency or spill to the MVP and Contractor EC(s) immediately.
4. Standby at a safe distance and keep others away.
5. Activate emergency shutdown, if necessary.

The Contractor Superintendent shall act as the Emergency Coordinator for the Contractor. The Chief Inspector shall act as the Emergency Coordinator for MVP. The responsibilities of the Emergency Coordinator are presented in the remainder of this section.

5.2.1 Contractor EC Responsibilities

The Contractor EC shall coordinate the response to all spills that occur as a result of Contractor operations. The Contractor shall not coordinate the response of spills of pipeline liquids, hazardous wastes, or the unanticipated release of hydrostatic test waters; these spills shall be coordinated by the MVP EC.

Following are specific Contractor EC responsibilities:

1. Determine any immediate threat to human health, the environment, and the neighboring community.
2. Ensure personnel safety and evacuate, if necessary.
3. Identify source, character, amount, and extent of release.
4. Determine if hazardous substances are involved.
5. Inform the MVP EC and follow instructions.
6. Direct and document remediation efforts to contain and control spill release.
7. Document remedial efforts.
8. Coordinate cleaning and disposal activities.

5.2.2 MVP EC Responsibilities

The MVP Emergency Coordinator shall coordinate clean-up of all spills of pipeline liquids, hazardous wastes, and any unanticipated release of hydrostatic test water.

Upon notification of pipeline liquid spills, hazardous materials spills, or the unanticipated release of hydrostatic test waters, the MVP EC shall be responsible for the following:

1. Assess situation for potential threat to human health, environment, and the neighboring community
2. Implement evacuation, if necessary
3. Ensure personnel safety
4. Control source as conditions warrant
5. Immediately notify supervisory personnel immediately for spills that meet one or more of the following criteria:
    a. One pound or more of a solid material (excluding horizontal directional drilling mud spilled on land)
    b. Five gallons or more of a liquid spilled on land
    c. Any substance that creates a sheen on water
    d. Air pollution incidents where there might be a release of a toxic substance
    e. Unanticipated release of hydrostatic test water
6. If necessary, notify the local fire department, law enforcement authority, or health authority as appropriate, and provide the following information:
    a. Name of the caller and call-back number

b. The exact location and nature of the incident
c. The extent of personnel injuries and damage
d. The extent of release
e. The material involved and appropriate safety information

7. Ensure that any waste or product that might be incompatible with a released material is kept away from the affected area.
8. Keep any potential ignition source away from emergency area, if spilled material is flammable.
9. Minimize affected area with appropriate containment or diking.
10. Assemble required spill response equipment as required (e.g., protective clothing, gear, heavy equipment, pumps, absorbent material, and empty drums).
11. Place spilled material in appropriate containers, in accordance with the MVP Environmental SOPs.
12. Label and store containers in accordance with the MVP Environmental SOPs.
13. Coordinate waste disposal and equipment decontamination.
14. Terminate response.
15. Ensure that all emergency response equipment is fully functional. Any equipment that cannot be reused shall be replaced.
16. For PCB spills, follow special spill response requirements related to PCB spills.
17. Assist with the coordination of clean-up and disposal activities as described in Sections 4.4, 4.5, and 4.6.
18. If necessary, contact outside remediation services to assist with clean-up.
19. Complete Waste Removal Storage and Disposal Record Form to track waste generated during this project.
20. Complete Field Spill Report (included at the end of this section) and distribute accordingly.
21. For unanticipated release of hydrostatic test waters, notify state contact if required by state permit in accordance with timeframes required by state permit.
22. As required by permit, arrange for immediate sampling of the test water (from the pipe or a representative sample of released water where possible) or soil where the test water was released and water from adjacent watercourse if test water was released into the watercourse. Samples shall be analyzed in accordance with hydrostatic test discharge permit criteria.
23. Ensure that an MVP representative notifies the municipal manager and/or mayor, as required.

5.3 Emergency Equipment

The construction site and r Contractor yards shall have adequate personnel and equipment necessary to divert any spill from waterbodies and wetland areas. Emergency equipment shall include, but is not limited to, shovels, backhoes, dozers, front-end loaders, oil absorbent booms, pillows, socks and/or mats, granular oil absorbent, and chemical absorbent pulp. Table 5-1 lists emergency response equipment and PPE (to be completed by Contractor).

TABLE 5-1
Spill Response Equipment

Equipment	Quantity	Location

TABLE 5-2
Fire Response Equipment

Equipment	Quantity	Location

TABLE 5-3
Personal Protective Equipment

Equipment	Quantity	Location

5.4 Spill Clean-Up/Waste Disposal Procedures

The following identifies the clean-up and control measures to be used in the event of a spill of oil, fuel, or hazardous substance or unanticipated release of hydrostatic test water.

5.4.1 Oil and/or Fuel Spills

- Ensure no immediate threat to surrounding landowners or environment.
- Remediate small spills and leaks as soon as feasible. Use absorbent pads whenever possible to reduce the amount of contaminated articles.
- Restrict the spill by stopping or diverting flow to the oil and/or fuel tank.
- If the release exceeds the containment system capacity, immediately construct additional containment using sandbags or fill material. Every effort must be made to prevent the seepage of oil into soils and waterways.

- If a release occurs into a facility drain or nearby watercourse, immediately pump any floating layer into drums. For high-velocity watercourses, place oils booms or hay bales between the release area and the site boundary and downstream of affected area. As soon as possible, excavate contaminated soils and sediments.
- After all recoverable oil has been collected and drummed, place contaminated soils and articles in containers.
- For larger quantities of soils, construct temporary waste piles using plastic liners and place the contaminated soils on top of the plastic and covered by plastic. Plastic-lined, roll-off bins should be leased for storing this material as soon as feasible.
- Label the drum following the procedures outlined in the MVP's Environmental SOPs.
- Move drum to secure staging or storage area.
- Document and report clean-up activities of the MVP EC as soon as feasible.
- If environmentally sensitive resources (e.g., wetlands, waterbodies) exist in the area, ensure that BMPs as described in the ESCP are used to minimize impact to these resources.

5.4.2 Hazardous Substance Releases

- Ensure no immediate threat to surrounding landowners or environment.
- Identify the material and quantity released.
- Block off drains and containment areas to limit the extent of the spill. Never wash down a spill with water.
- Ensure that PPE and containers are compatible with the substance.
- Collect and reclaim as much of the spill as possible using a hand pump or similar device. Containerize contaminated soils in an appropriate Department-of-Transportation approved container in accordance with the MVP's Environmental SOPs. (Note: Environmental SOP's are located in all division and area offices and kept by all engineering teams.) Never place incompatible materials in the materials in the same drum.
- Sample the substances for analysis and waste profiling.
- Decontaminate all equipment in a contained area and collect fluids in drums.
- Label the drum.
- Move the drum to secure staging or storage area.
- Document and report activities to the MVP EC as soon as feasible.
- If environmentally sensitive resources (wetlands, waterbodies) exist in the area, then ensure that BMPs as described in the ESCP are used to minimize impacts to these resources.

5.4.3 Unanticipated Release of Hydrostatic Test Water

- Ensure no immediate threat to surrounding landowners or environment.
- If environmentally sensitive resources (wetlands, waterbodies) exist in the area, then ensure that BMPs as described in the ESCP are used to minimize impacts to these resources.

5.5 Disposal of Contaminated Materials and/or Soils

- The Contractor shall work with the MVP EC to characterize waste generated during this project. All wastes generated as a result of spill response activities shall be analyzed to determine if hazardous or if PCBs are greater than 1 ppm. Knowledge of the contaminant(s) might be applied to classify the waste and spill materials as determined by the MVP EC.
- The Contractor is responsible for properly disposing of wastes generated during this project that is determined by the MVP EC to be nonhazardous and to contain PCBs less than 1 ppm; this includes obtaining applicable authorizations and registrations for waste disposal.
- The MVP EC is responsible for properly disposing of hazardous and PCB-containing wastes containing greater than 1 ppm generated during this project, including obtaining applicable U.S. Environmental Protection Agency ID numbers.
- Hazardous and PCB-containing waste shall be stored in a secured location (i.e. fenced, locked) until the material is transported off site. At no time shall hazardous waste be stored for more than 90 days or a waste containing PCBs with more than 50 ppm be stored for more than 30 days.

5.6 Equipment Cleaning/Storage

- Upon completion of remedial activities, the Contractor shall decontaminate emergency response equipment used to remediate a spill resulting from its operations. MVP shall be responsible if the spill is hazardous material.
- The Contractor shall be responsible for disposing of any contaminated waste or non-PCB containing waste generated as a result of the decontamination process.
- MVP shall be responsible for disposing of any contaminated Hazardous Waste or PCB Containing Material generated as a result of the decontamination process.
- The Contractor shall replace all spent emergency response equipment prior to resuming construction activities if spill resulted from their operations.
- The Contractor shall test and inventory reusable PPE prior to being placed back into service.

6.1 REGULATORY COMPLIANCE

This section provides the reader with a high-level overview of the regulatory requirements addressed in this SPCC Plan. This section is arranged by activity, in typical order or occurrence by job, with the corresponding regulation.

Regulatory Compliance by Activity			
Activity Type	**Federal Regulation Citation**	**State Regulation Citation**	**SPCC Plan Section**
General Applicability			
Is facility under purview of regulations?	40 CFR Part 112	9 VAC 25-91	
Does facility comply with applicable regulations?	40 CFR Part 112	9 VAC 25-91	
Materials Storage and Handling			
Material and Waste Inventory	40 CFR Part 112	9 VAC 25-91[1]	Spill Plan (Section 3)Waste Management (Section 2)
Material Transport and Disposal	40 CFR Part 112	9 VAC 25-91[1]	Contingency Plan (Section 5)
Spill Prevention and Containment			
Emergency Response Contacts	40 CFR Part 112	9 VAC 25-91[1]	Spill Plan (Section 3)
Training	40 CFR Part 112	9 VAC 25-91[1]	
Security	40 CFR Part 112	9 VAC 25-91[1]	
Prevention and Preparedness	40 CFR Part 112	9 VAC 25-91[1]	
Facility Information	40 CFR Part 112	9 VAC 25-91[1]	
Facility Drainage and Routes of Flow	40 CFR Part 112	9 VAC 25-91[1]	
Inspections and Reporting			
Emergency Response Contacts	40 CFR Part 112	9 VAC 25-91[1]	Spill Plan (Section 3) Contingency Plan (Section 5)
Inspections, Tests, and Records	40 CFR Part 112	9 VAC 25-91[1]	
Discharge Reporting	40 CFR Part 112	9 VAC 25-91[1]	

Regulatory Compliance by Activity			
Activity Type	**Federal Regulation Citation**	**State Regulation Citation**	**Plan Section**
Spills and Response			
Emergency Procedures and Response	40 CFR Part 112	9 VAC 25-91[1]	Spill Plan (Section 3) Contingency Plan (Section 5)
Discharge Notification	40 CFR Part 112	9 VAC 25-91	
Clean-up	40 CFR Part 112	9 VAC 25-91[1]	
Wastewater Discharge			
Facility Drainage	40 CFR Part 112	9 VAC 25-91[1]	Spill Plan (Section 3)
[1] if an oil discharge contingency plan is required			

Appendix A
Unanticipated Discovery of Contamination Plan

Unanticipated Discovery of Contamination Plan Introduction

The purpose of this Unanticipated Discovery of Contamination Plan (Plan) is to provide work, investigation, and reporting procedures for responding to the unanticipated discovery of contamination in soil, groundwater, or sediment during excavation, construction, or maintenance activities associated with construction of the MVP Pipeline Project.

Consistent with this purpose, the objectives of this Plan are to protect the health and safety of project personnel and the environment and to prevent the spread of contamination during and after an unanticipated discovery of contamination.

The greatest potential for the discovery of unanticipated contamination will occur during the excavation of the pipeline trench and horizontal boring procedures. The following response plan will be executed if any Project personnel detects potential contamination such as:

- Odor;
- Visible staining on soil;
- Sheen on ground or purge water;
- Unidentified underground service tank; or
- Potential cultural resources, including human remains.

Unanticipated Discovery Response Plan

Stage 1 – Suspend Work Activities
All construction and/or maintenance work in the immediate area of the discovery shall stop. Personnel shall move to upwind areas as necessary.

Stage 2 – Identify Immediate Threats
If an immediate threat is detected, emergency response (i.e., 911) shall be notified. The area shall be evacuated.

Stage 3 – Identify and Secure Area
If safe to do so, the area immediately around the potential contamination shall be secured with safety fencing or flagging. Site personnel shall remain on site to restrict access as appropriate.

Stage 4 – Conduct Notifications
Appropriate MVP environmental professionals and officials shall be notified of the potential contamination. It shall be the decision of the MVP environmental professional (TBD) to determine environmental agency or public official notification requirements. Primary points of contact are:

MVP: Megan Neylon, Environmental Permitting Supervisor, 724-873-3645
Virginia DEQ:VA Department of Emergency Management Watch Center, 800-468-8892USFS : Jefferson National Forest Supervisor, 540-265-5118

Stage 5 – Discovery Documentation Protocol

An appropriate MVP employee or designee will document the unanticipated contamination utilizing the attached Worksheet 1. Worksheet 1 includes instructions for the appropriate MVP employee or designee to record the site name, locations, and how suspected contamination was determined. The MVP employee or designee will coordinate with the construction contractor(s) who identified the contamination to assist in completing Worksheet 1.

Stage 6 – Remedial Action Planning

An onsite meeting (if appropriate) will be conducted among site personnel, MVP environmental professionals, and any appropriate contamination response contractors to determine remediation requirements and methodologies. If remediation activity is appropriate, an environmental consultant (if appropriate) should be contacted to assist with the remedial activity. Remedial activities should be conducted according to the following general sequence of events. This is a general plan and is not meant to apply to all contamination situations. A more robust, site-specific remedial action plan should be completed by an environmental consultant prior to completing remedial activities.

Step 1: Sampling – Representative samples should be collected and submitted to an environmental laboratory for analysis and/or waste classification. Results of this analysis may dictate notification requirements. An environmental consultant can assist in the determination of these requirements.

Step 2: Remedial Action Determination – Following laboratory analysis, the MVP environmental professional and/or the environmental consultant will evaluate the analysis results and, if appropriate, identify the type of remediation (in-situ, removal, etc.) to be completed.

Step 3: Remedial Action – MVP will mobilize an appropriate contractor, and remediation activities will be conducted. Any soil and/or groundwater suspected of containing contamination will be segregated from clean soil and/or water using plastic sheets, fractionation tanks, or other appropriate methodologies. Containers will be clearly labeled. Known hazardous wastes will be labeled and separated with orange construction fencing.

Step 4: Disposal – Wastes will be disposed of properly at a permitted facility. MVP environmental professional or its environmental consultant will determine disposal requirements.

Stage 7 – Record Keeping

A record of the sequence of events from the beginning (unanticipated discovery) to the end (disposal) of the incident will be recorded and kept on file with the MVP environmental professional in accordance with all mandated record keeping requirements.

Worksheet 1 – Unanticipated Discovery of Contamination Documentation Worksheet

Instructions: Complete this worksheet to document an unanticipated discovery of contamination event. Use a separate sheet (copy) for each occurrence.

A. Site Name, Physical Location, and Milepost

B. How Suspected Contamination was Determined (odor, stain, sheen, etc.). Include photographs as appropriate.

C. List dates, times, and officials notified

Environmental Response Contact Sheet

Primary points of contact are:

MVP:	Megan Neylon, Environmental Permitting Supervisor, 724-873-3645
Virginia DEQ:	Virginia Department of Emergency Management, 800-468-8892

Additional points of contact may be identified prior to construction

Appendix B
Key Emergency Contacts

Following are the key personnel who shall be contacted in the event of an emergency or spill incident.

		Contact Name	Phone Number
1.	**MVP Emergency Contacts**		
	MVP Emergency Coordinator (within 15 minutes of incident)	To be provided prior to construction	
2.	**Contractor Emergency Contact**		
	Contractor Emergency Coordinator	To be provided prior to construction	
3.	**Local Authorities (as necessary)**		
	State Police Local Police Local Fire Department Hospital Ambulance	To be provided prior to construction	
4.	**Environmental Agencies** Notification to be made by an MVP representative.		
	Virginia Department of Emergency Management Watch Center (800)-468-8892 (24 hours)		
5.	**Potential Environmental Remedial Service Contractors** (verify before issuing project-specific SPCC Plan) Clean Harbors Environmental Services, Inc.: 800-645-8265 Safety-Kleen (FS), Inc.: Edward A. Mitchell, 713-750- 5800 U.S.A. Environment: Cesar Garcia, 713-425-6925 or 832-473-5354 (cell phone) WRS Infrastructure and Environment, Inc.: Steve Maxwell, 281-731-0886		

Appendix C
Petroleum and Hazardous Material Spill Report

The Contractor must complete this for any petroleum or hazardous material spill regardless of size, and submit the form to the MVP EC within 48 hours of the occurrence.

Date of Spill_____ Incident No.:_____ Date of spill discovery _____

Time of Spill_____ Time of Spill Recovery_____

Location Name:_____ Spread:_____ County _____

Section_____ Township _____ Range _____

Name and title of discoverer: _____

Type of material spilled and product name

_____

Manufacturer's name: _____

Legal description of spill location _____

Directions from nearest community:

_____

Estimated volume of spill:

_____

Weather conditions: _____

Topography and surface conditions of spill site:

_____

Spill medium (e.g., pavement, sandy soil, water):

_____

Proximity of spill to surface waters or wetland:

_____

Did the spill reach a watercourse? ☐ Yes ☐ No

If so, was a sheen present? ☐ Yes ☐ No

Direction and time of travel (if in watercourse): _____

Name and telephone number of responsible party: ____

Causes and circumstances resulting in the spill: _____

Extent of observed contamination, both horizontal and vertical (e.g., spill-stained soil in a 5-inch radius to a depth of 1 inch):

_____

Potentially affected resources and installations: _____

Potential impact on human health:

_____

Immediate spill control and/or clean-up methods used and implementation schedule: _____

_____

Current status of clean-up actions: _____

_____

Name, company, address, and telephone number for the following:

Construction Superintendent: _____

Spill Coordinator: _____

Person who reported the spill: _____

Environmental Inspector: _____

On-Scene Agency Coordinator (where applicable): _____

Form completed by: _____ Date _____

APPENDIX 10

Miscellaneous

[i.e. Maps, Impaired Water Fact Sheets, Time of Year Restriction Table, Soils Map Units and Descriptions Table, Jefferson National Forest Documents, etc.]

Exhibit 1A

MVP SWPPP - Spread 9
Vicinity Map

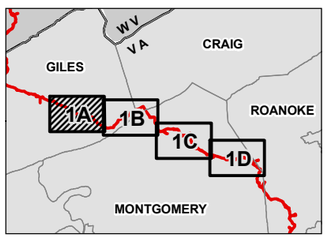
MVP Pipeline Limits of Disturbance

MVP Mile Marker

NORTH

0 0.25 0.5 Miles

Basemap Source: ESRI ArcGIS Online. World Street Map
Boundary Source: Tetra-Tech. September 7, 2017.



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MATCHLINE EXHIBIT 1B

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Exhibit 1B

MVP SWPPP - Spread 9
Vicinity Map

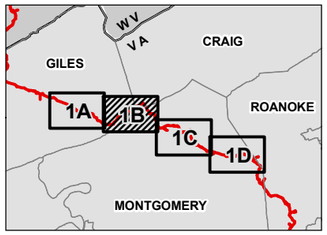
MVP Pipeline Limits of Disturbance

MVP Mile Marker

NORTH

0 0.25 0.5 Miles

Basemap Source: ESRI ArcGIS Online. World Street Map
Boundary Source: Tetra-Tech. September 7, 2017.



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MATCHLINE EXHIBIT 1C

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Exhibit 1C

MVP SWPPP - Spread 9
Vicinity Map

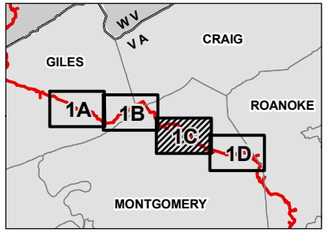
MVP Pipeline Limits of Disturbance

MVP Mile Marker

NORTH

0 0.25 0.5 Miles

Basemap Source: ESRI ArcGIS Online. World Street Map
Boundary Source: Tetra-Tech. September 7, 2017.



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MATCHLINE EXHIBIT 1D

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Exhibit 1D

MVP SWPPP - Spread 9
Vicinity Map

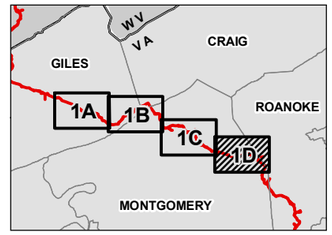
MVP Pipeline Limits of Disturbance

MVP Mile Marker

NORTH

0 0.25 0.5 Miles

Basemap Source: ESRI ArcGIS Online. World Street Map
Boundary Source: Tetra-Tech. September 7, 2017.



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Rocky Branch
Bradshaw Rd
Acre of Rocks Rd
Flatwoods Rd
Knob Forest Cir
Saddlesore Ln
Deaconess Dr
Dewberry Ln
Womack Branch
Norfolk Southern Railroad
Reese Mountain Rd
Meacham Rd
Twine Hollow
Kelley St
Campbell Dr
Malinda Rd
Thomas Dr
Tremont Rd
Taylor
Lindsay Dr
Logan Ln
New Ridge Rd
Myrtle Ln
Bluebell Rd
Abraham Rd
Flatwoods Branch
Craig Branch
Fox Holler
Minter Rd
Northfork Rd
Pedlar Rd
Lafayette
Honey Rd
Cannery Rd
Wallhall St
Wells St
Back St
Lafayette Rd
Historic Dr
Gardner St
Green Hill Ln
Apgar Dr
Cove Hollow Rd
Howard Dr
Enterprise Dr
Stones Keep Ln
Roanoke-Montgomery

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Exhibit 2A

MVP SWPPP - Spread 9
USGS Quadrangle Map

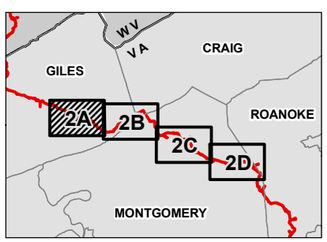
MVP Pipeline Limits of Disturbance

MVP Mile Marker

NORTH

0 0.25 0.5 Miles

Basemap Source: ESRI ArcGIS Online. USA Topo Map
Boundary Source: Tetra-Tech. September 7, 2017.



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MATCHLINE EXHIBIT 2B

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Exhibit 2B

MVP SWPPP - Spread 9
USGS Quadrangle Map

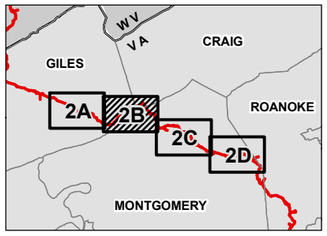
MVP Pipeline Limits of Disturbance

MVP Mile Marker

NORTH

0 0.25 0.5 Miles

Basemap Source: ESRI ArcGIS Online. USA Topo Map
Boundary Source: Tetra-Tech. September 7, 2017.



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MATCHLINE EXHIBIT 2C

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Exhibit 2C

MVP SWPPP - Spread 9
USGS Quadrangle Map

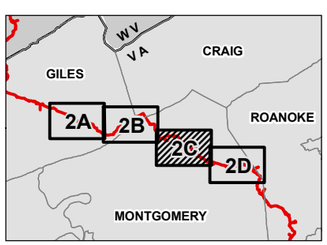
MVP Pipeline Limits of Disturbance

MVP Mile Marker

NORTH

0 0.25 0.5 Miles

Basemap Source: ESRI ArcGIS Online. USA Topo Map
Boundary Source: Tetra-Tech. September 7, 2017.



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MATCHLINE EXHIBIT 2B

MATCHLINE EXHIBIT 2D

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Exhibit 2D

MVP SWPPP - Spread 9
USGS Quadrangle Map

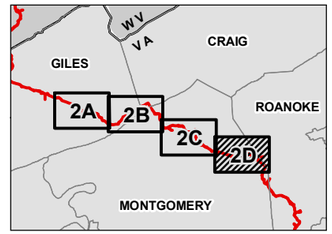
MVP Pipeline Limits of Disturbance

MVP Mile Marker

NORTH

0 0.25 0.5 Miles

Basemap Source: ESRI ArcGIS Online. USA Topo Map
Boundary Source: Tetra-Tech. September 7, 2017.



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MATCHLINE EXHIBIT 2C

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Exhibit 3A

MVP SWPPP - Spread 9 - National Wetlands Inventory Map

MVP Pipeline Limits of Disturbance

MVP Mile Marker

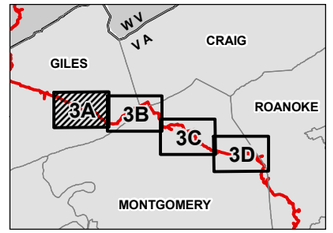
NWI Wetland Type

- Open Water
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Other Wetland

0 0.25 0.5 Miles

NORTH

NWI Data Updated: May 2016. www.fws.gov/wetlands/Data/State-Downloads.html
Boundary Source: Tetra-Tech. September 7, 2017.
Aerial: Summer 2016 NAIP.



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MATCHLINE EXHIBIT 3B

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Exhibit 3B

MVP SWPPP - Spread 9 - National Wetlands Inventory Map

MVP Pipeline Limits of Disturbance

MVP Mile Marker

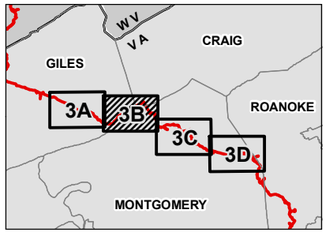
NWI Wetland Type

- Open Water
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Other Wetland

0 0.25 0.5 Miles

NORTH

NWI Data Updated: May 2016. www.fws.gov/wetlands/Data/State-Downloads.html
Boundary Source: Tetra-Tech. September 7, 2017.
Aerial: Summer 2016 NAIP.



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MATCHLINE EXHIBIT 3A

MATCHLINE EXHIBIT 3C

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Exhibit 3C

MVP SWPPP - Spread 9 - National Wetlands Inventory Map

MVP Pipeline Limits of Disturbance

MVP Mile Marker

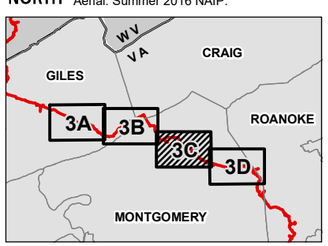
NWI Wetland Type

- Open Water
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Other Wetland

0 0.25 0.5 Miles

NORTH

NWI Data Updated: May 2016. www.fws.gov/wetlands/Data/State-Downloads.html
Boundary Source: Tetra-Tech. September 7, 2017.
Aerial: Summer 2016 NAIP.



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Mountain Valley PIPELINE

MATCHLINE EXHIBIT 3B

MATCHLINE EXHIBIT 3D

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Exhibit 3D

MVP SWPPP - Spread 9 - National Wetlands Inventory Map

MVP Pipeline Limits of Disturbance

MVP Mile Marker

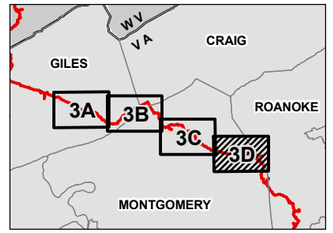
NWI Wetland Type

- Open Water
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Other Wetland

0 0.25 0.5 Miles

NORTH

NWI Data Updated: May 2016. www.fws.gov/wetlands/Data/State-Downloads.html
Boundary Source: Tetra-Tech. September 7, 2017.
Aerial: Summer 2016 NAIP.



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MATCHLINE EXHIBIT 3C

MATCHLINE EXHIBIT 3D

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Exhibit 4A

MVP SWPPP - Spread 9
Aerial Map

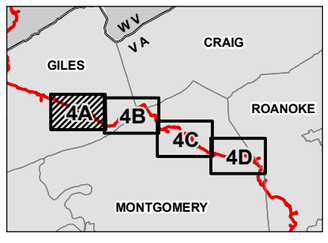
MVP Pipeline Limits of Disturbance

MVP Mile Marker

NORTH

0 0.25 0.5 Miles

Basemap Source: Summer 2016, NAIP.
Boundary Source: Tetra-Tech. September 7, 2017.



Mountain Valley PIPELINE

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MATCHLINE EXHIBIT 4B

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Exhibit 4B

MVP SWPPP - Spread 9
Aerial Map

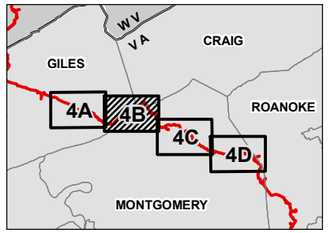
MVP Pipeline Limits of Disturbance

MVP Mile Marker

NORTH

0 0.25 0.5 Miles

Basemap Source: Summer 2016, NAIP.
Boundary Source: Tetra-Tech. September 7, 2017.



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MATCHLINE EXHIBIT 4A

MATCHLINE EXHIBIT 4C

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Exhibit 4C

MVP SWPPP - Spread 9
Aerial Map

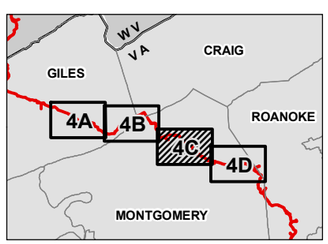
MVP Pipeline Limits of Disturbance

MVP Mile Marker

NORTH

0 0.25 0.5 Miles

Basemap Source: Summer 2016, NAIP.
Boundary Source: Tetra-Tech. September 7, 2017.



Mountain Valley PIPELINE

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MATCHLINE EXHIBIT 4B

MATCHLINE EXHIBIT 4D

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Exhibit 4D

MVP SWPPP - Spread 9
Aerial Map

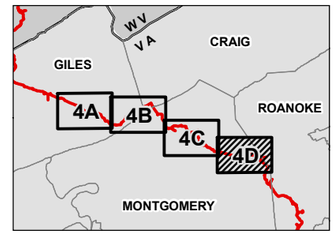
MVP Pipeline Limits of Disturbance

MVP Mile Marker

NORTH

0 0.25 0.5 Miles

Basemap Source: Summer 2016, NAIP.
Boundary Source: Tetra-Tech. September 7, 2017.



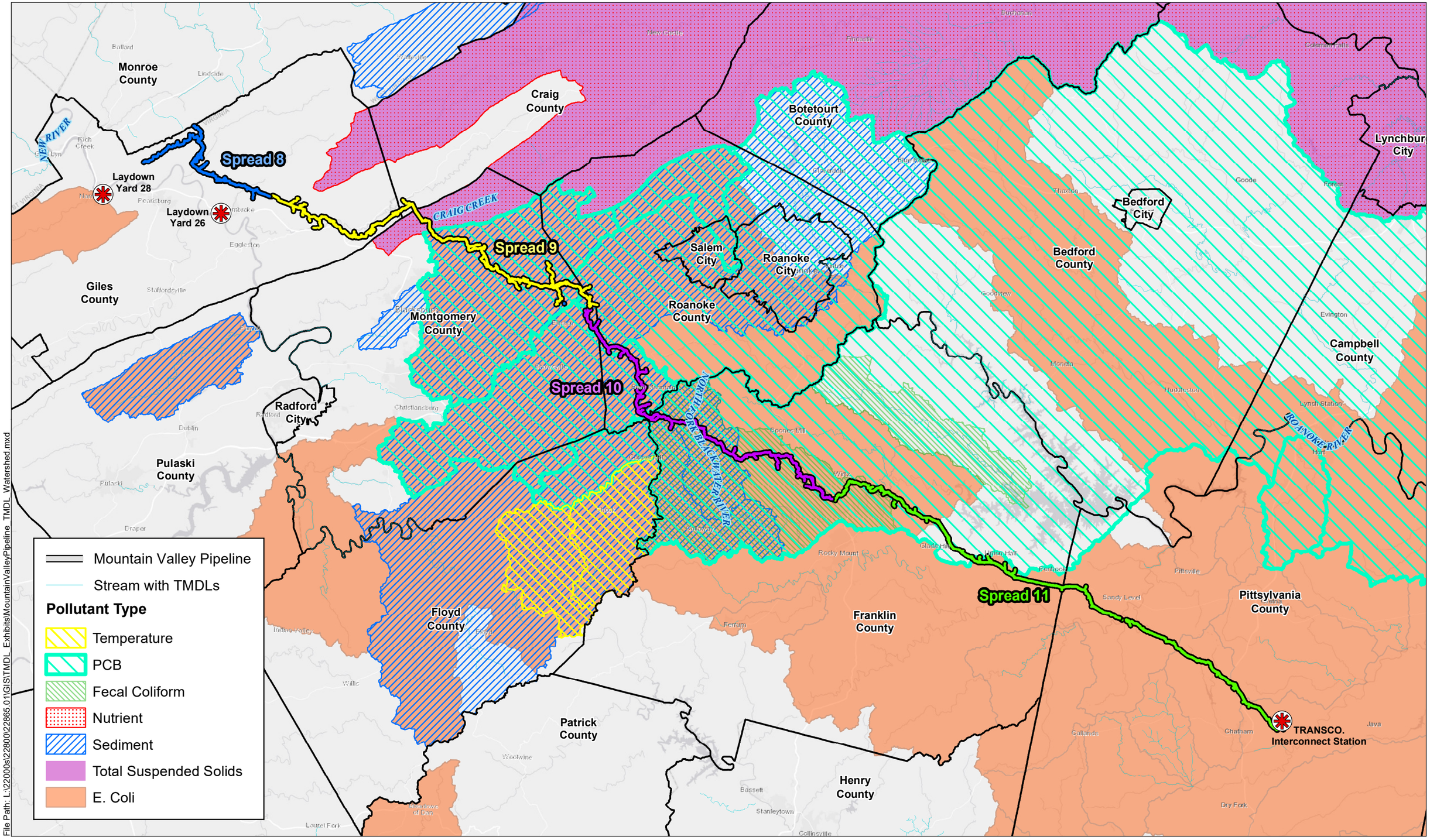
Mountain Valley PIPELINE

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MATCHLINE: EXHIBIT 4C

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Mountain Valley Pipeline - Watershed with TMDLs (DEQ)



File Path: L:\22000s\22800s\22865.01\GIS\TMDL_ExhibitsMountainValleyPipeline_TMDL_Watershed.mxd

NORTH

Boundary Source: Tetra-Tech. September 7, 2017.
Basemap Source: ESRI ArcGIS Online
TMDL Source: http://deq.state.va.us/ConnectWithDEQ/VEGIS/VEGISDatasets.aspx

0 3 6 12 Miles

Mountain Valley PIPELINE

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2014 Impaired Waters

Category 4 & 5 by Impaired Area ID*

New River Basin

Cause Group Code: **N22R-02-BAC** - **Stroubles Creek**

Location:	The upstream end is at the Duck Pond dam on the southwest end of the VPI&SU campus on the Blacksburg Quad. The downstream end is at the Walls Branch mouth on Stroubles Creek.
City/County	Montgomery Co.
Use(s):	Recreation
Cause(s) / VA Category:	Escherichia coli / 5A

Fecal coliform (FC) bacteria exceedances of the former 1000 cfu/100 ml WQS instantaneous criterion in 2002 cause impairment of the Recreational Use. Three of 23 observations exceed the former criterion at station 9-STE002.41 Rt. 705 Bridge (Coal Hollow Road). The 2004 IR at 9-STE002.41 records four exceedances from 35 samples in excess of the current 400 cfu/100 ml WQS instantaneous criterion. Escherichia coli (E.coli) bacteria replaced fecal coliform (FC) in 2006 as the indicator as required by Water Quality Standards [9 VAC 25-260-170. Bacteria; other waters]. 2008 results find E.coli exceedances at 9-STE002.41 are three of 31 samples and resulted in 2.11 miles delisted with the 2008 IR. This 2.11 mile delisted portion (partial - length) returned with the 2010 303(d) Listing.

