

# The Atlantic Coast Pipeline in West Virginia: Opportunities for Public Engagement regarding Erosion and Sedimentation



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## ABBREVIATIONS

ACP	Atlantic Coast Pipeline
BMP	best management practice
DPMC	Dominion Pipeline Monitoring Coalition
FOIA	Freedom of Information Act
GPP	Groundwater Protection Plan
NPDES	National Pollutant Discharge Elimination System
ROW	right-of-way
SRA	Site Registration Application
SWPPP	Stormwater Pollution Prevention Plan
USACE	United States Army Corps of Engineers
USEPA	United States Environmental Protection Agency
WVDEP	West Virginia Department of Environmental Protection

# 1. INTRODUCTION

The Atlantic Coast Pipeline (ACP), originally called the Southeast Reliability Project, is a joint venture between four U.S. energy companies—AGL Resources, Piedmont Natural Gas, Duke Energy, and Dominion.<sup>1</sup> The pipeline is proposed to run between Harrison County, West Virginia and southern North Carolina—a length of approximately 550 miles total, 80 of which are in West Virginia (Natural Resource Group, 2015a). If constructed, this pipeline will bring up to 1.5 billion cubic feet of Marcellus Shale gas to energy markets each day. The project is expected to cost between \$4.5 and \$5 billion (Dominion, Undated (a)).

In West Virginia, the pipeline will be 42 inches in diameter (Dominion, Undated (a)). To construct and bury this section of the pipeline, operators will timber and clear a 125 foot–wide right-of-way (ROW) and dig a 10 foot–deep trench along the centerline, in which the pipeline will be buried. Post-construction, the ROW will be reduced to a 75 foot–wide strip of grass. (Dominion, Undated (b))

In West Virginia, the proposed pipeline begins in Harrison County and crosses Lewis, Upshur, Randolph, and Pocahontas counties before crossing the state line into Virginia (See Figure 1). Pipeline construction would disturb approximately 1,200 acres in West Virginia for the ROW alone.

Pipeline construction can accelerate erosion and cause sedimentation of streams. According to the West Virginia Department of Environmental Protection’s (WVDEP’s) Fact Sheet for its general oil and gas construction stormwater permit:

“Earthmoving and grading projects create conditions where accelerated erosion can cause large quantities of soil to be deposited into the streams and rivers of the state. The lack of vegetation, steepening of slopes, increased runoff, decreased infiltration, and other ill effects of construction can cause a 1,000-fold increase in the rate of erosion over pre-existing conditions. The erosion rates on construction sites can run into the hundreds of tons per acre. By volume, sediment is the number one pollutant in the state’s waters and degrades more miles of stream [than] any other pollutant.” (WVDEP, 2013a, p. 2)



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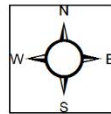
<sup>1</sup> In this report, we consider Dominion to be the potential permittee.

Figure 1: The Atlantic Coast Pipeline route in West Virginia



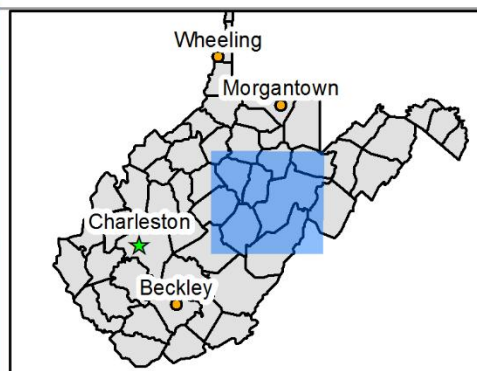
### Pipeline Route

-  Proposed route
-  Alternate route



### Data Sources

Basemap: ESRI, Pipeline ROW: Atlantic Coast LLC ,  
Alternative pipeline ROW: USFS.



Date: 7/1/2015

## 1.1 Dominion’s Consent Order

With the development of the Marcellus Shale, many other pipelines have been built, or are under construction in West Virginia, in order to move natural gas to market. One pipeline under construction now, the Stonewall Gathering-Momentum pipeline, is instructive because it is being constructed in similar terrain as the ACP (See Figure 2)

**Figure 2: Construction of the Stonewall Gathering-Momentum pipeline in West Virginia**



Photo credit: Rick Webb.

Even smaller pipelines can lead to environmental problems. In October 2014, Dominion signed a Consent Order issued by WVDEP. The Order resulted from multiple violations associated with its construction and operation of smaller pipelines, including the H-3904 and G-150 pipelines (the latter now no longer owned by Dominion), and the Lightburn Compressor Station. WVDEP identified “conditions not allowable” including multiple instances of slips and stream sedimentation and at least two leaks or spills, including one where a pipeline was ruptured and a spill of crude oil and produced water ensued. The company was further cited for “failure to immediately take all measures to contain the spill” and failure “...to report...non-compliance...immediately after becoming aware of the circumstances”. (WVDEP, 2015a)

The Order imposed an administrative penalty of \$55,470, which included a 55% increase due to “previous compliance/non-compliance history”. In addition to the penalty, Dominion agreed to:

- Develop and implement a written policy and procedure for slips.
- Submit a “...Geotechnical analysis to define the root cause(s) of historical pipeline right-of-way failures”, and a “plan of action to address the root cause(s)”. The analysis is also to include technical, managerial, and other accountability elements.
- Submit, for a period of 18 months, geo-referenced line work and placement data for all future projects that require a water pollution control stormwater permit associated with oil and gas construction activities (See Chapter 2 for a discussion of this permit).

- Immediately and exclusively use established best management practices (BMPs) “...for all Dominion pipeline construction projects actively covered under a water pollution control stormwater permit associated with oil and gas construction activities...as described in either the approved Storm Water Pollution Prevention Plan (SWPPP) or the West Virginia Erosion and Sediment Control Best Management Practice manual recognized by WVDEP Division of Water and Waste Management” (See Chapter 2 for a discussion of this permit and Appendix A for a description of BMPs in this manual). (WVDEP, 2015a)

## 1.2 West Virginia streams that may be impacted by erosion and sedimentation

Figure 3 highlights the streams that may be impacted by erosion and sedimentation from construction of the ACP. These include (1) streams that the pipeline crosses; (2) streams that receive drainage from pipeline construction activities, even if the pipeline is upgradient from the stream; and (3) all streams downstream from those that may be impacted. The thick blue line in Figure 3 illustrates the proposed route, and the thick yellow line illustrates the alternate route. No matter which route is chosen, the northern portion of the pipeline will impact streams that flow north into the West Fork and the Tygart Valley River. These rivers join together to form the Monongahela River near Fairmont, West Virginia. If the proposed route is followed, the pipeline will impact Shavers Fork, which flows north into the Cheat River, as well as the headwaters of the Greenbrier River, which flows south, eventually draining into the Kanawha River.

If the alternate route is followed (shown in yellow in Figure 3), Shavers Fork would not be affected; however, the Greenbrier River would still be impacted, as would the headwaters of the Elk River. The Elk flows drains into the Kanawha River in Charleston.

## 1.3 Objective of this report

The Dominion Pipeline Monitoring Coalition (DPMC) is engaging in permitting processes related to the ACP in West Virginia and Virginia and commissioned this report to learn about opportunities provided by state and federal water-related regulations to effectively participate in and ensure rigorous environmental review and regulatory compliance in West Virginia.

This report focuses on erosion and sedimentation of surface waters, which can be caused by construction within the pipeline ROW as well as related roads and infrastructure, including stream and wetland crossings. Pipeline construction can also alter runoff properties of disturbed areas, leading to additional surface water flows that can cause additional erosion and sedimentation.