9-STE002.41- (Rt. 705 Bridge- Coal Hollow Road) Twelve observations of escherichia coli (E.coli) exceed the 235 cfu/100 ml instantaneous criterion from 36 total samples in 2014. Values in excess of the instantaneous criterion range from 250 to greater than 2000 cfu/100 ml. The 2012 data window finds eight of 36 observations exceeding the 235 cfu/100 ml instantaneous criterion. Exceeding values range from 280 to greater than 2000 cfu/100 ml. 2010 E.coli samples find eight exceed the 235 cfu/100 ml instantaneous criterion from a total of 32 samples with the same range of exceedance.

9-STE007.29 (Rt. 657 Bridge below old B'Burg STP) Escherichia coli (E. coli) samples find eight exceed the 235 cfu/100 ml instantaneous criterion from a total of 24 samples. Exceeding values range from 280 to greater than 2000 cfu/100 ml within the 2014 data window. The 2012 IR reports eight E.coli samples exceed the instantaneous criterion from a total of 33. Exceeding values range from 280 to greater than 2000 cfu/100 ml. 2010 results find eight exceed from a total of 32 samples with the same range of exceedance as 2012. 2008 E.coli results exceed in five of 25 samples. The 2008 exceedance range is from 300 to greater than 2000 cfu/100 ml. 2006 E.coli samples reveal five exceed the instantaneous criterion from a total of 16. Exceeding values range from 490 to greater than 5000 cfu/100 ml.

Assessment Unit	Water name	Location Description	Cause Category	Cause Name	Cycle First Listed	TMDL Schedule	Size
VAW-N22R_STE03A00	Stroubles Creek	These mainstem waters extend from the Slate Branch mouth on Stroubles Creek upstream to the mouth of Walls Branch (NE59).	5A	Escherichia coli	2010	2014	2.11
VAW-N22R_STE04A00	Stroubles Creek	These mainstem waters extend from the Walls Branch mouth upstream to the Duck Pond located on the VPI&SU Campus (NE59).	5A	Escherichia coli	2006	2014	5.08

Stroubles Creek

		Estuary (sq. miles)	Reservoir (acres)	River (miles)
Impaired area ID: VAW-N22R-01				
Recreation	Escherichia coli / 5A			
	Total impaired size by water type:			7.19

Sources:

- Discharges from Municipal Separate Storm Sewer Systems (MS4)
- Livestock (Grazing or Feeding Operations)
- Municipal (Urbanized High Density Area)
- Unspecified Domestic Waste
- Wastes from Pets
- Wet Weather Discharges (Non-Point Source)
- Wildlife Other than Waterfowl

* Narrative descriptions, location and city/county describe the entire extent of the impairment. Sizes may not represent the total size of the impairment.

2014 Impaired Waters

Category 4 & 5 by Impaired Area ID*

New River Basin

Cause Group Code: **N22R-03-BAC** - **Back Creek**

Location:	The waters extend from 0.70 miles below the Rt. 636 Bridge crossing downstream to Back Creek's mouth on the New River.
City/County	Pulaski Co.
Use(s):	Recreation
Cause(s) / VA Category:	Escherichia coli / 4A

The 1996 303(d) Listed Back Creek Bacteria Total Maximum Daily Load (TMDL) is U.S. EPA approved on 6/21/2004 [Fed ID 24564] and SWCB approval on 12/02/2004. The Bacteria/Benthic Implementation Plan (IP) is SWCB approved 7/31/2008 (formerly VAW-N22R-03). 1996 fecal coliform (FC) exceedances are found in seven of seven observations at 9-BCK009.47; 2002 records 17 of 23 samples exceeding the former fecal coliform bacteria instantaneous criterion of 1000 cfu/100 ml. The 2004 Integrated Report (IR) records 19 of 21 samples exceeding the former WQS fecal coliform bacteria instantaneous criterion of 400 cfu/100 ml at 9-BCK009.47. The excursions range from 900 to >8000 cfu/100 ml. Escherichia coli (E.coli) bacteria replaced fecal coliform in 2006 as the indicator as required by Water Quality Standards [9 VAC 25-260-170. Bacteria; other waters]. The waters remain impaired for 17.53 miles with the 2014 Assessment.

9-BCK015.98 (Rt. 636 Bridge, Black Hollow Road) There are no additional data beyond the 2012 assessment where escherichia coli (E.coli) samples exceed the WQS instantaneous criterion of 235 cfu/100 ml in 24 of 36 total samples. Values in excess of the criterion range from 300 to greater than 2000 cfu/100 ml. 2010 E.coli samples exceed the instantaneous criterion in 25 of 35 samples. Values in excess of the criterion range from 300 to greater than 2000 cfu/100 ml. The 2008 assessment finds E.coli exceeds the instantaneous criterion in 19 of 26 samples. Values in excess of the criterion range from 250 to greater than 2000 cfu/100 ml. In 2006 E.coli samples exceed the instantaneous criterion in 11 of 14 samples with the same exceedance range.

9-BCK009.47 (Rt. 100 Bridge) There are no additional data beyond the 2012 Integrated Report (IR) where E.coli exceeds the 235 cfu/100 ml criterion in 34 of 36 samples. The range of exceedance is from 320 to greater than 2000 cfu/100 ml. 2010 E. coli exceedances of the instantaneous criterion are found in 39 of 42 samples. The range of exceeding values is from 310 cfu/100 ml to 18,000. E.coli exceeds the instantaneous criterion in 32 of 35 samples in 2008. The range of exceeding values is from 310 cfu/100 ml to 18,000. Two of two geometric mean calculations exceed the 126 cfu/100 ml criterion based on the former WQS frequency of collection.. The 2006 assessment found E.coli exceeds the instantaneous criterion in 20 of 21 samples with the same exceedance range.

9-BCK000.74 (Rt. 600 Bridge) There are no additional data beyond the 2012 IR where 20 of 36 E.coli exceedances occur ranging from 250 to greater than 2000 cfu/100 ml. E.coli exceedances are found in 29 of 43 samples within the 2010 data window. Exceedances range from 250 cfu/100 ml to 9000. The 2008 assessment finds E.coli exceeds the instantaneous criterion in 23 of 36 samples with exceedances ranging from 290 cfu/100 ml to greater than 2000. Three of three geometric mean calculations exceed the 126 cfu/100 ml criterion based on the former WQS frequency of collection. The exceedance range in 2006 is the same as 2008 where E.coli exceeds in 15 of 22 samples.

Assessment Unit	Water name	Location Description	Cause Category	Cause Name	Cycle First Listed	TMDL Schedule	Size
VAW-N22R_BCK01A00	Back Creek	Back Creek mainstem waters from the mouth of Shuffle Branch downstream to Back Creek's mouth on the New River (NE61).	4A	Escherichia coli	2006	2010	5.76
VAW-N22R_BCK02A08	Back Creek	Back Creek from 0.70 miles downstream of the Rt. 636 crossing on downstream to the confluence of Shuffle Branch (NE61).	4A	Escherichia coli	2006	2010	11.77

Back Creek

		Estuary (sq. miles)	Reservoir (acres)	River (miles)
Impaired area ID: VAW-N22R-01				
Recreation	Escherichia coli / 4A			17.53
	Total impaired size by water type:			

Sources:

- Livestock (Grazing or Feeding Operations)
- On-site Treatment Systems (Septic Systems and Similar Decentralized Systems)
- Unspecified Domestic Waste
- Wastes from Pets
- Wet Weather Discharges (Non-Point Source)

- Wildlife Other than Waterfowl

* Narrative descriptions, location and city/county describe the entire extent of the impairment. Sizes may not represent the total size of the impairment.

2014 Impaired Waters

Category 4 & 5 by Impaired Area ID*

New River Basin

Cause Group Code: **N23R-01-TEMP** - **Sinking Creek**

Location:	Sinking Creek mainstem waters from just downstream of the Rt. 778 Bridge upstream to the mouth of an unnamed tributary near the Rt. 700 crossing.
City/County	Craig Co., Giles Co.
Use(s):	Aquatic Life
Cause(s) / VA Category:	Temperature, water / 5C

The 2010 assessment reveals a 3.03 mile excursion of the stockable trout water criterion.

9-SNK005.38 (Rt. 778 Bridge)- Temperature exceeding values are found in three of 23 measurements within the 2014 data window. Measurements in excess of the 21°C criterion occur on 7/11/2007 at 21.4°C, 21.2°C on 7/9/2008 and 22.4°C on 9/2/2008. The 2010 assessment reports temperature exceeding values are found in three of 14 measurements. Measurements in excess of the Class V 21°C criterion are the same as 2014.

Assessment Unit	Water name	Location Description	Cause Category	Cause Name	Cycle First Listed	TMDL Schedule	Size
VAW-N23R_SNK01B10	Sinking Creek	Sinking Creek mainstem waters from just downstream of the Rt. 778 Bridge upstream to the mouth of an unnamed tributary near the Rt. 700 crossing (NE65).	5C	Temperature, water	2010	2022	3.03

Sinking Creek

Impaired area ID: VAW-N23R-01

Aquatic Life

	Estuary (sq. miles)	Reservoir (acres)	River (miles)
Temperature, water / 5C			
Total impaired size by water type:			3.03

Sources:

- Source Unknown

* Narrative descriptions, location and city/county describe the entire extent of the impairment. Sizes may not represent the total size of the impairment.

2014 Impaired Waters

Category 4 & 5 by Impaired Area ID*

New River Basin

Cause Group Code: **N23R-01-BAC** - **Sinking Creek**

Location:	Sinking Creek mainstem waters from just downstream of the Rt. 778 Bridge upstream to the mouth of Gravel Hill Branch.
City/County	Craig Co., Giles Co.
Use(s):	Recreation
Cause(s) / VA Category:	Escherichia coli / 5A

The initial 21.03 mile 2010 303(d) Listing of these waters is due to bacteria excursions of the WQS instantaneous criterion for escherichia coli (E.coli).

9-SNK012.06 (Rt. 42 Bridge)- There are no additional data beyond the 2010 IR where three of 12 E.coli samples exceed the 235 cfu/100 ml instantaneous criterion. The exceedance range is from 250 to greater than 2000 cfu/100 ml.

9-SNK005.38 (Rt. 778 Bridge)- E.coli excursions of the 235 cfu/100 ml instantaneous criterion occur in four of 23 observations within the 2014 data window. Values in excess of the instantaneous criterion range from 275 to 600 cfu/100 ml. E.coli excursions of the instantaneous criterion occur in two of 11 observations within the 2010 and 2012 data windows. Values in excess of the instantaneous criterion are 480 and 600 cfu/100 ml.

Assessment Unit	Water name	Location Description	Cause Category	Cause Name	Cycle First Listed	TMDL Schedule	Size
VAW-N23R_SNK01B10	Sinking Creek	Sinking Creek mainstem waters from just downstream of the Rt. 778 Bridge upstream to the mouth of an unnamed tributary near the Rt. 700 crossing (NE65).	5A	Escherichia coli	2010	2022	3.03
VAW-N23R_SNK01C14	Sinking Creek	Sinking Creek from just downstream of the Rt. 700 Bridge upstream to the junction of routes 601 & 604 - 6th Order Boundary (NE65)	5A	Escherichia coli	2010	2022	2.74
VAW-N23R_SNK02A00	Sinking Creek	Sinking Creek from the junction of routes 601 & 604 upstream to the mouth of Gravel Hill Branch-6th Order Boundary (NE64).	5A	Escherichia coli	2010	2022	15.26

Sinking Creek

		Estuary (sq. miles)	Reservoir (acres)	River (miles)
Impaired area ID: VAW-N23R-01				
Recreation	Escherichia coli / 5A			
	Total impaired size by water type:			21.03

Sources:

- Livestock (Grazing or Feeding Operations)
- On-site Treatment Systems (Septic Systems and Similar Decentralized Systems)
- Unspecified Domestic Waste
- Wet Weather Discharges (Non-Point Source)
- Wildlife Other than Waterfowl

* Narrative descriptions, location and city/county describe the entire extent of the impairment. Sizes may not represent the total size of the impairment.

2014 Impaired Waters

Category 4 & 5 by Impaired Area ID*

James River Basin

Cause Group Code: **I19R-01-BAC** - **Craig Creek**

Location:	Craig Creek mainstem from the mouth of Turnpike Creek extending downstream to the Rt. 311 crossing located downstream of the Abbott community.
City/County	Craig Co.
Use(s):	Recreation
Cause(s) / VA Category:	Escherichia coli / 5A

2-CRG062.29- (Rt. 311 Bridge nearest New Castle) The 2004 Listing basis is three of 27 fecal coliform (FC) samples exceeding the former 400 cfu/100 ml WQS instantaneous criterion. The maximum reported is 1100 cfu/100 ml with the remaining values at 900 and 500. These 2004 7.91 mile 303(d) Listed waters remain impaired for bacteria. The 2014 data window produces seven of 24 escherichia coli (E.coli) samples exceeding the 235 cfu/100 ml WQS instantaneous criterion. The exceeding values range from 280 to 1050 cfu/100 ml. The 2010 and 2012 assessments find two of 12 Escherichia coli (E.coli) samples exceeding the current 235 cfu/100 ml WQS instantaneous criterion. E.coli exceeding values are 280 and 400 cfu/100 ml. Data within the 2008 window finds one FC excursion (1100 cfu/100 ml) of the former instantaneous criterion of 400 cfu/100 ml from 15 samples. The 2006 IR also reports FC exceeds the former instantaneous criterion in one of 21 samples with the same exceeding value. Escherichia coli (E.coli) replaces fecal coliform (FC) bacteria as the indicator as per Water Quality Standards [9 VAC 25-260-170. Bacteria; other waters].

Assessment Unit	Water name	Location Description	Cause Category	Cause Name	Cycle First Listed	TMDL Schedule	Size
VAW-I19R_CRG02A02	Craig Creek	Craig Creek mainstem from downstream of Abbott and the Rt. 311 crossing upstream to the confluence of Trout Creek (JU43).	5A	Escherichia coli	2004	2016	6.55
VAW-I19R_CRG02A14	Craig Creek	Craig Creek mainstem from Trout Creek upstream to the confluence of Turnpike Creek (JU41).	5A	Escherichia coli	2004	2016	1.35

Craig Creek

Impaired area ID: VAW-I19R-01

Recreation

	Estuary (sq. miles)	Reservoir (acres)	River (miles)
Escherichia coli / 5A			
Total impaired size by water type:			7.9

Sources:

- Livestock (Grazing or Feeding Operations)
- On-site Treatment Systems (Septic Systems and Similar Decentralized Systems)
- Unspecified Domestic Waste
- Wildlife Other than Waterfowl

* Narrative descriptions, location and city/county describe the entire extent of the impairment. Sizes may not represent the total size of the impairment.

2014 Impaired Waters

Category 4 & 5 by Impaired Area ID*

James River Basin

Cause Group Code: **I22R-03-BEN** - **Crawford Branch**

Location:	Crawford Branch mainstem from its headwaters downstream to its confluence with Craig Creek
City/County	Botetourt Co.
Use(s):	Aquatic Life
Cause(s) / VA Category:	Benthic-Macroinvertebrate Bioassessments / 4C

A Level 3 US Forest Service site 6570 located approximately 0.19 miles from the Crawford Branch mouth on Craig Creek finds the benthic community impaired. A single 1999 MAIS survey score is 11; rating Poor/Fair or moderately impaired; there are no additional data beyond the 2004 Integrated Report (IR). These data are outside the 2006, 2008, 2010, 2012 and 2014 assessment data windows. Comments provided by the US Forest Service recommends not listing this site as drought conditions produced results indicating impairment thus Category 4C.

Assessment Unit	Water name	Location Description	Cause Category	Cause Name	Cycle First Listed	TMDL Schedule	Size
VAW-I22R_CRD01A04	Crawford Branch	Crawford Branch headwaters downstream to its mouth on Craig Creek (JU50).	4C	Benthic-Macroinvertebrate Bioassessments			1.87

Crawford Branch

Impaired area ID: VAW-I19R-01

Aquatic Life

	Estuary (sq. miles)	Reservoir (acres)	River (miles)
Benthic-Macroinvertebrate Bioassessments / 4C			
Total impaired size by water type:			1.87

Sources:

- Drought-related Impacts

* Narrative descriptions, location and city/county describe the entire extent of the impairment. Sizes may not represent the total size of the impairment.

2014 Impaired Waters

Category 4 & 5 by Impaired Area ID*

James River Basin

Cause Group Code: **I22R-04-BAC** - **Little Patterson Creek**

Location:	Little Patterson Creek from just upstream of the Rt. 684 (Sugar Tree Hollow Rd.) crossing downstream to its confluence with Patterson Creek.
City/County	Botetourt Co.
Use(s):	Recreation
Cause(s) / VA Category:	Escherichia coli / 5A

The 2004 Integrated Report (IR) initially 303(d) Lists the 4.24 mile fecal coliform (FC) bacteria impairment. Escherichia coli replaces the fecal coliform impairment with the 2012 IR.

Station 2-LIP001.00 (Rt. 682 Bridge - Sugartree Hollow Rd.) There are no additional data beyond the 2012 Integrated Report (IR). Five of 12 escherichia coli (E.coli) samples exceed the 235 cfu/100 ml instantaneous criterion within the 2012 data window. Exceeding values range from 250 to 1300 cfu/100 ml. The 2004 IR reports FC exceeds the former 400 cfu/100 ml WQS instantaneous criterion in two of nine samples. The two exceedances are 2800 (2001) and 2100 cfu/100 ml (2001). In both the 2006 and 2008 assessments FC exceeds in two of 12 samples with the same excursions as in previous cycles. No additional data extended into the 2010 data window where three observations did not exceed.

Assessment Unit	Water name	Location Description	Cause Category	Cause Name	Cycle First Listed	TMDL Schedule	Size
VAW-I22R_LIP01A04	Little Patterson Creek	Little Patterson Creek from just upstream of the Rt. 684 (Sugar Tree Hollow Rd.) crossing downstream to its confluence with Patterson Creek (JU49).	5A	Escherichia coli	2012	2016	4.24

Little Patterson Creek

Impaired area ID: VAW-I19R-01

Recreation

	Estuary (sq. miles)	Reservoir (acres)	River (miles)
Escherichia coli / 5A			
Total impaired size by water type:			4.24

Sources:

- Livestock (Grazing or Feeding Operations)
- On-site Treatment Systems (Septic Systems and Similar Decentralized Systems)
- Unspecified Domestic Waste
- Wildlife Other than Waterfowl

* Narrative descriptions, location and city/county describe the entire extent of the impairment. Sizes may not represent the total size of the impairment.

2014 Impaired Waters

Category 4 & 5 by Impaired Area ID*

James River Basin

Cause Group Code: **I22R-02-BAC** - **Craig Creek**

Location:	Craig Creek from the mouth of Johns Creek downstream to Barbours Creek confluence with Craig Creek
City/County	Craig Co.
Use(s):	Recreation
Cause(s) / VA Category:	Escherichia coli / 5A

2-CRG048.53 (Below New Castle STP) - There are no additional data beyond the 2012 Integrated Report (IR). The 2012 initial 303(d) Listing results from escherichia coli (E.coli) exceedances from two of 12 samples within the 2012 data window. Values in excess of the 235 cfu/10 ml instantaneous criterion are 320 and 700 cfu/100 ml. A downstream station 2-CRG042.34 (Rt. 614 Bridge) records a single exceedance of greater than 2000 cfu/100 ml from 12 samples. The exceedance indicates potential for impairment although not impaired via Guidance.

Assessment Unit	Water name	Location Description	Cause Category	Cause Name	Cycle First Listed	TMDL Schedule	Size
VAW-I22R_CRG05A02	Craig Creek	Craig Creek mainstem from the confluence of Mill Creek upstream to the Barbours Creek mouth (JU48).	5A	Escherichia coli	2012	2024	5.38
VAW-I22R_CRG05B14	Craig Creek	Craig Creek mainstem from the confluence of Barbours Creek upstream to the Johns Creek mouth (JU46).	5A	Escherichia coli	2012	2024	6.05

Craig Creek

Impaired area ID: VAW-I19R-01

Recreation

	Estuary (sq. miles)	Reservoir (acres)	River (miles)
Escherichia coli / 5A			
Total impaired size by water type:			11.43

Sources:

- Livestock (Grazing or Feeding Operations)
- Municipal (Urbanized High Density Area)
- Unspecified Domestic Waste
- Wastes from Pets
- Wet Weather Discharges (Non-Point Source)
- Wildlife Other than Waterfowl

* Narrative descriptions, location and city/county describe the entire extent of the impairment. Sizes may not represent the total size of the impairment.

2014 Impaired Waters

Category 4 & 5 by Impaired Area ID*

James River Basin

Cause Group Code: **I22R-01-PH** - **Mill Creek**

Location:	Mill Creek mainstem from ~2.0 miles upstream of its mouth on Craig Creek upstream to its headwaters and above the upstream most pond.
City/County	Craig Co.
Use(s):	Aquatic Life
Cause(s) / VA Category:	pH / 5A

2-MIU002.97 (Upstream of Upper pond and downstream of former iron mine) Three 2010-2011 observations each of pH are in excess of the WQS acidic minimum criterion of 6.0 Standard Units (SU) at 5.2, 5.4 and 4.4 SU. This is a 2012 initial Listing.

Assessment Unit	Water name	Location Description	Cause Category	Cause Name	Cycle First Listed	TMDL Schedule	Size
VAW-I22R_MIU02A02	Mill Creek	Mill Creek mainstem from ~2.0 miles upstream of its mouth on Craig Creek upstream to its headwaters and above the upstream most pond (JU48).	5A	pH	2012	2024	4.24

Mill Creek

		Estuary (sq. miles)	Reservoir (acres)	River (miles)
Impaired area ID: VAW-I19R-01				
Aquatic Life	pH / 5A			4.24
	Total impaired size by water type:			

Sources:

- Mine Tailings

* Narrative descriptions, location and city/county describe the entire extent of the impairment. Sizes may not represent the total size of the impairment.

2014 Impaired Waters

Category 4 & 5 by Impaired Area ID*

James River Basin

Cause Group Code: **I22R-01-TEMP** - **Barbours Creek**

Location:	Barbours Creek from its mouth on +Craig Creek upstream to the I23 Watershed Boundary located just downstream of the Rt. 617 and 611 junction at the mouth of Valley Branch.
City/County	Craig Co.
Use(s):	Aquatic Life
Cause(s) / VA Category:	Temperature, water / 5C

The original 7.15 mile temperature impairment continues with the 2014 Integrated Report (IR). The 2006 IR extended the impairment 6.29 miles (2-BAR010.10 - I23R) from the initial 2002 303(d) Listing (2-BAR000.60 - I22R). The 6.29 mile upstream extension is de-listed with the 2012 Integrated Report with station 2-BAR010.10 recording no exceeding Class VI temperatures of the 20°C WQS criterion from 15 observations.

2-BAR000.60- (Rt. 614 Bridge) There are no additional data beyond the 2004 IR. The 2004 assessment finds temperature exceeds the WQS 20°C natural trout water criterion in three of 18 observations with a maximum of 22°C on 7/10/00. Each of the remaining two temperature excursions occur on 7/08/98 (20.6°C) and 7/12/99 (20.5°C). The 2006 IR data window reveals one of nine temperature measurements in excess of the Class VI criterion. The 2008 data window finds no excursions from three measurements. There are no additional data within the 2010 assessment data window.

Assessment Unit	Water name	Location Description	Cause Category	Cause Name	Cycle First Listed	TMDL Schedule	Size
VAW-I22R_BAR01A00	Barbours Creek	Barbours Creek from its mouth on Craig Creek upstream to the I23 Watershed Boundary located just downstream of the Rt. 617 and 611 junction at the mouth of Valley Branch JU47.	5C	Temperature, water	2002	2014	7.15

Barbours Creek

		Estuary (sq. miles)	Reservoir (acres)	River (miles)
Impaired area ID: VAW-I19R-01				
Aquatic Life	Temperature, water / 5C			7.15
	Total impaired size by water type:			

Sources:

- Natural Conditions - Water Quality Standards Use Attainability Analyses Needed

* Narrative descriptions, location and city/county describe the entire extent of the impairment. Sizes may not represent the total size of the impairment.

2014 Impaired Waters

Category 4 & 5 by Impaired Area ID*

James River Basin

Cause Group Code: **I23R-01-BEN** - **Cove Branch**

Location:	Cove Branch mainstem from its confluence with Barbours Creek upstream to its headwaters.
City/County	Craig Co.
Use(s):	Aquatic Life
Cause(s) / VA Category:	Benthic-Macroinvertebrate Bioassessments / 4C

The 2008 Listing of these category 4C waters occurs due to a Level 3 U.S. Forest Service 2005 MAIS survey. Station 6511 is located in the headwaters of Cove Branch approximately 4 miles from its confluence with Barbours Creek.

6511- One 2005 survey (MAIS 9 PF) Lv.3. USGS 7.5 Minute Quadrangle shows the station to be located in the intermittent headwater portion of Cove Branch and may not be indicative of the perennial stream. In developing the Virginia Stream Condition Index (VSCI) investigators found the benthic community composed of different aquatic insects than that found in perennial waters. Therefore the use of the VSCI for intermittent headwater streams is discouraged as it may not be applicable. Based on this judgment the waters are categorized 4C.

Assessment Unit	Water name	Location Description	Cause Category	Cause Name	Cycle First Listed	TMDL Schedule	Size
VAW-I23R_CVA01A02	Cove Branch	Cove Branch mainstem from its confluence with Barbours Creek upstream to its headwaters (JU47).	4C	Benthic-Macroinvertebrate Bioassessments			6.04

Cove Branch

Impaired area ID: VAW-I19R-01

Aquatic Life

	Estuary (sq. miles)	Reservoir (acres)	River (miles)
Benthic-Macroinvertebrate Bioassessments / 4C			
Total impaired size by water type:			6.04

Sources:

- Natural Conditions - Water Quality Standards Use Attainability Analyses Needed

* Narrative descriptions, location and city/county describe the entire extent of the impairment. Sizes may not represent the total size of the impairment.

2014 Impaired Waters

Category 4 & 5 by Impaired Area ID*

James River Basin

Cause Group Code: **I22R-01-BAC** - **Barbours Creek**

Location:	Barbours Creek from just downstream of the Rt. 617 and 611 junction at the mouth of Valley Branch on downstream to its mouth on Craig Creek. (New Castle Quad).
City/County	Craig Co.
Use(s):	Recreation
Cause(s) / VA Category:	Fecal Coliform / 5A

The 7.15 mile bacteria impairment initially 303(d) Listed in 2004 remains.

2-BAR000.60- (Rt. 614 Bridge) There are no additional bacteria data beyond the 2004 Integrated Report (IR). The 2004 IR reports the maximum fecal coliform (FC) of 1100 cfu/100 ml and a second at 500; both exceed the former WQS instantaneous criterion of 400 cfu/100 ml from 18 samples. The 2006 IR finds no excursions of the former WQS FC instantaneous criterion from nine samples. The 2008 data window finds no excursions of the aforementioned from 3 samples. There are no bacteria data within the 2010 or 2012 assessment data windows.

Assessment Unit	Water name	Location Description	Cause Category	Cause Name	Cycle First Listed	TMDL Schedule	Size
VAW-I22R_BAR01A00	Barbours Creek	Barbours Creek from its mouth on Craig Creek upstream to the I23 Watershed Boundary located just downstream of the Rt. 617 and 611 junction at the mouth of Valley Branch JU47.	5A	Fecal Coliform	2004	2016	7.15

Barbours Creek

Impaired area ID: VAW-I19R-01

Recreation

	Estuary (sq. miles)	Reservoir (acres)	River (miles)
Fecal Coliform / 5A			
Total impaired size by water type:			7.15

Sources:

- Livestock (Grazing or Feeding Operations)
- On-site Treatment Systems (Septic Systems and Similar Decentralized Systems)
- Unspecified Domestic Waste
- Wildlife Other than Waterfowl

* Narrative descriptions, location and city/county describe the entire extent of the impairment. Sizes may not represent the total size of the impairment.

2014 Impaired Waters

Category 4 & 5 by Impaired Area ID*

New River Basin

Cause Group Code: **N29R-01-PCB** - **New River, Reed Creek, Claytor Lake, Peak Creek, Stony Creek and Walker Creek**

Location:	The impairment begins at the I-77 bridge crossing the New River and extends downstream to the VA/WVA State Line and includes the tributaries Peak Creek and Reed Creek as described below.
City/County	Giles Co., Montgomery Co., Pulaski Co., Radford City, Wythe Co.
Use(s):	Fish Consumption
Cause(s) / VA Category:	PCB in Fish Tissue / 5A

The Virginia Department of Health (VDH) issued a fish consumption advisory on August 6, 2001 for polychlorinated biphenyls (PCBs) for the lower portion of the New River (Rt. 114 Bridge downstream to the VA / WVA State Line - 52.0 miles) based on fish tissue collections from Carp. An Advisory extension to Claytor dam was issued 8/06/2003 (11.47 miles) recommends that no carp be consumed in these waters and no more than two meals per month of flathead and channel catfish. The VDH PCB Fish Consumption Advisory was further extended upstream on the New River (13 miles) to the I-77 Bridge to include the lower portions of Peak Creek (4.02 miles), Reed Creek (16.35 miles) and Claytor Lake (4,287 acres) on 12/02/2004. The VDH advises consumption should not exceed two meals per month for carp and smallmouth bass. Stony Creek is a 2010 Integrated Report (IR) addition to the original 2002 303(d) Listing. The VDH level of concern is 50 parts per billion (ppb) in fish tissue.

Water column data from 2010 thru 2012 are listed below where excursions of the WQS water column criterion of 640 pg/L are contravened causing an Observed Effect (OE) or 303(d) Listing for 'PCBs in Water Column'. Water column data collection is in support of TMDL development for PCBs in the New River drainage. Sample collections are made in both wet weather (WW) and dry weather (DW) conditions.

2012 Fish tissue and water column data follow reporting exceedances of the WQS based 20 ppb fish tissue value (TV) (VDH Lower Level of Concern 50 ppb). And excursions of the WQS water column criterion of 640 pg/L. Fish tissue data are in addition to previous years collections. Fish tissue data are reviewed by the VDH in making an advisory determination. A complete listing of fish tissue collection sites and associated fish tissue data are available at http://www.deq.virginia.gov. A more detailed presentation of the data can also be found using an interactive mapping application at http://www.deq.virginia.gov. The VDH Advisory information is also available via the web at http://www.vdh.virginia.gov/Epidemiology/PublicHealthToxicology/Advisories/.

9-RDC009.00 (Near Rt. 619 at Grahams Forge) 2012 two species analyzed - Carp exceeds WQS TV of 20 ppb (5 fish composite [62.6 - 69.4 cm] at 68.24 ppb. Remaining species analyzed Smallmouth Bass (5 fish composite [21.8 - 26.6 cm] at 3.04 ppb.

9-NEW098.32 (Rt. 672 Bridge, Lighthouse) 2012 four species analyzed - Channel Catfish exceeds WQS TV of 20 ppb; (2 fish composite (70.5 - 71.5 cm) at 65.15 ppb. Remaining species analyzed Largemouth Bass (5 fish composite [34.5 - 43.1]) at 7.76 ppb; Spotted Bass (5 fish composite [34.2 - 38.2 cm]) at 11.00 ppb; and Carp (3 fish composite [45.8 - 56.5]) at 6.04 ppb.

9-PKC007.82 (Route 99 Bridge) 2012 three species analyzed - Stoneroller exceeds WQS criterion of 20 ppb (15 fish comp. [14.3 - 16.0 cm] at 33.18 ppb. Remaining species analyzed Rock Bass (5 fish comp. [16.7 - 18.6 cm]); at 10.49 ppb) and Redbreast Sunfish (5 fish comp. [14.3 - 18.1 cm]; at 3.01 ppb).

9-PKC004.65 (Rt. 100 Bridge) 2012 five species analyzed. Channel catfish exceeds WQS criterion of 20 ppb (2 fish composite [63.1 - 69.0 cm] at 33.15 ppb. Remaining species analyzed Largemouth Bass (5 fish composite [33.4 - 40.8 cm]; @2.68 ppb), Carp 2 sizes (4 fish composite [54.6 - 62.0 cm]; @2.32 ppb) and (4 fish composite [54.6 - 62.0 cm]; @9.16 ppb) and Smallmouth Bass (3 fish composite [35.3 - 42.6 cm]; @6.90 ppb).

9-NEW088.86 (New River Claytor Lake at Dam) 2012 six species analyzed - Flathead Catfish exceeds WQS criterion of 20 ppb (2 fish composite [83.0 - 87.5 cm]) at 86.67 ppb. Remaining species analyzed Carp (4 fish composite [56.5 - 67.0 cm] at 2.05 ppb; Channel Catfish (1 fish [58.8 cm]) at 7.43 ppb; Largemouth Bass (5 fish composite [32.5 - 34.5 cm] at 0.36 ppb; Smallmouth Bass (4 fish composite [27.0 - 32.2 cm] at 0.88 ppb and Spotted Bass (3 fish composite [28.8 - 36.8 cm] at 0.00 ppb.

9-NEW085.94 (New River downstream of Claytor Dam) 2012 two species analyzed - Flathead Catfish exceeds WQS criterion of 20 ppb (5 fish composite [57.5 - 70.3 cm]) at 33.74 ppb. Remaining species analyzed Carp (5 fish composite [62.6 - 81.0 cm] at 11.27 ppb.