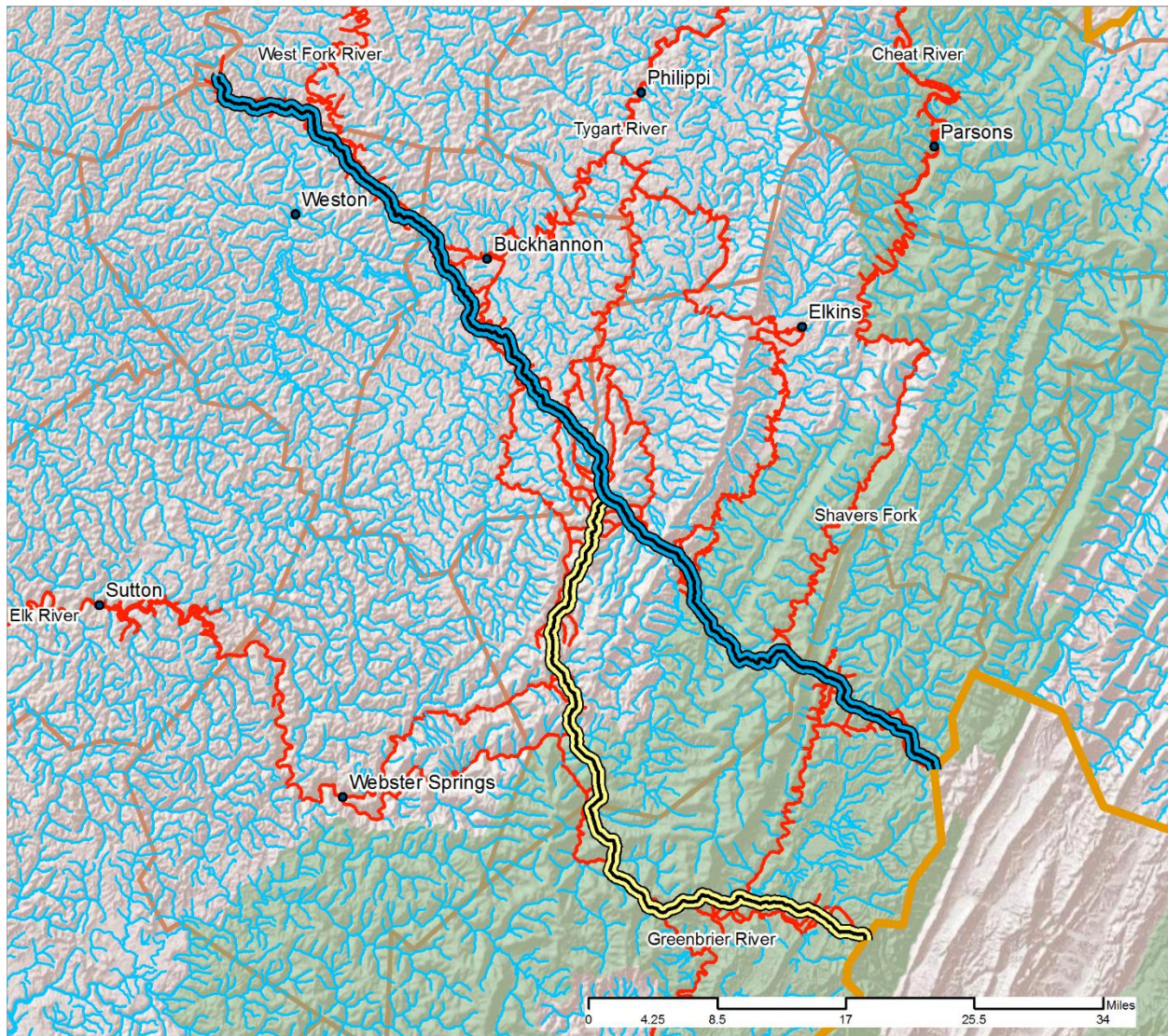
In addition, this report considers surface water impacts other than those caused by erosion and sedimentation as well as potential effects on groundwater resources in karst areas. It makes recommendations for what DPMC and the public can do to participate effectively in two permitting processes:

1. the oil and gas construction stormwater National Pollutant Discharge Elimination System (NPDES) permit issued by WVDEP (See Chapter 2) and
2. the dredge and fill (“404”) permit issued by the United States Army Corps of Engineers (USACE), including the 401 certification issued by WVDEP (See Chapter 3).



Opportunities exist for DPMC and concerned citizens to participate in both of these permitting processes to ensure that issued permits protect water resources and that the regulatory agencies appropriately inspect and enforce the permits after issuance.




**Figure 3: Streams potentially impacted by erosion and sedimentation from the Atlantic Coast Pipeline**

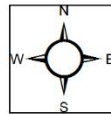


### Surface Water

-  Proposed route
-  Alternate route

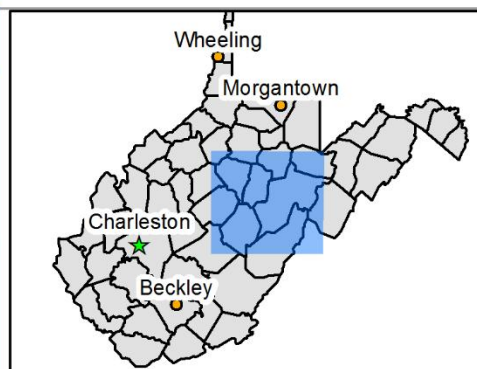
#### Stream Impacts

-  Sedimentation less likely
-  Sedimentation more likely



### Data Sources

Basemap: ESRI, Pipeline ROW: Atlantic Coast LLC ,  
Alternative pipeline ROW: USFS.



Date: 7/2/2015

## 2. OIL AND GAS CONSTRUCTION STORMWATER PERMIT

WVDEP issues NPDES permits for point sources of pollution that discharge to rivers and streams. In order to control erosion and sedimentation from construction, WVDEP typically utilizes one of its general NPDES permits. General permits, as opposed to individual permits, are written for categories of dischargers, and permittees “register” under pre-written permits rather than submitting full individual permit applications.

WVDEP has at its disposal four types of stormwater-related general NPDES permits:

1. **Oil and gas construction stormwater**, which covers stormwater discharges from construction activities related to the oil and gas industry.
2. **Construction stormwater**, which covers stormwater discharges from construction activities that disturb one acre or more (typically not oil and gas activities).
3. **Industrial multi-sector**, which covers stormwater discharges from certain industrial activities.
4. **Municipal separate storm sewer systems**, which covers stormwater discharges from densely populated cities and other urbanized areas. (WVDEP, 2015b)

Stormwater-related general NPDES permits are different from other general NPDES permits in two key ways. First, certain site-specific plans and information must be submitted by the permittee, and these plans and information are part of the public record. Second, depending on the amount of land disturbed and other factors related to receiving streams, general permit registrations may be subject to public notice and comment (The public will have an opportunity for public engagement for the ACP). In contrast, under other types of general permits, permittees typically receive coverage simply by registering under the general permit—with no opportunity for public engagement.

The Energy Policy Act of 2005 exempted oil and gas–related activities from coverage under NPDES stormwater permits; therefore, WVDEP issued a new oil and gas construction stormwater permit to provide clear guidance and consistent application of pollution control measures and to establish a level playing field of the oil and gas industry (WVDEP, 2013a).

This oil and gas construction stormwater permit, WV0116815, is most relevant to the ACP. This permit applies to “...oil and gas field construction activities or operations such as exploration, production, processing or treatment operations or transmission facilities, disturbing one acre or greater of land area...” (WVDEP, 2013b, p. 1)

Figure 4: Steep slope construction of the Stonewall Gathering-Momentum pipeline in West Virginia



Photo credit: Rick Webb.

## 2.1 The use of a general versus individual permit

While WVDEP typically provides coverage under a general permit for construction activities, it has the authority to require an individual permit. An individual permit would likely receive a more detailed level of review by the WVDEP permit writer, which might result in site-specific conditions being written into the permit that would be absent if a general permit were utilized. Both an individual and general permit would provide the same public notice and comment opportunities (See Section 2.3). NPDES permit violations, whether individual or general permits, would still be subject to citizen suits.

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Petition the WVDEP Director to require an individual permit, rather than a general permit, for the ACP.

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The oil and gas construction stormwater permit provides specific authority for WVDEP to require an individual permit:

“G.1. Requiring an Individual Permit. The Director may require any person otherwise eligible for this permit to apply for and obtain an Individual Permit ***in the event that the proposed project will involve land disturbance across a very significant area or other unique impacts*** that the Director determines require the imposition of special conditions beyond those contained in this General Permit. ***Any interested person may petition the Director*** to take action under this paragraph...” (WVDEP, 2013b, p. 12, emphasis added)

According to this language, an individual permit might be required for a land disturbance across a “very significant area.” The ACP will disturb an estimated 1,200 acres for the ROW alone, plus additional area for

roads and other related facilities. This disturbance will impact five West Virginia counties. This would appear to be a “very significant area.”

An individual permit might also be required if the project will involve “other unique impacts.” The ACP’s unique impacts include a large number of stream crossings (See Figure 3) and construction over karst areas (See Section 2.6).

“Any interested person” may file a petition for an individual permit. Absent a petition and action taken by WVDEP, the ACP will be provided coverage under a general permit; therefore, this report assumes that WVDEP will issue a general permit for the ACP.