9-NEW081.72- (Route 11 Bridge - at Radford) 2010 water column PCB WQS criterion of 640 pg/L: Dry Weather (DW) 320 pg/L - 'FS'; Wet Weather (WW) exceeds at 4,739- 'OE'.

9-NEW079.19 (New River below Radford University) 2012 one species two exceeding composites analyzed - Carp exceeds WQS criterion of 20 ppb (2 fish composite [67.5 - 76.5 cm] at 53.28 ppb and Carp exceeding (2 fish composite [76.8 - 83.6 cm] at 94.85 ppb.

9-NEW066.90 (New River at Whitethorne) 2012 one species analyzed exceeds WQS criterion of 20 ppb Carp (1 fish [72.0 cm] at 125.58 ppb.

9-WLK004.34 (Route 622 Bridge - Giles Co.) Water column samples find two excursions of the WQS criterion of 640 pg/L. 2010 Wet Weather (WW) at 1,706 pg/L and 2011 WW at 649 pg/L.

9-NEW050.70 (New River near Pembroke) 2012 three species analyzed Carp exceeds WQS criterion of 20 ppb (2 fish composite [67.5 - 71.6 cm] at 419.87 ppb and Channel Catfish (1 fish [58.1 cm] at 23.26 ppb. Remaining species analyzed Flathead Catfish (1 fish [51.4 cm] at 9.60 ppb.

9-NEW038.71 (New River below Celeanse) 2012 two species analyzed - Each of the following exceed the WQS criterion of 20 ppb. Carp (2 fish composite [68.1 - 69.0 cm] at 355.63 ppb and Flathead Catfish (1 fish [56.0 cm] at 25.39 ppb. 2010 water column PCB DW- 129 pg/L- 'FS; Wet 784 pg/L- 'OE' and
2011 water column PCB Wet- 222 pg/L- 'FS'

9-NEW030.15 (Route 460 Bridge at Glen Lyn) 2012 one species analyzed - Each of the following exceed the WQS criterion of 20 ppb. Carp 1 (1 fish [85.0 cm] at 234.01 ppb; Carp 2 (2 fish composite [72.5 - 74.8 cm]) at 448.15 ppb.

9-NEW031.00 (Above Glen Lyn) 2010 water column PCB DW- 66 pg/L- 'FS'; WW- 841 pg/L- 'OE'.

9-NEW028.95 (New River below Glen Lyn) 2010 water column PCB WW- 710 pg/L- 'OE'. 2011 water column PCB DW- 110 pg/L- 'FS'; WW- 400 pg/l- 'FS'.

Assessment Unit	Water name	Location Description	Cause Category	Cause Name	Cycle First Listed	TMDL Schedule	Size
VAW-N24R_NEW01A00	New River	New River mainstem from the confluence of Stony Creek upstream to the mouth of Walker Creek on the New River (NE74).	5A	PCB in Fish Tissue	2002	2014	3.87
VAW-N24R_NEW02A00	New River	New River mainstem waters from the mouth of Walker Creek upstream to the confluence of Little Stony Creek with the New River (NE74).	5A	PCB in Fish Tissue	2002	2014	2.00
VAW-N24R_NEW03A00	New River	New River mainstem waters from the confluence of Little Stony Creek upstream to mouth of Sinking Creek on the New River. (NE74)	5A	PCB in Fish Tissue	2002	2014	3.87

New River, Reed Creek, Claytor Lake, Peak Creek, Stony Creek and Walker Creek

		Estuary (sq. miles)	Reservoir (acres)	River (miles)
Impaired area ID: VAW-N24R-01	PCB in Fish Tissue / 5A			
	Total impaired size by water type:			9.74
Fish Consumption				

Sources:

- Source Unknown

* Narrative descriptions, location and city/county describe the entire extent of the impairment. Sizes may not represent the total size of the impairment.

2014 Impaired Waters

Category 4 & 5 by Impaired Area ID*

Roanoke and Yadkin River Basins

Cause Group Code: **L01R-01-BAC** - **Roanoke River, South Fork and Goose Creek**

Location:	South Fork Roanoke River mainstem from the mouth of Elliott Creek extending downstream to the confluence of the North and South Forks of the Roanoke River. And Goose Creek from the Lick Fork mouth downstream to its confluence with the South Fork Roanoke River.
City/County	Floyd Co., Montgomery Co.
Use(s):	Recreation
Cause(s) / VA Category:	Escherichia coli / 4A, Fecal Coliform / 4A

The 2004 assessment initially 303(d) Listed the 12.61 mile fecal coliform (FC) bacteria impairment. Two stations on the S.F. Roanoke River, 4ARSF011.73 located on the Rt. 637 Bridge and 4ARSF002.20 above the old Green Hill industrial site near Rt. 11/460, find the Recreational Use is not supported. The 2012 assessment extends the bacteria impairment upstream 6.27 miles based on data from station 4ARSF014.02. The 2012 assessment also incorporates the Goose Creek 2012 bacteria impairment. The South Fork Roanoke River nested extension of 6.43 miles and Goose Creek nested addition of 2.30 miles brings the total impaired miles to 19.61.

The Roanoke River Bacteria Total Maximum Daily Load (TMDL) is U.S. EPA approved on 8/02/2006 [Fed ID 24538] with SWCB approval on 6/27/2006. Assessment Units below are nested within the approved Roanoke River TMDL Watershed. Allocation scenario development is for the entire drainage to provide pollutant reductions for all watersheds contributing to the bacteria impairment. The entirety of the approved TMDL and allocations can be viewed at http://www.deq.virginia.gov. 1996 & 2002 fecal coliform (FC) observations are the basis for the original Roanoke bacteria impaired listing. The 2014 total bacteria impaired length on the Roanoke River is 29.56 miles and 165.29 acres in Smith Mountain Lake. The approved TMDL did not specifically address the South Fork Roanoke River or Goose Creek bacteria impairments but are nested within the overall Roanoke River Bacteria TMDL Watershed and allocations.

South Fork Roanoke River:
4ARSF014.02 (Persimmon Road Bridge) The 2012 assessment finds two Escherichia coli (E.coli) samples exceed the 235 cfu/100 ml instantaneous criterion from 12 obs. at 650 & 1500 cfu/100 ml. There are no additional data beyond the 2012 IR.

4ARSF011.73 (Rt. 637 Bridge) The 2004 Integrated Report (IR) reveals three excursions from 12 FC observations in excess of the former instantaneous criterion of 400 cfu/100 ml. 2004 exceedances range from 600 to 3000 cfu/100 ml. 2010 and 2008 E.coli observations are insufficient to delist where no excursions of the E.coli criterion are found in eight samples. Therefore the 2004 FC impaired status remains.

4ARSF002.20- (Private Bridge above Green Hill) There are no additional data beyond the 2004 IR. Three of 18 FC observations exceed the instantaneous criterion in 2004. 2004 IR exceedances range from 600 to 5300 cfu/100 ml. The waters remain impaired for FC. There are no E.coli data to assess.

Goose Creek:
4AGOS000.71 (Along Rt. 653) The 2012 and 2014 assessments find three of 12 Escherichia coli (E.coli) samples exceed the 235 cfu/100 ml instantaneous criterion at 400, 480 and 780 cfu/100 ml.

Assessment Unit	Water name	Location Description	Cause Category	Cause Name	Cycle First Listed	TMDL Schedule	Size
VAW-L01R_GOS01A02	Goose Creek	Goose Creek from its confluence with the South Fork Roanoke R. upstream to the mouth of Lick Fork (RU01).	4A	Escherichia coli	2012	2024	2.30
VAW-L01R_RSF03A00	S.F. Roanoke River	South Fork Roanoke River from the mouth of Elliott Creek downstream to the Shawsville STP (RU05).	4A	Escherichia coli	2012	2014	6.43
VAW-L01R_RSF04A02	S.F. Roanoke River	South Fork Roanoke R. from the confluence of Elliot Creek upstream to the mouth of Bottom Creek (RU03).	4A	Escherichia coli	2012	2014	4.61

Roanoke River, South Fork and Goose Creek

		Estuary (sq. miles)	Reservoir (acres)	River (miles)
Impaired area ID: VAW-L04R-01				
Recreation	Escherichia coli / 4A Total impaired size by water type:			13.34

Assessment Unit	Water name	Location Description	Cause Category	Cause Name	Cycle First Listed	TMDL Schedule	Size
VAW-L01R_RSF01A00	S.F. Roanoke River	South Fork Roanoke River mainstem extends from the PWS WQS upstream ending on downstream to the South Fork's confluence with the North Fork Roanoke River (RU05).	4A	Fecal Coliform	2004	2014	3.27
VAW-L01R_RSF02A00	S.F. Roanoke River	South Fork Roanoke River mainstem segment extends from Shawsville STP downstream to the WQS designated PWS upstream ending (RU05).	4A	Fecal Coliform	2004	2014	3.00

Impaired area ID: VAW-L04R-01

Recreation

	Estuary (sq. miles)	Reservoir (acres)	River (miles)
Fecal Coliform / 4A			
Total impaired size by water type:			6.27

Sources:

- Livestock (Grazing or Feeding Operations)
- Municipal (Urbanized High Density Area)
- On-site Treatment Systems (Septic Systems and Similar Decentralized Systems)
- Unspecified Domestic Waste
- Wastes from Pets
- Wet Weather Discharges (Non-Point Source)
- Wildlife Other than Waterfowl

* Narrative descriptions, location and city/county describe the entire extent of the impairment. Sizes may not represent the total size of the impairment.

2014 Impaired Waters

Category 4 & 5 by Impaired Area ID*

Roanoke and Yadkin River Basins

Cause Group Code: **L04R-01-BAC** - **Roanoke River and Smith Mountain Lake**

Location:	The upstream limit is at the Roanoke County Spring Hollow Reservoir water intake downstream to 3/4 miles upstream of the Hardy Ford Bridge.
City/County	Bedford Co., Franklin Co., Roanoke City, Roanoke Co., Salem City
Use(s):	Recreation
Cause(s) / VA Category:	Escherichia coli / 4A

The Roanoke River Bacteria Total Maximum Daily Load (TMDL) is U.S. EPA approved on 8/02/2006 [Fed ID 24538] with SWCB approval on 9/07/2006. 1996 & 2002 fecal coliform (FC) observations are the basis for the original bacteria impaired listing. The 2010 total bacteria impaired length is 29.56 miles and 349.99 acres in Smith Mountain Lake. Geometric mean calculations from previous assessments are not valid in 2010 in light of the four samples per month requirement of the new WQS criterion.

Improvement is noted in downstream stations 4AROA202.20, 4AROA199.20, 4AROA196.05 and 4AROA192.94 within the 2014 data window. E.coli maxima are greatly reduced as compared to previous assessments. 2012 Flow Adjusted Trend Analysis reports a declining trend for E.coli at 4AROA202.20.

Stations 4AROA192.94 and 4AROA192.55 each have exceedance rates less than 10.5%. These waters in Smith Mountain Lake from ~ 3/4 miles upstream of the Hardy Road Bridge downstream to the confluence of Falling Creek are partially delisted with the 2014 assessment. A total of 184.70 acres. Station 4AROA202.20 also has an exceedance rate less than 10.5% but is not proposed for delisting in 2014 due to stations 4AROA199.20 and 4AROA196.05 continuing to exceed the instantaneous criterion at a rate greater than 10.5 %. Continued reductions/improvement could result in a delisting of this portion of the Roanoke River in future assessments.

Station 4AROA227.42 (Rt. 773 Bridge in Lafayette) is included in the 1999 Federal Consent Decree as an Attachment B station for fecal coliform bacteria. The station was not listed in 2002 as exceedances of the former WQS 1000 cfu/100 ml instantaneous criterion were at 5 percent. The waters were not de-listed in recognition of the forth coming change of the fecal coliform WQS instantaneous criterion from 1000 to 400 cfu/100 ml. The 2004 Integrated Report (IR) records an 11.8 percent exceedance rate and initial 303(d) Listing for fecal coliform bacteria. In 2008 escherichia coli (E.coli) replaces fecal coliform bacteria as the indicator as per Water Quality Standards [9 VAC 25-260-170. Bacteria; other waters]. The 2008 assessment reports one of 21 escherichia coli (E.coli) samples in excess of the 235 cfu/100 ml instantaneous criterion and was partially delisted with the 2008 IR for 2.22 miles. 2010 and 2012 assessments find continued Full Support from 4AROA227.42. The 2014 assessment reports two of 36 E.coli excursions indicating continued full support of the Recreational Use.

4AROA224.54- (Rt. 639 Bridge at Riverside) There are no additional E.coli data beyond the 2008 Integrated Report (IR) where E.coli exceeds the criterion in two of 11 observations. Maximum excursions are 400 cfu/100 ml and 780. The results are the same for both the 2008 and 2010 assessments. The 2006 IR finds E.coli exceeds the instantaneous criterion in two of eight observations. The maximum exceedance is 780 cfu/100 ml.

4AROA220.94- (Rt. 639 Bridge just south of Wabun) 2012, 2010 and 2008 results are the same with no additional data. E.coli samples exceed the instantaneous criterion in two of 12 observations ranging from 250 to 850 cfu/100 ml. In 2006 E.coli exceeds the criterion in two of eight observations. The maximum exceedance is 780 cfu/100 ml.

4AROA215.13 - No additional E.coli data beyond the 2008 IR. One of 12 Escherichia coli (E.coli) observations exceeds the 235 cfu/100 ml instantaneous criterion at 920 cfu/100 ml.

4AROA212.17- (Rt. 11 Bridge - below Eaton, Inc.) There are no additional E.coli data beyond the 2010 IR where four of 23 E.coli samples exceed the instantaneous criterion in 2010. Exceedances range from 290 cfu/100 ml to 790. Four of 23 E.coli samples also exceed the 235 cfu/100 ml WQS instantaneous criterion within 2008 data window. E.coli excursions are the same as 2010.

4AROA205.73- (Franklin Road Bridge, Roanoke, VA) There are no additional data within the 2010 data window. The 2008 assessment reports eight of 32 E.coli samples exceed the instantaneous criterion and three of five geometric mean calculations exceed the former (two samples/calendar month) WQS 126 cfu/100 ml criterion. The 2008 range of exceedance is from 270 to 570 cfu/100 ml. 2006 results find seven of 20 E.coli samples exceed the instantaneous criterion with the same range of exceedance. E.coli geomeans exceed the former WQS (2 samples/month) 126 cfu/100 ml criterion in three of six calculations.

4AROA202.20- (13th Street Bridge - above STP) Three of 34 escherichia coli (E.coli) observations exceed the 235 cfu/100 ml instantaneous criterion ranging from 300 to 1,400 cfu/10 ml within the 2014 data window. These waters continue to be Listed as downstream stations 4AROA199.20 and 4AROA196.05 continue to exceed the instantaneous criterion at greater than 10.5%. The 2012 assessment finds E.coli exceeds the instantaneous criterion in 4 of 36 observations. Exceedance range: 280 to 1400 cfu/100 ml. The 2012 flow adjusted Trend analysis reports a declining trend for E.coli. 2010 data reveal nine of 45 E.coli samples in excess of the instantaneous criterion. Values in excess range from 280 to greater than 2000 cfu/100 ml. No geometric means are calculated due to insufficient data. Eight of 33 E.coli samples exceed the instantaneous criterion in 2008 and two of six geometric mean calculations exceed the former WQS (2 samples/month) 126 cfu/100 ml criterion. The 2008 range of exceedance is the same as 2010. 2006 E.coli exceeds the instantaneous criterion of in six of 21 observations.

Exceedance range: 330 to greater than 2000 cfu/100 ml. Two of six geometric mean calculations exceed the former WQS criterion as in 2008.

4AROA199.20- (Blue Ridge Parkway Bridge - Niagara) Five of 23 escherichia coli (E.coli) exceedances occur within the 2014 data window ranging from 250 to 775 cfu/100 ml. The 2012 assessment finds escherichia coli (E.coli) exceed in 5 of 20 obs. Exceedance range is 250 to greater than 2000 cfu/100 ml. Both the 2010 and 2008 assessments find nine of 21 E.coli samples exceed the instantaneous criterion of 235 cfu/100 ml. Exceedances range from 280 cfu/100 ml to greater than 2000. 2006 results found six of 12 samples exceeding while the range is from 280 to 610 cfu/100 ml.

4AROA196.05- (McVeigh Ford) The 2014 IR reports escherichia coli (E.coli) exceed the 235 cfu/100 ml instantaneous criterion in 5 of 40 observations. Exceedances range from 250 to 750 cfu/100 ml. E.coli bacteria exceeds the instantaneous criterion in 9 of 41 observations within the 2012 data window. 2012 exceedances range from 250 to 1000 cfu/100 ml. E.coli data within the 2010 data window find 10 of 38 samples exceeding the instantaneous criterion. Values in excess of the criterion range from 250 to greater than 2000 cfu/100 ml. E.coli samples for 2008 find 10 of 32 in excess of the instantaneous criterion ranging from 250 to greater than 2000 cfu/100 ml. 2006 samples find five of 18 E.coli samples exceed the instantaneous criterion ranging from 400 to greater than 2000 cfu/100 ml.

4AROA192.94- (Upstream of Hardy Ford) Only one escherichia coli (E.coli) exceedance of the 235 cfu/100 ml instantaneous criterion is found from 42 samples within the 2014 data window at 1,600 cfu/100 ml. E.coli samples exceed the instantaneous criterion in two of 42 samples within the 2012 data window. Exceedances are 350 and 1,600 cfu/100 ml. 2010 data reveal a range of E.coli samples in excess of the instantaneous criterion from 280 to greater than 2000 cfu/10 ml in eight of 51 observations. 2008 E.coli samples exceed the 235 cfu/100 ml instantaneous criterion in eight of 44 observations with the excursion range the same as 2010. The 2006 IR finds seven of 30 samples in excess of the instantaneous criterion and the same range of exceedance also.

4AROA192.55 (Hardy Bridge) One of 36 E.coli samples exceed the 235 cfu/100 ml instantaneous criterion at 325 cfu/100 ml in 2014. 2012 results are zero of 36 samples in excess of the criterion. E.coli exceeds in two of 32 samples in 2010. Excessive values are 620 and greater than 2000 cfu/100 ml. The 2008 assessment reports two of 20 E.coli samples in excess of the instantaneous criterion and 2006 two of eight exceedances. Exceedances for 2008 and 2006 are the same as 2010.

Assessment Unit	Water name	Location Description	Cause Category	Cause Name	Cycle First Listed	TMDL Schedule	Size
VAW-L03R_ROA01A00	Roanoke River	Roanoke River mainstem from the Mason Creek mouth upstream to the Rt. 419 Bridge (RU09).	4A	Escherichia coli	2006	2014	1.20
VAW-L03R_ROA02A00	Roanoke River	Roanoke River mainstem from the Rt. 419 Bridge upstream to the City of Salem downtown intake on the Roanoke River (RU09).	4A	Escherichia coli	2006	2014	2.67
VAW-L03R_ROA03A00	Roanoke River	Roanoke River mainstem from the Salem City WTP downtown intake upstream to the Big Bear Branch mouth on the Roanoke River (RU09).	4A	Escherichia coli	2006	2014	3.42
VAW-L03R_ROA04A00	Roanoke River	Roanoke River mainstem from the Big Bear Rock Branch mouth upstream to end of the WQS designated public water supply (PWS) section just downstream of an unnamed tributary at Dixie Caverns (RU09).	4A	Escherichia coli	2006	2014	5.57
VAW-L03R_ROA05A00	Roanoke River	Roanoke River mainstem from the end of the WQS designated public water supply (PWS) section just downstream of an unnamed tributary at Dixie Caverns upstream to the Roanoke County Spring Hollow Reservoir intake (RU09).	4A	Escherichia coli	2006	2014	1.43
VAW-L04R_ROA01A00	Roanoke River	Roanoke River mainstem waters from Niagara Dam downstream to the mouth of Back Creek (PWS section 6i) (RU14).	4A	Escherichia coli	2006	2010	3.16
VAW-L04R_ROA02A00	Roanoke River Niagara	These are the Roanoke River mainstem impounded waters of the Niagara Dam (PWS section 6i) (RU14).	4A	Escherichia coli	2006	2010	0.76
VAW-L04R_ROA03A00	Roanoke River Niagara	Roanoke River mainstem from near the backwaters of the Niagara Impoundment upstream to the end of the WQS designated public water supply (PWS section 6i) segment. The upstream ending of the PWS segment from SML 795 ft. pool elevation (RU14).	4A	Escherichia coli	2006	2010	0.87
VAW-L04R_ROA04A00	Roanoke River	Roanoke R. mainstem from near the backwaters of Niagara Impoundment upstream to the Tinker Cr. confluence on the Roanoke R. (section 6). The upstream ending of the WQS designated public water supply (PWS) segment from SML 795 ft. pool elevation (RU14).	4A	Escherichia coli	2006	2010	0.20
VAW-L04R_ROA05A00	Roanoke River	Roanoke River mainstem from the Western Virginia Water Authority Roanoke Regional Water Pollution Control Plant downstream to the Tinker Creek confluence (WQS section 6) (RU14).	4A	Escherichia coli	2006	2010	0.40
VAW-L04R_ROA06A00	Roanoke River	Roanoke River mainstem from the Murray Run mouth downstream to the Western Virginia Water Authority Roanoke Regional Water Pollution Control Plant (RU14).	4A	Escherichia coli	2006	2010	4.34
VAW-L04R_ROA07A00	Roanoke River	Roanoke River mainstem from the Peters Creek mouth downstream to the Murray Run confluence on the Roanoke River (RU14).	4A	Escherichia coli	2006	2010	3.32
VAW-L04R_ROA08A02	Roanoke River	Roanoke River mainstem from the Mason Creek mouth downstream to the confluence of Peters Creek on the Roanoke River (RU14).	4A	Escherichia coli	2006	2010	2.22

Roanoke River and Smith Mountain Lake

Impaired area ID: VAW-L04R-01

Recreation

	Estuary (sq. miles)	Reservoir (acres)	River (miles)
Escherichia coli / 4A			
Total impaired size by water type:			29.56

Sources:

- Discharges from Municipal Separate Storm Sewer Systems (MS4)
- Livestock (Grazing or Feeding Operations)
- Municipal (Urbanized High Density Area)
- On-site Treatment Systems (Septic Systems and Similar Decentralized Systems)
- Sanitary Sewer Overflows (Collection System Failures)
- Unspecified Domestic Waste
- Wet Weather Discharges (Non-Point Source)
- Wildlife Other than Waterfowl

* Narrative descriptions, location and city/county describe the entire extent of the impairment. Sizes may not represent the total size of the impairment.

2014 Impaired Waters

Category 4 & 5 by Impaired Area ID*

Roanoke and Yadkin River Basins

Cause Group Code: **L12L-01-PCB** - **Roanoke River, Tinker Creek and Peters Creek.**

Location:	Roanoke River from the confluence of the North and South Forks downstream to Niagara Dam. The impairment includes Peters Creek from the Rt. 460 Bridge downstream to its confluence on the Roanoke River; and Tinker Creek from the mouth of Deer Branch downstream to the Tinker Creek confluence on the Roanoke River.
City/County	Montgomery Co., Roanoke City, Roanoke Co., Salem City
Use(s):	Fish Consumption, Public Water Supply, Wildlife
Cause(s) / VA Category:	PCB in Fish Tissue / 4A, PCB in Water Column / 4A, PCB in Water Column / 4A, PCB in Water Column / 4A

The waters of the Roanoke River (28.61 miles), Peters Creek (2.52 miles) and Tinker Creek (5.37 miles) are under a Virginia Department of Health (VDH) Fish Consumption Advisory for Polychlorinated Biphenols (PCB) issued 7/27/05. An additional 3.16 miles on the Roanoke from Niagara Dam to Smith Mtn. Lake are under advisory and described in Fact Sheet L12L-02-PCB. The VDH Advisory is based on fish tissue found to originally contain greater than 50 parts per billion (ppb) of PCBs. The DEQ Water Quality Standard (WQS) based tissue value (TV) criterion is 20 ppb in fish tissue. The previous advisory (issued 10/20/03) recommended that no more than two eight-ounce meals per month of flathead catfish (less than 32 inches in size), striped bass, gizzard shad, redhorse sucker, largemouth bass and carp should be consumed. Per the previous advisory, flathead catfish (greater than 32 inches in size) should not be eaten. The advisory has been updated to also recommend that no more than two eight-ounce meals per month of channel catfish should be consumed.

The Roanoke (Staunton) River PCB TMDL Study is U.S. Environmental Protection Agency (EPA) approved on 4/9/2010 and State Water Control Board (SWCB) approved 12/9/2010. A 3.16 mile portion of the Roanoke River is not included in the PCB TMDL Study. The following Federal Identification Numbers by watershed are approved:

L03R Roanoke River: 38624, 38625, 38627, 38629, 38543, 38630
L04R Roanoke River: 24537, 38552, 38632, 38633, 38634, 38635, 38636
Peters Creek: 38468
L05R Tinker Creek: 38467

Fish tissue collections from locations on the Roanoke mainstem, Blackwater River, Mason Creek, Mudlick Creek, Paint Bank Branch, Peters Creek, Tinker Creek and the North and South Forks of the Roanoke River are reviewed by the VDH in making an advisory determination. A complete listing of collection sites and associated fish tissue data are available at http://www.deq.virginia.gov/fishtissue/fishtissue.html. A more detailed presentation of the data can also be found using an interactive mapping application at http://www.deq.virginia.gov/wqa/. The VDH Advisory information is also available via the web at http://www.vdh.virginia.gov/epidemiology/DEE/PublicHealthToxicology/Advisories/index.htm.

Thirty day deployment of Semi-Permeable Membrane Devices (SPMD) or virtual fish in 2008 find exceedances of the WQS PCB water column criterion of 0.00064 micrograms per liter (µg/L) or 640 picograms per liter (pg/L). Exceedances are recorded for the Fish Consumption Use via WQS 'Other Waters' (12.09 miles) as well as the Wildlife Use (12.09 miles) and the 'Public Water Supply Use' (PWS 1.64 miles) for the human health criterion at the stations listed below. The 640 pg/L criterion applies to these Uses. The 'PCB in Water Column' impairment on the mainstem of the Roanoke River extends from the confluence of Mason Creek downstream to the mouth of Back Creek (15.23 miles). Fact Sheet L12L-02-PCB describes and the additional 3.14 miles for each of these uses. The 'PCB in Water Column' impairment overlays a total 15.23 mile portion of the overall VDH Fish Consumption Advisory area above Smith Mountain Lake.

4AROA207.08- (Near Memorial Bridge downstream of Peters Creek)- 2008 SPMD 'OE'. Exceeds PCB WQS 'Other Waters' 640 pg/L criterion from one of two deployments at 642.

4AROA204.76 (Downstream of Ore Br., near VA Scrap Iron Co. above American Visco)- Two 2008 SPMD deployments find exceedance of the WQS 'Other Waters' 640 pg/L criterion at 987 and 3,014 pg/L.

4AROA202.20 (13th Street Bridge - above STP)- Two 2008 SPMD deployments find exceedance of the WQS 'Other Waters' 640 pg/L criterion at 1,376 and 3,044 pg/L.

4AROA199.20 (Blue Ridge Parkway Bridge - Niagara)- Two 2008 SPMD deployments find exceedance of the WQS 'Other Waters' and 'PWS' 640 pg/L criterion at 1,213 and 1,588 pg/L.

Assessment Unit	Water name	Location Description	Cause Category	Cause Name	Cycle First Listed	TMDL Schedule	Size
VAW-L03R_ROA01A00	Roanoke River	Roanoke River mainstem from the Mason Creek mouth upstream to the Rt. 419 Bridge (RU09).	4A	PCB in Fish Tissue	2002	2014	1.20
VAW-L03R_ROA02A00	Roanoke River	Roanoke River mainstem from the Rt. 419 Bridge upstream to the City of Salem downtown intake on the Roanoke River (RU09).	4A	PCB in Fish Tissue	2002	2014	2.67
VAW-L03R_ROA03A00	Roanoke River	Roanoke River mainstem from the Salem City WTP downtown intake upstream to the Big Bear Branch mouth on the Roanoke River (RU09).	4A	PCB in Fish Tissue	2002	2014	3.42
VAW-L03R_ROA04A00	Roanoke River	Roanoke River mainstem from the Big Bear Rock Branch mouth upstream to end of the WQS designated public water supply (PWS) section just downstream of an unnamed tributary at Dixie Caverns (RU09).	4A	PCB in Fish Tissue	2002	2014	5.57
VAW-L03R_ROA05A00	Roanoke River	Roanoke River mainstem from the end of the WQS designated public water supply (PWS) section just downstream of an unnamed tributary at Dixie Caverns upstream to the Roanoke County Spring Hollow Reservoir intake (RU09).	4A	PCB in Fish Tissue	2002	2014	1.43
VAW-L03R_ROA06A00	Roanoke River	Roanoke River mainstem from the Roanoke County Spring Hollow Reservoir intake upstream to the confluence of the North & South Forks of the Roanoke River (RU09).	4A	PCB in Fish Tissue	2002	2014	0.95
VAW-L03R_ROA07A12	Roanoke River	Roanoke River mainstem from the Montgomery/Roanoke County Line upstream to the confluence of the North & South Forks of the Roanoke River (RU09).	4A	PCB in Fish Tissue	2002	2014	1.26
VAW-L04R_PEE01A02	Peters Creek	Peters Creek mainstem from its confluence with the Roanoke River upstream to the Melrose Avenue Bridge (Rt. 11/460) (RU14).	4A	PCB in Fish Tissue	2004	2016	2.58
VAW-L04R_ROA02A00	Roanoke River Niagara	These are the Roanoke River mainstem impounded waters of the Niagara Dam (PWS section 6i) (RU14).	4A	PCB in Fish Tissue	2002	2014	0.76
VAW-L04R_ROA03A00	Roanoke River Niagara	Roanoke River mainstem from near the backwaters of the Niagara Impoundment upstream to the end of the WQS designated public water supply (PWS section 6i) segment. The upstream ending of the PWS segment from SML 795 ft. pool elevation (RU14).	4A	PCB in Fish Tissue	2002	2014	0.87
VAW-L04R_ROA04A00	Roanoke River	Roanoke R. mainstem from near the backwaters of Niagara Impoundment upstream to the Tinker Cr. confluence on the Roanoke R. (section 6). The upstream ending of the WQS designated public water supply (PWS) segment from SML 795 ft. pool elevation (RU14).	4A	PCB in Fish Tissue	2002	2014	0.20
VAW-L04R_ROA05A00	Roanoke River	Roanoke River mainstem from the Western Virginia Water Authority Roanoke Regional Water Pollution Control Plant downstream to the Tinker Creek confluence (WQS section 6) (RU14).	4A	PCB in Fish Tissue	2002	2014	0.40
VAW-L04R_ROA06A00	Roanoke River	Roanoke River mainstem from the Murray Run mouth downstream to the Western Virginia Water Authority Roanoke Regional Water Pollution Control Plant (RU14).	4A	PCB in Fish Tissue	2002	2014	4.34
VAW-L04R_ROA07A00	Roanoke River	Roanoke River mainstem from the Peters Creek mouth downstream to the Murray Run confluence on the Roanoke River (RU14).	4A	PCB in Fish Tissue	2002	2014	3.32
VAW-L04R_ROA08A02	Roanoke River	Roanoke River mainstem from the Mason Creek mouth downstream to the confluence of Peters Creek on the Roanoke River (RU14).	4A	PCB in Fish Tissue	2002	2014	2.22

Roanoke River, Tinker Creek and Peters Creek.