## 2.2 Regulatory review and approval processes

In order to gain coverage under the oil and gas construction stormwater permit, Dominion must submit a Site Registration Application (SRA).<sup>2</sup> This form includes certain general information about the anticipated construction activities, which will be made terms and conditions of the permit (WVDEP, 2013b, p. 2).

Many more details must be submitted in the Stormwater Pollution Prevention Plan (SWPPP) and Groundwater Protection Plan (GPP), which accompany the SRA. The SWPPP and GPP may be submitted separately or as a single document. Requirements for these plans are summarized in Sections 2.4 and 2.5.

After submission, WVDEP will review the SRA, SWPPP, and GPP (if the GPP is submitted to WVDEP) and request clarifications as necessary. WVDEP will also initiate a public notice and comment process and may hold a public hearing. The 30-day public comment period, and the public hearing if it is held, provide the formal opportunities for engagement by DPMC and the public.

Following the public notice and comment process, WVDEP will likely issue the registration under the general permit.

**Table 1: Availability of permit application materials and plans**

Item	Submitted to WVDEP?	Public availability
SRA	Submitted before registration under the general permit.	Available from WVDEP via FOIA.
SWPPP	Submitted before registration under the general permit.	Available from WVDEP via FOIA. Considered report that shall be available to the public under Section 308(b) of the Clean Water Act. The owner or operator shall make it available for review to the public upon request.
GPP	Not required to be submitted before registration under the general permit, but may be combined with SWPPP into a single plan that is submitted.	If submitted, available from WVDEP via FOIA. Considered report that shall be available to the public under Section 308(b) of the Clean Water Act. The owner or operator shall make it available for review to the public upon request.

Sources: WVDEP (2013b) Sections G.4 and G.4.f. and WVDEP (2013c), p. 4.

<sup>2</sup> SRAs are required for sites that disturb three or more acres.

## 2.3 Opportunities for public participation in review and oversight of the project plans

There will be several opportunities for public participation—either within or outside of the public comment period.

DPMC or members of the public can contact WVDEP now, even if the SRA has not yet been submitted, to talk with the permit writer and to gain an understanding of when WVDEP expects the materials to be submitted. Concerns can be expressed even at this early stage.

DPMC or members of the public can also submit a FOIA request to WVDEP for all information already submitted by Dominion—even if the SRA, SWPPP, and GPP have not yet been submitted.

As shown in Table 1, DPMC or members of the public should also have access to the SRA and SWPPP, and likely will also have access to the GPP, after they are submitted. These materials should be requested as soon as they are available.

WVDEP permit writers may make themselves available for a face-to-face or phone meeting to share information or to discuss concerns after Dominion has submitted its materials.

When the public comment period opens, WVDEP will issue a public notice. DPMC and concerned citizens can sign up to receive public notices by email for NPDES permits issued by WVDEP at <https://apps.dep.wv.gov/MLists2/Archive/index.cfm?listID=1>. These public notices are organized by county; therefore, it will be important to sign up for all counties that the ACP may cross. WVDEP also posts public notices directly on the Web page listed above. DPMC should first confirm that WVDEP is, indeed, distributing public notices for the oil and gas construction stormwater permit by email.

Before the public comment period closes, DPMC and members of the public should submit formal written comments and should consider requesting a public hearing. If a public hearing is scheduled, DPMC and members of the public should participate in the hearing and work with community members to ensure that there is a solid turnout among with broad representation that includes local governments, private businesses, and nonprofit organizations.

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Contact the WVDEP permit writer, even before the SRA has been submitted.

Submit a FOIA requesting all information that has already been submitted to WVDEP, even before the SRA has been submitted.

Submit a FOIA requesting the SRA, SWPPP, and GPP.

Request a meeting with the WVDEP permit writer to share information or to discuss concerns after reviewing the SRA, SWPPP, and GPP.

Sign up to receive public notices for NPDES permits issued by WVDEP.

Submit formal written comments on the NPDES permit.

Request a public hearing, participate in the hearing, and ensure a solid turnout from diverse people and organizations.

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## 2.4 Stormwater Pollution Prevention Plan

Section G.4 of the general permit provides detailed requirements for the SWPPP. For the ACP, the SWPPP and SRA must be submitted at least 90 days before construction activity is to begin; this extended period includes the 30-day public comment period.<sup>3</sup>

According to the permit, permittees “should” submit the SWPPP and SRA before accepting construction bids because WVDEP may notify the permittee if the SWPPP does not meet the minimum requirements of the permit. If this happens, the permittee is provided a certain amount of time to make necessary changes.

SWPPPs must include the following components to control erosion and sedimentation:

- **Maintenance and inspections** (Sections G.4.d.1.A and G.4.e.2.D). A preventive maintenance program must include inspection and maintenance of erosion and sediment control BMPs. Inspection intervals are specified.
- **Good housekeeping** (Section G.4.d.1.B). Good housekeeping requires the maintenance of a clean and orderly project.
- **Spill prevention and response procedures** (Section G.4.d.1.C). The SWPPP must identify areas where potential spills may occur, along with procedures and equipment for cleaning up spills, among other things.
- **Site description** (Section G.4.e.1). This description must include the nature of the construction activity, a timetable, estimates of key land areas, site maps with specific requirements, and details on construction entrances.
- **Erosion and sediment controls** (Section G.4.e.2.A). At a minimum, the SWPPP must describe vegetative practices (e.g., stabilization practices such as seeding, mulching, or vegetative buffer strips) and structural practices (e.g., silt fences, check dams, and sediment traps).
- **Stormwater management plan** (Section G.4.e.2.B). The SWPPP must include a description of measures that will be installed to control pollutants in stormwater discharges after the project is completed.
- **Other controls** (Section G.4.e.2.C). Other controls in the SWPPP relate to disposal of solid waste and construction/demolition material, controlling fugitive dust, training employees, conducting visual inspections, and recordkeeping.

Information submitted on the SWPPP will be made terms and conditions of the permit (WVDEP, 2013b, p. 2).

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Review the SWPPP in detail.

Pay particular attention to the erosion and sediment controls and stormwater management plan for information about controlling sediment pollution.

Pay particular attention to the spill prevention and response procedures for information about preventing the discharge of non-sediment pollutants.

Provide comments on the SWPPP during the public comment period.

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<sup>3</sup> Only 45 days are required for projects that disturb less than 100 acres.

## 2.5 Groundwater Protection Plan

A GPP is required for coverage under this general permit. Dominion may combine the GPP with the SWPPP, so long as the requirements for both plans are met. Alternatively, Dominion may choose to keep them separate.

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Review the GPP in detail.

Provide comments on the GPP during the public comment period.

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If they are kept separate, then according to the general permit, Dominion is not required to submit the GPP to WVDEP (See Table 1). The West Virginia Groundwater Protection Rule appears to contradict the permit: “The GPP is to be submitted and reviewed as part of the facility's or activity's permit application/renewal process.”<sup>4</sup>

The general permit provides general guidance on the GPP:

“The GPP shall identify all operations that may reasonably be expected to contaminate the groundwater resources with an indication of the potential for soil and groundwater contamination from those operations. In addition the GPP shall provide a thorough and detailed description of procedures designed to protect groundwater from the identified potential contamination sources.” (WVDEP, 2013b, p. 13)

The general permit points to West Virginia’s Groundwater Protection Rule<sup>5</sup> for more detailed GPP requirements. According to this rule, the GPP must contain:

- An **inventory of all operations** that may reasonably be expected to contaminate the groundwater resources with an indication of the potential for soil and groundwater contamination from those operations.
- A description of **procedures designed to protect groundwater** from the identified potential contamination sources, with specific attention given to manufacturing facilities; materials handling; equipment cleaning; construction activities; maintenance activities; pipelines carrying contaminants; and sumps and tanks containing contaminants.
- A list of procedures to be employed in the design of any **new equipment/operations**.
- A summary of all **activities carried out under other regulatory programs** that have relevance to groundwater protection.
- A discussion of all available information reasonably available to the facility/activity regarding **existing groundwater quality** at, or which may be affected by the site.
- A clarification that **no wastes be used** for deicing, fills, etc., unless provided for in existing rule.
- Provisions for all **employees to be instructed and trained** on their responsibility to ensure groundwater protection. Job procedures shall provide direction on how to prevent groundwater contamination.
- **Quarterly inspections** to ensure that all elements and equipment of the site's groundwater protection program are in place, properly functioning and appropriately managed.

Information submitted on the GPP may be made terms and conditions of the permit (WVDEP, 2013b, p. 2).<sup>6</sup>

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<sup>4</sup> 47 CSR 58 Section 4.12.c.

<sup>5</sup> 47 CSR 58 Section 4.11.

<sup>6</sup> The exact language in the general permit (“The information submitted on and with the site registration application form will hereby be made terms and conditions of the General Permit...”) is somewhat unclear with regards to the GPP, because the general permit does not require submission of the GPP to WVDEP.

## 2.6 Karst

A portion of the ACP will cross karst terrain, which is characterized by sinkholes and caves formed by dissolved limestone. In karst terrain, surface water and groundwater are often directly linked, and surface water pollution can immediately impact groundwater.

An analysis of the impacts of the ACP on karst, Dr. James Van Gundy states:

“While the actual area of karst that will be crossed by the ACP in West Virginia is small it should be pointed out that water draining from non-limestone areas upslope of karst frequently sinks into the ground almost immediately after crossing onto the limestone. Hence, karst drainage systems are potentially affected by activities occurring in all areas that contribute water to them and not just water from the karst surface itself. Since the three narrow bands of affected West Virginia karst all occur on the flanks of ridges, they will also collect water from everything upslope of them, which is likely to be a considerably larger area than the karst itself.” (Van Gundy, 2015)

The general permit defines “karst” as: “a type of topography formed over limestone, dolomite, or gypsum resulting in dissolving or solution of the underlying calcareous rock” (WVDEP, 2013b, p. 9). However, this term does not appear to be used within the permit itself.

The general permit also defines “sinkhole” as “a depression in the land surface formed by solution or collapse that directs surface runoff into subsurface or to an underground drainage flow” (WVDEP, 2013b, p. 11). The general permit applies this term by explicitly not authorizing discharges of stormwater into sinkholes (WVDEP, 2013b, p. 12).

## 2.7 Minimum design standards for erosion and sediment control

The minimum design standards for erosion and sediment control are provided in the SWPPP requirements, which are summarized above in Section 2.4. More specifically, Section G.4.e.2.A, labeled “Erosion and sediment controls,” provides specific requirements for vegetative practices (Section G.4.e.2.A.i) and structural practices (Section G.4.e.2.A.ii).

Dominion’s written policy and procedure for slips, required pursuant to its Consent Order, should provide guidance on minimum design standards for the ACP. Also, the geotechnical analysis to define the root cause(s) of historical pipeline ROW failures and the associated plan of action to address the root cause(s)—both of which were also required pursuant to the Consent Order—should provide further guidance on how to address the stability of backfill used in pipeline construction on steep slopes.

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Provide information on karst to the permit writer, including any existing research on groundwater flow through karst in the impacted area.

Consider seeking additional research on groundwater flow through karst in the impacted area.

Ensure that the SWPPP includes appropriate BMPs for construction across karst areas.

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Review and provide comment on the vegetative and structural practices included in the SWPPP.

Ensure that the practices included in the SWPPP are consistent with Dominion’s written policy and procedure for slips.

Ensure that the practices included in the SWPPP are consistent with Dominion’s root cause documents.

---



### 2.7.1 *Vegetative practices*

The general permit includes detailed requirements for vegetative erosion and sediment control practices:

“G.4.e.2.A.i. Vegetative practices. A description of interim and permanent stabilization practices, including site specific implementation schedules of the practices shall be provided. Site plans should ensure that existing vegetation is preserved where attainable and that disturbed portions of the site are stabilized as rapidly as possible. Stabilization practices may include: temporary seeding, permanent seeding, mulching, geotextiles, sod stabilization, vegetative buffer strips, protection of trees, preservation of mature vegetation, and other appropriate measures. Also include in the plan seedbed preparation requirements and the type and amount of soil amendments necessary to establish a healthy stand of vegetation. A record of the dates when major grading activities will occur, and when construction activities temporarily or permanently cease on a portion of the site, and when stabilization measures will be initiated shall be included in the plan. Except as noted below, stabilization measures shall be initiated as soon as practicable in portions of the site where construction activities have temporarily or permanently ceased, but in no case more than seven days after the construction activity in that portion of the site has permanently ceased.

G.4.e.2.A.i.a. Where the initiation of stabilization measures by the seventh day after construction activity temporarily or permanently ceases is precluded by natural causes, stabilization measures shall be initiated as soon as conditions allow.

G.4.e.2.A.i.b. Where construction activity will resume on a portion of the site within 21 days from when activities ceased, (e.g., the total time period that construction activity is temporarily halted is less than 21 days) then stabilization measures do not have to be initiated on that portion of the site by the seventh day after construction activities have temporarily ceased.

G.4.e.2.A.i.c. Areas where the seed has failed to germinate adequately (uniform perennial vegetative cover with a density of 70%) within 30 days after seeding and mulching must be reseeded immediately, or as soon as weather conditions allow.

G.4.e.2.A.i.d. Clean water diversions must be stabilized prior to becoming functional.” (WVDEP, 2013b, p. 16-17)

### 2.7.2 *Structural practices*

The general permit includes detailed requirements for structural erosion and sediment control practices:

GA.e.2.A.ii. Structural practices. A description of the structural practices to be used to divert flows around exposed soils, store flows or otherwise limit runoff from exposed areas and eliminate sediment-laden runoff from the site. Such practices may include but are not limited to silt fences, earth dikes and berms, land grading, diversions, drainage swales, check dams, subsurface drains, pipe slope drains, storm drain inlet protection, rock outlet protection, reinforced soil retention systems and geotextiles, gabions and riprap, and permanent and temporary sediment traps/basins.

G.4.e.2.A.ii.a. For locations on a site that have a drainage area of five acres or less, a sediment trap which provides a storage volume equal to 3,600 cubic feet per acre of drainage area shall be installed. Half of the volume of the trap will be in a permanent pool and half will be dry storage.

G.4.e.2.A.ii.b. For drainage areas of greater than five acres, a sediment basin providing 3,600 cubic feet per drainage acre shall be installed. Half of the volume of the basin shall be in a permanent pool and half shall be dry storage. Sediment basins must be able to dewater the dry storage volume in 48

to 72 hours. A sediment basin must be able to pass through the spillway(s) a 25-year, 24-hour storm event, and still maintain at least one foot of freeboard.

G.4.e.2.A.ii.c. The inlet(s) and outlet(s) for a sediment trapping structure must be protected against erosion by appropriate material such as riprap or other similar media.

G.4.e.2.A.ii.d. If necessary, diversions will be used to direct runoff to the trapping structure. Diversions may need to be stabilized prior to becoming functional.

G.4.e.2.A.ii.e. For locations served by a common drainage where a detention basin providing 3,600 cubic feet of storage is not attainable, additional sediment and erosion controls within the project area are required in lieu of the required sized sediment basin. Justification and a narrative description of the additional measures proposed must be provided for use of any practice(s) other than sediment basins or traps.

G.4.e.2.A.ii.f. Fill slopes must be protected by measures used to divert runoff away from fill slopes to conveyance measures such as pipe slope drains or stable channels.

G.4.e.2.A.ii.g. Sediment trapping structures will be eliminated and the area properly reclaimed and stabilized when the contributing drainage area is stabilized and the structures are no longer needed, unless the structure is converted into a permanent stormwater detention/retention structure.

G.4.e.2.A.ii.h. All trapped sediments will be disposed on an upland area where there is no chance of entering nearby streams.

G.4.e.2.A.ii.i. Breaching the embankment to dewater the structure is not permitted. Dewatering and structure removal shall not cause a violation of water quality standards. Provide a description of the procedures that will be used in removing these structures and the time frame.

G.4.e.2.A.ii.j. No sediment-laden water will be allowed to leave the site without going through an appropriate best management practice.

G.4.e.2.A.ii.k. Hay or straw bales are not acceptable BMPs.” (WVDEP, 2013b, p. 17-19)

### **2.7.3 *The West Virginia Erosion and Sediment Control Best Management Practice Manual***

The West Virginia Erosion and Sediment Control Best Management Practice Manual:

“...is designed to assist construction site developers, engineers, designers, and contractors in identifying and implementing the most appropriate best management practices for construction activities. The purpose of this manual is to provide standardized and comprehensive erosion and sediment control management practices for implementation on construction projects throughout West Virginia. It is intended that this manual be used as guidance for developing sediment control plans for the West Virginia/National [Pollutant] Discharge Elimination System General Water Pollution Control Permit for Stormwater Associated with Construction Activities. However, the use of other best management practices manuals may also be acceptable. The goal is to reduce the water quality impacts of land-disturbing activities through the design and implementation of effective erosion prevention and sediment control.” (WVDEP, 2006)

Appendix A summarizes each of the BMP guidelines and specifications that are included in this manual. Many of these BMPs would be applicable to the construction of the ACP.