Impaired area ID: VAW-L04R-01

Fish Consumption

	Estuary (sq. miles)	Reservoir (acres)	River (miles)
PCB in Fish Tissue / 4A			
Total impaired size by water type:			31.19

Assessment Unit	Water name	Location Description	Cause Category	Cause Name	Cycle First Listed	TMDL Schedule	Size
VAW-L04R_ROA02A00	Roanoke River Niagara	These are the Roanoke River mainstem impounded waters of the Niagara Dam (PWS section 6i) (RU14).	4A	PCB in Water Column	2010	2014	2.28
VAW-L04R_ROA03A00	Roanoke River Niagara	Roanoke River mainstem from near the backwaters of the Niagara Impoundment upstream to the end of the WQS designated public water supply (PWS section 6i) segment. The upstream ending of the PWS segment from SML 795 ft. pool elevation (RU14).	4A	PCB in Water Column	2010	2014	2.61
VAW-L04R_ROA04A00	Roanoke River	Roanoke R. mainstem from near the backwaters of Niagara Impoundment upstream to the Tinker Cr. confluence on the Roanoke R. (section 6). The upstream ending of the WQS designated public water supply (PWS) segment from SML 795 ft. pool elevation (RU14).	4A	PCB in Water Column	2010	2014	0.40
VAW-L04R_ROA05A00	Roanoke River	Roanoke River mainstem from the Western Virginia Water Authority Roanoke Regional Water Pollution Control Plant downstream to the Tinker Creek confluence (WQS section 6) (RU14).	4A	PCB in Water Column	2010	2014	0.80
VAW-L04R_ROA06A00	Roanoke River	Roanoke River mainstem from the Murray Run mouth downstream to the Western Virginia Water Authority Roanoke Regional Water Pollution Control Plant (RU14).	4A	PCB in Water Column	2010	2014	8.68
VAW-L04R_ROA07A00	Roanoke River	Roanoke River mainstem from the Peters Creek mouth downstream to the Murray Run confluence on the Roanoke River (RU14).	4A	PCB in Water Column	2010	2014	6.64
VAW-L04R_ROA08A02	Roanoke River	Roanoke River mainstem from the Mason Creek mouth downstream to the confluence of Peters Creek on the Roanoke River (RU14).	4A	PCB in Water Column	2010	2014	4.44

Impaired area ID: VAW-L04R-01

Fish Consumption

	Estuary (sq. miles)	Reservoir (acres)	River (miles)
PCB in Water Column / 4A Total impaired size by water type:			12.11

Assessment Unit	Water name	Location Description	Cause Category	Cause Name	Cycle First Listed	TMDL Schedule	Size
VAW-L04R_ROA02A00	Roanoke River Niagara	These are the Roanoke River mainstem impounded waters of the Niagara Dam (PWS section 6i) (RU14).	4A	PCB in Water Column	2010	2014	2.28
VAW-L04R_ROA03A00	Roanoke River Niagara	Roanoke River mainstem from near the backwaters of the Niagara Impoundment upstream to the end of the WQS designated public water supply (PWS section 6i) segment. The upstream ending of the PWS segment from SML 795 ft. pool elevation (RU14).	4A	PCB in Water Column	2010	2014	2.61
VAW-L04R_ROA04A00	Roanoke River	Roanoke R. mainstem from near the backwaters of Niagara Impoundment upstream to the Tinker Cr. confluence on the Roanoke R. (section 6). The upstream ending of the WQS designated public water supply (PWS) segment from SML 795 ft. pool elevation (RU14).	4A	PCB in Water Column	2010	2014	0.40
VAW-L04R_ROA05A00	Roanoke River	Roanoke River mainstem from the Western Virginia Water Authority Roanoke Regional Water Pollution Control Plant downstream to the Tinker Creek confluence (WQS section 6) (RU14).	4A	PCB in Water Column	2010	2014	0.80
VAW-L04R_ROA06A00	Roanoke River	Roanoke River mainstem from the Murray Run mouth downstream to the Western Virginia Water Authority Roanoke Regional Water Pollution Control Plant (RU14).	4A	PCB in Water Column	2010	2014	8.68
VAW-L04R_ROA07A00	Roanoke River	Roanoke River mainstem from the Peters Creek mouth downstream to the Murray Run confluence on the Roanoke River (RU14).	4A	PCB in Water Column	2010	2014	6.64
VAW-L04R_ROA08A02	Roanoke River	Roanoke River mainstem from the Mason Creek mouth downstream to the confluence of Peters Creek on the Roanoke River (RU14).	4A	PCB in Water Column	2010	2014	4.44

Impaired area ID: VAW-L04R-01

Public Water Supply

	Estuary (sq. miles)	Reservoir (acres)	River (miles)
PCB in Water Column / 4A Total impaired size by water type:			1.63

Assessment Unit	Water name	Location Description	Cause Category	Cause Name	Cycle First Listed	TMDL Schedule	Size
VAW-L04R_ROA02A00	Roanoke River Niagara	These are the Roanoke River mainstem impounded waters of the Niagara Dam (PWS section 6i) (RU14).	4A	PCB in Water Column	2010	2014	2.28
VAW-L04R_ROA03A00	Roanoke River Niagara	Roanoke River mainstem from near the backwaters of the Niagara Impoundment upstream to the end of the WQS designated public water supply (PWS section 6i) segment. The upstream ending of the PWS segment from SML 795 ft. pool elevation (RU14).	4A	PCB in Water Column	2010	2014	2.61
VAW-L04R_ROA04A00	Roanoke River	Roanoke R. mainstem from near the backwaters of Niagara Impoundment upstream to the Tinker Cr. confluence on the Roanoke R. (section 6). The upstream ending of the WQS designated public water supply (PWS) segment from SML 795 ft. pool elevation (RU14).	4A	PCB in Water Column	2010	2014	0.40
VAW-L04R_ROA05A00	Roanoke River	Roanoke River mainstem from the Western Virginia Water Authority Roanoke Regional Water Pollution Control Plant downstream to the Tinker Creek confluence (WQS section 6) (RU14).	4A	PCB in Water Column	2010	2014	0.80
VAW-L04R_ROA06A00	Roanoke River	Roanoke River mainstem from the Murray Run mouth downstream to the Western Virginia Water Authority Roanoke Regional Water Pollution Control Plant (RU14).	4A	PCB in Water Column	2010	2014	8.68
VAW-L04R_ROA07A00	Roanoke River	Roanoke River mainstem from the Peters Creek mouth downstream to the Murray Run confluence on the Roanoke River (RU14).	4A	PCB in Water Column	2010	2014	6.64
VAW-L04R_ROA08A02	Roanoke River	Roanoke River mainstem from the Mason Creek mouth downstream to the confluence of Peters Creek on the Roanoke River (RU14).	4A	PCB in Water Column	2010	2014	4.44

Impaired area ID: VAW-L04R-01

Wildlife

	Estuary (sq. miles)	Reservoir (acres)	River (miles)
PCB in Water Column / 4A Total impaired size by water type:			12.11

Sources:

- Landfills
- Source Unknown
- Urban Runoff/Storm Sewers
- Wet Weather Discharges (Non-Point Source)

* Narrative descriptions, location and city/county describe the entire extent of the impairment. Sizes may not represent the total size of the impairment.

2014 Impaired Waters

Category 4 & 5 by Impaired Area ID*

Roanoke and Yadkin River Basins

Cause Group Code: **L04R-03-BEN** - **Roanoke River**

Location:	Roanoke River mainstem from Niagara Dam downstream to the mouth of Back Creek.
City/County	Bedford Co., Roanoke Co.
Use(s):	Aquatic Life
Cause(s) / VA Category:	Benthic-Macroinvertebrate Bioassessments / 5A

The benthic impairment is extended downstream with the 2008 Integrated Report (IR) for 3.16 miles from Niagara Dam downstream to the mouth of Back Creek. The 2008 and 2010 Integrated Reports assigned a Cause Group Code of L04R-01-BEN incorporating the entire 14.45 mile benthic impairment. This 3.14 mile portion is Category 5A as the TMDL Study did not address these waters. Thus a new Cause Group Code of L04R-03-BEN is assigned with the 2012 Integrated Report. The impairment does not include the impounded waters of Niagara Dam.

4AROA198.08- (Explore Park near the Shenandoah Pavilion) Bio 'IM' There are no additional data beyond the 2012 assessment that reports four VSCI surveys (fall 2005 & fall 2009 & 2010 spring & fall) with an average score of 51.5. 2010 and 2008 data windows contain two VSCI surveys 2005 and 2006 both fall scores are 56.3 and 55.0. Previous surveys had benthic communities dominated by net-spinning caddisfly larvae (Hydropsychidae). These organisms typically dominate streams that have high amounts of organic matter. These surveys find low numbers of pollution sensitive taxa such as mayflies and stoneflies. In stream habitat, riparian zone vegetation, and bank stability are all optimal providing conditions favorable for a healthy benthic community. However, algae (filamentous and periphyton) growth is thick on stream substrates indicating that nutrients may be excessive.

Assessment Unit	Water name	Location Description	Cause Category	Cause Name	Cycle First Listed	TMDL Schedule	Size
VAW-L04R_ROA01A00	Roanoke River	Roanoke River mainstem waters from Niagara Dam downstream to the mouth of Back Creek (PWS section 6i) (RU14).	5A	Benthic-Macroinvertebrate Bioassessments	2008	2020	3.16

Roanoke River

		Estuary (sq. miles)	Reservoir (acres)	River (miles)
Impaired area ID: VAW-L04R-01				
Aquatic Life	Benthic-Macroinvertebrate Bioassessments / 5A			3.16
	Total impaired size by water type:			

Sources:

- Discharges from Municipal Separate Storm Sewer Systems (MS4)
- Industrial Point Source Discharge
- Industrial/Commercial Site Stormwater Discharge (Permitted)
- Municipal (Urbanized High Density Area)
- Municipal Point Source Discharges
- Post-development Erosion and Sedimentation
- Residential Districts
- Sediment Resuspension (Clean Sediment)
- Wet Weather Discharges (Point Source and Combination of Stormwater, SSO or CSO)

* Narrative descriptions, location and city/county describe the entire extent of the impairment. Sizes may not represent the total size of the impairment.

2014 Impaired Waters

Category 4 & 5 by Impaired Area ID*

Roanoke and Yadkin River Basins

Cause Group Code: **L12L-02-PCB - Roanoke River, Blackwater River and Smith Mountain Lake.**

Location:	Roanoke River from Niagara Dam downstream to Smith Mtn. Dam and the Blackwater River from the Rt. 122 crossing downstream to its confluence with the Roanoke River in Smith Mtn. Lake.
City/County	Bedford Co., Franklin Co., Pittsylvania Co., Roanoke Co.
Use(s):	Fish Consumption, Public Water Supply, Wildlife
Cause(s) / VA Category:	PCB in Fish Tissue / 4A, PCB in Water Column / 4A, PCB in Water Column / 4A, PCB in Water Column / 4A

The waters of the Roanoke River (3.14 miles), Blackwater River (11.29 miles) and Smith Mountain Lake (19,820.09 acres) are under a Virginia Department of Health (VDH) Fish Consumption Advisory for Polychlorinated Biphenols (PCB) issued 7/27/05. The VDH Advisory is based on fish tissue found to originally contain greater than 50 parts per billion (ppb) of PCBs. The DEQ Water Quality Standard (WQS) based tissue value (TV) criterion is 20 ppb in fish tissue. The previous advisory (issued 10/20/03) recommended that no more than two eight-ounce meals per month of flathead catfish (less than 32 inches in size), striped bass, gizzard shad, redhorse sucker, largemouth bass and carp should be consumed. Per the previous advisory, flathead catfish (greater than 32 inches in size) should not be eaten. The advisory has been updated to also recommend that no more than two eight-ounce meals per month of channel catfish should be consumed.

The Roanoke (Staunton) River PCB TMDL Study is U.S. Environmental Protection Agency (EPA) approved on 4/9/2010 and State Water Control Board (SWCB) approved 12/9/2010. The Roanoke River (3.14 miles), Blackwater River (11.29 miles) and the waters of Smith Mountain Lake (19,820.09 acres) are nested within the Roanoke (Staunton) River TMDL. EPA approved the nesting on 7/9/2012 for PCB in Fish Tissue and PCB in Water Column. The Roanoke River portion (VAW-L04R_ROA01A00) is assigned Federal ID 24537 and the remaining waters are assigned Federal ID 38618.

Fish tissue collections from locations on the Roanoke mainstem, Blackwater River are reviewed by the VDH in making an advisory determination. A complete listing of collection sites and associated fish tissue data are available at http://www.deq.virginia.gov/fishtissue/fishtissue.html. A more detailed presentation of the data can also be found using an interactive mapping application at http://www.deq.virginia.gov/wqa/. The VDH Advisory information is also available via the web at http://www.vdh.virginia.gov/epidemiology/DEE/PublicHealthToxicology/Advisories/index.htm.

Thirty day deployment of Semi-Permeable Membrane Devices (SPMD) or virtual fish in 2008 find exceedances of the WQS PCB water column criterion of 0.00064 micrograms per liter (µg/L) or 640 picograms per liter (pg/L). Exceedances are recorded for both the Fish Consumption Use via WQS 'Other Waters' (3.14 miles in the Roanoke) as well as the Wildlife Use (3.14 miles) and for the 'Public Water Supply Use' (PWS 3.14 miles) human health criterion at the station listed below. The 640 pg/L criterion applies to both Uses. The 'PCB in Water Column' impairment on the mainstem of the Roanoke River extends from the confluence of Mason Creek downstream to the mouth of Back Creek (15.23 miles). The 'PCB in Water Column' impairment overlays a total of 15.23 miles of the overall VDH Fish Consumption Advisory area above Smith Mountain Lake on the Roanoke River.

4AROA199.20 (Blue Ridge Parkway Bridge - Niagara)- There are no additional data. Two 2008 SPMD deployments find exceedance of the WQS 'Other Waters' and 'PWS' 640 pg/L criterion at 1,213 and 1,588 pg/L.

Assessment Unit	Water name	Location Description	Cause Category	Cause Name	Cycle First Listed	TMDL Schedule	Size
VAW-L04R_ROA01A00	Roanoke River	Roanoke River mainstem waters from Niagara Dam downstream to the mouth of Back Creek (PWS section 6i) (RU14).	4A	PCB in Fish Tissue	2002	2014	3.16

Roanoke River, Blackwater River and Smith Mountain Lake.

		Estuary (sq. miles)	Reservoir (acres)	River (miles)
Impaired area ID: VAW-L04R-01	PCB in Fish Tissue / 4A			
Fish Consumption	Total impaired size by water type:			3.16

Assessment Unit	Water name	Location Description	Cause Category	Cause Name	Cycle First Listed	TMDL Schedule	Size
VAW-L04R_ROA01A00	Roanoke River	Roanoke River mainstem waters from Niagara Dam downstream to the mouth of Back Creek (PWS section 6i) (RU14).	4A	PCB in Water Column	2010	2014	9.48

Impaired area ID: VAW-L04R-01

Fish Consumption

	Estuary (sq. miles)	Reservoir (acres)	River (miles)
PCB in Water Column / 4A Total impaired size by water type:			3.16

Assessment Unit	Water name	Location Description	Cause Category	Cause Name	Cycle First Listed	TMDL Schedule	Size
VAW-L04R_ROA01A00	Roanoke River	Roanoke River mainstem waters from Niagara Dam downstream to the mouth of Back Creek (PWS section 6i) (RU14).	4A	PCB in Water Column	2010	2014	9.48

Impaired area ID: VAW-L04R-01

Public Water Supply

	Estuary (sq. miles)	Reservoir (acres)	River (miles)
PCB in Water Column / 4A Total impaired size by water type:			3.16

Assessment Unit	Water name	Location Description	Cause Category	Cause Name	Cycle First Listed	TMDL Schedule	Size
VAW-L04R_ROA01A00	Roanoke River	Roanoke River mainstem waters from Niagara Dam downstream to the mouth of Back Creek (PWS section 6i) (RU14).	4A	PCB in Water Column	2010	2014	9.48

Impaired area ID: VAW-L04R-01

Wildlife

	Estuary (sq. miles)	Reservoir (acres)	River (miles)
PCB in Water Column / 4A Total impaired size by water type:			3.16

Sources:

- Source Unknown

* Narrative descriptions, location and city/county describe the entire extent of the impairment. Sizes may not represent the total size of the impairment.

2014 Impaired Waters

Category 4 & 5 by Impaired Area ID*

Roanoke and Yadkin River Basins

Cause Group Code: **L04R-04-BEN - Ore Branch**

Location:	Ore Branch mainstem headwaters near Hunting Hills downstream to its confluence with the Roanoke River (Garden City and Roanoke Quads).
City/County	Roanoke City, Roanoke Co.
Use(s):	Aquatic Life
Cause(s) / VA Category:	Benthic-Macroinvertebrate Bioassessments / 4A

The Roanoke River General Standard - Benthic (Sediment) TMDL Study is US EPA approved 5/10/2006 (FED ID: 33861) and State Water Control Board (SWCB) approved 9/07/2006. Ore Branch is nested within the Roanoke River General Standard-Benthic (Sediment) TMDL watershed.

4AORE000.01 (Mouth of Ore Branch)- A 2011 Probabilistic site. Bio 'IM' Two VSCI surveys scoring spring 22.5 and fall 24.1 with an average score of 23.3. The benthic community is severely impacted. Both samples were dominated by midges (Chironomidae) which can tolerate sediment deposition, nutrient enrichment and/or other impacts. VDEQ uses a target of 200 (minimum) organisms per sample in its benthic lab procedures. The entire sample was processed resulting in only 142 (spring) and 78 (fall) organisms collected. An average benthic sample will contain thousands of organisms.

Assessment Unit	Water name	Location Description	Cause Category	Cause Name	Cycle First Listed	TMDL Schedule	Size
VAW-L04R_ORE01A00	Ore Branch	Ore Branch mainstem headwaters near Hunting Hills downstream to its confluence with the Roanoke River (RU14).	4A	Benthic-Macroinvertebrate Bioassessments	2014	2026	2.55

Ore Branch

Impaired area ID: VAW-L04R-01

Aquatic Life

	Estuary (sq. miles)	Reservoir (acres)	River (miles)
Benthic-Macroinvertebrate Bioassessments / 4A			
Total impaired size by water type:			2.55

Sources:

- Loss of Riparian Habitat
- Municipal (Urbanized High Density Area)
- Streambank Modifications/destabilization
- Urban Runoff/Storm Sewers
- Wet Weather Discharges (Non-Point Source)

* Narrative descriptions, location and city/county describe the entire extent of the impairment. Sizes may not represent the total size of the impairment.

2014 Impaired Waters

Category 4 & 5 by Impaired Area ID*

Roanoke and Yadkin River Basins

Cause Group Code: **L04R-08-BEN - Gish Branch**

Location:	Gish Branch mainstem from its mouth on Mason Creek upstream to its headwaters.
City/County	Roanoke Co.
Use(s):	Aquatic Life
Cause(s) / VA Category:	Benthic-Macroinvertebrate Bioassessments / 4A

The Gish Branch benthic community exhibits impaired conditions for the 2.40 mile 2014 303(d) Listed waters. The Roanoke River General Standard - Benthic (Sediment) TMDL Study is U.S. EPA approval on 5/10/2006 [Fed. ID 33861] and SWCB approved 9/07/2006. Gish Branch is nested within the Roanoke River General Standard - Benthic (Sediment) TMDL watershed.

4AGSH001.28 (Off Rt. 311 downstream of I-81)- Bio 'IM' Two VSCI surveys scoring an average of 47.9. There were more midges (Chironomidae) and stoneflies (Nemouridae) in the spring sample whereas beetles accounted for a high percentage (33.1%) of the fall sample. The instream habitat was affected by sediment deposition. The sediment load results a low embeddedness score meaning that the interstitial spaces between rocks is clogged by fine material thus limiting available habitat for sensitive macroinvertebrates. The banks appeared eroded possibly due to flashy flows from storm water runoff from highways in the upper reaches of the watershed.

Assessment Unit	Water name	Location Description	Cause Category	Cause Name	Cycle First Listed	TMDL Schedule	Size
VAW-L04R_GSH01A14	Gish Branch	Gish Branch mainstem from its mouth on Mason Creek upstream to its headwaters (RU10).	4A	Benthic-Macroinvertebrate Bioassessments	2014	2026	2.40

Gish Branch

Impaired area ID: VAW-L04R-01

Aquatic Life

	Estuary (sq. miles)	Reservoir (acres)	River (miles)
Benthic-Macroinvertebrate Bioassessments / 4A			
Total impaired size by water type:			2.4

Sources:

- Loss of Riparian Habitat
- Municipal (Urbanized High Density Area)
- Residential Districts
- Urban Runoff/Storm Sewers
- Wet Weather Discharges (Non-Point Source)

* Narrative descriptions, location and city/county describe the entire extent of the impairment. Sizes may not represent the total size of the impairment.

2014 Impaired Waters

Category 4 & 5 by Impaired Area ID*

Roanoke and Yadkin River Basins

Cause Group Code: **L06R-01-BEN** - **Back Creek**

Location:	Back Creek mainstem waters from ~0.1 miles downstream of the Mt. Haran Church on downstream of the Blue Ridge Parkway crossing and downstream of the Back Creek Church.
City/County	Roanoke Co.
Use(s):	Aquatic Life
Cause(s) / VA Category:	Benthic-Macroinvertebrate Bioassessments / 5A

4ABAA023.07 (Along Rt. 221 Roanoke County) The 2014 initial 303(d) Listing finds the benthic community impaired from a total of six Virginia Stream Condition Index (VSCI) surveys conducted in 2008, 2009 and 2012. The average score is 57.8 resulting in this Listing.

Initially a fall 2005 sediment discharge from a construction site prompted sampling of this site. The 2005 fall score of 61.3 and 2006 scores spring of 50.9 and fall 60.9 caused assessment decisions to be reserved due to the improvement of scores in fall 2006 and fall 2008 (70.3). Subsequent 2009 fall survey scored 52.8 and 2012 surveys scored spring 52.5 and fall 2012 at 64.9. The abundance of macroinvertebrates that feed by scraping algae and periphyton (%Scrapers) has always been low indicating a lack of clean substrate or often scoured substrates. The 2008, 2009, and 2012 habitat surveys find sand and fine sediment impact the stream substrate. This would indicate continued sources of fines beyond the initial 2005 release.

This station was sampled initially to determine the impact from a discharge of sediment laden water from a holding pond at a construction site in fall 2005. An upstream station (4ABAA023.29) was used as a control site during earlier surveys. Due to the improvement of scores in fall 2006 (60.9) and fall 2008 (70.3), VDEQ reserved judgment for a number of years until more data could be collected to determine if the stream recovered from the sediment release. From 2009 to 2012 the benthic community has more impaired scores than non-impaired. The abundance of macroinvertebrates that feed by scraping algae and periphyton (%Scrapers) has always been low indicating a lack of clean substrate/often scoured substrates. 2008, 2009, and 2012 habitat surveys continue to indicate that sand and fine sediment still impact the stream substrate indicating a continuing problem beyond the initial discharge of sediment.

Assessment Unit	Water name	Location Description	Cause Category	Cause Name	Cycle First Listed	TMDL Schedule	Size
VAW-L06R_BAA04A00	Back Creek	Back Creek mainstem waters from the confluence of an unnamed tributary (XVE) on downstream of the Blue Ridge Parkway crossing and Back Creek Church (RU15).	5A	Benthic-Macroinvertebrate Bioassessments	2014	2026	5.11
VAW-L06R_BAA04B14	Back Creek	Back Creek mainstem waters from the mouth of Little Back Creek on downstream to the confluence of an unnamed tributary to Back Creek (XVE) (RU15).	5A	Benthic-Macroinvertebrate Bioassessments	2014	2026	1.25
VAW-L06R_BAA05A08	Back Creek	Back Creek from ~0.1 miles downstream of the Mt. Haran Church on downstream to the mouth of Little Back Creek (RU15).	5A	Benthic-Macroinvertebrate Bioassessments	2014	2026	0.56

Back Creek

		Estuary (sq. miles)	Reservoir (acres)	River (miles)
Impaired area ID: VAW-L04R-01				
Aquatic Life	Benthic-Macroinvertebrate Bioassessments / 5A			
	Total impaired size by water type:			6.92

Sources:

- Municipal (Urbanized High Density Area)
- Non-Point Source
- Residential Districts
- Site Clearance (Land Development or Redevelopment)
- Wet Weather Discharges (Non-Point Source)

* Narrative descriptions, location and city/county describe the entire extent of the impairment. Sizes may not represent the total size of the impairment.

2014 Impaired Waters

Category 4 & 5 by Impaired Area ID*

Roanoke and Yadkin River Basins

Cause Group Code: **L01R-02-TEMP** - **Bottom Creek**

Location:	Bottom Creek mainstem from its mouth on the South Fork Roanoke River on upstream to the Rt. 669 crossing.
City/County	Montgomery Co.
Use(s):	Aquatic Life
Cause(s) / VA Category:	Temperature, water / 5C

4ABTM000.04 (Rt. 637 Bridge)-Temperature measurements within the 2014 data window result in three exceeding values from 11 observations with no additional data beyond the 2012 IR. Measurements in excess of the Class VI criterion occur on 8/13/2009 at 22.9, 6/10/2010 at 23.0 and 8/31/2010 at 24.0 °C. The 2012 data window reports five of 20 measurements exceeding the 20°C criterion. Exceeding values range from 20.5 to 24°C. Temperature measurements within the 2010 data window find two of nine measurements exceeding the WQS Class VI 20°C criterion. Exceeding values occur on 7/7/2005 at 21 and 7/25/2006 at 20.5 °C. The 2008 IR finds three of 10 temperature measurements exceed the Class VI criterion on 06/04/02 at 24.4 °C; 7/7/2005 at 21 and 7/25/2006 at 20.5 °C.

Assessment Unit	Water name	Location Description	Cause Category	Cause Name	Cycle First Listed	TMDL Schedule	Size
VAW-L01R_BTM01A06	Bottom Creek	Bottom Creek mainstem from its mouth on the South Fork Roanoke River on upstream to the downstream WQS Tier III ending at the southern most Nature Conservancy property boundary (RU02).	5C	Temperature, water	2008	2020	2.32
VAW-L01R_BTM02A06	Bottom Creek	Bottom Creek mainstem from the southern most Nature Conservancy property boundary upstream to the Rt. 669 crossing. WQS designated Tier III waters (RU02).	5C	Temperature, water	2008	2020	2.17

Bottom Creek

Impaired area ID: VAW-L04R-01

Aquatic Life

	Estuary (sq. miles)	Reservoir (acres)	River (miles)
Temperature, water / 5C Total impaired size by water type:			4.49

Sources:

- Natural Conditions - Water Quality Standards Use Attainability Analyses Needed

* Narrative descriptions, location and city/county describe the entire extent of the impairment. Sizes may not represent the total size of the impairment.

2014 Impaired Waters

Category 4 & 5 by Impaired Area ID*

Roanoke and Yadkin River Basins

Cause Group Code: **L04R-02-BEN - Mud Lick Creek**

Location:	Mud Lick Creek mainstem from its confluence on the Roanoke River upstream to its headwaters.
City/County	Roanoke City, Roanoke Co., Salem City
Use(s):	Aquatic Life
Cause(s) / VA Category:	Benthic-Macroinvertebrate Bioassessments / 4A

Virginia Stream Condition Index (VSCI) surveys find the Mud Lick Creek benthic community is impaired for 7.61 miles as a result of the 2008 assessment. The Roanoke River General Standard - Benthic (Sediment) TMDL Study is U.S. EPA approved on 5/10/2006 [Fed. ID 33861] and SWCB approved 9/07/2006. Mudlick Creek is a nested benthic impairment within the Roanoke River Benthic (Sediment) TMDL watershed.

4AMDL003.34- (Downstream of Brambleton Ave. behind Shell) Bio 'IM' Two VSCI surveys spring 2006 scoring 22.2 and fall 2005 scoring 35.1 for an average score of 28.7. There are no additional data beyond the 2008 assessment. Habitat data show stream impacts related to sedimentation, extensive bank erosion, and riparian zone disturbance. Low scores were observed for most of the eight individual metrics in the VSCI indicating a benthic community that is tolerant of pollution. Urban land cover with high levels of impervious surface causes an altered hydrology and resulting bank erosion. Sedimentation impacts may also be increased as land in the watershed is quickly being developed.

4AMDL002.93- (Near Foot Bridge Lower Station) There are no additional data beyond the 2012 IR. Four VSCI surveys with an average score of 20.10 remain within the 2014 data window. The 2012 assessment reports seven VSCI surveys (2005 - 2009) with and average score of 24.3. Five (2005-2007) VSCI surveys score 25.5 within the 2010 data window. 2007 probabilistic sediment sampling finds no PEC Sediment exceedances; metals only. 2008 assessment reports three VSCI surveys (2005 - 2006) with and average score of 29.9. Roanoke County implemented a stream restoration project along the Garst Mill Park Greenway in 2008. Habitat data indicates stream impacts related to sedimentation, extensive bank erosion, and riparian zone disturbance. Most of the individual metrics in the VSCI show a degraded benthic community that is tolerant of pollution. Since the stream bank enhancement project was completed in 2008, scores for bank stability and bank vegetation have improved.

Assessment Unit	Water name	Location Description	Cause Category	Cause Name	Cycle First Listed	TMDL Schedule	Size
VAW-L04R_MDL01A06	Mud Lick Creek	Mud Lick Creek from its confluence on the Roanoke River upstream to its headwaters (RU14).	4A	Benthic-Macroinvertebrate Bioassessments	2008	2020	7.61

Mud Lick Creek

		Estuary (sq. miles)	Reservoir (acres)	River (miles)
Impaired area ID: VAW-L04R-01				
Aquatic Life	Benthic-Macroinvertebrate Bioassessments / 4A			
	Total impaired size by water type:			7.61

Sources:

- Loss of Riparian Habitat
- Municipal (Urbanized High Density Area)
- Sediment Resuspension (Clean Sediment)
- Streambank Modifications/destabilization
- Urban Runoff/Storm Sewers

* Narrative descriptions, location and city/county describe the entire extent of the impairment. Sizes may not represent the total size of the impairment.

2014 Impaired Waters

Category 4 & 5 by Impaired Area ID*

Roanoke and Yadkin River Basins

Cause Group Code: **L04R-05-BEN - Mason Creek**

Location:	Mason Creek mainstem from the Mason Cove Community, river mile 7.61, extending downstream to the mouth of Mason Creek on the Roanoke River (Salem Quad).
City/County	Roanoke Co., Salem City
Use(s):	Aquatic Life
Cause(s) / VA Category:	Benthic-Macroinvertebrate Bioassessments / 4A

The Mason Creek benthic community exhibits impaired conditions for the 7.72 mile 2008 303(d) Listed waters. The Roanoke River General Standard - Benthic (Sediment) TMDL Study is U.S. EPA approval on 5/10/2006 [Fed. ID 33861] and SWCB approved 9/07/2006. Mason Creek is nested within the Roanoke River General Standard - Benthic (Sediment) TMDL watershed.

4AMSN003.05- (Off Kessler Mill Rd.) Bio 'IM' Three Virginia Stream Condition Index (VSCI) surveys (2004 - 2005) assessed with an average score of 55.4. There are no additional data beyond the 2008 IR. The average VSCI score indicates the benthic community is impaired. Most of the habitat scores are in the optimal and sub-optimal range indicating that potential water quality problems are related to water chemistry rather than habitat limitations.

4AMSN000.53- (Arnold Burton Technical School Campus) Bio 'IM' Three VSCI surveys (2004 - 2005) with an average score of 37.6. There are no additional data beyond the 2008 IR. The benthic community is dominated by pollution tolerant organisms. Most of the habitat scores are in the optimal and sub-optimal range indicating that potential water quality problems are related to water chemistry rather than habitat limitations.

Assessment Unit	Water name	Location Description	Cause Category	Cause Name	Cycle First Listed	TMDL Schedule	Size
VAW-L04R_MSN01A00	Mason Creek	Mason Creek mainstem from its confluence with the Roanoke River upstream to near the Mason Cove Community (RU10).	4A	Benthic-Macroinvertebrate Bioassessments	2008	2020	7.72

Mason Creek		**Estuary (sq. miles)**	**Reservoir (acres)**	**River (miles)**
Impaired area ID: VAW-L04R-01				
Aquatic Life	Benthic-Macroinvertebrate Bioassessments / 4A			
	Total impaired size by water type:			7.72

Sources:

- Loss of Riparian Habitat
- Municipal (Urbanized High Density Area)
- Residential Districts
- Urban Runoff/Storm Sewers
- Wet Weather Discharges (Non-Point Source)

* Narrative descriptions, location and city/county describe the entire extent of the impairment. Sizes may not represent the total size of the impairment.

2014 Impaired Waters

Category 4 & 5 by Impaired Area ID*

Roanoke and Yadkin River Basins

Cause Group Code: **L01R-01-BEN - Smith Creek, UT (XMV)**

Location:	Smith Creek, UT (XMV) from its mouth on Smith Creek upstream to its headwaters.
City/County	Montgomery Co.
Use(s):	Aquatic Life
Cause(s) / VA Category:	Benthic-Macroinvertebrate Bioassessments / 4A

The 2010 original assessment finds the WQS General Standard contravened with benthic community impairment continuing through the 2012 and 2014 Cycles.

4AXMV000.63 (Off Rt. 615 along Chaucer Lane)- A 2007 Probabilistic site. Two Virginia Stream Condition Index (VSCI) surveys scoring spring 46.6 and fall 62.5 for an average score of 54.6. Taxa richness scores were higher in the spring sample; however, the abundance of pollution-tolerant organisms was high as well resulting in a lower VSCI score. Stream habitat scores were affected by the lack of instream cover for macroinvertebrates and fish, lack of bank vegetation and lack of riparian vegetative buffer. The station is on a 1st order headwater stream. There are ponds upstream of the station and immediate land use is residences with mowed lawns adjacent to the stream.

Assessment Unit	Water name	Location Description	Cause Category	Cause Name	Cycle First Listed	TMDL Schedule	Size
VAW-L01R_XMV01A10	Smith Creek, UT (XMV)	Smith Creek, UT (XMV) from its mouth on Smith Creek upstream to its headwaters (RU04).	4A	Benthic-Macroinvertebrate Bioassessments	2010	2022	1.61

Smith Creek, UT (XMV)		**Estuary (sq. miles)**	**Reservoir (acres)**	**River (miles)**
Impaired area ID: VAW-L04R-01				
Aquatic Life	Benthic-Macroinvertebrate Bioassessments / 4A			
	Total impaired size by water type:			1.61

Sources:

- Loss of Riparian Habitat

* Narrative descriptions, location and city/county describe the entire extent of the impairment. Sizes may not represent the total size of the impairment.

2014 Impaired Waters

Category 4 & 5 by Impaired Area ID*

Roanoke and Yadkin River Basins

Cause Group Code: **L02R-03-BAC - Bradshaw Creek**

Location:	Bradshaw Creek from its mouth on the N.F. Roanoke River upstream to its headwaters.
City/County	Montgomery Co., Roanoke Co.
Use(s):	Recreation
Cause(s) / VA Category:	Escherichia coli / 4A

The 2010 assessment finds Bradshaw Creek does not support the Recreational Use. Escherichia coli (E.coli) exceed the WQS instantaneous criterion. The Roanoke River Bacteria Total Maximum Daily Load (TMDL) is U.S. EPA approved on 8/02/2006 [Fed ID 24538] with SWCB approval on 9/07/2006. Bradshaw Creek is nested within the Roanoke River Bacteria TMDL Watershed. Allocation scenario development is for the entire drainage to provide pollutant reductions for all watersheds contributing to the bacteria impairment. The entirety of the approved TMDL and allocations can be viewed at http://www.deq.virginia.gov.

4ABDC002.36 (Rt. 629 Bridge)- There are no additional data beyond the 2010 Integrated Report (IR). The 2010 assessment finds E.coli exceeds the 235 cfu/100 ml instantaneous criterion in two of 12 observations. Values in excess of the criterion are 250 and greater than 2000 cfu/100 ml.

Assessment Unit	Water name	Location Description	Cause Category	Cause Name	Cycle First Listed	TMDL Schedule	Size
VAW-L02R_BDC01A04	Bradshaw Creek	Bradshaw Creek from the upstream end of the WQS PWS designation downstream to its mouth on the North Fork Roanoke River (RU08).	4A	Escherichia coli	2010	2022	0.85
VAW-L02R_BDC02A04	Bradshaw Creek	Bradshaw Creek mainstem from near its headwaters downstream to the upstream ending of the WQS PWS designation (RU08).	4A	Escherichia coli	2010	2022	9.51

Bradshaw Creek

Impaired area ID: VAW-L04R-01

Recreation

	Estuary (sq. miles)	Reservoir (acres)	River (miles)
Escherichia coli / 4A			
Total impaired size by water type:			10.36

Sources:

- Livestock (Grazing or Feeding Operations)
- On-site Treatment Systems (Septic Systems and Similar Decentralized Systems)
- Unspecified Domestic Waste
- Wet Weather Discharges (Non-Point Source)
- Wildlife Other than Waterfowl

* Narrative descriptions, location and city/county describe the entire extent of the impairment. Sizes may not represent the total size of the impairment.

2014 Impaired Waters

Category 4 & 5 by Impaired Area ID*

Roanoke and Yadkin River Basins

Cause Group Code: **L02R-01-PH** - **Bradshaw Creek**

Location:	Bradshaw Creek from its mouth on the N.F. Roanoke River upstream to its headwaters.
City/County	Montgomery Co., Roanoke Co.
Use(s):	Aquatic Life
Cause(s) / VA Category:	pH / 5C

4ABDC002.36 (Rt. 629 Bridge)- The aquatic life use is impaired based on 2010 pH data. Four of 16 pH observations exceed the pH criterion of 6.5. The range of exceeding values are 6.1 to 6.3 SU. There are no additional data beyond the 2010 Integrated Report (IR).