As described above in Section 1.1, Dominion’s Consent Order with WVDEP requires it to use BMPs described in its approved SWPPP or in this manual.

## 2.8 Minimum design standards for stormwater management

The general permit includes requirements for stormwater management:

“G.4.e.2.B. Stormwater management plan. Projects located in areas that have local government requirements and/or criteria for post development stormwater management must meet those requirements and/or criteria. Compliance with this General Permit does not assure compliance with local codes regulations, or ordinances. A description of measures that will be installed during construction to control pollutants in stormwater discharges after the project is completed shall be included in the SWPPP.

The permittee shall submit all calculations, watershed mapping, design drawings, and any other information necessary to explain the technical basis for the stormwater management plan. Since development site conditions vary widely, plan preparers will have significant latitude in designing practices to comply with this provision of the permit. However, design procedures shall follow professionally accepted engineering and hydrologic methodologies. Permanent stormwater management structures that will impound water (detention/retention basins or similar structures) shall be designed and certified by a registered professional engineer.” (WVDEP, 2013b, p. 19)

The permit requires that the SWPPP include a stormwater management plan, which includes description of measures to be installed to “control pollutants” after the project is completed, as well as calculations, maps, design drawings, and other information. However, the general permit does not include any minimum standards for stormwater management over and above those that may already be required for the area in which the construction is taking place. There are no known local codes, regulations, or ordinances in the counties across which the ACP is proposed to be built.

According to the permit writer, WVDEP will require that water exit the site in a non-erosive manner. But the agency’s expectation for a pipeline project is that rip-rap channels, detention basins, or other practices will not likely be required because the land will be returned to its existing contours. (Cochran, 2015)

## 2.9 Project inspections, oversight, and compliance enforcement

The permittee must allow access by WVDEP to the construction location, as well as the location at which required records are kept—and to the records themselves. Access must be provided to allow WVDEP to inspect the site, including the installed BMPs, and to collect compliance samples. (WVDEP, 2013b, p. 4)

WVDEP has primary responsibility for performing inspections under this permit. Although a FOIA request has been submitted to WVDEP regarding inspections and enforcement actions under this general permit, this request has not yet been fulfilled.

## 2.10 Water quality standards and antidegradation

West Virginia’s surface water quality standards include numeric criteria and narrative criteria<sup>7</sup> and antidegradation provisions.<sup>8</sup> In two places, the permit explicitly requires compliance with surface and groundwater standards:

“Section A. TERMS OF PERMIT. Discharges covered under this General Permit shall not cause or contribute to a violation of the surface water or groundwater standards.” (WVDEP, 2013b, p. 2)

“C.12. Water Quality. The discharges covered by this permit are to be of such quality so as to not cause violations of applicable water quality standards.” (WVDEP, 2013b, p. 5)

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<sup>7</sup> 47 CSR 2.

<sup>8</sup> 60 CSR 5.

Even though monitoring is not required (See Section 2.11), Dominion will still be responsible for ensuring compliance with standards.

The most likely surface water quality standards to be violated by a large construction project on steep land include:

1. the turbidity criterion, which only allows a certain increase in turbidity in the receiving stream from an earth disturbance activity;<sup>9</sup>
2. the prohibition of wastes present in any of the waters of the state that cause or contribute to distinctly visible floating or settleable solids, suspended solids, scum, foam or oily slicks;<sup>10</sup>
3. the prohibition of wastes present in any of the waters of the state that cause or contribute to materials in concentrations which are harmful, hazardous or toxic to man, animal or aquatic life;<sup>11</sup> or
4. the prohibition of wastes present in any of the waters of the state that cause or contribute to distinctly visible color;<sup>12</sup>

Other numeric or narrative water quality criteria may also apply.

West Virginia's antidegradation policy is described in the water quality standards rule,<sup>13</sup> but detailed implementation procedures are provided elsewhere.<sup>14</sup> Antidegradation categorizes the state's streams into one of three tiers: Tier 1, 2, or 3. Tier 3 streams, also known as outstanding national resource waters, receive the highest level of protection.

As illustrated in Figure 5, numerous Tier 3 streams are located in the vicinity of the proposed and alternate route for the ACP. Tier 3 streams that are not likely to be impacted by the ACP are shown as dark green segments; those that are directly affected or downstream from an affected stream are shown as bright red segments. Table 2 summarizes these segments, which are located in the Shavers Fork, Elk, Tygart Valley, and Greenbrier River watersheds.

According to the oil and gas construction stormwater permit:

"G.4.e.2.A.iii. Presumptive conditions for discharges to Tier 3 waters. Construction activities discharging upstream or to Tier 3 waters will go through the Tier 3.0 anti-degradation review process." (WVDEP, 2013b, p. 19)

This review process is outlined in West Virginia's antidegradation implementation procedures.<sup>15</sup> Tier 3 waters receive the highest level of protection:

"6.1. Tier 3 waters. [Outstanding National Resource Waters] are to be maintained, protected and improved where necessary. Any proposed new or expanded regulated activity that would degrade (result in a lowering of water quality) a water body that has been designated an ONRW, other than temporary lowering of water quality, is prohibited."<sup>16</sup>

The antidegradation implementation procedures provide factors used to determine whether a proposed activity is short term; if so, then WVDEP may authorize the activity. If not, then WVDEP must deny the activity.

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<sup>9</sup> 47 CSR 2, Appendix E, Table 1, Section 8.33

<sup>10</sup> 47 CSR 2 §3.2.a

<sup>11</sup> 47 CSR 2 §3.2.e

<sup>12</sup> 47 CSR 2 §3.2.f

<sup>13</sup> 47 CSR 2 §47-2-4

<sup>14</sup> 60 CSR 5.

<sup>15</sup> 60 CSR 5 §6

<sup>16</sup> 60 CSR 5 §60-5-6.1

The oil and gas construction stormwater permit addresses Tier 3 streams by requiring a public notice procedure.<sup>17</sup> This public notice procedure is also required for projects that disturb 100 or more acres; therefore, the ACP's impacts on Tier 3 streams does not appear to trigger any additional protections in the oil and gas construction stormwater permit.

## 2.11 Monitoring and reporting requirements

The general permit relies on proper implementation of BMPs to protect water quality and does not require water quality monitoring at outfalls that discharge to streams:

“SECTION E. MONITORING AND REPORTING.  
Monitoring of discharges is not required for construction activities unless directed by the Director.” (WVDEP, 2013b, p. 8)

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Consider requesting that the Director require monitoring of discharges below steep slopes, in karst areas, or in other locations most likely to impact water resources.

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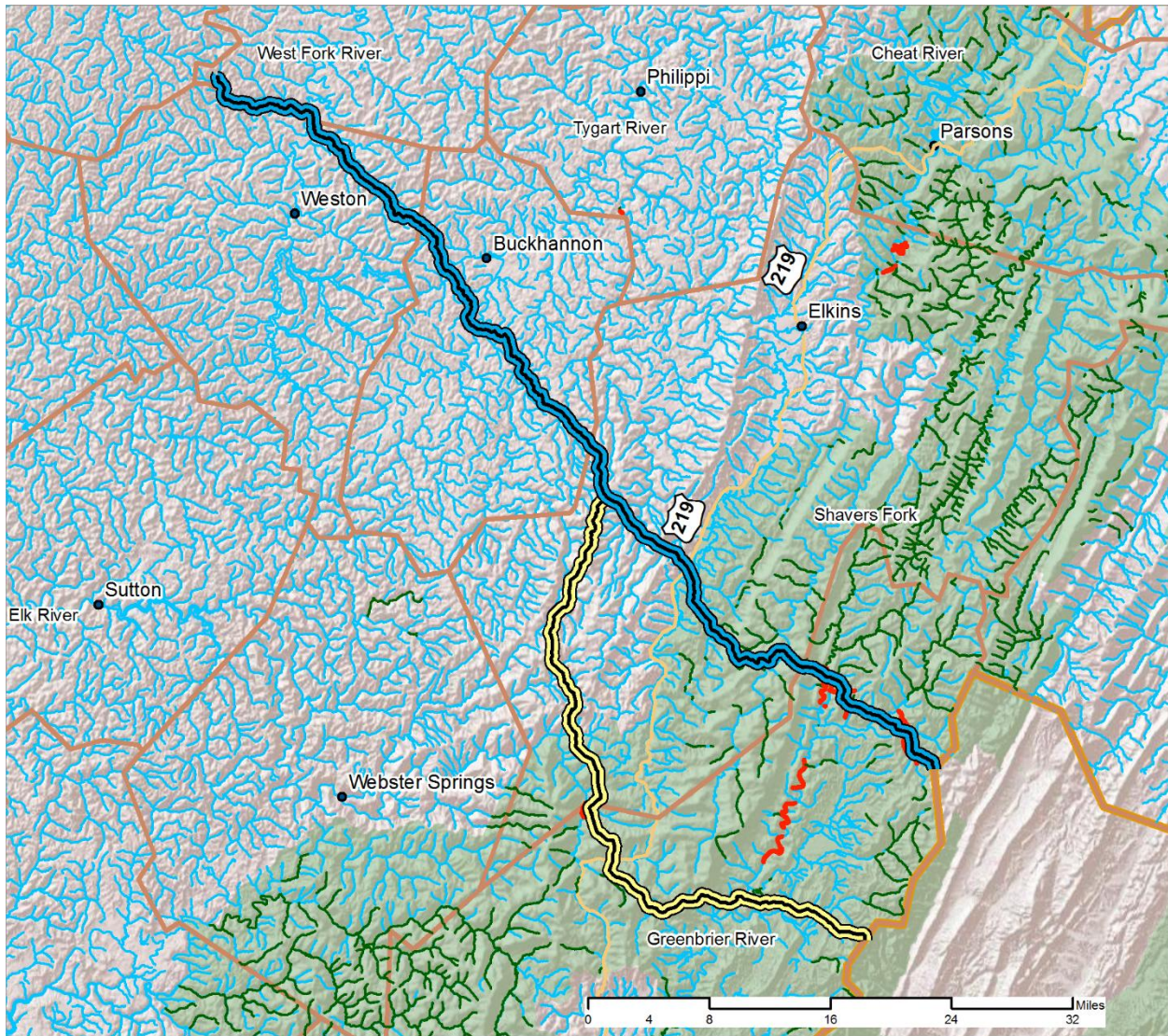
However, the permittee does have the duty to provide certain information to WVDEP:

“C.8. Duty to Provide Information. The permittee shall furnish to the Director, within a reasonably specified time, any information which the Director may request to determine whether cause exists for modifying, revoking and reissuing, suspending, or revoking this permit, **or to determine compliance with this permit. This information may include water quality information** as specified by the Director...” (WVDEP, 2013b, p. 4, emphasis added)





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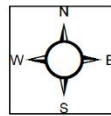
<sup>17</sup> §G.4.b.4

**Figure 5: Tier 3 streams in the vicinity of the Atlantic Coast Pipeline**



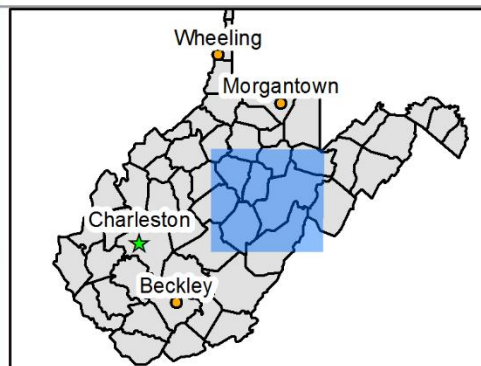
**Outstanding National Resource Waters**

-  Proposed route
-  Alternate route
- Tier 3 Waters**
-  Unaffected
-  Potentially Affected



**Data Sources**

Basemap: ESRI, Pipeline ROW: Atlantic Coast LLC ,  
 Alternative pipeline ROW: USFS, Tier 3 Shapefile: WWDNR



Date: 7/2/2015

**Table 2: Tier 3 stream segments potentially impacted by the Atlantic Coast Pipeline in West Virginia**

<b>Stream name</b>	<b>Miles</b>	<b>Number of segments</b>	<b>Stream code</b>
<b><u>Shavers Fork watershed</u></b>			
Blister Run	1.20	2	WVMCS-47
Shavers Fork	4.52	54	WVMCS
<b>Subtotal</b>	<b>5.73</b>	<b>56</b>	
<b><u>Elk River watershed</u></b>			
Elk River	1.07	2	WVKE
<b>Subtotal</b>	<b>1.07</b>	<b>2</b>	
<b><u>Greenbrier River watershed</u></b>			
Greenbrier River	9.11	21	WVKNG
Trout Run	0.01	1	WVKNG-74
Johns Run and UNT/Johns Run RM 0.90	0.44	1	WVKNG-78-A
Little River	4.19	11	WVKNG-78-C
West Fork/Greenbrier River	3.19	7	WVKNG-79
Mountain Lick Creek	1.22	1	WVKNG-79-A
UNT/Mountain Lick Creek RM 0.9	0.97	2	WVKNG-79-A-1
UNT/West Fork RM 5.97/Greenbrier River (Braucher Run)	1.04	3	WVKNG-79-B.5
<b>Subtotal</b>	<b>20.18</b>	<b>47</b>	
<b><u>Tygart Valley River watershed</u></b>			
Middle Fork River	0.19	1	WVMTM
<b>Subtotal</b>	<b>0.19</b>	<b>1</b>	
<b>Total</b>	<b>27.16</b>	<b>106</b>	

### 3. 404 PERMIT

While the oil and gas construction stormwater permit described in Chapter 2 addresses erosion and sedimentation from earth disturbance activities during construction, a different permit, typically called a “404” permit, addresses stream crossings and impacts on wetlands. With regards to stream crossings, 404 permits control the discharge of dredged or fill materials into navigable waters and are issued by the U.S. Army Corps of Engineers for activities that directly impact stream beds.

**Figure 6: Constructing a pipeline stream crossing between Ireland and Flatwoods, West Virginia**



Photo credit: April Keating.

USACE divides the country into districts. Most of the ACP route in West Virginia is located within the Pittsburgh district, but near the Virginia border the pipeline crosses into the Huntington district. Dominion initiated contact with USACE staff at both districts starting in 2014 (Natural Resource Group, 2015b). Pre-application meetings, in which applicants discuss preliminary information with USACE, have already been held. In one meeting held in October 2014, a USACE representative suggested that one USACE district would likely take the lead and that it would not likely be the Huntington district (Hammer, 2014).

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Communicate with USACE regarding the status of jurisdictional determinations for stream crossings in West Virginia, and more generally regarding the status of the 404 permit.

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As shown above in Figure 3, the ACP directly crosses many streams, but most of these streams are small, headwaters streams. In order to determine whether 404 permits and 401 certifications are needed, jurisdictional determinations will need to be made.

In its Water Use and Quality Resource Report, Dominion inventories waterbodies using the FERC definition of “any natural or artificial stream, river, or drainage with perceptible flow at the time of crossing, and other permanent waterbodies such as lakes or ponds” (Natural Resource Group, 2015c, p. 2-19). These may be perennial, intermittent, or ephemeral streams. According to this inventory, these waterbodies are those that are potentially subject to USACE jurisdiction for 404 permits (Natural Resource Group, 2015c).



A total of 100 waterbody crossings are documented for the ACP route in West Virginia. These include 58 perennial, 39 intermittent, and three ephemeral streams. These streams vary in width from 1.5 to 90 feet. Streams with widths of 25 feet or greater include (listed along the pipeline route from west to east):

- West Fork River (65 feet),
- Buckhannon River (75 feet),
- Right Fork Middle Fork River (32 feet),
- Birch Fork (25 feet),
- Kittle Creek (30 feet),
- Unnamed Tributary to Tygart Valley River (35 feet),
- Unnamed Tributary to Tygart Valley River (45 feet),
- Tygart Valley River (30 feet),
- Shavers Fork (90 feet), and
- West Fork Greenbrier River (80 feet) (Natural Resource Group, 2015c).

In addition to the pipeline itself, access roads will cross 20 waterbodies in West Virginia (Natural Resource Group, 2015c).