Assessment Unit	Water name	Location Description	Cause Category	Cause Name	Cycle First Listed	TMDL Schedule	Size
VAW-L02R_BDC01A04	Bradshaw Creek	Bradshaw Creek from the upstream end of the WQS PWS designation downstream to its mouth on the North Fork Roanoke River (RU08).	5C	pH	2010	2022	0.85
VAW-L02R_BDC02A04	Bradshaw Creek	Bradshaw Creek mainstem from near its headwaters downstream to the upstream ending of the WQS PWS designation (RU08).	5C	pH	2010	2022	9.51

Bradshaw Creek

		Estuary (sq. miles)	Reservoir (acres)	River (miles)
Impaired area ID: VAW-L04R-01				
Aquatic Life	pH / 5C			
	Total impaired size by water type:			10.36

Sources:

- Natural Conditions - Water Quality Standards Use Attainability Analyses Needed

* Narrative descriptions, location and city/county describe the entire extent of the impairment. Sizes may not represent the total size of the impairment.

2014 Impaired Waters

Category 4 & 5 by Impaired Area ID*

Roanoke and Yadkin River Basins

Cause Group Code: **L04R-01-HG - Roanoke River**

Location:	Roanoke River from the confluence of Mason Creek downstream to the confluence of Tinker Creek.
City/County	Roanoke City, Roanoke Co., Salem City
Use(s):	Fish Consumption
Cause(s) / VA Category:	Mercury in Fish Tissue / 5A

This initial 2010 303(d) Listing is based on 2006 fish tissue collections and new Water Quality Standards effective 2/01/2010. Mercury (Hg) exceedances of the DEQ 0.3 parts per million (ppm) and Virginia Department of Health (VDH) level of concern of 0.5 ppm are found in fish tissue causing impairment of the Fish Consumption Use. No VDH Fish Consumption or Drinking Water Advisories are issued for mercury for these waters. Please visit http://www.deq.virginia.gov for more information about mercury contamination and http://www.vdh.virginia.gov/Epidemiology/dee/PublicHealthToxicology/Advisories/ for VDH Advisories or Bans.

4AROA206.80 (Roanoke R. @Wasena Park near Rt. 11 Bridge)- Exceedance of the Mercury (Hg) WQS based tissue value (TV) of 0.3 ppm is found in two species from 2006 collections; smallmouth bass (1 fish 37.0 cm) at 0.37 and (4 fish composite 21.8-27.5 cm) at 0.537 ppm and rock bass (6 fish composite 17.4-19.4 cm) at 0.446 ppm. There are no additional data.

Assessment Unit	Water name	Location Description	Cause Category	Cause Name	Cycle First Listed	TMDL Schedule	Size
VAW-L04R_ROA05A00	Roanoke River	Roanoke River mainstem from the Western Virginia Water Authority Roanoke Regional Water Pollution Control Plant downstream to the Tinker Creek confluence (WQS section 6) (RU14).	5A	Mercury in Fish Tissue	2010	2022	0.40
VAW-L04R_ROA06A00	Roanoke River	Roanoke River mainstem from the Murray Run mouth downstream to the Western Virginia Water Authority Roanoke Regional Water Pollution Control Plant (RU14).	5A	Mercury in Fish Tissue	2010	2022	4.34
VAW-L04R_ROA07A00	Roanoke River	Roanoke River mainstem from the Peters Creek mouth downstream to the Murray Run confluence on the Roanoke River (RU14).	5A	Mercury in Fish Tissue	2010	2022	3.32
VAW-L04R_ROA08A02	Roanoke River	Roanoke River mainstem from the Mason Creek mouth downstream to the confluence of Peters Creek on the Roanoke River (RU14).	5A	Mercury in Fish Tissue	2010	2022	2.22

Roanoke River

Impaired area ID: VAW-L04R-01

Fish Consumption

	Estuary (sq. miles)	Reservoir (acres)	River (miles)
Mercury in Fish Tissue / 5A Total impaired size by water type:			10.28

Sources:

- Source Unknown

* Narrative descriptions, location and city/county describe the entire extent of the impairment. Sizes may not represent the total size of the impairment.

2014 Impaired Waters

Category 4 & 5 by Impaired Area ID*

Roanoke and Yadkin River Basins

Cause Group Code: **L04R-07-BAC** - **Murray Run**

Location:	Murray Run mainstem from its headwaters to its mouth on the Roanoke River.
City/County	Roanoke City, Roanoke Co.
Use(s):	Recreation
Cause(s) / VA Category:	Fecal Coliform / 4A

The Murray Run 3.57 mile 2004 303(d) Listed Recreational impairment remains.

The Roanoke River Bacteria Total Maximum Daily Load (TMDL) is U.S. EPA approved on 8/02/2006 [Fed ID 24538] with SWCB approval on 6/27/2007. 1996 & 2002 fecal coliform (FC) observations are the basis for the original Roanoke River bacteria impaired listing. The 2014 total bacteria impaired length is 29.56 miles and 165.29 acres in Smith Mountain Lake. The approved TMDL did not specifically address the Murray Run bacteria impairment but is nested within the Roanoke Bacteria TMDL Watershed. Allocation scenario development is for the entire drainage to provide pollutant reductions for all watersheds contributing to the bacteria impairment. The entirety of the approved TMDL and allocations can be viewed at http://www.deq.virginia.gov.

4AMUR001.63- There are no escherichia coli (E.coli) data to assess. The 2004 Integrated Report (IR) reports FC exceeds the 400 cfu/100 ml instantaneous criterion in two of six observations. Exceeding values are 600 and 8000+ cfu/100 ml. Observations within the 2008 data window find one of three FC samples in excess of the instantaneous criterion. There are no additional data within the 2014, 2012 or 2010 data windows.

Assessment Unit	Water name	Location Description	Cause Category	Cause Name	Cycle First Listed	TMDL Schedule	Size
VAW-L04R_MUR01A00	Murray Run	Murray Run mainstem from its headwaters to its mouth on the Roanoke River (RU14).	4A	Fecal Coliform	2004	2016	3.57

Murray Run

Impaired area ID: VAW-L04R-01

Recreation

	Estuary (sq. miles)	Reservoir (acres)	River (miles)
Fecal Coliform / 4A			
Total impaired size by water type:			3.57

Sources:

- Discharges from Municipal Separate Storm Sewer Systems (MS4)
- Municipal (Urbanized High Density Area)
- Sanitary Sewer Overflows (Collection System Failures)
- Wet Weather Discharges (Non-Point Source)
- Wildlife Other than Waterfowl

* Narrative descriptions, location and city/county describe the entire extent of the impairment. Sizes may not represent the total size of the impairment.

2014 Impaired Waters

Category 4 & 5 by Impaired Area ID*

Roanoke and Yadkin River Basins

Cause Group Code: **L04R-06-BAC** - **Peters Creek**

Location:	Peters Creek mainstem from its headwaters (Salem Quad) extending downstream to the Peters Creek confluence on the Roanoke River (Roanoke Quad).
City/County	Roanoke City, Roanoke Co.
Use(s):	Recreation
Cause(s) / VA Category:	Escherichia coli / 4A

The 2002 303(d) Listed 7.20 mile Peters Creek Recreational impairment remains.

The Roanoke River Bacteria Total Maximum Daily Load (TMDL) is U.S. EPA approved on 8/02/2006 [Fed ID 24538] with SWCB approval on 6/27/2007. 1996 & 2002 fecal coliform (FC) observations are the basis for the original Roanoke River bacteria impaired listing. The 2014 total bacteria impaired length is 29.56 miles on the Roanoke and 165.29 acres in Smith Mountain Lake. The approved TMDL did not specifically address the Peters Creek bacteria impairment but is nested within the Roanoke Bacteria TMDL Watershed. Allocation scenario development is for the entire drainage to provide pollutant reductions for all watersheds contributing to the bacteria impairment. The entirety of the approved TMDL and allocations can be viewed at http://www.deq.virginia.gov.

4APEE001.04- (Shenandoah Avenue Bridge) The 2012 assessment reports escherichia coli (E.coli) exceeds the 235 cfu/100 ml instantaneous criterion in two of 14 samples at 280 and 420 cfu/10 ml. There are no additional data within the 2014 data window. Data within both the 2010 and 2008 data windows find E.coli exceeds the instantaneous criterion in 11 of 32 observations ranging from 250 cfu/100 ml to >2000. The 2006 Integrated Report (IR) finds the same range of exceedance from 10 of 20 samples. The original 2002 bacteria 303(d) Listing is based on a Special Study (SS 975101) conducted in 1997 where fecal coliform data resulted in geometric mean exceedances of the former WQS criterion and frequency of samples derived from the special study data.

Assessment Unit	Water name	Location Description	Cause Category	Cause Name	Cycle First Listed	TMDL Schedule	Size
VAW-L04R_PEE01A02	Peters Creek	Peters Creek mainstem from its confluence with the Roanoke River upstream to the Melrose Avenue Bridge (Rt. 11/460) (RU14).	4A	Escherichia coli	2006	2016	2.58
VAW-L04R_PEE02A02	Peters Creek	Peters Creek mainstem from the Melrose Avenue Bridge (Rt. 11/460) upstream to its headwaters (RU14).	4A	Escherichia coli	2006	2016	4.62

Peters Creek

Impaired area ID: VAW-L04R-01

Recreation

	Estuary (sq. miles)	Reservoir (acres)	River (miles)
Escherichia coli / 4A			
Total impaired size by water type:			7.2

Sources:

- Discharges from Municipal Separate Storm Sewer Systems (MS4)
- Municipal (Urbanized High Density Area)
- Unspecified Domestic Waste
- Wet Weather Discharges (Non-Point Source)
- Wildlife Other than Waterfowl

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2014 Impaired Waters

Category 4 & 5 by Impaired Area ID*

Roanoke and Yadkin River Basins

Cause Group Code: **L06R-01-BAC - Back Creek**

Location:	Back Creek mainstem waters from just downstream of Rt. 220 near Red Hill on downstream to the mouth of Back Creek on the Roanoke River.
City/County	Roanoke Co.
Use(s):	Recreation
Cause(s) / VA Category:	Escherichia coli / 4A

The Back Creek 2004 9.87 mile bacteria impairment remains. The Roanoke River Bacteria Total Maximum Daily Load (TMDL) is U.S. EPA approved on 8/02/2006 [Fed ID 24538] with SWCB approval on 9/07/2006. 1996 & 2002 fecal coliform (FC) observations are the basis for the original Roanoke bacteria impaired listing. The 2010 Roanoke total bacteria impaired length is 29.51 miles and 350.06 acres in Smith Mountain Lake. The approved TMDL did not specifically address the Back Creek bacteria impairment. However Back Creek is nested within the Roanoke River Bacteria TMDL Watershed. Allocation scenario development is for the entire drainage to provide pollutant reductions for all watersheds contributing to the bacteria impairment. The entirety of the approved TMDL and allocations can be viewed at http://www.deq.virginia.gov.

4ABAA000.03- (Off Rt. 618- Rutrough Road) There are no additional data beyond the 2008 assessment where two of 12 Escherichia coli (E.coli) samples exceed the 235 cfu/100 ml instantaneous criterion exceeding values are 420 and 480 cfu/100 ml.

4ABAA002.61- (Rt. 660 Bridge - at USGS Gaging Station) The original Listing station has no additional data beyond the 2004 Integrated Report (IR). 2004 FC excursions were as follows: FC exceeds the 400 cfu/100 ml instantaneous criterion in three of 19 samples. Exceeding observations are 500, 2400 and 3700 cfu/100 ml.

Assessment Unit	Water name	Location Description	Cause Category	Cause Name	Cycle First Listed	TMDL Schedule	Size
VAW-L06R_BAA01A00	Back Creek	Back Creek mainstem from the WQS section 6i designated end of the public water supply (PWS) section, ~0.83 miles upstream of the Rt. 116 crossing downstream to the Back Creek mouth; as determined from the 795 ft. Smith Mountain Lake pool elevation (RU15).	4A	Escherichia coli	2008	2016	5.68
VAW-L06R_BAA02A00	Back Creek	Back Creek mainstem waters from below the Rt. 220 crossing, Red Hill, at the mouth of an unnamed tributary to Back Cr. on downstream to the WQS designated section 6i end of the PWS section, ~0.83 miles upstream of the Rt. 116 crossing (RU15).	4A	Escherichia coli	2008	2016	4.36

Back Creek

		Estuary (sq. miles)	Reservoir (acres)	River (miles)
Impaired area ID: VAW-L04R-01				
Recreation	Escherichia coli / 4A			
	Total impaired size by water type:			10.04

Sources:

- Livestock (Grazing or Feeding Operations)
- Municipal (Urbanized High Density Area)
- On-site Treatment Systems (Septic Systems and Similar Decentralized Systems)
- Unspecified Domestic Waste
- Wastes from Pets
- Wildlife Other than Waterfowl

* Narrative descriptions, location and city/county describe the entire extent of the impairment. Sizes may not represent the total size of the impairment.

2014 Impaired Waters

Category 4 & 5 by Impaired Area ID*

Roanoke and Yadkin River Basins

Cause Group Code: **L04R-04-BAC** - **Ore Branch**

Location:	Ore Branch mainstem headwaters near Hunting Hills downstream to its confluence with the Roanoke River (Garden City and Roanoke Quads).
City/County	Roanoke City, Roanoke Co.
Use(s):	Recreation
Cause(s) / VA Category:	Escherichia coli / 4A

The Ore Branch Bacteria Total Maximum Daily Load (TMDL) is U.S. EPA approved 8/02/2006 [Fed ID 24539] and SWCB approved 6/27/2007. The impairment was initially Listed in 1996 for fecal coliform bacteria.

4AORE000.19- (Sherwood Avenue - Roanoke City) There are no additional escherichia coli (E.coli) data within the 2014 data window. The 2012 data window finds six of the remaining 12 samples exceed the instantaneous criterion. Both 2010 and 2008 data reveal E.coli bacteria exceed the 235 cfu/100 ml instantaneous criterion in 22 of 33 observations. The range of exceedance is from 320 cfu/100 ml to 7600. The 2006 Integrated Report (IR) finds E.coli exceeds the instantaneous criterion in 16 of 21 samples. Exceedances are the same range as in 2010 and 2008.

Assessment Unit	Water name	Location Description	Cause Category	Cause Name	Cycle First Listed	TMDL Schedule	Size
VAW-L04R_ORE01A00	Ore Branch	Ore Branch mainstem headwaters near Hunting Hills downstream to its confluence with the Roanoke River (RU14).	4A	Escherichia coli	2006	2010	2.55

Ore Branch

	Estuary (sq. miles)	Reservoir (acres)	River (miles)
Impaired area ID: VAW-L04R-01			
Recreation			
Escherichia coli / 4A			
Total impaired size by water type:			2.55

Sources:

- Discharges from Municipal Separate Storm Sewer Systems (MS4)
- Municipal (Urbanized High Density Area)
- Sanitary Sewer Overflows (Collection System Failures)
- Wet Weather Discharges (Non-Point Source)
- Wildlife Other than Waterfowl

* Narrative descriptions, location and city/county describe the entire extent of the impairment. Sizes may not represent the total size of the impairment.

2014 Impaired Waters

Category 4 & 5 by Impaired Area ID*

Roanoke and Yadkin River Basins

Cause Group Code: **L02R-01-BAC** - **Roanoke River, North Fork**

Location:	North Fork Roanoke River from the mouth of Dry Run on the North Fork Roanoke River downstream to an unnamed tributary in the community of Ironto.
City/County	Montgomery Co.
Use(s):	Recreation
Cause(s) / VA Category:	Escherichia coli / 4A

Station 4ARNF013.66 located at Rt. 603 Bridge near Ellett (incorrectly coded 4ARNF015.09 in previous cycles), originally listed for fecal coliform (FC) bacteria in 2002 is now listed for escherichia coli (E.coli). The bacteria impairment is extended upstream with the 2012 assessment by 9.16 miles.

The Roanoke River Bacteria Total Maximum Daily Load (TMDL) is U.S. EPA approved on 8/02/2006 [Fed ID 24538] with SWCB approval on 9/07/2006. The Roanoke Bacteria TMDL watershed encompasses the North Fork Roanoke River. This recreational impairment is nested within the overall Roanoke River Bacteria TMDL Watershed. Allocation scenario development is for the entire drainage to provide pollutant reductions for all watersheds contributing to the bacteria impairment. The entirety of the approved TMDL and allocations can be viewed at http://www.deq.virginia.gov. 1996 & 2002 fecal coliform (FC) observations are the basis for the original Roanoke bacteria impaired listing. The 2014 total bacteria impaired length is 29.56 miles and 165.29 acres in Smith Mountain Lake.

4ARNF016.80 (Rt. 712 Bridge) 2012 assessment finds four of 12 escherichia coli (E.coli) samples exceed the 235 cfu/10 ml instantaneous criterion; exceeding values range from 520 to 1000 cfu/100 ml. There are no additional data within the 2014 data window.

4ARNF013.66 (Rt. 603 Bridge) The 2014 data window finds seven of 36 escherichia coli (E.coli) samples exceed the instantaneous criterion of 235 cfu/100 ml. The range of exceeding values is 250 to 1400 cfu/100 ml. 2012 data find E.coli bacteria exceeds in nine of 36 samples with the same range of exceedance. Seventeen of 45 E.coli samples exceed the instantaneous criterion within the 2010 data window. E.coli exceedances range from 280 to 1500 cfu/100 ml. Sufficient data does not exist to determine the new WQS geometric mean. The 2008 Integrated Report (IR) finds E.coli bacteria exceeds the 235 cfu/100 ml instantaneous criterion in 14 of 33 samples with the same range of exceedance as 2010. The former WQS E.coli geomean, minimum two samples/calendar month, of 126 cfu/100 ml is exceeded in three of six calculations. The 2006 IR reports E.coli bacteria exceeds the 235 cfu/100 ml instantaneous criterion in 12 of 21 samples with exceedances also ranging from 280 to 1500 cfu/100 ml. The former E.coli WQS geomean exceeds in three of four calculations.

Assessment Unit	Water name	Location Description	Cause Category	Cause Name	Cycle First Listed	TMDL Schedule	Size
VAW-L02R_RNF03A02	N.F. Roanoke River	North Fork Roanoke River mainstem from a right bank entry of an unnamed tributary in the community of Ironto upstream to the mouth of Wilson Cr (RU07).	4A	Escherichia coli	2006	2014	6.93
VAW-L02R_RNF04A02	N.F. Roanoke River	North Fork Roanoke River mainstem from the mouth of Wilson Creek upstream to the mouth of Dry Run (RU06).	4A	Escherichia coli	2012	2024	9.16

Roanoke River, North Fork

Impaired area ID: VAW-L04R-01

Recreation

	Estuary (sq. miles)	Reservoir (acres)	River (miles)
Escherichia coli / 4A			
Total impaired size by water type:			16.09

Sources:

- Livestock (Grazing or Feeding Operations)
- Municipal (Urbanized High Density Area)
- Unspecified Domestic Waste
- Wastes from Pets
- Wildlife Other than Waterfowl

* Narrative descriptions, location and city/county describe the entire extent of the impairment. Sizes may not represent the total size of the impairment.

2014 Impaired Waters

Category 4 & 5 by Impaired Area ID*

Roanoke and Yadkin River Basins

Cause Group Code: **L04R-05-BAC - Mason Creek**

Location:	Mason Creek mainstem from the Mason Cove Community, river mile 7.61, extending downstream to the mouth of Mason Creek on the Roanoke River (Salem Quad).
City/County	Roanoke Co., Salem City
Use(s):	Recreation
Cause(s) / VA Category:	Escherichia coli / 4A

The Mason Creek Recreational Use remains impaired for 7.72 miles from the original 2002 303(d) Listing based on 1997 special study (SS 975101) data and fecal coliform exceedances.

The Roanoke River Bacteria Total Maximum Daily Load (TMDL) is U.S. EPA approved on 8/02/2006 [Fed ID 24538] with SWCB approval on 6/27/2007. 1996 & 2002 fecal coliform (FC) observations are the basis for the original Roanoke bacteria impaired listing. The 2014 total bacteria impaired length is 29.56 miles and 165.29 acres in Smith Mountain Lake. The approved TMDL did not specifically address the Mason Creek bacteria impairment but is nested within the Roanoke Bacteria TMDL Watershed. Allocation scenario development is for the entire drainage to provide pollutant reductions for all watersheds contributing to the bacteria impairment. The entirety of the approved TMDL and allocations can be viewed at http://www.deq.virginia.gov.

4AMSN000.67- (Boulevard) There are no additional escherichia coli (E.coli) data beyond the 2010 IR where seven of 32 E.coli samples exceed the instantaneous criterion of 235 cfu/100 ml in both the 2010 and 2008 assessments. Exceedances range from 250 to 1000 cfu/100 ml. 2006 Integrated Report (IR) shows five of 20 E.coli samples exceed the instantaneous criterion with the same range of exceedance.

Assessment Unit	Water name	Location Description	Cause Category	Cause Name	Cycle First Listed	TMDL Schedule	Size
VAW-L04R_MSN01A00	Mason Creek	Mason Creek mainstem from its confluence with the Roanoke River upstream to near the Mason Cove Community (RU10).	4A	Escherichia coli	2006	2014	7.72

Mason Creek

Impaired area ID: VAW-L04R-01

Recreation

	Estuary (sq. miles)	Reservoir (acres)	River (miles)
Escherichia coli / 4A			
Total impaired size by water type:			7.72

Sources:

- Discharges from Municipal Separate Storm Sewer Systems (MS4)
- Municipal (Urbanized High Density Area)
- Sanitary Sewer Overflows (Collection System Failures)
- Wet Weather Discharges (Non-Point Source)
- Wildlife Other than Waterfowl

* Narrative descriptions, location and city/county describe the entire extent of the impairment. Sizes may not represent the total size of the impairment.

2014 Impaired Waters

Category 4 & 5 by Impaired Area ID*

Roanoke and Yadkin River Basins

Cause Group Code: **L02R-02-BAC - Wilson Creek and Wilson Creek, UT**

Location:	Wilson Creek to include a northern unnamed tributary from its headwaters downstream to the Wilson Creek confluence on the North Fork Roanoke River. Note: The northern arm extends upstream from mainstem Wilson Creek to near the Rt. 114 & Rt. 460 intersection behind a commercially developed area near New River Valley Mall.
City/County	Montgomery Co.
Use(s):	Recreation
Cause(s) / VA Category:	Escherichia coli / 4A

The Wilson Creek Bacteria Total Maximum Daily Load (TMDL) is U.S. EPA approved 8/02/2006 [Fed ID 23395] and SWCB approved 6/27/2007. Wilson Creek is originally 303(d) listed for bacteria (fecal coliform) with the 2002 assessment. Escherichia coli (E.coli) replaces fecal coliform (FC) bacteria as the indicator as per Water Quality Standards [9 VAC 25-260-170. Bacteria; other waters]. The 6.99 mile bacteria impairment remains.

4AWLN000.40 - E.coli data within the 2010 data window find 11 of 23 samples exceed the WQS 235 cfu/100 ml instantaneous criterion. There are no additional data beyond the 2008 assessment where 13 of 27 E. coli samples exceed the instantaneous criterion. The minimum exceedance is 300 cfu/100 ml with a maximum of 2200. In 2006 twelve of 23 E. coli samples exceed the instantaneous criterion of 235 cfu/100 ml with the same range of exceedance.

Assessment Unit	Water name	Location Description	Cause Category	Cause Name	Cycle First Listed	TMDL Schedule	Size
VAW-L02R_WLN01A00	Wilson Creek	Wilson Creek mainstem segment extends from WLN02A00 downstream to the Wilson Creek mouth on the North Fork Roanoke River (RU07).	4A	Escherichia coli	2004	2010	2.76
VAW-L02R_WLN02A00	Wilson Creek	This northern arm extends upstream from mainstem Wilson Creek to the Rt. 114 & Rt. 460 intersection behind major developed area near New River Valley Mall (RU07).	4A	Escherichia coli	2004	2010	1.73
VAW-L02R_WLN03A00	Wilson Creek	Wilson Creek mainstem segment extends from near Rt. 460/I-81 intersection downstream to intersection of segments WLN02A with WLN01A (RU07).	4A	Escherichia coli	2004	2010	2.50

Wilson Creek and Wilson Creek, UT

Impaired area ID: VAW-L04R-01

Recreation

	Estuary (sq. miles)	Reservoir (acres)	River (miles)
Escherichia coli / 4A			
Total impaired size by water type:			6.99

Sources:

- Livestock (Grazing or Feeding Operations)
- Municipal (Urbanized High Density Area)
- Unspecified Domestic Waste
- Wastes from Pets
- Wildlife Other than Waterfowl

* Narrative descriptions, location and city/county describe the entire extent of the impairment. Sizes may not represent the total size of the impairment.

2014 Impaired Waters

Category 4 & 5 by Impaired Area ID*

Roanoke and Yadkin River Basins

Cause Group Code: **L04R-06-BEN - Barnhardt Creek**

Location:	Barnhardt Creek from its confluence on the Roanoke River upstream to its headwaters.
City/County	Roanoke City, Roanoke Co., Salem City
Use(s):	Aquatic Life
Cause(s) / VA Category:	Benthic-Macroinvertebrate Bioassessments / 4A

The Roanoke River General Standard - Benthic (Sediment) TMDL Study is U.S. EPA approval on 5/10/2006 [Fed. ID 33861] and SWCB approved 9/07/2006. Barnhart Creek is nested within the Roanoke River General Standard- Benthic (Sediment) TMDL watershed.

The 2012 Integrated Report (IR) finds the Aquatic Life Use is impaired. There are no additional data within the 2014 data window.

4ABHT001.90 (Downstream of Rt. 419, Roanoke City) Bio 'IM' Three VSCI surveys (2009-2010) with an average score of 36.8.indicating a benthic community dominated by pollution-tolerant taxa. Although several habitat scores were sub-optimal the habitat in this reach should support more mayfly and stonefly taxa which were extremely low during the surveys. Suburban land cover with a major road (Rt. 419) upstream of this station may cause altered hydrology and resulting bank erosion, sediment deposition, and runoff from roads. Riparian buffers are impacted on both sides by the sports fields at the school and residential backyards.

Assessment Unit	Water name	Location Description	Cause Category	Cause Name	Cycle First Listed	TMDL Schedule	Size
VAW-L04R_BHT01A10	Barnhardt Creek	Barnhardt Creek from its confluence on the Roanoke River upstream to its headwaters (RU14).	4A	Benthic-Macroinvertebrate Bioassessments	2012	2024	5.31

Barnhardt Creek

		Estuary (sq. miles)	Reservoir (acres)	River (miles)
Impaired area ID: VAW-L04R-01				
Aquatic Life	Benthic-Macroinvertebrate Bioassessments / 4A			
	Total impaired size by water type:			5.31

Sources:

- Loss of Riparian Habitat
- Municipal (Urbanized High Density Area)
- Streambank Modifications/destabilization
- Urban Runoff/Storm Sewers
- Wet Weather Discharges (Non-Point Source)

* Narrative descriptions, location and city/county describe the entire extent of the impairment. Sizes may not represent the total size of the impairment.

2014 Impaired Waters

Category 4 & 5 by Impaired Area ID*

Roanoke and Yadkin River Basins

Cause Group Code: **L04R-07-BEN - Murray Run**

Location:	Murray Run mainstem from its headwaters to its mouth on the Roanoke River.
City/County	Roanoke City, Roanoke Co.
Use(s):	Aquatic Life
Cause(s) / VA Category:	Benthic-Macroinvertebrate Bioassessments / 4A

The Roanoke River General Standard - Benthic (Sediment) TMDL Study is U.S. EPA approval on 5/10/2006 [Fed. ID 33861] and SWCB approved 9/07/2006. Murray Run is nested within the Roanoke River General Standard - Benthic (Sediment) TMDL watershed.

The Aquatic Life Use is found impaired with the 2012 assessment.

4AMUR001.82- Bio 'IM' There are no additional data within the 2014 data window. The 2012 Integrated Report (IR) reports three VSCI surveys (2009-2010) with an average score of 19.5 indicating a benthic community dominated by pollution-tolerant taxa most notably Chironomidae (midge larvae). Although several habitat scores were sub-optimal the habitat in this reach should support more mayfly and stonefly taxa which were extremely low or absent during the surveys. Urban land cover with high levels of impervious surface upstream causes altered hydrology and resulting bank erosion, sediment deposition, and runoff of toxic substances from roads. Riparian buffers are good on one side of the stream while the opposite side of the stream is bordered by a mowed field.

Assessment Unit	Water name	Location Description	Cause Category	Cause Name	Cycle First Listed	TMDL Schedule	Size
VAW-L04R_MUR01A00	Murray Run	Murray Run mainstem from its headwaters to its mouth on the Roanoke River (RU14).	4A	Benthic-Macroinvertebrate Bioassessments	2012	2024	3.57

Murray Run

		Estuary (sq. miles)	Reservoir (acres)	River (miles)
Impaired area ID: VAW-L04R-01				
Aquatic Life	Benthic-Macroinvertebrate Bioassessments / 4A			
	Total impaired size by water type:			3.57

Sources:

- Loss of Riparian Habitat
- Municipal (Urbanized High Density Area)
- Streambank Modifications/destabilization
- Urban Runoff/Storm Sewers
- Wet Weather Discharges (Non-Point Source)

* Narrative descriptions, location and city/county describe the entire extent of the impairment. Sizes may not represent the total size of the impairment.

2014 Impaired Waters

Category 4 & 5 by Impaired Area ID*

Roanoke and Yadkin River Basins

Cause Group Code: **L01R-01-TEMP** - **Roanoke River, South Fork**

Location:	South Fork Roanoke River mainstem from the mouth of Elliott Creek extending downstream to the confluence of the South and North Forks of the Roanoke River.
City/County	Montgomery Co.
Use(s):	Aquatic Life
Cause(s) / VA Category:	Temperature, water / 5C

USGS Gaging Station 02053800 (S.F. Roanoke R. near Shawsville)- There are no additional data beyond the 2010 IR. 2010 assessment reveals two of 12 Temperature measurements exceed the Class V 21°C criterion. Measurements in excess of the criterion occur on 8/07/2007 at 24.5°C and 8/29/2007 at 22°C. These data result in the return of 6.43 miles to the temperature 303(d) List that were partially de-listed with the 2008 IR. The temperature impairment is extended upstream for 4.61 miles based on 2012 data for 4ARSF014.02.

4ARSF014.02 (Persimmon Road Bridge) The 2012 assessment finds three temp measurements from 12 observations exceed the 21°C criterion at 23.1°C (8/13/2009); 22°C (6/10/2010) and 23.2°C (8/31/2010). There are no additional data beyond the 2012 IR.

4ARSF011.73- (Rt. 637 Bridge) There are no additional data beyond the 2008 IR. Observations within the 2010 data window find no excursions of the respective criterion for temperature. The 2008 IR finds only one exceedance of the Class V 21°C criterion from 12 observations. 2008 data resulted in the partial de-list of temperature for 6.43 miles. The 2004 IR reported two of 12 temperature measurements in excess of the criterion. Each exceedance is 22°C occurring on 7/22/99 and 6/06/01. The 2004 Category 5C assessment remains. Low stream flows and drought conditions were observed during both 1999 and 2001.

4ARSF002.20- (above the old Green Hill industrial site near Rt. 11/460) No additional data beyond the 2004 IR. The 2004 IR records two of 18 temperature measurements exceed the WQS criterion. Each 2004 exceedance is 22°C occurring on 7/22/99 and 6/06/01. The 6.27 mile waters remain impaired (Category 5C) for temperature.

Assessment Unit	Water name	Location Description	Cause Category	Cause Name	Cycle First Listed	TMDL Schedule	Size
VAW-L01R_RSF01A00	S.F. Roanoke River	South Fork Roanoke River mainstem extends from the PWS WQS upstream ending on downstream to the South Fork's confluence with the North Fork Roanoke River (RU05).	5C	Temperature, water	2004	2016	3.27
VAW-L01R_RSF02A00	S.F. Roanoke River	South Fork Roanoke River mainstem segment extends from Shawsville STP downstream to the WQS designated PWS upstream ending (RU05).	5C	Temperature, water	2004	2016	3.00
VAW-L01R_RSF03A00	S.F. Roanoke River	South Fork Roanoke River from the mouth of Elliott Creek downstream to the Shawsville STP (RU05).	5C	Temperature, water	2010	2016	6.43
VAW-L01R_RSF04A02	S.F. Roanoke River	South Fork Roanoke R. from the confluence of Elliot Creek upstream to the mouth of Bottom Creek (RU03).	5C	Temperature, water	2012	2016	4.61

Roanoke River, South Fork

		Estuary (sq. miles)	Reservoir (acres)	River (miles)
Impaired area ID: VAW-L04R-01				
Aquatic Life	Temperature, water / 5C			
	Total impaired size by water type:			17.31

Sources:

- Natural Conditions - Water Quality Standards Use Attainability Analyses Needed

* Narrative descriptions, location and city/county describe the entire extent of the impairment. Sizes may not represent the total size of the impairment.

2014 Impaired Waters

Category 4 & 5 by Impaired Area ID*

Roanoke and Yadkin River Basins

Cause Group Code: **L03R-01-TEMP** - **Roanoke River**

Location:	Roanoke River mainstem from Spring Hollow Reservoir extending downstream to the Rt. 419 Bridge crossing.
City/County	Roanoke Co., Salem City
Use(s):	Aquatic Life
Cause(s) / VA Category:	Temperature, water / 5C

The waters remain impaired for the Aquatic Life Use. Station 4AROA227.42 is located within the Water Quality Standards 'hh' special standard [9VAC25-260-310] establishing a maximum temperature of 31°C May 1 through October 31 for these seasonally stockable trout waters. Temperature data from 4AROA227.42 (located at the Rt. 773 Bridge in Lafayette) now meets the temperature criterion and 1.28 miles of the Roanoke are delisted with the 2012 Integrated Report (IR). Station 4AROA227.42 is no longer a Listing station for the temperature impairment.