**Figure 7: Construction of a pipeline stream crossing in West Virginia**

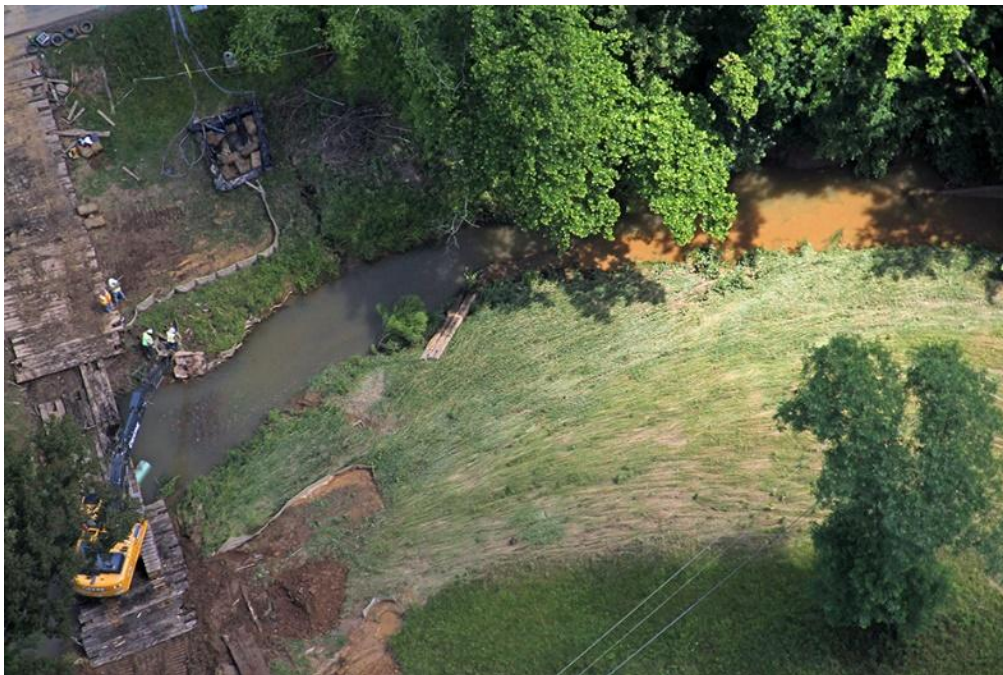


Photo credit: Rick Webb.

USACE may issue an individual 404 or a nationwide permit. An individual permit would likely receive a more detailed level of review by the USACE permit writer, which might result in site-specific conditions being written into the permit that would be absent if a nationwide permit were utilized. 404 permit violations, whether individual or nationwide permits, would still be subject to citizen suits.

In an October 2014 meeting, a USACE representative suggested that it was too early to determine whether an individual permit would be required, or if Nationwide Permit 12 would be utilized (Hammer, 2014). Nationwide Permit 12 authorizes the construction of utility lines, including pipelines that transport natural gas, provided there is no change in preconstruction contours (USACE, Undated).

DPMC and concerned citizens can sign up to receive public notices for 404 permits from the USACE Pittsburgh district by sending an email to [regulatory.permits@usace.army.mil](mailto:regulatory.permits@usace.army.mil) or by calling (412) 395-7155 (USACE, 2015). USACE also posts public notices for individual and nationwide permits at <http://www.lrp.usace.army.mil/Missions/Regulatory/PublicNotices.aspx>.

### 3.1 401 certification

Before USACE can issue a 404 permit, WVDEP must issue a 401 water quality certification, in which the agency certifies that the discharge of fill materials will not cause a violation West Virginia water quality standards.

Dominion contacted WVDEP in 2014 to start to make staff aware of the project and to seek appropriate contacts for the 401 water quality certification process (Natural Resource Group, 2015b).

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Determine whether USACE intends to require an individual 404 permit or a Nationwide 12 permit.

Sign up to receive public notices for 404 permits issued by the USACE Pittsburgh district.

Submit formal written comments on the 404 permit.

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Communicate with WVDEP regarding the status of the 401 certification process.

Submit formal written comments on the 401 certification.

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## 4. CONCLUSIONS AND RECOMMENDATIONS

The proposed ACP route begins in Harrison County and crosses Lewis, Upshur, Randolph, and Pocahontas counties before entering Virginia. In West Virginia, it crosses numerous streams, which range from small headwaters streams to larger rivers with widths of up to 90 feet. Pipeline construction, especially in mountainous areas, can accelerate erosion and cause sedimentation of streams. This sedimentation can impact other rivers downstream from those directly crossed by the pipeline, including Tier 3 streams that receive special protections under West Virginia's antidegradation implementation procedures.

Dominion signed a Consent Order issued by WVDEP in 2014, which resulted from multiple violations associated with its construction and operation of smaller pipelines in West Virginia. In addition to a cash penalty, this Order requires Dominion to submit certain documents that will inform future pipeline projects such as the ACP. It also requires Dominion to use certain BMPs during future construction.

Opportunities exist for DPMC and concerned citizens to participate in two permitting processes to ensure that issued permits protect water resources and that the regulatory agencies appropriately inspect and enforce the permits after issuance: (1) the oil and gas construction stormwater NPDES permit and (2) the 404 permit and the linked 401 certification.

The following recommendations are provided for DPMC and concerned citizens regarding the oil and gas construction stormwater NPDES permit:

- Petition the WVDEP Director to require an individual permit, rather than a general permit, for the ACP.
- Contact the WVDEP permit writer, even before the SRA has been submitted.
- Submit a FOIA requesting all information that has already been submitted to WVDEP, even before the SRA has been submitted.
- Submit a FOIA requesting the SRA, SWPPP, and GPP.
- Request a meeting with the WVDEP permit writer to share information or to discuss concerns after reviewing the SRA, SWPPP, and GPP.
- Sign up to receive public notices for NPDES permits issued by WVDEP.
- Submit formal written comments on the NPDES permit.
- Request a public hearing, participate in the hearing, and ensure a solid turnout from diverse people and organizations.
- Review the SWPPP in detail.
- Pay particular attention to the erosion and sediment controls and stormwater management plan for information about controlling sediment pollution.
- Pay particular attention to the spill prevention and response procedures for information about preventing the discharge of non-sediment pollutants.
- Provide comments on the SWPPP during the public comment period.
- Review the GPP in detail.
- Provide comments on the GPP during the public comment period.
- Provide information on karst to the permit writer, including any existing research on groundwater flow through karst in the impacted area.
- Consider seeking additional research on groundwater flow through karst in the impacted area. Ensure that the SWPPP includes appropriate BMPs for construction across karst areas.
- Review and provide comment on the vegetative and structural practices included in the SWPPP.
- Ensure that the practices included in the SWPPP are consistent with Dominion's written policy and procedure for slips.

- Ensure that the practices included in the SWPPP are consistent with Dominion’s root cause documents.
- Consider requesting that the Director require monitoring of discharges below steep slopes, in karst areas, or in other locations most likely to impact water resources.

The following recommendations are provided for DPMC and concerned citizens regarding the 404 permit and 401 certification:

- Communicate with USACE regarding the status of jurisdictional determinations for stream crossings in West Virginia, and more generally regarding the status of the 404 permit.
- Determine whether USACE intends to require an individual 404 permit or a Nationwide 12 permit.
- Sign up to receive public notices for 404 permits issued by the USACE Pittsburgh district.
- Submit formal written comments on the 404 permit.
- Communicate with WVDEP regarding the status of the 401 certification process.
- Submit formal written comments on the 401 certification.

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## APPENDIX A: BEST MANAGEMENT PRACTICES THAT MAY APPLY TO PIPELINE CONSTRUCTION

The West Virginia Erosion and Sediment Control Best Management Practice Manual includes specifications for numerous BMPs, as summarized in Table 3.

**Table 3: Best management practices that may apply to pipeline construction**

Standard guideline	Specification
Preserving existing vegetation	This practice is to preserve the existing natural vegetation thereby reducing erosion wherever practicable. Limiting the amount of disturbance on a construction site is the single most effective method for reducing erosion.
Stabilized construction entrance	Large quantities of mud can be tracked onto public and private roads causing dangerous driving conditions and muddy runoff when it rains. Construction entrances are stabilized to reduce the amount of sediment transported onto paved roads by vehicles or equipment by constructing a stabilized pad of stone at entrances to construction sites.
Temporary construction road, work and parking area stabilization	The temporary stabilization of access roads, haul roads, parking areas, laydown, material storage and other onsite vehicle transportation routes with stone immediately after grading. This practice is used to reduce the erosion and subsequent re-grading of temporary and permanent roadbeds, work areas and parking areas rutted by construction traffic during wet weather.
Safety fence	Protective fencing should be installed to prevent access to potentially hazardous areas of a construction site.
Rock check dams	Small temporary stone dams can be constructed across a waterway to reduce the velocity of stormwater flows, thereby reducing erosion of the channel and trapping sediment. This practice is the replacement for the traditionally misused hay/straw bales and silt fence ditch checks. Constructing a small dugout trap upstream of the structure can enhance the sediment trapping efficiency.
Wattles	Wattles are erosion and sediment control barriers consisting of straw or other organic materials wrapped in biodegradable tubular plastic or similar encasing material. Sometimes called Fiber Rolls. Wattles may reduce the velocity and theoretically spread the flow of rill and sheet runoff, and can capture and retain sediment.
Commercial silt dikes	Commercial silt dikes work on the same principle as rock check dams; they intercept and pond sediment-laden runoff. Ponding the water reduces the velocity of any incoming flow and allows some of the suspended sediment to settle. Water exits some commercial silt dikes by flowing over the top and others by flowing through with higher flows going over the top. The apron on the downstream side of the dike helps prevent scour caused by this flowing water.
Surface roughening	Surface roughening means providing a rough soil surface with horizontal depressions created by operating a tillage or other suitable implement on the contour, or by leaving slopes in a roughened condition by not fine-grading them. This will aid in establishment of vegetative cover with seed, reduce runoff velocity, and increase infiltration, and reduce erosion and provide for sediment trapping. Surface roughening is also a way to prepare the seedbed.
Topsoiling	Topsoiling is the spreading of topsoil of a suitable quality over an area to be stabilized by establishing vegetation. Topsoil is the surface layer of the soil profile, generally characterized as darker than the subsoil due to the enrichment with organic matter. It is the major zone of root development and biological activity. Microorganisms that enhance plant growth thrive in this layer. Topsoil can usually be differentiated from subsoil by texture as well as color. Clay content usually increases in the subsoil. Where the subsoil is high in clay, the topsoil layer may be significantly coarser in texture. The depth of natural topsoil may be quite variable. On severely eroded sites it may be gone entirely.

Standard guideline	Specification
Temporary seeding	Temporary erosion control measures consist of seeding and mulching, or matting used to produce a quick ground cover to reduce erosion on exposed soils that may be re-disturbed or permanently stabilized at a later date.
Permanent seeding	Permanent seeding is the establishment of perennial vegetative cover on disturbed areas by planting seed.
Mulching including flexible growth medium and bonded fiber matric	<p>The application of straw, hay or other suitable materials to the soil surface used to:</p> <ol style="list-style-type: none"> <li>1. Prevent erosion by protecting the soil surface from raindrop impact and reducing the velocity of overland flow.</li> <li>2. Foster the growth of vegetation by increasing available moisture and providing insulation against extreme heat and cold. Mulching increases the window of opportunity for seeding by moderating temperature and moisture extremes. This is important because the general permit does not define specific seeding dates and requires only that areas be seeded within seven days of reaching final grade.</li> </ol>
Rolled erosion control products	Rolled Erosion Control Products (RECPs) are temporary or permanent erosion control nets, blankets and three-dimensional matrixes made from a wide variety of natural (such as jute, coir and straw) and manmade materials alone or in combination. There are numerous commercially available products so great care must be used to choose the correct product for the application.
Sodding	The purpose of sodding is to establish permanent turf for immediate erosion protection and to stabilize drainage ways where concentrated overland flow will occur.
Temporary diversion	A temporary berm or excavated channel or combination berm and channel constructed across sloping land on a predetermined grade. This variable practice is used to protect work areas from upslope runoff and reduce the size of the drainage are going to sediment trapping structures, transport runoff across a project to minimize erosion and to divert sediment-laden water to an appropriate sediment trapping facility.
Pipe slope drain	A flexible tubing or conduit extending from the top to the bottom of a cut or fill slope to temporarily conduct concentrated stormwater runoff down the face of the cut or fill in a non-erosive manner.
Outlet protection	Outlet protection consists of the construction of an erosion resistant section between a conduit outlet and a stable downstream channel. Erosion at an outlet is chiefly a function of soil type and the velocity of the conduit discharge. Therefore, in order to mitigate erosion, an adequate design must stabilize the area at the conduit outlet and reduce the outlet velocity to a velocity consistent with a stable condition in the downstream channel.
Right-of-way diversion	Right-of-way interceptor diversion is a ridge of dirt or a ridge and a channel combination constructed on an angle across a utility right-of way used to shorten flow paths and flatten slopes to reduce the erosive force of water or to direct water away from critical resources. It can be both a temporary and permanent structure.
Level lip spreader	An outlet for dikes and diversions consisting of an excavated depression constructed at zero grade across a slope used to convert concentrated runoff to sheet flow and release it uniformly onto areas stabilized by existing vegetation.
Surface water control	<p>By anticipating where runoff will occur and directing water to go where it will do the least damage, erosion can be, in some cases, almost eliminated. By directing runoff to stabilized conveyances such as pipe slope drains, riprap channels and rock underdrains, slopes, fills and haul roads can be protected from excessive erosion. Work areas dry quicker after rainfall events, and the contractor saves time and money by not having to re-grade areas damaged by erosion.</p>



Standard guideline	Specification
Instream construction BMPs	<p>Large amounts of sediment can be generated when equipment is working in a stream. The only way that sediment be reduced during instream construction is by isolating the work or “working in the dry”. By isolating the work area from the stream flow much of this sediment can be eliminated. There are several techniques that can be used to dewater and isolate the work area.</p> <p>When the project will last more than 72 hours and the work area has to be completely dewatered such as when culverts are being installed, the temporary stream diversion can be used.</p>
Dewatering	<p>Dewatering refers to the act of removing and discharging water from excavated areas on construction sites, utility line construction or from sediment traps or basins on construction sites.</p>
Riprap	<p>A permanent, erosion-resistant ground cover of large, loose, angular stone with filter fabric or granular underlining used to protect the soil from:</p> <ol style="list-style-type: none"> <li>1. The erosive forces of concentrated runoff.</li> <li>2. To slow the velocity of concentrated runoff while enhancing the potential for infiltration.</li> <li>3. To stabilize slopes with seepage problems and/or non-cohesive soils.</li> </ol>
Geotextiles	<p>Geotextiles are any permeable textile fabric used to increase soil stability, provide erosion control or aid in drainage. Geotextiles are usually made from a synthetic polymer such as polypropylene, polyester, polyethylenes and polyamides. Geotextiles can be woven, knitted or non-woven.</p>
Vegetative buffer strip	<p>A vegetative buffer strip is the maintenance of existing or planted vegetation adjacent to streams, wetlands, or other areas of significant natural resource value for the purpose of stormwater pollutant removal. The term vegetative buffer is typically used to describe the preservation of existing vegetation without specific regard to pollutant removal efficiency, whereas the term filter strip is generally used when vegetation (usually grass) is specifically designed to achieve pollutant removal goals.</p>
Silt fence	<p>A temporary sediment barrier consisting of a synthetic filter fabric stretched across and attached to supporting posts and entrenched. Used to intercept and detain small amounts of sediment from disturbed areas during construction operations in order to prevent sediment from leaving the site.</p>
Super silt fence	<p>A super silt fence is a temporary barrier of geotextile fabric over chain link fence. It is used to intercept sediment-laden runoff from areas that are too large for regular silt fence. Super silt fence can be a replacement for sediment traps in certain instances.</p>
Sediment trap	<p>A temporary ponding area formed by constructing an embankment or excavation and embankment that will trap the flow of sediment-laden runoff. Sediment traps have a properly stabilized outlet/weir or riser and pipe to detain sediment-laden runoff from small disturbed areas of five acres or less. Outlets must be designed to extend the detention time and allow the majority of the sediment to settle out.</p>
Sediment basin	<p>A temporary structure consisting of an earthen embankment, or embankment and excavated area, located in a suitable area to capture sediment laden runoff from a construction site. A sediment basin reduces the energy of the water through extended detention (48 to 72 hours) to settle out the majority of the suspended solids and sediment and prevent sedimentation in waterways, culverts, streams and rivers. Sediment basins have both wet and dry storage space to enhance the trapping efficiency and are appropriate in drainage areas of 5 acres and greater. For drainage areas of less than 5 acres see the standard for sediment trap.</p>
Drop inlet protection	<p>A sediment barrier and/or an excavated impounding area around a storm drain drop inlet or curb inlet used to trap sediment before contaminated runoff enters a storm drainage system.</p>

Standard guideline	Specification
Access road/low volume road/driveway	To control sediment from roads it is necessary to practice aggressive erosion control. The single most important thing to do when designing and building a road is to control the water. Running water more than a few hundred feet down a road will cause long-term erosion and increase maintenance costs. It is important that concentrated upslope water from streams or drainageways is directed immediately across the road with a culvert. Adequately sized and stabilized ditches to catch minor hillside runoff must also be constructed. The goal is to maintain the existing hydrologic conditions as much as possible by installing adequate numbers of cross culverts.

Note: Language copied directly from WVDEP (2006).