4AROA212.17- (Rt. 11 Bridge - below Eaton, Inc.) One temperature excursion from six observations exceeds the stockable trout water criterion at 22.8°C (6/08/2010) within the 2014 data window. This same excursion occurs within the 2012 data window from a total of 8 measurements. Two of 17 temperature measurements exceed the criterion within the 2010 data window. Measurements in excess of the criterion are 21.3 on 7/15/2003 and 25.4 on 7/13/2004. These same exceedances occur within the 2008 data window where two of 21 temperature measurements exceed the 21°C criterion. Temperature data within the 2006 data window finds exceedances in six of 32 measurements ranging from 21 to 25°C. The 2004 assessment finds temperature exceeds the stockable trout water criterion in eight of 42 measurements. Exceedances range from 22 to 25°C. Eleven of 67 temperature measurements exceed the criterion within the 2002 assessment.

Assessment Unit	Water name	Location Description	Cause Category	Cause Name	Cycle First Listed	TMDL Schedule	Size
VAW-L03R_ROA02A00	Roanoke River	Roanoke River mainstem from the Rt. 419 Bridge upstream to the City of Salem downtown intake on the Roanoke River (RU09).	5C	Temperature, water	2002	2014	2.67
VAW-L03R_ROA03A00	Roanoke River	Roanoke River mainstem from the Salem City WTP downtown intake upstream to the Big Bear Branch mouth on the Roanoke River (RU09).	5C	Temperature, water	2002	2014	3.42
VAW-L03R_ROA04A00	Roanoke River	Roanoke River mainstem from the Big Bear Rock Branch mouth upstream to end of the WQS designated public water supply (PWS) section just downstream of an unnamed tributary at Dixie Caverns (RU09).	5C	Temperature, water	2002	2014	5.57
VAW-L03R_ROA05A00	Roanoke River	Roanoke River mainstem from the end of the WQS designated public water supply (PWS) section just downstream of an unnamed tributary at Dixie Caverns upstream to the Roanoke County Spring Hollow Reservoir intake (RU09).	5C	Temperature, water	2002	2014	1.43

Roanoke River

		Estuary (sq. miles)	Reservoir (acres)	River (miles)
Impaired area ID: VAW-L04R-01				
Aquatic Life	Temperature, water / 5C			
	Total impaired size by water type:			13.09

Sources:

- Natural Conditions - Water Quality Standards Use Attainability Analyses Needed

* Narrative descriptions, location and city/county describe the entire extent of the impairment. Sizes may not represent the total size of the impairment.

2014 Impaired Waters

Category 4 & 5 by Impaired Area ID*

Roanoke and Yadkin River Basins

Cause Group Code: **L04R-01-BEN** - **Roanoke River**

Location:	Roanoke River mainstem from the Murray Run confluence downstream to the backwaters of the Niagara impoundment. Note: Impounded waters of Niagara Dam are not included with this impairment.
City/County	Roanoke City, Roanoke Co.
Use(s):	Aquatic Life
Cause(s) / VA Category:	Benthic-Macroinvertebrate Bioassessments / 4A

The Roanoke River General Standard - Benthic (Sediment) Total Maximum Daily Load (TMDL) is U.S. EPA approved 5/10/2006 [Fed. ID 33861] and SWCB approved 9/07/2006. Formerly coded VAW-L04R-01.

The 2010 Integrated Report (IR) extended the benthic impairment upstream 3.87 miles from the mouth of Mason Creek upstream to the City of Salem downtown intake on the Roanoke River. These mainstem waters are delisted with the 2014 IR as well as an additional 5.54 miles downstream to the Murray Run confluence on the Roanoke River. A total of 9.41 miles are delisted with the 2014 IR. The delisting is based on stations 4AROA212.17- (Rt. 11 Bridge - below Eaton, Inc.), 4AROA206.27- (Wasena Park) and a probabilistic site 4AROA210.56 (Behind Veterans Administration Hospital (Salem). Category 4A waters equal 5.81 miles. The impairment does not include the impounded waters of Niagara Dam.

The benthic impairment is extended downstream with the 2008 Integrated Report (IR) for 3.16 miles from Niagara Dam downstream to the mouth of Back Creek (station 4AROA198.08). This portion of the impairment is Category 5A as the TMDL Study did not address these waters. A new Cause Group Code of L04R-03-BEN and Fact Sheet are assigned to this portion with the 2012 IR as a result.

4AROA202.20- (13th Street Bridge - above STP) Bio 'J' The 2014 assessment records four VSCI surveys (2009, 2010 and 2012) with an average score of 60.8. Both spring and fall samples collected in 2009 and 2010 indicate water quality is non-impaired. The fall 2009 survey records the highest score at 67.6. Following the 2009 and 2010 samples the VSCI scores declined. One sample is below the impairment threshold of 60 at 51.5 and one sample above at 63.9. Both Spring samples were lower than the fall samples. The final 2 year average is below the impairment threshold while the 6 year average is above the threshold. As a result the final 2014 assessment rating is to reserve judgment and conduct additional surveys. These additional data will aid in determining if the 6 year average VSCI score is an indicator of typical water quality or an indicator of the abnormal conditions during 2011 and 2012.

2012 data find from three VSCI surveys (2005 & 2009-2010) an average score of 54.28. The final 6-year average (n=3) VSCI score is driven by a fall 2005 score of 34.69. For seven seasons samples were not collected at this station. The eighth and ninth seasons following the 34.69 score the VSCI scores were non-impaired. An active hurricane season also occurred in 2004. There are no additional data from the 2010 data window where four VSCI surveys (2003-2005) record impairment with an average VSCI score of 49.9. 2008 assessment reports five VSCI surveys (2001-2005) with an average score of 51.4 also finding impairment. Historically sedimentation has decreased the amount of substrate available for macro invertebrate colonization. The benthic community declined from fall 2001 to fall 2003 and improved during spring and fall 2004. The fall 2004 survey resulted in a non-impaired score of 65.08. This was the only Roanoke River station sampled in fall 2004 and it was used as the benthic macro invertebrate sample location for a nearby probabilistic monitoring site (4AROA202.32).

Assessment Unit	Water name	Location Description	Cause Category	Cause Name	Cycle First Listed	TMDL Schedule	Size
VAW-L04R_ROA03A00	Roanoke River Niagara	Roanoke River mainstem from near the backwaters of the Niagara Impoundment upstream to the end of the WQS designated public water supply (PWS section 6i) segment. The upstream ending of the PWS segment from SML 795 ft. pool elevation (RU14).	4A	Benthic-Macroinvertebrate Bioassessments	1996	2010	0.87
VAW-L04R_ROA04A00	Roanoke River	Roanoke R. mainstem from near the backwaters of Niagara Impoundment upstream to the Tinker Cr. confluence on the Roanoke R. (section 6). The upstream ending of the WQS designated public water supply (PWS) segment from SML 795 ft. pool elevation (RU14).	4A	Benthic-Macroinvertebrate Bioassessments	1996	2010	0.20
VAW-L04R_ROA05A00	Roanoke River	Roanoke River mainstem from the Western Virginia Water Authority Roanoke Regional Water Pollution Control Plant downstream to the Tinker Creek confluence (WQS section 6) (RU14).	4A	Benthic-Macroinvertebrate Bioassessments	1996	2010	0.40
VAW-L04R_ROA06A00	Roanoke River	Roanoke River mainstem from the Murray Run mouth downstream to the Western Virginia Water Authority Roanoke Regional Water Pollution Control Plant (RU14).	4A	Benthic-Macroinvertebrate Bioassessments	1996	2006	4.34

Roanoke River

		Estuary (sq. miles)	Reservoir (acres)	River (miles)
Impaired area ID: VAW-L04R-01				
Aquatic Life	Benthic-Macroinvertebrate Bioassessments / 4A			
	Total impaired size by water type:			5.81

Sources:

- Discharges from Municipal Separate Storm Sewer Systems (MS4)
- Industrial Point Source Discharge
- Industrial/Commercial Site Stormwater Discharge (Permitted)
- Municipal (Urbanized High Density Area)
- Municipal Point Source Discharges
- Post-development Erosion and Sedimentation
- Residential Districts
- Sediment Resuspension (Clean Sediment)
- Sediment Resuspension (Contaminated Sediment)
- Wet Weather Discharges (Point Source and Combination of Stormwater, SSO or CSO)

* Narrative descriptions, location and city/county describe the entire extent of the impairment. Sizes may not represent the total size of the impairment.

2014 Impaired Waters

Category 4 & 5 by Impaired Area ID*

Roanoke and Yadkin River Basins

Cause Group Code: **L04R-02-BAC** - **Mud Lick Creek**

Location:	Mud Lick Creek mainstem from its confluence on the Roanoke River upstream to its headwaters.
City/County	Roanoke City, Roanoke Co., Salem City
Use(s):	Recreation
Cause(s) / VA Category:	Escherichia coli / 4A

The Mud Lick Creek 2006 initially 303(d) Listed bacterial impairment extends for 7.61 miles.

The Roanoke River Bacteria Total Maximum Daily Load (TMDL) is U.S. EPA approved on 8/02/2006 [Fed ID 24538] with SWCB approval on 6/27/2007. 1996 & 2002 fecal coliform (FC) observations are the basis for the original Roanoke bacteria impaired listing. The 2014 Roanoke River total bacteria impaired length is 29.56 miles and 165.29 acres in Smith Mountain Lake. The approved TMDL did not specifically address the Mud Lick Creek bacteria impairment but is nested within the Roanoke Bacteria TMDL Watershed. Allocation scenario development is for the entire drainage to provide pollutant reductions for all watersheds contributing to the bacteria impairment. The entirety of the approved TMDL and allocations can be viewed at http://www.deq.virginia.gov.

4AMDL000.34- (Downstream of Brambleton Ave. behind Shell) There are no additional escherichia coli (E.coli) data beyond the 2010 IR. E.coli exceeds the WQS instantaneous criterion of 235 cfu/100 ml in four of 12 observations in both the 2010 and 2008 assessments. Exceeding values range from 550 cfu/100 ml to greater than 2000. The 2006 E.coli initial 303(d) Listing reports four of nine exceedances with the same range of exceedance.

Assessment Unit	Water name	Location Description	Cause Category	Cause Name	Cycle First Listed	TMDL Schedule	Size
VAW-L04R_MDL01A06	Mud Lick Creek	Mud Lick Creek from its confluence on the Roanoke River upstream to its headwaters (RU14).	4A	Escherichia coli	2006	2018	7.61

Mud Lick Creek

Impaired area ID: VAW-L04R-01

Recreation

	Estuary (sq. miles)	Reservoir (acres)	River (miles)
Escherichia coli / 4A			
Total impaired size by water type:			7.61

Sources:

- Discharges from Municipal Separate Storm Sewer Systems (MS4)
- Municipal (Urbanized High Density Area)
- Sanitary Sewer Overflows (Collection System Failures)
- Wet Weather Discharges (Non-Point Source)
- Wildlife Other than Waterfowl

* Narrative descriptions, location and city/county describe the entire extent of the impairment. Sizes may not represent the total size of the impairment.

Mountain Valley Pipeline
Stream Identification Table

Mountain Valley Pipeline Stream Crossing Identification Table - Spread 9						
Stream ID	**NHD Stream Name**	**Station # Start**	**Bank Width (ft)**	**Crossing Method**	**TOYR**	**TOYR Reason**
S-Y3	UNT to Doe Creek	10835+60	10	Dam and Pump		
S-Y2	Doe Creek	10837+50	25	Dam and Pump	Fish Relocation 1-2 Days Prior to Construction Activity	
S-E24	UNT to Sinking Creek	10893+80	20	Dam and Pump	October 1 - June 30	Coldwater Fishery and Wild Trout
S-E25 Upstream	UNT to Sinking Creek	10895+25	10	Dam and Pump	October 1 - June 30	Coldwater Fishery and Wild Trout
S-E25 Downstream	UNT to Sinking Creek	10895+00	8	Dam and Pump	October 1 - June 30	Coldwater Fishery and Wild Trout
S-RR5	UNT to Sinking Creek	10923+50	10	Dam and Pump	October 1 - June 30	Coldwater Fishery and Wild Trout
S-IJ16-B	UNT to Sinking Creek	10958+00	5	Dam and Pump		
S-IJ17	UNT to Sinking Creek	10958+00	3	Dam and Pump		
S-NN17	Sinking Creek	11067+00	55	VMRC Crossing Detail	October 1 - June 30	Coldwater Fishery and Wild Trout
S-RR2	Greenbriar Branch	11162+00	8	Dam and Pump	October 1 - June 30	Coldwater Fishery and Wild Trout
S-MM18	UNT to Sinking Creek	11200+75	5	Dam and Pump		
S-NN12	UNT to Sinking Creek	11236+90	2	Dam and Pump		
S-NN11	UNT to Sinking Creek	11261+00	5	Dam and Pump		
S-KL43	UNT to Sinking Creek	11268+50	8	Dam and Pump	October 1 - June 30	Coldwater Fishery and Wild Trout
S-0014	UNT to Sinking Creek	11356+90	4	Dam and Pump	October 1 - June 30	Coldwater Fishery and Wild Trout
S-0013	UNT to Sinking Creek	11359+00	20	Dam and Pump	October 1 - June 30	Coldwater Fishery and Wild Trout
S-0012	UNT to Sinking Creek	11359+90	2	Dam and Pump		
S-PP1	UNT to Sinking Creek	11397+50	3	Dam and Pump		
S-PP3	UNT to Sinking Creek	11415+75	3	Dam and Pump	October 1 - June 30	Coldwater Fishery and Wild Trout
S-PP4	UNT to Sinking Creek	11426+50	2	Dam and Pump		
S-PP22	UNT to Craig Creek	11475+50	2.5	Dam and Pump		
S-PP21	UNT to Craig Creek	11493+50	4	Dam and Pump		
S-PP20	UNT to Craig Creek	11496+50	6	Dam and Pump		
S-OO6	Craig Creek	11516+00	35	VMRC Crossing Detail	March 1 - July 31	James Spinymussel, Atlantic Pigtoe, Orangefin Madtom, Coldwater Fishery, Threatened/Endangered Species Stream
S-RR14	UNT to Craig Creek	11522+00	7	Dam and Pump		
S-HH18	UNT to Craig Creek	11534+00	6	Dam and Pump	March 1 - July 31	James Spinymussel, Atlantic Pigtoe, Coldwater Fishery, Threatened/Endangered Species Stream
S-MN21	UNT to Mill Creek	11595+25 (5+25)	7	Dam and Pump		
S-MN22	UNT to Roanoke River	11612+00 (22+00)	15	Dam and Pump		
S-EF65	Mill Creek	11648+00 (58+00)	12	Dam and Pump	October 1 - June 30	Orangefin Madtom, Coldwater Fishery, Threatened/Endangered Species Stream, Wild Trout
S-EF62	UNT to Mill Creek	11652+00 (62+00)	9	Dam and Pump	Fish Relocation 1-2 Days Prior to Construction Activity	
S-IJ52	UNT to Mill Creek	11675+00 (85+00)	7	Dam and Pump	Fish Relocation 1-2 Days Prior to Construction Activity	
S-G36	North Fork Roanoke River	11930+50	20	VMRC Crossing Detail	October 1 - June 30	Roanoke Logperch, Orangefin Madtom, Coldwater Fishery, Threatened/Endangered Species Stream, Wild Trout
S-G38	UNT to North Fork Roanoke River	11937+50	3	Dam and Pump		

S-G39	UNT to North Fork Roanoke River	11953+00	6	Dam and Pump		
S-G40	UNT to North Fork Roanoke River	11956+70	3	Dam and Pump	Fish Relocation 1-2 Days Prior to Construction Activity	Roanoke Logperch, Orangefin Madtom, Wild Trout
S-PP23	UNT to North Fork Roanoke River	11957+50	2.5	Dam and Pump		
S-MM15	UNT to Flatwoods Branch	11998+50	6	Dam and Pump		
S-MM14	UNT to Flatwoods Branch	12008+25	7	Dam and Pump		
S-MM13	UNT to Flatwoods Branch	12020+00	5	Dam and Pump		
S-MM11	UNT to Flatwoods Branch	12023+00	8	Dam and Pump		
S-F15	UNT to Flatwoods Branch	12030+00	6	Dam and Pump		
S-F16A-F16B	UNT to Flatwoods Branch	12033+90	3	Dam and Pump		
S-C36	UNT to Flatwoods Branch	12043+50	3	Dam and Pump		
S-MM31	UNT to Flatwoods Branch	12047+00	4	Dam and Pump		
S-C29	Flatwoods Branch	12054+25	1.2	Dam and Pump		
S-C25	UNT to Bradshaw Creek	12085+00	3	Dam and Pump		
S-C24	UNT to Bradshaw Creek	12088+25	3	Dam and Pump		
S-C21	Bradshaw Creek	12114+00	25	VMRC Crossing Detail	October 1 - June 30	Roanoke Logperch, Orangfin Madtom, Coldwater Fishery, Threatened/Endangered Species Stream
S-OO11	UNT to Bradshaw Creek	12118+00 & 12120+00	2	Dam and Pump		
S-OO16	UNT to Bradshaw Creek	2295+80 (3+8	4	Dam and Pump	Fish Relocation 1-2 Days Prior to Construction Activity	
S-NN19	UNT to Roanoke River	12301+25	3.5	Dam and Pump		
S-NN16	Roanoke River	12361+50	70	VMRC Crossing Detail	March 15 - July 15	Roanoke Logperch, Orangfin Madtom, Warmwater Fishery,Threaten/Endangered Species Stream
S-AB16	UNT to Roanoke River	12369+50	5	Dam and Pump		

Stream crossing information provided by Tetra Tech in Spread 9 ESC Plans. TOYR restrictions are listed as found in the project JPA (December 2017).

Mountain Valley Pipeline
Soil Map Units and Descriptions in Virginia by Milepost – Spread 9
Provided by Tetra Tech

Pipeline Route Soil Map Units and Descriptions in Virginia by Milepost - Spread 9

MP	Mapunit Symbol	Mapunit Name	Farm Class	Slope Gradient - Dominant Component	Cover Kind 1	Cover Kind 2	Hydric Rating	Drainage Class - Dominant Condition	Drainage Class - Wettest	Particle Size	Bedrock Depth - Minimum	Hydrologic Group - Dominant	K-Factor Whole Soil		K-Factor Rock Free	
Milepost	**Symbol**	**Soil Name**	**Farmland Type**	**Slope**	**Ground Cover**	**Ground Cover**	**Hydric**	**Drainage**	**Drainage**	**Particle Size**	**Depth to Bedrock**	**Hydrologic Soil Group**	**Erodibility Factor**	**Erodibility Classification**	**Erodibility Factor**	**Erodibility Classification**
205.8	30F	Macove channery silt loam, cool, 35 to 55 percent slopes, very stony	Not prime farmland	45	-	-	No	Well drained	Well drained	fine-loamy	-	A	0.1	Low	0.17	Low
205.9	15E	Frederick-Poplimento very gravelly loams, 25 to 60 percent slopes	Not prime farmland	43	-	-	No	Well drained	Well drained	fine	-	B	0.2	Low	0.37	High
206	30F	Macove channery silt loam, cool, 35 to 55 percent slopes, very stony	Not prime farmland	45	-	-	No	Well drained	Well drained	fine-loamy	-	A	0.1	Low	0.17	Low
206.1	30C	Tankerville and Philomont soils, 7 to 15 percent slopes	Farmland of statewide importance	11	-	-	No	Well drained	Well drained	fine-loamy	89	B	0.1	Low	0.17	Low
206.2	30C	Tankerville and Philomont soils, 7 to 15 percent slopes	Farmland of statewide importance	11	-	-	No	Well drained	Well drained	fine-loamy	89	B	0.1	Low	0.17	Low
206.3	30F	Macove channery silt loam, cool, 35 to 55 percent slopes, very stony	Not prime farmland	45	-	-	No	Well drained	Well drained	fine-loamy	-	A	0.1	Low	0.17	Low
206.4	30D	Tankerville and Philomont soils, 15 to 25 percent slopes	Farmland of statewide importance	20	-	-	No	Well drained	Well drained	fine-loamy	89	B	0.1	Low	0.17	Low
206.5	30D	Tankerville and Philomont soils, 15 to 25 percent slopes	Farmland of statewide importance	20	-	-	No	Well drained	Well drained	fine-loamy	89	B	0.1	Low	0.17	Low
206.6	30D	Tankerville and Philomont soils, 15 to 25 percent slopes	Farmland of statewide importance	20	-	-	No	Well drained	Well drained	fine-loamy	89	B	0.1	Low	0.17	Low
206.7	30C	Tankerville and Philomont soils, 7 to 15 percent slopes	Farmland of statewide importance	11	-	-	No	Well drained	Well drained	fine-loamy	89	B	0.1	Low	0.17	Low
206.8	5D	Barkers Crossroads-Rhodhiss complex, 15 to 25 percent slopes	Not prime farmland	20	-	-	No	Well drained	Well drained	very-fine	-	C	0.37	High	0.37	High
206.9	14C	Frederick-Poplimento loams, 7 to 15 percent slopes	Farmland of statewide importance	11	rass/herbaceous cov	Fame pasturelanc	No	Well drained	Well drained	fine	-	B	0.24	Moderate	0.32	Moderate
207	14D	Frederick-Poplimento loams, 15 to 25 percent slopes	Farmland of statewide importance	20	rass/herbaceous cov	Fame pasturelanc	No	Well drained	Well drained	fine	-	B	0.24	Moderate	0.32	Moderate
207.1	29B	Eubanks loam, 2 to 7 percent slopes, stony	Farmland of statewide importance	4	-	-	No	Well drained	Well drained	fine-loamy	-	A	0.32	Moderate	0.32	Moderate
207.2	14C	Frederick-Poplimento loams, 7 to 15 percent slopes	Farmland of statewide importance	11	rass/herbaceous cov	Fame pasturelanc	No	Well drained	Well drained	fine	-	B	0.24	Moderate	0.32	Moderate
207.3	6F	Berks-Weikert complex, 55 to 80 percent slopes	Not prime farmland	63	-	-	No	Well drained	Well drained	very-fine	41	B	0.37	High	0.37	High
207.4	6F	Berks-Weikert complex, 55 to 80 percent slopes	Not prime farmland	63	-	-	No	Well drained	Well drained	very-fine	41	B	0.37	High	0.37	High
207.5	6F	Berks-Weikert complex, 55 to 80 percent slopes	Not prime farmland	63	-	-	No	Well drained	Well drained	very-fine	41	B	0.37	High	0.37	High
207.6	6F	Berks-Weikert complex, 55 to 80 percent slopes	Not prime farmland	63	-	-	No	Well drained	Well drained	very-fine	41	B	0.37	High	0.37	High
207.7	6F	Berks-Weikert complex, 55 to 80 percent slopes	Not prime farmland	63	-	-	No	Well drained	Well drained	very-fine	41	B	0.37	High	0.37	High
207.8	30F	Macove channery silt loam, cool, 35 to 55 percent slopes, very stony	Not prime farmland	45	-	-	No	Well drained	Well drained	fine-loamy	-	A	0.1	Low	0.17	Low
207.9	33F	Mandy channery silt loam, 35 to 55 percent slopes, very stony	Not prime farmland	45	-	-	No	Well drained	Well drained	fine	94	C	0.37	High	0.37	High
208	30D	Tankerville and Philomont soils, 15 to 25 percent slopes	Farmland of statewide importance	20	-	-	No	Well drained	Well drained	fine-loamy	89	B	0.1	Low	0.17	Low
208.1	11F	Dekalb-Alticrest complex, 35 to 55 percent slopes, very stony	Not prime farmland	45	-	-	No	Excessively drained	Well drained	fine	76	A	0.32	Moderate	0.32	Moderate
208.2	33F	Mandy channery silt loam, 35 to 55 percent slopes, very stony	Not prime farmland	45	-	-	No	Well drained	Well drained	fine	94	C	0.37	High	0.37	High
208.3	33F	Mandy channery silt loam, 35 to 55 percent slopes, very stony	Not prime farmland	45	-	-	No	Well drained	Well drained	fine	94	C	0.37	High	0.37	High
208.4	30D	Tankerville and Philomont soils, 15 to 25 percent slopes	Farmland of statewide importance	20	-	-	No	Well drained	Well drained	fine-loamy	89	B	0.1	Low	0.17	Low
208.5	11D	Chilhowie silty clay loam, 15 to 25 percent slopes	Not prime farmland	20	-	-	No	Well drained	Well drained	fine	89	D	0.32	Moderate	0.32	Moderate
208.6	33D	Jefferson sandy loam, 15 to 35 percent slopes, very stony	Not prime farmland	25	-	-	No	Well drained	Well drained	fine	-	A	0.37	High	0.37	High
208.7	5D	Barkers Crossroads-Rhodhiss complex, 15 to 25 percent slopes	Not prime farmland	20	-	-	No	Well drained	Well drained	very-fine	-	C	0.37	High	0.37	High
208.8	16F	Frederick-Rock outcrop complex, 30 to 60 percent slopes	Not prime farmland	45	-	-	No	Well drained	Well drained	-	-	-	-	-	-	-
208.9	16F	Frederick-Rock outcrop complex, 30 to 60 percent slopes	Not prime farmland	45	-	-	No	Well drained	Well drained	-	-	-	-	-	-	-
209	14E	Dekalb channery sandy loam, 35 to 55 percent slopes, extremely stony	Not prime farmland	45	rass/herbaceous cov	Fame pasturelanc	No	Somewhat excessively drained	Somewhat excessively drained	fine	76	A	0.24	Moderate	0.32	Moderate
209.1	14D	Frederick-Poplimento loams, 15 to 25 percent slopes	Farmland of statewide importance	20	rass/herbaceous cov	Fame pasturelanc	No	Well drained	Well drained	fine	-	B	0.24	Moderate	0.32	Moderate
209.2	14D	Frederick-Poplimento loams, 15 to 25 percent slopes	Farmland of statewide importance	20	rass/herbaceous cov	Fame pasturelanc	No	Well drained	Well drained	fine	-	B	0.24	Moderate	0.32	Moderate
209.3	14E	Dekalb channery sandy loam, 35 to 55 percent slopes, extremely stony	Not prime farmland	45	rass/herbaceous cov	Fame pasturelanc	No	Somewhat excessively drained	Somewhat excessively drained	fine	76	A	0.24	Moderate	0.32	Moderate
209.4	31E	Myersville-Catoctin silt loams, 25 to 65 percent slopes, very stony	Not prime farmland	45	-	-	No	Well drained	Well drained	fine	76	C	0.37	High	0.37	High
209.5	29B	Eubanks loam, 2 to 7 percent slopes, stony	Farmland of statewide importance	4	-	-	No	Well drained	Well drained	fine-loamy	-	A	0.32	Moderate	0.32	Moderate
209.6	29D	Eubanks loam, 15 to 25 percent slopes, stony	Farmland of statewide importance	20	-	-	No	Well drained	Well drained	fine-loamy	-	A	0.32	Moderate	0.32	Moderate
209.7	29D	Eubanks loam, 15 to 25 percent slopes, stony	Farmland of statewide importance	20	-	-	No	Well drained	Well drained	fine-loamy	-	A	0.32	Moderate	0.32	Moderate
209.8	14C	Frederick-Poplimento loams, 7 to 15 percent slopes	Farmland of statewide importance	11	rass/herbaceous cov	Fame pasturelanc	No	Well drained	Well drained	fine	-	B	0.24	Moderate	0.32	Moderate
209.9	31C	Jefferson sandy loam, 7 to 15 percent slopes	Farmland of statewide importance	11	-	-	No	Well drained	Well drained	fine	-	A	0.37	High	0.37	High
210	14D	Frederick-Poplimento loams, 15 to 25 percent slopes	Farmland of statewide importance	20	rass/herbaceous cov	Fame pasturelanc	No	Well drained	Well drained	fine	-	B	0.24	Moderate	0.32	Moderate
210.1	31C	Jefferson sandy loam, 7 to 15 percent slopes	Farmland of statewide importance	11	-	-	No	Well drained	Well drained	fine	-	A	0.37	High	0.37	High
210.2	31D	Myersville-Catoctin silt loams, 15 to 25 percent slopes, very stony	Farmland of statewide importance	20	-	-	No	Well drained	Well drained	fine	76	C	0.37	High	0.37	High
210.3	31E	Myersville-Catoctin silt loams, 25 to 65 percent slopes, very stony	Not prime farmland	45	-	-	No	Well drained	Well drained	fine	76	C	0.37	High	0.37	High
210.4	31C	Jefferson sandy loam, 7 to 15 percent slopes	Farmland of statewide importance	11	-	-	No	Well drained	Well drained	fine	-	A	0.37	High	0.37	High
210.5	31C	Jefferson sandy loam, 7 to 15 percent slopes	Farmland of statewide importance	11	-	-	No	Well drained	Well drained	fine	-	A	0.37	High	0.37	High
210.6	14D	Frederick-Poplimento loams, 15 to 25 percent slopes	Farmland of statewide importance	20	rass/herbaceous cov	Fame pasturelanc	No	Well drained	Well drained	fine	-	B	0.24	Moderate	0.32	Moderate
210.7	14C	Frederick-Poplimento loams, 7 to 15 percent slopes	Farmland of statewide importance	11	rass/herbaceous cov	Fame pasturelanc	No	Well drained	Well drained	fine	-	B	0.24	Moderate	0.32	Moderate
210.8	14C	Frederick-Poplimento loams, 7 to 15 percent slopes	Farmland of statewide importance	11	rass/herbaceous cov	Fame pasturelanc	No	Well drained	Well drained	fine	-	B	0.24	Moderate	0.32	Moderate
210.9	14C	Frederick-Poplimento loams, 7 to 15 percent slopes	Farmland of statewide importance	11	rass/herbaceous cov	Fame pasturelanc	No	Well drained	Well drained	fine	-	B	0.24	Moderate	0.32	Moderate
211	5D	Barkers Crossroads-Rhodhiss complex, 15 to 25 percent slopes	Not prime farmland	20	-	-	No	Well drained	Well drained	very-fine	-	C	0.37	High	0.37	High
211.1	7	Atkins fine sandy loam	Not prime farmland	2	-	-	Yes	Poorly drained	Poorly drained	not used	-	B/D	0.28	Moderate	0.28	Moderate
211.2	4B	Buchanan very stony sandy loam, 2 to 7 percent slopes	Not prime farmland	5	-	-	No	Somewhat poorly drained	Somewhat poorly drained	fine	-	C/D	0.17	Low	0.17	Low
211.3	14C	Frederick-Poplimento loams, 7 to 15 percent slopes	Farmland of statewide importance	11	rass/herbaceous cov	Fame pasturelanc	No	Well drained	Well drained	fine	-	B	0.24	Moderate	0.32	Moderate
211.4	6F	Berks-Weikert complex, 55 to 80 percent slopes	Not prime farmland	63	-	-	No	Well drained	Well drained	very-fine	41	B	0.37	High	0.37	High
211.5	17D	Endcav silt loam, 15 to 25 percent slopes	Farmland of statewide importance	20	-	-	No	Well drained	Well drained	fine-loamy	147	C	0.32	Moderate	0.32	Moderate
211.6	17D	Endcav silt loam, 15 to 25 percent slopes	Farmland of statewide importance	20	-	-	No	Well drained	Well drained	fine-loamy	147	C	0.32	Moderate	0.32	Moderate
211.7	17F	Elliber-Watahala complex, 35 to 55 percent slopes	Not prime farmland	45	-	-	No	Well drained	Well drained	fine-loamy	-	A	0.32	Moderate	0.32	Moderate
211.8	17D	Endcav silt loam, 15 to 25 percent slopes	Farmland of statewide importance	20	-	-	No	Well drained	Well drained	fine-loamy	147	C	0.32	Moderate	0.32	Moderate
211.9	17D	Endcav silt loam, 15 to 25 percent slopes	Farmland of statewide importance	20	-	-	No	Well drained	Well drained	fine-loamy	147	C	0.32	Moderate	0.32	Moderate
212	33D	Jefferson sandy loam, 15 to 35 percent slopes, very stony	Not prime farmland	25	-	-	No	Well drained	Well drained	fine	-	A	0.37	High	0.37	High
212.1	33D	Jefferson sandy loam, 15 to 35 percent slopes, very stony	Not prime farmland	25	-	-	No	Well drained	Well drained	fine	-	A	0.37	High	0.37	High
212.2	33D	Jefferson sandy loam, 15 to 35 percent slopes, very stony	Not prime farmland	25	-	-	No	Well drained	Well drained	fine	-	A	0.37	High	0.37	High
212.3	33D	Jefferson sandy loam, 15 to 35 percent slopes, very stony	Not prime farmland	25	-	-	No	Well drained	Well drained	fine	-	A	0.37	High	0.37	High
212.4	17F	Elliber-Watahala complex, 35 to 55 percent slopes	Not prime farmland	45	-	-	No	Well drained	Well drained	fine-loamy	-	A	0.32	Moderate	0.32	Moderate
212.5	14D	Frederick-Poplimento loams, 15 to 25 percent slopes	Farmland of statewide importance	20	rass/herbaceous cov	Fame pasturelanc	No	Well drained	Well drained	fine	-	B	0.24	Moderate	0.32	Moderate
212.6	14C	Frederick-Poplimento loams, 7 to 15 percent slopes	Farmland of statewide importance	11	rass/herbaceous cov	Fame pasturelanc	No	Well drained	Well drained	fine	-	B	0.24	Moderate	0.32	Moderate
212.7	14E	Dekalb channery sandy loam, 35 to 55 percent slopes, extremely stony	Not prime farmland	45	rass/herbaceous cov	Fame pasturelanc	No	Somewhat excessively drained	Somewhat excessively drained	fine	76	A	0.24	Moderate	0.32	Moderate
212.8	13E	Frankstown channery silt loam, 25 to 35 percent slopes	Not prime farmland	30	-	-	No	Well drained	Well drained	fine	-	B	0.37	High	0.37	High
212.9	14E	Dekalb channery sandy loam, 35 to 55 percent slopes, extremely stony	Not prime farmland	45	rass/herbaceous cov	Fame pasturelanc	No	Somewhat excessively drained	Somewhat excessively drained	fine	76	A	0.24	Moderate	0.32	Moderate
213	14E	Dekalb channery sandy loam, 35 to 55 percent slopes, extremely stony	Not prime farmland	45	rass/herbaceous cov	Fame pasturelanc	No	Somewhat excessively drained	Somewhat excessively drained	fine	76	A	0.24	Moderate	0.32	Moderate
213.1	14C	Frederick-Poplimento loams, 7 to 15 percent slopes	Farmland of statewide importance	11	rass/herbaceous cov	Fame pasturelanc	No	Well drained	Well drained	fine	-	B	0.24	Moderate	0.32	Moderate
213.2	14E	Dekalb channery sandy loam, 35 to 55 percent slopes, extremely stony	Not prime farmland	45	rass/herbaceous cov	Fame pasturelanc	No	Somewhat excessively drained	Somewhat excessively drained	fine	76	A	0.24	Moderate	0.32	Moderate
213.3	14E	Dekalb channery sandy loam, 35 to 55 percent slopes, extremely stony	Not prime farmland	45	rass/herbaceous cov	Fame pasturelanc	No	Somewhat excessively drained	Somewhat excessively drained	fine	76	A	0.24	Moderate	0.32	Moderate
213.4	14C	Frederick-Poplimento loams, 7 to 15 percent slopes	Farmland of statewide importance	11	rass/herbaceous cov	Fame pasturelanc	No	Well drained	Well drained	fine	-	B	0.24	Moderate	0.32	Moderate
213.5	14E	Dekalb channery sandy loam, 35 to 55 percent slopes, extremely stony	Not prime farmland	45	rass/herbaceous cov	Fame pasturelanc	No	Somewhat excessively drained	Somewhat excessively drained	fine	76	A	0.24	Moderate	0.32	Moderate
213.6	14E	Dekalb channery sandy loam, 35 to 55 percent slopes, extremely stony	Not prime farmland	45	rass/herbaceous cov	Fame pasturelanc	No	Somewhat excessively drained	Somewhat excessively drained	fine	76	A	0.24	Moderate	0.32	Moderate
213.7	14D	Frederick-Poplimento loams, 15 to 25 percent slopes	Farmland of statewide importance	20	rass/herbaceous cov	Fame pasturelanc	No	Well drained	Well drained	fine	-	B	0.24	Moderate	0.32	Moderate
213.8	14C	Frederick-Poplimento loams, 7 to 15 percent slopes	Farmland of statewide importance	11	rass/herbaceous cov	Fame pasturelanc	No	Well drained	Well drained	fine	-	B	0.24	Moderate	0.32	Moderate
213.9	14E	Dekalb channery sandy loam, 35 to 55 percent slopes, extremely stony	Not prime farmland	45	rass/herbaceous cov	Fame pasturelanc	No	Somewhat excessively drained	Somewhat excessively drained	fine	76	A	0.24	Moderate	0.32	Moderate
214	14E	Dekalb channery sandy loam, 35 to 55 percent slopes, extremely stony	Not prime farmland	45	rass/herbaceous cov	Fame pasturelanc	No	Somewhat excessively drained	Somewhat excessively drained	fine	76	A	0.24	Moderate	0.32	Moderate
214.1	14D	Frederick-Poplimento loams, 15 to 25 percent slopes	Farmland of statewide importance	20	rass/herbaceous cov	Fame pasturelanc	No	Well drained	Well drained	fine	-	B	0.24	Moderate	0.32	Moderate
214.2	14E	Dekalb channery sandy loam, 35 to 55 percent slopes, extremely stony	Not prime farmland	45	rass/herbaceous cov	Fame pasturelanc	No	Somewhat excessively drained	Somewhat excessively drained	fine	76	A	0.24	Moderate	0.32	Moderate
214.3	14E	Dekalb channery sandy loam, 35 to 55 percent slopes, extremely stony	Not prime farmland	45	rass/herbaceous cov	Fame pasturelanc	No	Somewhat excessively drained	Somewhat excessively drained	fine	76	A	0.24	Moderate	0.32	Moderate
214.4	14C	Frederick-Poplimento loams, 7 to 15 percent slopes	Farmland of statewide importance	11	rass/herbaceous cov	Fame pasturelanc	No	Well drained	Well drained	fine	-	B	0.24	Moderate	0.32	Moderate
214.5	14C	Frederick-Poplimento loams, 7 to 15 percent slopes	Farmland of statewide importance	11	rass/herbaceous cov	Fame pasturelanc	No	Well drained	Well drained	fine	-	B	0.24	Moderate	0.32	Moderate
214.6	14D	Frederick-Poplimento loams, 15 to 25 percent slopes	Farmland of statewide importance	20	rass/herbaceous cov	Fame pasturelanc	No	Well drained	Well drained	fine	-	B	0.24	Moderate	0.32	Moderate
214.7	14E	Dekalb channery sandy loam, 35 to 55 percent slopes, extremely stony	Not prime farmland	45	rass/herbaceous cov	Fame pasturelanc	No	Somewhat excessively drained	Somewhat excessively drained	fine	76	A	0.24	Moderate	0.32	Moderate
214.8	14D	Frederick-Poplimento loams, 15 to 25 percent slopes	Farmland of statewide importance	20	rass/herbaceous cov	Fame pasturelanc	No	Well drained	Well drained	fine	-	B	0.24	Moderate	0.32	Moderate
214.9	14D	Frederick-Poplimento loams, 15 to 25 percent slopes	Farmland of statewide importance	20	rass/herbaceous cov	Fame pasturelanc	No	Well drained	Well drained	fine	-	B	0.24	Moderate	0.32	Moderate
215	14C	Frederick-Poplimento loams, 7 to 15 percent slopes	Farmland of statewide importance	11	rass/herbaceous cov	Fame pasturelanc	No	Well drained	Well drained	fine	-	B	0.24	Moderate	0.32	Moderate
215.1	14D	Frederick-Poplimento loams, 15 to 25 percent slopes	Farmland of statewide importance	20	rass/herbaceous cov	Fame pasturelanc	No	Well drained	Well drained	fine	-	B	0.24	Moderate	0.32	Moderate
215.2	14C	Frederick-Poplimento loams, 7 to 15 percent slopes	Farmland of statewide importance	11	rass/herbaceous cov	Fame pasturelanc	No	Well drained	Well drained	fine	-	B	0.24	Moderate	0.32	Moderate
215.3	14C	Frederick-Poplimento loams, 7 to 15 percent slopes	Farmland of statewide importance	11	rass/herbaceous cov	Fame pasturelanc	No	Well drained	Well drained	fine	-	B	0.24	Moderate	0.32	Moderate
215.4	14D	Frederick-Poplimento loams, 15 to 25 percent slopes	Farmland of statewide importance	20	rass/herbaceous cov	Fame pasturelanc	No	Well drained	Well drained	fine	-	B	0.24	Moderate	0.32	Moderate
215.5	14D	Frederick-Poplimento loams, 15 to 25 percent slopes	Farmland of statewide importance	20	rass/herbaceous cov	Fame pasturelanc	No	Well drained	Well drained	fine	-	B	0.24	Moderate	0.32	Moderate
215.6	4C	Buchanan very stony sandy loam, 7 to 15 percent slopes	Not prime farmland	11	-	-	No	Somewhat poorly drained	Somewhat poorly drained	fine	-	C/D	0.2	Low	0.2	Low
215.7	14D	Frederick-Poplimento loams, 15 to 25 percent slopes	Farmland of statewide importance	20	rass/herbaceous cov	Fame pasturelanc	No	Well drained	Well drained	fine	-	B	0.24	Moderate	0.32	Moderate
215.8	30D	Tankerville and Philomont soils, 15 to 25 percent slopes	Farmland of statewide importance	20	-	-	No	Well drained	Well drained	fine-loamy	89	B	0.1	Low	0.17	Low
215.9	14C	Frederick-Poplimento loams, 7 to 15 percent slopes	Farmland of statewide importance	11	rass/herbaceous cov	Fame pasturelanc	No	Well drained	Well drained	fine	-	B	0.24	Moderate	0.32	Moderate

216	14C	Frederick-Poplimento loams, 7 to 15 percent slopes	Farmland of statewide importance	11	rass/herbaceous cowFame pasturelanc		No	Well drained	Well drained	fine	-	B	0.24	Moderate	0.32	Moderate
216.1	6F	Berks-Weikert complex, 55 to 80 percent slopes	Not prime farmland	63	-	-	No	Well drained	Well drained	very-fine	41	B	0.37	High	0.37	High
216.2	6F	Berks-Weikert complex, 55 to 80 percent slopes	Not prime farmland	63	-	-	No	Well drained	Well drained	very-fine	41	B	0.37	High	0.37	High
216.3	30D	Tankerville and Philomont soils, 15 to 25 percent slopes	Farmland of statewide importance	20	-	-	No	Well drained	Well drained	fine-loamy	89	B	0.1	Low	0.17	Low
216.4	30D	Tankerville and Philomont soils, 15 to 25 percent slopes	Farmland of statewide importance	20	-	-	No	Well drained	Well drained	fine-loamy	89	B	0.1	Low	0.17	Low
216.5	31C	Jefferson sandy loam, 7 to 15 percent slopes	Farmland of statewide importance	11	-	-	No	Well drained	Well drained	fine	-	A	0.37	High	0.37	High
216.6	30D	Tankerville and Philomont soils, 15 to 25 percent slopes	Farmland of statewide importance	20	-	-	No	Well drained	Well drained	fine-loamy	89	B	0.1	Low	0.17	Low
216.7	18D	Gainesboro-Lehew complex, 15 to 25 percent slopes	Not prime farmland	20	-	-	No	Well drained	Well drained	fine-loamy	81	B	0.32	Moderate	0.32	Moderate
216.8	18D	Gainesboro-Lehew complex, 15 to 25 percent slopes	Not prime farmland	20	-	-	No	Well drained	Well drained	fine-loamy	81	B	0.32	Moderate	0.32	Moderate
216.9	18F	Matewan-Gilpin-Rock outcrop complex, 55 to 80 percent slopes, extremely s	Not prime farmland	70	-	-	No	Well drained	Well drained	fine-loamy	89	A	0.32	Moderate	0.32	Moderate
217	30F	Macove channery silt loam, cool, 35 to 55 percent slopes, very stony	Not prime farmland	45	-	-	No	Well drained	Well drained	fine-loamy	-	A	0.1	Low	0.17	Low
217.1	27E	Gilpin channery silt loam, 25 to 35 percent slopes, stony	Not prime farmland	30	-	-	No	Well drained	Well drained	loamy-skeletal	66	C	0.1	Low	0.2	Low
217.2	19C	Gilpin channery loam, 7 to 15 percent slopes	Not prime farmland	11	rass/herbaceous cowFame pasturelanc		No	Well drained	Well drained	fine	94	C	0.37	High	0.37	High
217.3	27E	Gilpin channery silt loam, 25 to 35 percent slopes, stony	Not prime farmland	30	-	-	No	Well drained	Well drained	loamy-skeletal	66	C	0.1	Low	0.2	Low
217.4	19D	Laidig channery loam, 8 to 25 percent slopes	Not prime farmland	17	rass/herbaceous cowFame pasturelanc		No	Well drained	Well drained	fine	-	B	0.17	Low	0.17	Low
217.5	19C	Gilpin channery loam, 7 to 15 percent slopes	Not prime farmland	11	rass/herbaceous cowFame pasturelanc		No	Well drained	Well drained	fine	94	C	0.37	High	0.37	High
217.6	27E	Gilpin channery silt loam, 25 to 35 percent slopes, stony	Not prime farmland	30	-	-	No	Well drained	Well drained	loamy-skeletal	66	C	0.1	Low	0.2	Low
217.7	19D	Laidig channery loam, 8 to 25 percent slopes	Not prime farmland	17	rass/herbaceous cowFame pasturelanc		No	Well drained	Well drained	fine	-	B	0.17	Low	0.17	Low
217.8	19D	Laidig channery loam, 8 to 25 percent slopes	Not prime farmland	17	rass/herbaceous cowFame pasturelanc		No	Well drained	Well drained	fine	-	B	0.17	Low	0.17	Low
217.9	19D	Laidig channery loam, 8 to 25 percent slopes	Not prime farmland	17	rass/herbaceous cowFame pasturelanc		No	Well drained	Well drained	fine	-	B	0.17	Low	0.17	Low
218	27E	Gilpin channery silt loam, 25 to 35 percent slopes, stony	Not prime farmland	30	-	-	No	Well drained	Well drained	loamy-skeletal	66	C	0.1	Low	0.2	Low
218.1	6E	Barkers Crossroads-Rhodhiss-Rock outcrop complex, 25 to 45 percent slopes	Not prime farmland	40	-	-	No	Well drained	Well drained	loamy-skeletal	-	C	<Null>	High	<Null>	High
218.2	6E	Barkers Crossroads-Rhodhiss-Rock outcrop complex, 25 to 45 percent slopes	Not prime farmland	40	-	-	No	Well drained	Well drained	loamy-skeletal	-	C	<Null>	High	<Null>	High
218.3	6E	Barkers Crossroads-Rhodhiss-Rock outcrop complex, 25 to 45 percent slopes	Not prime farmland	40	-	-	No	Well drained	Well drained	loamy-skeletal	-	C	<Null>	High	<Null>	High
218.4	6G	Berks-Culleoka complex, 35 to 70 percent slopes	Not prime farmland	53	-	-	No	Well drained	Well drained	fine-loamy	69	B	0.17	Low	0.28	Moderate
218.5	10G	Calvin-Rough complex, 35 to 70 percent slopes, very stony	Not prime farmland	53	-	-	No	Well drained	Well drained	loamy-skeletal	20	B	0.17	Low	0.49	High
218.6	4E	Ashe loam, 25 to 45 percent slopes	Not prime farmland	35	-	-	No	Somewhat excessively drained	Somewhat excessively drained	loamy-skeletal	61	B	0.2	Low	0.43	High
218.7	24D	Gainesboro-Berks complex, 15 to 25 percent slopes	Not prime farmland	20	-	-	No	Well drained	Well drained	fine-loamy	76	B	0.2	Low	0.32	Moderate
218.8	24D	Gainesboro-Berks complex, 15 to 25 percent slopes	Not prime farmland	20	-	-	No	Well drained	Well drained	fine-loamy	76	B	0.2	Low	0.32	Moderate
218.9	24D	Gainesboro-Berks complex, 15 to 25 percent slopes	Not prime farmland	20	-	-	No	Well drained	Well drained	fine-loamy	76	B	0.2	Low	0.32	Moderate
219	24D	Gainesboro-Berks complex, 15 to 25 percent slopes	Not prime farmland	20	-	-	No	Well drained	Well drained	fine-loamy	76	B	0.2	Low	0.32	Moderate
219.1	24D	Gainesboro-Berks complex, 15 to 25 percent slopes	Not prime farmland	20	-	-	No	Well drained	Well drained	fine-loamy	76	B	0.2	Low	0.32	Moderate
219.2	24D	Gainesboro-Berks complex, 15 to 25 percent slopes	Not prime farmland	20	-	-	No	Well drained	Well drained	fine-loamy	76	B	0.2	Low	0.32	Moderate
219.3	23C	Hazleton very stony sandy loam, 7 to 15 percent slopes	Not prime farmland	11	-	-	No	Well drained	Well drained	fine-loamy	200	A	0.17	Low	0.28	Moderate
219.4	24D	Gainesboro-Berks complex, 15 to 25 percent slopes	Not prime farmland	20	-	-	No	Well drained	Well drained	fine-loamy	76	B	0.2	Low	0.32	Moderate
219.5	10	Craigsville cobbly sandy loam	Not prime farmland	3	-	-	No	Well drained	Well drained	loamy-skeletal	-	A	0.05	Low	0.15	Low
219.6	6E	Barkers Crossroads-Rhodhiss-Rock outcrop complex, 25 to 45 percent slopes	Not prime farmland	40	-	-	No	Well drained	Well drained	loamy-skeletal	-	C	0.2	Low	0.43	High
219.7	6E	Barkers Crossroads-Rhodhiss-Rock outcrop complex, 25 to 45 percent slopes	Not prime farmland	40	-	-	No	Well drained	Well drained	loamy-skeletal	-	C	0.2	Low	0.43	High
219.8	6E	Barkers Crossroads-Rhodhiss-Rock outcrop complex, 25 to 45 percent slopes	Not prime farmland	40	-	-	No	Well drained	Well drained	loamy-skeletal	-	C	0.2	Low	0.43	High
219.9	6E	Barkers Crossroads-Rhodhiss-Rock outcrop complex, 25 to 45 percent slopes	Not prime farmland	40	-	-	No	Well drained	Well drained	loamy-skeletal	-	C	0.2	Low	0.43	High
220	5D	Barkers Crossroads-Rhodhiss complex, 15 to 25 percent slopes	Not prime farmland	20	-	-	No	Well drained	Well drained	loamy-skeletal	-	C	0.17	Low	0.37	High
220.1	6E	Barkers Crossroads-Rhodhiss-Rock outcrop complex, 25 to 45 percent slopes	Not prime farmland	40	-	-	No	Well drained	Well drained	loamy-skeletal	-	C	0.2	Low	0.43	High
220.2	6E	Barkers Crossroads-Rhodhiss-Rock outcrop complex, 25 to 45 percent slopes	Not prime farmland	40	-	-	No	Well drained	Well drained	loamy-skeletal	-	C	0.2	Low	0.43	High
220.3	6E	Barkers Crossroads-Rhodhiss-Rock outcrop complex, 25 to 45 percent slopes	Not prime farmland	40	-	-	No	Well drained	Well drained	loamy-skeletal	-	C	0.2	Low	0.43	High
220.4	6E	Barkers Crossroads-Rhodhiss-Rock outcrop complex, 25 to 45 percent slopes	Not prime farmland	40	-	-	No	Well drained	Well drained	loamy-skeletal	-	C	0.2	Low	0.43	High
220.5	6E	Barkers Crossroads-Rhodhiss-Rock outcrop complex, 25 to 45 percent slopes	Not prime farmland	40	-	-	No	Well drained	Well drained	loamy-skeletal	-	C	0.2	Low	0.43	High
220.6	6E	Barkers Crossroads-Rhodhiss-Rock outcrop complex, 25 to 45 percent slopes	Not prime farmland	40	-	-	No	Well drained	Well drained	loamy-skeletal	-	C	0.2	Low	0.43	High
220.7	7D	Cataska-Cardiff slaty loams, 15 to 45 percent slopes	Not prime farmland	30	-	-	No	Excessively drained	Well drained	loamy-skeletal	75	D	0.2	Low	0.43	High
220.8	7D	Cataska-Cardiff slaty loams, 15 to 45 percent slopes	Not prime farmland	30	-	-	No	Excessively drained	Well drained	loamy-skeletal	75	D	0.2	Low	0.43	High
220.9	7D	Cataska-Cardiff slaty loams, 15 to 45 percent slopes	Not prime farmland	30	-	-	No	Excessively drained	Well drained	loamy-skeletal	75	D	0.2	Low	0.43	High
221	7D	Cataska-Cardiff slaty loams, 15 to 45 percent slopes	Not prime farmland	30	-	-	No	Excessively drained	Well drained	loamy-skeletal	75	D	0.2	Low	0.43	High
221.1	6E	Barkers Crossroads-Rhodhiss-Rock outcrop complex, 25 to 45 percent slopes	Not prime farmland	40	-	-	No	Well drained	Well drained	loamy-skeletal	-	C	0.2	Low	0.43	High
221.2	6E	Barkers Crossroads-Rhodhiss-Rock outcrop complex, 25 to 45 percent slopes	Not prime farmland	40	-	-	No	Well drained	Well drained	loamy-skeletal	-	C	0.2	Low	0.43	High
221.3	6E	Barkers Crossroads-Rhodhiss-Rock outcrop complex, 25 to 45 percent slopes	Not prime farmland	40	-	-	No	Well drained	Well drained	loamy-skeletal	-	C	0.2	Low	0.43	High
221.4	1C	Berks channery silt loam, 8 to 15 percent slopes	Not prime farmland	12	-	-	No	Well drained	Well drained	loamy-skeletal	91	B	0.2	Low	0.43	High
221.5	1C	Berks channery silt loam, 8 to 15 percent slopes	Not prime farmland	12	-	-	No	Well drained	Well drained	loamy-skeletal	91	B	0.2	Low	0.43	High
221.6	1C	Berks channery silt loam, 8 to 15 percent slopes	Not prime farmland	12	-	-	No	Well drained	Well drained	loamy-skeletal	91	B	0.2	Low	0.43	High
221.7	5D	Barkers Crossroads-Rhodhiss complex, 15 to 25 percent slopes	Not prime farmland	20	-	-	No	Well drained	Well drained	loamy-skeletal	-	C	0.17	Low	0.37	High
221.8	16E	Cataska channery silt loam, 15 to 45 percent slopes	Not prime farmland	30	-	-	No	Excessively drained	Excessively drained	fine	43	D	0.32	Moderate	0.32	Moderate
221.9	10	Craigsville cobbly sandy loam	Not prime farmland	3	-	-	No	Well drained	Well drained	loamy-skeletal	-	A	0.05	Low	0.15	Low
222	6E	Barkers Crossroads-Rhodhiss-Rock outcrop complex, 25 to 45 percent slopes	Not prime farmland	40	-	-	No	Well drained	Well drained	loamy-skeletal	-	C	0.2	Low	0.43	High
222.1	16E	Cataska channery silt loam, 15 to 45 percent slopes	Not prime farmland	30	-	-	No	Excessively drained	Excessively drained	fine	43	D	0.32	Moderate	0.32	Moderate
222.2	12C	Chilhowie silty clay loam, 7 to 15 percent slopes, rocky	Not prime farmland	11	-	-	No	Well drained	Well drained	fine	89	D	0.37	High	0.37	High
222.3	6E	Barkers Crossroads-Rhodhiss-Rock outcrop complex, 25 to 45 percent slopes	Not prime farmland	40	-	-	No	Well drained	Well drained	loamy-skeletal	-	C	0.2	Low	0.43	High
222.4	1D	Craigsville cobbly sandy loam	Not prime farmland	3	-	-	No	Well drained	Well drained	loamy-skeletal	-	A	0.05	Low	0.15	Low
222.5	8E	Cataska channery silt loam, 25 to 65 percent slopes	Not prime farmland	45	-	-	No	Excessively drained	Excessively drained	clayey	43	D	0.37	High	0.37	High
222.6	12C	Chilhowie silty clay loam, 7 to 15 percent slopes, rocky	Not prime farmland	11	-	-	No	Well drained	Well drained	fine	89	D	0.37	High	0.37	High
222.7	13D	Frankstown channery silt loam, 15 to 25 percent slopes	Farmland of statewide importance	20	-	-	No	Well drained	Well drained	fine	-	B	0.24	Moderate	0.24	Moderate
222.8	11B	Clymer channery loam, 3 to 15 percent slopes	Farmland of statewide importance	9	-	-	No	Well drained	Well drained	fine-loamy	-	B	0.28	Moderate	0.28	Moderate
222.9	16E	Cataska channery silt loam, 15 to 45 percent slopes	Not prime farmland	30	-	-	No	Excessively drained	Excessively drained	fine	43	D	0.32	Moderate	0.32	Moderate
223	13C	Frankstown channery silt loam, 7 to 15 percent slopes	Farmland of statewide importance	11	-	-	No	Well drained	Well drained	fine	-	B	0.24	Moderate	0.37	High
223.1	16E	Cataska channery silt loam, 15 to 45 percent slopes	Not prime farmland	30	-	-	No	Excessively drained	Excessively drained	fine	43	D	0.32	Moderate	0.32	Moderate
223.2	16E	Cataska channery silt loam, 15 to 45 percent slopes	Not prime farmland	30	-	-	No	Excessively drained	Excessively drained	fine	43	D	0.32	Moderate	0.32	Moderate
223.3	12B	Rohrersville cobbly silt loam, 0 to 7 percent slopes, occasionally flooded	Farmland of statewide importance	4	-	-	No	Somewhat poorly drained	Somewhat poorly drained	fine	-	C/D	0.37	High	0.37	High
223.4	8E	Cataska channery silt loam, 25 to 65 percent slopes	Not prime farmland	45	-	-	No	Excessively drained	Excessively drained	clayey	43	D	0.37	High	0.37	High
223.5	8D	Catoctin-Myersville complex, 15 to 45 percent slopes	Not prime farmland	30	-	-	No	Well drained	Well drained	clayey	76	B	0.37	High	0.37	High
223.6	8D	Catoctin-Myersville complex, 15 to 45 percent slopes	Not prime farmland	30	-	-	No	Well drained	Well drained	clayey	76	B	0.37	High	0.37	High
223.7	8D	Catoctin-Myersville complex, 15 to 45 percent slopes	Not prime farmland	30	-	-	No	Well drained	Well drained	clayey	76	B	0.37	High	0.37	High
223.8	12C	Chilhowie silty clay loam, 7 to 15 percent slopes, rocky	Not prime farmland	11	-	-	No	Well drained	Well drained	fine	89	D	0.37	High	0.37	High
223.9	8D	Catoctin-Myersville complex, 15 to 45 percent slopes	Not prime farmland	30	-	-	No	Well drained	Well drained	clayey	76	B	0.37	High	0.37	High
224	8D	Catoctin-Myersville complex, 15 to 45 percent slopes	Not prime farmland	30	-	-	No	Well drained	Well drained	clayey	76	B	0.37	High	0.37	High
224.1	16E	Cataska channery silt loam, 15 to 45 percent slopes	Not prime farmland	30	-	-	No	Excessively drained	Excessively drained	fine	43	D	0.32	Moderate	0.32	Moderate
224.2	17C	Frederick-Poplimento-Rock outcrop complex, 2 to 15 percent slopes	Not prime farmland	9	-	-	No	Well drained	Well drained	fine	0	B	0.24	Moderate	0.24	Moderate
224.3	17C	Frederick-Poplimento-Rock outcrop complex, 2 to 15 percent slopes	Not prime farmland	9	-	-	No	Well drained	Well drained	fine	0	B	0.24	Moderate	0.24	Moderate
224.4	13D	Frankstown channery silt loam, 15 to 25 percent slopes	Farmland of statewide importance	20	-	-	No	Well drained	Well drained	fine	-	B	0.24	Moderate	0.24	Moderate
224.5	16E	Cataska channery silt loam, 15 to 45 percent slopes	Not prime farmland	30	-	-	No	Excessively drained	Excessively drained	fine	43	D	0.32	Moderate	0.32	Moderate
224.6	8D	Catoctin-Myersville complex, 15 to 45 percent slopes	Not prime farmland	30	-	-	No	Well drained	Well drained	clayey	76	B	0.37	High	0.37	High
224.7	8D	Catoctin-Myersville complex, 15 to 45 percent slopes	Not prime farmland	30	-	-	No	Well drained	Well drained	clayey	76	B	0.37	High	0.37	High
224.8	8D	Catoctin-Myersville complex, 15 to 45 percent slopes	Not prime farmland	30	-	-	No	Well drained	Well drained	clayey	76	B	0.37	High	0.37	High
224.9	8D	Catoctin-Myersville complex, 15 to 45 percent slopes	Not prime farmland	30	-	-	No	Well drained	Well drained	clayey	76	B	0.37	High	0.37	High
225	8D	Catoctin-Myersville complex, 15 to 45 percent slopes	Not prime farmland	30	-	-	No	Well drained	Well drained	clayey	76	B	0.37	High	0.37	High
225.1	8D	Catoctin-Myersville complex, 15 to 45 percent slopes	Not prime farmland	30	-	-	No	Well drained	Well drained	clayey	76	B	0.37	High	0.37	High
225.2	8D	Catoctin-Myersville complex, 15 to 45 percent slopes	Not prime farmland	30	-	-	No	Well drained	Well drained	clayey	76	B	0.37	High	0.37	High
225.3	8E	Cataska channery silt loam, 25 to 65 percent slopes	Not prime farmland	45	-	-	No	Excessively drained	Excessively drained	clayey	43	D	0.37	High	0.37	High
225.4	8D	Catoctin-Myersville complex, 15 to 45 percent slopes	Not prime farmland	30	-	-	No	Well drained	Well drained	clayey	76	B	0.37	High	0.37	High
225.5	8D	Catoctin-Myersville complex, 15 to 45 percent slopes	Not prime farmland	30	-	-	No	Well drained	Well drained	clayey	76	B	0.37	High	0.37	High
225.6	13C	Frankstown channery silt loam, 7 to 15 percent slopes	Farmland of statewide importance	11	-	-	No	Well drained	Well drained	fine	-	B	0.24	Moderate	0.37	High
225.7	13C	Frankstown channery silt loam, 7 to 15 percent slopes	Farmland of statewide importance	11	-	-	No	Well drained	Well drained	fine	-	B	0.24	Moderate	0.37	High
225.8	16D	Frederick-Poplimento loams, very rocky, 15 to 25 percent slopes	Not prime farmland	20	-	-	No	Well drained	Well drained	fine	-	B	0.43	High	0.43	High
225.9	17C	Frederick-Poplimento-Rock outcrop complex, 2 to 15 percent slopes	Not prime farmland	9	-	-	No	Well drained	Well drained	fine	0	B	0.24	Moderate	0.24	Moderate
226	17C	Frederick-Poplimento-Rock outcrop complex, 2 to 15 percent slopes	Not prime farmland	9	-	-	No	Well drained	Well drained	fine	0	B	0.24	Moderate	0.24	Moderate
226.1	17C	Frederick-Poplimento-Rock outcrop complex, 2 to 15 percent slopes	Not prime farmland	9	-	-	No	Well drained	Well drained	fine	0	B	0.24	Moderate	0.24	Moderate
226.2	17C	Frederick-Poplimento-Rock outcrop complex, 2 to 15 percent slopes	Not prime farmland	9	-	-	No	Well drained	Well drained	fine	0	B	0.24	Moderate	0.24	Moderate
226.3	8E	Cataska channery silt loam, 25 to 65 percent slopes	Not prime farmland	45	-	-	No	Excessively drained	Excessively drained	clayey	43	D	0.37	High	0.37	High
226.4	8E	Cataska channery silt loam, 25 to 65 percent slopes	Not prime farmland	45	-	-	No	Excessively drained	Excessively drained	clayey	43	D	0.37	High	0.37	High
226.5	17C	Frederick-Poplimento-Rock outcrop complex, 2 to 15 percent slopes	Not prime farmland	9	-	-	No	Well drained	Well drained	fine	0	B	0.24	Moderate	0.24	Moderate
226.6	17C	Frederick-Poplimento-Rock outcrop complex, 2 to 15 percent slopes	Not prime farmland	9	-	-	No	Well drained	Well drained	fine	0	B	0.24	Moderate	0.24	Moderate

226.7	17C	Frederick-Poplimento-Rock outcrop complex, 2 to 15 percent slopes	Not prime farmland	9	-	-	No	Well drained	Well drained	fine	0	B	0.24	Moderate	0.24	Moderate
226.8	13D	Frankstown channery silt loam, 15 to 25 percent slopes	Farmland of statewide importance	20	-	-	No	Well drained	Well drained	fine	-	B	0.24	Moderate	0.24	Moderate
226.9	9C	Clearbrook channery silt loam, 7 to 15 percent slopes	Not prime farmland	11	-	-	No	Somewhat poorly drained	Somewhat poorly drained	very-fine	69	C/D	0.37	High	0.37	High
227	9C	Clearbrook channery silt loam, 7 to 15 percent slopes	Not prime farmland	11	-	-	No	Somewhat poorly drained	Somewhat poorly drained	very-fine	69	C/D	0.37	High	0.37	High
227.1	19B	Hawksbill cobbly loam, 2 to 7 percent slopes, occasionally flooded	Not prime farmland	5	-	-	No	Well drained	Well drained	fine	-	B	0.32	Moderate	0.32	Moderate
227.2	25	Pamlico and Portsmouth soils	Not prime farmland	1	-	-	No	Very poorly drained	Very poorly drained	fine	-	A/D	0.43	High	0.43	High
227.3	28	Lobdell silt loam	All areas are prime farmland	2	-	-	No	Moderately well drained	Moderately well drained	fine-loamy	-	C	0.37	High	0.37	High
227.4	33	Newark silt loam, 0 to 2 percent slopes, frequently flooded	Farmland of statewide importance	1	-	-	Yes	Somewhat poorly drained	Somewhat poorly drained	fine	-	B/D	0.37	High	0.37	High
227.5	9C	Clearbrook channery silt loam, 7 to 15 percent slopes	Not prime farmland	11	-	-	No	Somewhat poorly drained	Somewhat poorly drained	very-fine	69	C/D	0.37	High	0.37	High
227.6	8E	Cataska channery silt loam, 25 to 65 percent slopes	Not prime farmland	45	-	-	No	Excessively drained	Excessively drained	clayey	43	D	0.37	High	0.37	High
227.7	8E	Cataska channery silt loam, 25 to 65 percent slopes	Not prime farmland	45	-	-	No	Excessively drained	Excessively drained	clayey	43	D	0.37	High	0.37	High
227.8	3E	Blocktown-Yellowbottom complex, 25 to 45 percent slopes	Not prime farmland	32	-	-	No	Well drained	Well drained	loamy-skeletal	36	D	0.2	Low	0.43	High
227.9	3E	Blocktown-Yellowbottom complex, 25 to 45 percent slopes	Not prime farmland	32	-	-	No	Well drained	Well drained	loamy-skeletal	36	D	0.2	Low	0.43	High
228	34E	Myersville-Catoctin complex, 35 to 55 percent slopes, very stony	Not prime farmland	45	-	-	No	Well drained	Well drained	loamy-skeletal	91	B	0.2	Low	0.37	High
228.1	34E	Myersville-Catoctin complex, 35 to 55 percent slopes, very stony	Not prime farmland	45	-	-	No	Well drained	Well drained	loamy-skeletal	91	B	0.2	Low	0.37	High
228.2	6E	Barkers Crossroads-Rhodhiss-Rock outcrop complex, 25 to 45 percent slopes	Not prime farmland	40	-	-	No	Well drained	Well drained	loamy-skeletal	-	C	0.2	Low	0.43	High
228.3	4E	Ashe loam, 25 to 45 percent slopes	Not prime farmland	35	-	-	No	Somewhat excessively drained	Somewhat excessively drained	loamy-skeletal	61	B	0.2	Low	0.43	High
228.4	7D	Cataska-Cardiff slaty loams, 15 to 45 percent slopes	Not prime farmland	30	-	-	No	Excessively drained	Well drained	loamy-skeletal	75	D	0.2	Low	0.43	High
228.5	24D	Gainesboro-Berks complex, 15 to 25 percent slopes	Not prime farmland	20	-	-	No	Well drained	Well drained	fine-loamy	76	B	0.2	Low	0.32	Moderate
228.6	24D	Gainesboro-Berks complex, 15 to 25 percent slopes	Not prime farmland	20	-	-	No	Well drained	Well drained	fine-loamy	76	B	0.2	Low	0.32	Moderate
228.7	24D	Gainesboro-Berks complex, 15 to 25 percent slopes	Not prime farmland	20	-	-	No	Well drained	Well drained	fine-loamy	76	B	0.2	Low	0.32	Moderate
228.8	24D	Gainesboro-Berks complex, 15 to 25 percent slopes	Not prime farmland	20	-	-	No	Well drained	Well drained	fine-loamy	76	B	0.2	Low	0.32	Moderate
228.9	24D	Gainesboro-Berks complex, 15 to 25 percent slopes	Not prime farmland	20	-	-	No	Well drained	Well drained	fine-loamy	76	B	0.2	Low	0.32	Moderate
229	24D	Gainesboro-Berks complex, 15 to 25 percent slopes	Not prime farmland	20	-	-	No	Well drained	Well drained	fine-loamy	76	B	0.2	Low	0.32	Moderate
229.1	6E	Barkers Crossroads-Rhodhiss-Rock outcrop complex, 25 to 45 percent slopes	Not prime farmland	40	-	-	No	Well drained	Well drained	loamy-skeletal	-	C	0.2	Low	0.43	High
229.2	6E	Barkers Crossroads-Rhodhiss-Rock outcrop complex, 25 to 45 percent slopes	Not prime farmland	40	-	-	No	Well drained	Well drained	loamy-skeletal	-	C	0.2	Low	0.43	High
229.3	6E	Barkers Crossroads-Rhodhiss-Rock outcrop complex, 25 to 45 percent slopes	Not prime farmland	40	-	-	No	Well drained	Well drained	loamy-skeletal	-	C	0.2	Low	0.43	High
229.4	6E	Barkers Crossroads-Rhodhiss-Rock outcrop complex, 25 to 45 percent slopes	Not prime farmland	40	-	-	No	Well drained	Well drained	loamy-skeletal	-	C	0.2	Low	0.43	High
229.5	1C	Berks channery silt loam, 8 to 15 percent slopes	Not prime farmland	12	-	-	No	Well drained	Well drained	loamy-skeletal	91	B	0.2	Low	0.43	High
229.6	1C	Berks channery silt loam, 8 to 15 percent slopes	Not prime farmland	12	-	-	No	Well drained	Well drained	loamy-skeletal	91	B	0.2	Low	0.43	High
229.7	23C	Hazleton very stony sandy loam, 7 to 15 percent slopes	Not prime farmland	11	-	-	No	Well drained	Well drained	fine-loamy	200	A	0.17	Low	0.28	Moderate
229.8	5D	Barkers Crossroads-Rhodhiss complex, 15 to 25 percent slopes	Not prime farmland	20	-	-	No	Well drained	Well drained	loamy-skeletal	-	C	0.17	Low	0.37	High
229.9	1C	Berks channery silt loam, 8 to 15 percent slopes	Not prime farmland	12	-	-	No	Well drained	Well drained	loamy-skeletal	91	B	0.2	Low	0.43	High
230	5D	Barkers Crossroads-Rhodhiss complex, 15 to 25 percent slopes	Not prime farmland	20	-	-	No	Well drained	Well drained	loamy-skeletal	-	C	0.17	Low	0.37	High
230.1	6E	Barkers Crossroads-Rhodhiss-Rock outcrop complex, 25 to 45 percent slopes	Not prime farmland	40	-	-	No	Well drained	Well drained	loamy-skeletal	-	C	0.2	Low	0.43	High
230.2	6E	Barkers Crossroads-Rhodhiss-Rock outcrop complex, 25 to 45 percent slopes	Not prime farmland	40	-	-	No	Well drained	Well drained	loamy-skeletal	-	C	0.2	Low	0.43	High
230.3	6E	Barkers Crossroads-Rhodhiss-Rock outcrop complex, 25 to 45 percent slopes	Not prime farmland	40	-	-	No	Well drained	Well drained	loamy-skeletal	-	C	0.2	Low	0.43	High
230.4	6E	Barkers Crossroads-Rhodhiss-Rock outcrop complex, 25 to 45 percent slopes	Not prime farmland	40	-	-	No	Well drained	Well drained	loamy-skeletal	-	C	0.2	Low	0.43	High
230.5	1C	Berks channery silt loam, 8 to 15 percent slopes	Not prime farmland	12	-	-	No	Well drained	Well drained	loamy-skeletal	91	B	0.2	Low	0.43	High
230.6	1C	Berks channery silt loam, 8 to 15 percent slopes	Not prime farmland	12	-	-	No	Well drained	Well drained	loamy-skeletal	91	B	0.2	Low	0.43	High
230.7	1C	Berks channery silt loam, 8 to 15 percent slopes	Not prime farmland	12	-	-	No	Well drained	Well drained	loamy-skeletal	91	B	0.2	Low	0.43	High
230.8	22C	Hayter very cobbly loam, 7 to 15 percent slopes	Not prime farmland	11	-	-	No	Well drained	Well drained	fine-loamy	200	A	0.2	Low	0.32	Moderate
230.9	10	Craigsville cobbly sandy loam	Not prime farmland	3	-	-	No	Well drained	Well drained	loamy-skeletal	-	A	0.05	Low	0.15	Low
231	22C	Hayter very cobbly loam, 7 to 15 percent slopes	Not prime farmland	11	-	-	No	Well drained	Well drained	fine-loamy	200	A	0.2	Low	0.32	Moderate
231.1	6E	Barkers Crossroads-Rhodhiss-Rock outcrop complex, 25 to 45 percent slopes	Not prime farmland	40	-	-	No	Well drained	Well drained	loamy-skeletal	-	C	0.2	Low	0.43	High
231.2	6E	Barkers Crossroads-Rhodhiss-Rock outcrop complex, 25 to 45 percent slopes	Not prime farmland	40	-	-	No	Well drained	Well drained	loamy-skeletal	-	C	0.2	Low	0.43	High
231.3	6E	Barkers Crossroads-Rhodhiss-Rock outcrop complex, 25 to 45 percent slopes	Not prime farmland	40	-	-	No	Well drained	Well drained	loamy-skeletal	-	C	0.2	Low	0.43	High
231.4	6E	Barkers Crossroads-Rhodhiss-Rock outcrop complex, 25 to 45 percent slopes	Not prime farmland	40	-	-	No	Well drained	Well drained	loamy-skeletal	-	C	0.2	Low	0.43	High
231.5	6E	Barkers Crossroads-Rhodhiss-Rock outcrop complex, 25 to 45 percent slopes	Not prime farmland	40	-	-	No	Well drained	Well drained	loamy-skeletal	-	C	0.2	Low	0.43	High
231.6	6E	Barkers Crossroads-Rhodhiss-Rock outcrop complex, 25 to 45 percent slopes	Not prime farmland	40	-	-	No	Well drained	Well drained	loamy-skeletal	-	C	0.2	Low	0.43	High
231.7	6E	Barkers Crossroads-Rhodhiss-Rock outcrop complex, 25 to 45 percent slopes	Not prime farmland	40	-	-	No	Well drained	Well drained	loamy-skeletal	-	C	0.2	Low	0.43	High
231.8	6E	Barkers Crossroads-Rhodhiss-Rock outcrop complex, 25 to 45 percent slopes	Not prime farmland	40	-	-	No	Well drained	Well drained	loamy-skeletal	-	C	0.2	Low	0.43	High
231.9	6E	Barkers Crossroads-Rhodhiss-Rock outcrop complex, 25 to 45 percent slopes	Not prime farmland	40	-	-	No	Well drained	Well drained	loamy-skeletal	-	C	0.2	Low	0.43	High
232	6E	Barkers Crossroads-Rhodhiss-Rock outcrop complex, 25 to 45 percent slopes	Not prime farmland	40	-	-	No	Well drained	Well drained	loamy-skeletal	-	C	0.2	Low	0.43	High
232.1	6E	Barkers Crossroads-Rhodhiss-Rock outcrop complex, 25 to 45 percent slopes	Not prime farmland	40	-	-	No	Well drained	Well drained	loamy-skeletal	-	C	0.2	Low	0.43	High
232.2	6E	Barkers Crossroads-Rhodhiss-Rock outcrop complex, 25 to 45 percent slopes	Not prime farmland	40	-	-	No	Well drained	Well drained	loamy-skeletal	-	C	0.2	Low	0.43	High
232.3	6E	Barkers Crossroads-Rhodhiss-Rock outcrop complex, 25 to 45 percent slopes	Not prime farmland	40	-	-	No	Well drained	Well drained	loamy-skeletal	-	C	0.2	Low	0.43	High
232.4	6E	Barkers Crossroads-Rhodhiss-Rock outcrop complex, 25 to 45 percent slopes	Not prime farmland	40	-	-	No	Well drained	Well drained	loamy-skeletal	-	C	0.2	Low	0.43	High
232.5	6E	Barkers Crossroads-Rhodhiss-Rock outcrop complex, 25 to 45 percent slopes	Not prime farmland	40	-	-	No	Well drained	Well drained	loamy-skeletal	-	C	0.2	Low	0.43	High
232.6	6E	Barkers Crossroads-Rhodhiss-Rock outcrop complex, 25 to 45 percent slopes	Not prime farmland	40	-	-	No	Well drained	Well drained	loamy-skeletal	-	C	0.2	Low	0.43	High
232.7	6E	Barkers Crossroads-Rhodhiss-Rock outcrop complex, 25 to 45 percent slopes	Not prime farmland	40	-	-	No	Well drained	Well drained	loamy-skeletal	-	C	0.2	Low	0.43	High
232.8	6E	Barkers Crossroads-Rhodhiss-Rock outcrop complex, 25 to 45 percent slopes	Not prime farmland	40	-	-	No	Well drained	Well drained	loamy-skeletal	-	C	0.2	Low	0.43	High
232.9	6E	Barkers Crossroads-Rhodhiss-Rock outcrop complex, 25 to 45 percent slopes	Not prime farmland	40	-	-	No	Well drained	Well drained	loamy-skeletal	-	C	0.2	Low	0.43	High
233	6E	Barkers Crossroads-Rhodhiss-Rock outcrop complex, 25 to 45 percent slopes	Not prime farmland	40	-	-	No	Well drained	Well drained	loamy-skeletal	-	C	0.2	Low	0.43	High
233.1	6E	Barkers Crossroads-Rhodhiss-Rock outcrop complex, 25 to 45 percent slopes	Not prime farmland	40	-	-	No	Well drained	Well drained	loamy-skeletal	-	C	0.2	Low	0.43	High
233.2	6E	Barkers Crossroads-Rhodhiss-Rock outcrop complex, 25 to 45 percent slopes	Not prime farmland	40	-	-	No	Well drained	Well drained	loamy-skeletal	-	C	0.2	Low	0.43	High
233.3	6E	Barkers Crossroads-Rhodhiss-Rock outcrop complex, 25 to 45 percent slopes	Not prime farmland	40	-	-	No	Well drained	Well drained	loamy-skeletal	-	C	0.2	Low	0.43	High
233.4	6E	Barkers Crossroads-Rhodhiss-Rock outcrop complex, 25 to 45 percent slopes	Not prime farmland	40	-	-	No	Well drained	Well drained	loamy-skeletal	-	C	0.2	Low	0.43	High
233.5	6E	Barkers Crossroads-Rhodhiss-Rock outcrop complex, 25 to 45 percent slopes	Not prime farmland	40	-	-	No	Well drained	Well drained	loamy-skeletal	-	C	0.2	Low	0.43	High
233.6	6E	Barkers Crossroads-Rhodhiss-Rock outcrop complex, 25 to 45 percent slopes	Not prime farmland	40	-	-	No	Well drained	Well drained	loamy-skeletal	-	C	0.2	Low	0.43	High
233.7	6E	Barkers Crossroads-Rhodhiss-Rock outcrop complex, 25 to 45 percent slopes	Not prime farmland	40	-	-	No	Well drained	Well drained	loamy-skeletal	-	C	0.2	Low	0.43	High
233.8	6E	Barkers Crossroads-Rhodhiss-Rock outcrop complex, 25 to 45 percent slopes	Not prime farmland	40	-	-	No	Well drained	Well drained	loamy-skeletal	-	C	0.2	Low	0.43	High
233.9	6E	Barkers Crossroads-Rhodhiss-Rock outcrop complex, 25 to 45 percent slopes	Not prime farmland	40	-	-	No	Well drained	Well drained	loamy-skeletal	-	C	0.2	Low	0.43	High
234	5D	Barkers Crossroads-Rhodhiss complex, 15 to 25 percent slopes	Not prime farmland	20	-	-	No	Well drained	Well drained	loamy-skeletal	-	C	0.17	Low	0.37	High
234.1	5D	Barkers Crossroads-Rhodhiss complex, 15 to 25 percent slopes	Not prime farmland	20	-	-	No	Well drained	Well drained	loamy-skeletal	-	C	0.17	Low	0.37	High
234.2	5D	Barkers Crossroads-Rhodhiss complex, 15 to 25 percent slopes	Not prime farmland	20	-	-	No	Well drained	Well drained	loamy-skeletal	-	C	0.17	Low	0.37	High
234.3	29	Massanetta loam	All areas are prime farmland	2	-	-	Yes	Moderately well drained	Moderately well drained	fine	-	C	0.37	High	0.37	High
234.4	16E	Cataska channery silt loam, 15 to 45 percent slopes	Not prime farmland	30	-	-	No	Excessively drained	Excessively drained	fine	43	D	0.32	Moderate	0.32	Moderate
234.5	8E	Cataska channery silt loam, 25 to 65 percent slopes	Not prime farmland	45	-	-	No	Excessively drained	Excessively drained	clayey	43	D	0.37	High	0.37	High
234.6	8D	Catoctin-Myersville complex, 15 to 45 percent slopes	Not prime farmland	30	-	-	No	Well drained	Well drained	clayey	76	B	0.37	High	0.37	High
234.7	12C	Chilhowie silty clay loam, 7 to 15 percent slopes, rocky	Not prime farmland	11	-	-	No	Well drained	Well drained	fine	89	D	0.37	High	0.37	High
234.8	30B	Monongahela gravelly loam, 2 to 7 percent slopes	Not prime farmland	5	-	-	No	Moderately well drained	Moderately well drained	fine	109	C	0.32	Moderate	0.32	Moderate
234.9	30C	Tankerville and Philomont soils, 7 to 15 percent slopes	Farmland of statewide importance	11	-	-	No	Well drained	Well drained	fine	89	B	0.32	Moderate	0.32	Moderate
235	30C	Tankerville and Philomont soils, 7 to 15 percent slopes	Farmland of statewide importance	11	-	-	No	Well drained	Well drained	fine	89	B	0.32	Moderate	0.32	Moderate
235.1	30C	Tankerville and Philomont soils, 7 to 15 percent slopes	Farmland of statewide importance	11	-	-	No	Well drained	Well drained	fine	89	B	0.32	Moderate	0.32	Moderate
235.2	39C	Swimley silt loam, 7 to 15 percent slopes	Farmland of statewide importance	11	rass/herbaceous cov	Fame pasturelanc	No	Well drained	Well drained	fine	-	B	0.28	Moderate	0.28	Moderate
235.3	3E	Blocktown-Yellowbottom complex, 25 to 45 percent slopes	Not prime farmland	32	-	-	No	Well drained	Well drained	loamy-skeletal	36	D	0.2	Low	0.43	High
235.4	11B	Clymer channery loam, 3 to 15 percent slopes	Farmland of statewide importance	9	-	-	No	Well drained	Well drained	fine-loamy	-	B	0.28	Moderate	0.28	Moderate
235.5	28	Lobdell silt loam	All areas are prime farmland	2	-	-	No	Moderately well drained	Moderately well drained	fine-loamy	-	C	0.37	High	0.37	High
235.6	W	Water	Not prime farmland	-	-	-	Unranked	-	-	-	-	-	-	-	-	-
235.7	25	Pamlico and Portsmouth soils	Not prime farmland	1	-	-	No	Very poorly drained	Very poorly drained	fine	-	A/D	0.43	High	0.43	High
235.8	11C	Dekalb channery loam, 7 to 15 percent slopes	Not prime farmland	11	-	-	No	Well drained	Well drained	fine-loamy	89	A	0.28	Moderate	0.28	Moderate

SUGGESTED SEED MIXES FOR PIPELINE RIGHTS-OF-WAYS AND ASSOCIATED DISTURBANCES ON THE MONONGAHELA AND GEORGE WASHINGTON-JEFFERSON NATIONAL FORESTS

November 2016

Prepared by:
Stephanie Connolly, Forest Soil Scientist MNF
Steffany Scagline, Soil Scientist for Special Projects MNF
Tom Bailey, Forest Soil Scientist GWJNF
Whitney Bailey, Forest Ecologist MNF

Introduction

This document is meant to provide direction for assembling seed mixes to be used in reclamation and restoration of disturbed soils associated with pipeline installations and repairs/maintenance on the MNF and GW-Jefferson National Forests. Initially, the primary goal of seeding is to establish a vegetative cover to minimize surface erosion and sedimentation resulting from precipitation and surface flow. The secondary goal of these seeding guidelines is to assist with establishing an assortment of native species beneficial for wildlife and pollinators. All recommended species are commercially available.

Because this area possesses such diverse landscapes and microclimates, it is critical to deploy appropriate seed mixes in appropriate habitats. However, native plants that provide diverse wildlife benefits and structural diversity on the landscape often do not germinate or grow fast enough to provide initial erosion control. Therefore, fast-germinating, non-invasive, annual cover crops are recommended for the first round of seeding to stabilize exposed soil. Once those have established and erosion is no longer an immediate threat, native seed mixes tailored to site-specific conditions should be installed among the erosion control species where possible.

When using native seed, use as local an ecotype as is available, in the following order of preference:

- from within state
- from the mountain regions of an adjoining state
- from within 100 miles, as long as it is within the Appalachian mountain ecosystem

This document contains:

- Species recommendations for both temporary and permanent erosion control mixes
- Species recommendations for native mixes beneficial for wildlife and pollinators
- Site specific species recommendations for special site conditions (upland/high elevation, riparian, wetland, and dry low pH soils). Wetland indicator status codes are used to indicate species' soil moisture preferences. (USDA NRCS)

SPECIES FOR EROSION CONTROL

Temporary erosion control species:
To be applied

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

Select at least two of the following species for temporary mixes, or suggest an existing erosion control seed mix containing at least some of these species but not containing anything that would act invasive at the site. Please describe how seed mixes will be adjusted to accommodate different slope classes (for example, 0-8%, 8-15%, 15-30%, 30-50%, etc.)

Table 1: Temporary erosion control species

Name	**pH preference**	**Wetland Indicator Status**
Annual Ryegrass (Lolium multiflorum (L. perenne var. italicum))	5.0-7.9	NI/moderate
German/Foxtail Millet (Setaria italica)	5.3-6.9	FACU
Cereal Rye (Secale cereale)	52-8.0	NI/damp
Browntop Millet (Panicum ramosum) (introduced in VA & south; possibly ok for WV?)	5.5-6.9	FACU

Permanent erosion control species:
To be applied

- only during normal seeding season in spring and fall
- on slopes too steep or inaccessible for planting equipment, or
- on areas planned to be left not in final grade for more than 1 year.

Select at least 5 of the following species for permanent mixes, or suggest an existing restoration seed mix containing at least some of these species but not containing anything that would act invasive at the site. Please also include at least one species from Table 1 or one non-native from Table 2 to provide quick cover and mulching/organic matter. Please describe how seed mixes will be adjusted to accommodate different slope classes (for example, 0-8%, 8-15%, 15-30%, 30-50%, etc.).

Table 2: Permanent erosion control species

Name	**pH preference**	**Wetland Indicator Status**
Non-native		
Hard Fescue (Festuca ovina var. duriuscula (F. longifolia))	4.5-8.5	NI/dry
Creeping Red Fescue (Festuca rubra)	5.8-8.0	FACU

Chewings Fescue (Festuca rubra ssp. commutata)	acid tol.	FACU
Redtop (Agrostis alba)	4.5-8.0	FACW
Native		
Highly Preferred		
Indiangrass, (Sorghastrum nutans)	5.0-7.8	UPL
Purpletop (Tridens flavus)	4.5-6.5	FACU
Preferred		
Autumn Bentgrass, (Agrostis perennans)	5.5-7.5	FACU
Canada Wildrye (Elymus canadensis)	5.0-7.9	FACU+
Creeping Red Fescue (Festuca rubra)	5.8-8.0	FACU
Deertongue (Dichanthelium clandestinum)	4.0-7.5	FAC+
Marsh (Dense) Blazing Star (Spiked Gayfeather), (Liatris spicata)	5.6-7.5	FAC+
New England Aster, (Aster novae-angliae (Symphyotrichum)	?	FACW
Oxeye Sunflower, (Heliopsis helianthoides)	?	FACU
Panicledleaf Ticktrefoil, (Desmodium paniculatum)	6.0-7.0	FACU
Showy Ticktrefoil, (Desmodium canadense)	wide tol	FAC
Slender Bushclover, (Lespedeza virginica)	acid tol	NI/dry
Slender Mountainmint (Pycnanthemum tenuifolium)	?	FAC-FACW
Virginia Wildrye, (Elymus virginicus)	5.0-7.4	FACW-
Wild Bergamot, (Monarda fistulosa)	6.0-8.0	UPL
Wild Senna (Senna hebecarpa (Cassia h.))	circumn.	FAC
Moderately preferred		
Partridge pea (Chamaecrista fasciculate)	5.5-7.5	FACU
Blackeyed Susan, (Rudbeckia hirta)	6.0-7.0	FACU-
Grain Rye (Secale cereale)	5.2-8.0	NI
Switchgrass (Panicum virgatum)	4.5-8.0	FAC
Ticklegrass (Rough Bentgrass), (Agrostis scabra)	6.0-8.0	FAC

NATIVE SPECIES FOR WILDLIFE AND POLLINATORS

To be installed as permanent vegetation in areas accessible to necessary drill or other planting equipment. (Because native seed mixes need to be drilled or otherwise covered to enhance germination success, only areas accessible to the necessary equipment should be designated for follow-up native seeding.)

For each habitat type, pick at least five species, or suggest an existing restoration seed mix containing at least some of these species but not containing anything not native to the state, or anything that would act invasive at the site. A temporary cover crop will also likely be necessary to stabilize the site and protect overwintering seeds.

As with erosion control mixes, please describe how native seed mixes will be adjusted to accommodate different slope classes (for example, 0-8%, 8-15%, 15-30%, 30-50%, etc.).

Table 3: Native species for wildlife and pollinators (pH and Wetland indicator status left blank for duplicate species)

Name	**pH preference**	**Wetland Indicator Status**
Dry Soils/Upland		
Blackeyed Susan, (Rudbeckia hirta)	6.0-7.0	FACU-
Common Milkweed, (Asclepias syriaca)	calcareous	FACU
Indiangrass, (Sorghastrum nutans)	5.0-7.8	UPL
Oxeye Sunflower, (Heliopsis helianthoides)	?	FACU
Panicledleaf Ticktrefoil, (Desmodium paniculatum)	6.0-7.0	FACU
Partridge Pea, (Chamaecrista fasciculata (Cassia f.))	5.5-7.5	FACU
Showy Ticktrefoil, (Desmodium canadense)	wide tol	FAC
Switchgrass, (Panicum virgatum)	4.5-8.0	FAC
Virginia Wildrye, (Elymus virginicus)	5.0-7.4	FACW-
High Elevation		
Mountain Mint, Pycnanthemum spp.	?	FAC-FACW
Wild Bergamot, (Monarda fistulosa)	6.0-8.0	UPL
Virginia Wildrye, (Elymus virginicus)	5.0-7.4	FACW-
Riparian		
Autumn Bentgrass, (Agrostis perennans)	5.5-7.5	FACU
Big Bluestem, 'Niagara' (Andropogon gerardii, 'Niagara')	6.0-7.5	FAC
Boneset, (Eupatorium perfoliatum)	?	FACW+
Common Sneezeweed, (Helenium autumnale)	4.0-7.5	FACW+
Indiangrass, (Sorghastrum nutans)	5.0-7.8	UPL
Joe Pye Weed, (Eupatorium fistulosum)	4.5-7.0	FAC+
Maryland Senna (Senna marilandica (Cassia m.))	4.0-7.0	FAC+
New York Ironweed, (Vernonia noveboracensis)	4.5-8.0	FACW+
Partridge Pea, (Chamaecrista fasciculata (Cassia f.))	5.5-7.5	FACU
Spotted Joe Pye Weed, (Eupatorium maculatum (Eupatoriadelphus maculatus))	5.5-7.0	FACW
Swamp Milkweed (Asclepias incarnata)	5.0-8.0	OBL
Virginia Wildrye, (Elymus virginicus)	5.0-7.4	FACW-
Wild Senna (Senna hebecarpa (Cassia h.))	circumn.	FAC
Wetland/Wet Soils (pH indicators left blank in this section because the majority of "problem" acid soil sites are dry uplands. Wetland indicators left blank because all plants are appropriate for wetlands)		
Blue False Indigo, (Baptisia australis)		
Bottlebrush Grass, (Elymus hystrix (Hystrix patula))		
Canadian Anemone, (Anemone canadensis)		
Canadian Burnet, (Sanguisorba canadensis)		

Deertongue, 'Tioga' (Panicum clandestinum (Dichanthelium c.), 'Tioga')		
Fringed (Nodding) Sedge, (Carex crinita)		
Great Blue Lobelia, (Lobelia siphilitica)		
New York Ironweed, (Vernonia noveboracensis)		
Path Rush, (Juncus tenuis,)		
Purple Node Joe Pye Weed, (Eupatorium purpureum)		
Redtop Panicgrass, (Panicum rigidulum (P. stipitatum))		
Soft Rush (Juncus effusus)		
Spotted Joe Pye Weed, (Eupatorium maculatum (Eupatoriadelphus maculatus))		
Squarrose Sedge, (Carex squarrosa)		
Swamp Milkweed (Asclepias incarnata)		
Switchgrass, 'Cave-In-Rock' (Panicum virgatum, 'Cave-In-Rock')		
Tussock Sedge, (Carex stricta)		
Wild Senna (Senna hebecarpa (Cassia h.))		
Woolgrass, (Scirpus cyperinus)		

Low pH (acidic) soils

Few of the species listed above would naturally grow well in acidic soils as defined in this project (pH less than 4.8) However, many of the species listed above would persist for several years following a lime addition with the initial seeding of soils. Blackberries and goldenrods do well in sunny, acid, dry soils, and ferns, lycopodiums, and mosses persist as vegetative cover in more shaded areas. The following are some suggestions of upland/dry site perennial species native to WV and VA, and the minimum pHs they can tolerate (all available from Ernst Seeds):

Table 4: Species for low pH soils

Name	**pH preference**	**Wetland Indicator Status**
Purpletop (Tridens flavus)	4.5-6.5	FACU
Purple lovegrass (Eragrostis spectabilis (Pursh) Steud.)	4.0-7.5	UPL
Virginia spiderwort (Tradescantia virginiana)	4.0-8.0	FACU
Common blackberry (Rubus allegheniensis)	4.6-7.5	FACU-
Canada goldenrod, (Solidago Canadensis)	4.8-7.5	FACU
Indian hemp (Apocynum cannabinum)	4.5-7.0	FACU
White avens, (Geum canadense)	4.5-7.5	FACU
Splitbeard bluestem (Andropogon ternarius var. Michx.) (native to VA & KY, & south; a warm season bunchgrass.)	4.0-7.5	FACU
Slender woodoats ((Chasmanthium laxum (Uniola laxa))	4.5-7.0	FAC

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SUGGESTED SEEDING TECHNIQUES FOR PIPELINE RIGHTS-OF-WAYS AND ASSOCIATED DISTURBANCES ON THE MONONGAHELA AND GEORGE WASHINGTON-JEFFERSON NATIONAL FORESTS

November 2016

Prepared by:
Stephanie Connolly, Forest Soil Scientist, MNF
Steffany Scagline, Soil Scientist for Special Projects MNF
Tom Bailey, Forest Soil Scientist GWJNF
Whitney Bailey, Forest Ecologist MNF

Introduction

This document provides guidelines for erosion control seeding techniques in the reclamation and restoration of disturbed soils associated with pipeline installations and repairs/maintenance on National Forest lands. Erosion is an expected consequence of any soil disturbing activity that crosses variable and severe terrain. Therefore, a variety of short term and long term erosion control measures must be implemented. These include but are not limited to physical measures such as contouring; revegetation measures such as re-seeding and mulching; and follow up monitoring. This document specifically addresses seeding and mulching techniques.

The goal of this document is to assist contractors with designing projects so that projects are consistent with Forest Plan goals and objectives. Because every site is unique, guidelines are meant to be descriptive, not prescriptive. Specific proposals still need Forest Service approval. However, ensuring from the start that project designs are consistent with Forest Plan direction will facilitate both the review and implementation process.

Restoration objectives

The initial goal of seeding is to establish a vegetative cover to minimize surface erosion and sedimentation. The secondary goal of seeding is to assist with establishing an assortment of native species beneficial for wildlife and pollinators. Because native species often do not establish as easily nor spread as readily as species typically used for erosion control, it is important to use them in conjunction with erosion control species, and also to use techniques that maximize germination rates and likelihood of survival. This includes proper initial site stabilization, choosing appropriate site specific seed mixes, and using appropriate seeding techniques once the site has been stabilized. Follow-up monitoring and maintenance are also required so that site problems are dealt with immediately and treatments adjusted as needed.

This document includes guidelines for the following:

1) General erosion control and seeding
2) Seeding seasons
3) Nutrient additions
4) Mulch and binders

GENERAL DIRECTION FOR EROSION CONTROL AND SEEDING

Project plans must specify how each of these guidelines will be met.

- Placement of sequestered topsoil prior to seeding.
- Seed shall be Virginia or West Virginia certified seed (bag tags attached; seed certification shall meet each state's standards for their certified seed classification) or alternative seed sourced from approved distributers.
- USFS approval of treatments outside normal seeding seasons.
- All leguminous seed shall be either be pre-inoculated from a supplier, or mixed with inoculant specified for use on that particular seed according to manufacturer's directions. Inoculants shall be manually applied at double the manufacturer's rate. Inoculant shall be mixed with legume seed prior to mixing with other seeds. For hydro-seeding, use a minimum of five times the dry seeding rate of inoculant. (Flynn, 2015; Monsanto 2015)
- A minimum of 100 lbs/ac of seed will be applied when seeding for permanent erosion control (VA BMP) unless otherwise specified by the seed mix provider.
- A success standard/threshold, such as 70-85% ground cover, must be delineated, and provisions to monitor and report on site conditions. Please describe plans for implementing mitigation measures (in case of planting failures) to ensure planting success.
- Describe how subsoil will be tested for compaction, and loosened prior to topsoil replacement if necessary.
- Dry fertilizer and lime may need to be incorporated into the top 2-5 inches of soil after application, at rates indicated by the results of site-specific soil tests. Please describe plans for doing so. (FERC 2013, Virginia DEQ)
- All seeding must occur promptly after construction halts, either temporarily or permanently. Erosion control seed mixtures must be sufficient to stabilize sites for varying lengths of time, and seed mixes may need to vary depending on that timeframe. Please describe how quickly seeding will occur, and the decision thresholds for applying temporary versus permanent erosion control seed mixtures.
- Areas to be planted with species beneficial for wildlife after pipeline installation will be treated with temporary erosion control mix during a normal seeding season.
- Areas not to be treated with wildlife seed species will be treated with permanent erosion control seeding during a normal seeding season.
- Seeding rates should be doubled when hydroseeding (Steinfeld et. al., 2007)

NORMAL SEEDING SEASONS

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.
Please describe the timeframe in which seeding is proposed according to site specific elevations. Seeding windows should allow time for application, germination, and survival.

NUTRIENT ADDITIONS

In the absence of soil chemistry tests, the following guidelines can be used to develop fertilizer and liming rates**. Whenever possible, nutrient additions should be based on soil chemistry data in the interpretations provided with the order 1 soil survey.**

Fertilizer: 600-800 lbs/ac, 10-20-10 (Nitrogen, Phosphorous, Potassium), 400 lbs/ac 15-30-15, 800-1000 lbs/ac 10-10-10.

Lime: 1500-4000 lbs/ac (pelletized or dust), 4000 lbs/ac, Hydro Lime (2.5 gal container is equivalent to 1000 lbs limestone)—5-10 containers /ac.

MULCH AND BINDERS

Use of mulch materials and binders will be needed. Use of hay is prohibited on National Forest land due to invasive species concerns. Below are some guidelines that apply when selecting these materials for various sections of the ROW. Please describe how each of these issues will be addressed. All techniques must be appropriate for the % slope on which they will be applied. Please describe how mulching, seeding, and binding techniques will be adjusted to accommodate different slope classes (for example, 0-8%, 8-15%, 15-30%, 30-50%, etc.)

- Materials must be certified weed free or be accompanied by vendor's test results for noxious weed content.
- Seeded areas can be mulched with weed free straw at a rate of 2-4K lbs/ac, hand spread or blown, fiber mulch hydro-seeded at 1500-2000 lbs/ac., or other appropriate material.
- Natural biodegradable products are preferred. Materials must be demonstrated to be free of invasive species, including but not limited to plants, pests, and pathogens.
- Hydraulic erosion control products (HEPC) must be suitable for wildlife.
- If the use of stabilization netting is required/permitted, wildlife friendly geotextiles must be used. These products must either not contain netting, or netting must be made of 100% biodegradable non-plastic materials such as jute, sisal, or coir fiber. Plastic netting (such as polypropylene, nylon, polyethylene, and polyester), even if advertised as biodegradable, is not an acceptable alternative. Any netting used must also have a loose-weave design with movable joints between horizontal and vertical twines to reduce the chance for wildlife entanglement, injury, or death. (CA Coastal Commission, 2012)
- Avoid the use of silt fences reinforced with metal or plastic mesh.
- When no longer required, (after soils are stable and the vegetative cover is established), temporary erosion control and sediment control products should be promptly removed.
- Any products that require mixing with water need to have a Forest Service-approved water source. The source of water must not be contaminated with non-native invasive organisms that could spread into streams.

Hydroseeding

- Wood-fiber hydraulic mulches are generally short-lived and require a 24-hour period to dry before rainfall occurs.

- Wood fiber naturally has tackifying properties, but fiber alone may not be sufficient on steep slopes. In those cases the addition of a tackifier will help keep the seeds in contact with the soil. Describe plans to assess when this will be necessary, and describe the tackifier and application methods to be used.
- As wood chips, shredded woody materials, and other high-carbon materials decompose, they remove plant nutrients such as nitrogen from the soil. This can reduce soil fertility and make it difficult for grasses to grow. This should be taken into account when planning restoration seeding.

Binders

- The use of hydroseeding with binders will most likely be required in many areas on FS lands due to the steep terrain. Please describe site conditions where this will be used.
- The success of soil binders are somewhat dependent on the soil type present. If soil is compacted or high in clay and silt, soil binders may not penetrate soil surfaces.
- Whether short-life or long-life, soil binders should be non-toxic and organic based, such as guar, psyllium, or pitch and rosin emulsions. Please describe type of binder to be used under what circumstances, and specific application rates and methods.
- Materials or additives used as binders or emulsifiers cannot be toxic to soil organisms or otherwise prevent or inhibit seed germination.

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