UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

Mountain Valley Pipeline, LLC	)	
	)	CP16-10-000
Mountain Valley Pipeline Project	)	

MOTION BY PRESERVE CRAIG, INDIAN CREEK WATERSHED ASSOCIATION, PRESERVE BENT MOUNTAIN, PRESERVE FRANKLIN, PRESERVE MONTGOMERY COUNTY VA, PRESERVE MONROE, THE BORDER CONSERVANCY, SAVE MONROE, SUMMERS COUNTY RESIDENTS AGAINST THE PIPELINE, GREENBRIER RIVER WATERSHED ASSOCIATION, PROTECT OUR WATER, HERITAGE, RIGHTS, AND PRESERVE GILES FOR REVISED PEAK STORMWATER DISCHARGE ANALYSIS FOR THE MOUNTAIN VALLEY PIPELINE PROJECT

1. Pursuant to the Commission's Rules of Practice and Procedure, 18 C.F.R. § 385.212, Preserve Craig, Indian Creek Watershed Association, Preserve Bent Mountain, Preserve Franklin, Preserve Montgomery County VA, Preserve Monroe, The Border Conservancy, Save Monroe, Summers County Residents Against the Pipeline, Greenbrier River Watershed Association, Protect Our Water, Heritage, Rights, and Preserve Giles (collectively, Movants), move for the Commission, in coordination with the Pipeline and Hazardous Materials Safety Administration (PHMSA) and U.S. Army Corps of Engineers (Army Corps), to direct Mountain Valley Pipeline, LLC (Mountain Valley) to undertake revised analysis of changes to peak stormwater discharge due to construction of the Mountain Valley Pipeline Project (MVP Project) in accordance with scientifically accepted methods. Such analysis is necessary to identify and mitigate impacts to waterbodies downstream of the limits of disturbance for the MVP Project some of which provide habitat for federally listed endangered species, and to accurately assess the potential for scour and channel migration at each waterbody crossing so as

to prevent damage to the buried pipeline and protect public safety. Movants request the Commission issue a project-wide stop work order until such analysis is complete.

2. Movants are community organizations based in Virginia and West Virginia dedicated to the study, protection, and enjoyment of natural, historical, and cultural resources in the Appalachian Region.[1] Their individual members include landowners, farmers, educators, scientists, and naturalists who live, recreate, and own property along the path of the pipeline. They have an interest in construction of the MVP Project in compliance with the Certificate Order and applicable laws.

3. This Motion is organized as follows: Section I provides background information, Section II presents the argument, Section III sets forth the requested relief, and Section IV states the conclusion. This Motion is supported by two expert declarations provided by Kirk A. Bowers, P.E. (Attachment 1) and Pamela C. Dodds, Ph.D. (Attachment 2), and other supporting documents designated in the text.

[1] Preserve Craig, Inc., "Motion of Preserve Craig, Inc. for Leave to Intervene," eLibrary no. 20151127-5055 (Nov. 25, 2015); Indian Creek Watershed Association, "Motion to Intervene of Indian Creek Watershed Association," eLibrary no. 20151123-5166 (Nov. 23, 2015); Appalachian Mountain Advocates, et. al., "Motion to Intervene and Protest of Appalachian Mountain Advocates, Appalachian Voices, Chesapeake Climate Action Network, Friends of the Lower Greenbrier River, Greenbrier River Watershed Association, Headwaters Defense, Preserve Bent Mountain, Preserve Giles County Virginia, Preserve Greenbrier County, Preserve Monroe, Preserve Montgomery County Virginia, Protect Our Water, Heritage, Rights, Save Monroe, the Sierra Club, the Sierra Club (Virginia Chapter), Summers County Residents Against the Pipeline, West Virginia Highlands Conservancy, and West Virginia Rivers Coalition," eLibrary no. 20151127-5155 (Nov. 27, 2015); Preserve Franklin, "Motion to Intervene and Protest: Parties listed below collectively the 'Protestants,'" eLibrary no. 20151130-5432 (Nov. 30, 2015); The Border Conservancy, "Motion to Intervene of Border Conservancy," eLibrary no. 20151127-5035 (Nov. 27, 2015); Save Monroe, "Motion to Intervene of Save Monroe, Inc.," eLibrary no. 20151125-5076 (Nov. 25, 2015); Protect Our Water, Heritage, Rights, "Motion to Intervene of Protect Our Water, Heritage and Rights (POWHR)," eLibrary no. 20151125-5343 (Nov. 25, 2015).

I.
BACKGROUND

4. On October 23, 2015, Mountain Valley filed an application for a Certificate of Public Convenience and Necessity under Natural Gas Act section 7(c).[2]

5. On June 23, 2017, the Commission issued the final Environmental Impact Statement (EIS) for the MVP Project. The final EIS described the potential effects of increased peak stormwater discharge, especially during periods of seasonal and flash flooding:

> Seasonal and flash flooding hazards are a potential concern where the proposed pipeline would cross or be near major streams and small watersheds. Although flooding itself does not generally present a risk to pipeline facilities, bank erosion and/or scour could expose the pipeline or cause sections of pipe to become unsupported. All pipeline facilities are required to be designed and constructed in accordance with 49 C.F.R. 192. These regulations include specifications for installing the pipeline at a sufficient depth to avoid possible scour at waterbody crossings. Mountain Valley conducted a scour analysis to determine, in part, the depth of trench that would be required at all perennial waterbody crossings with FERC classification of intermediate or major to avoid scour…[3]

6. On October 13, 2017, the Commission issued the Certificate Order. The Certificate Order approves Mountain Valley's construction of a 303.5-mile-long, 42-inch-diameter natural gas pipeline from Wetzel County, West Virginia (milepost (MP) 0.0) to an interconnection with Columbia Gas Transmission, LLC's WB System in Braxton County, West Virginia, at MP 77.6, and then to an interconnection with Transco's mainline system at MP 303.5 in Pittsylvania County, Virginia.[4]

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[2] *See* Mountain Valley, "Application for Certificate of Public Convenience and Necessity and Related Authorizations," eLibrary no. 20151023-5035 (Oct. 23, 2015). Prior to filing its application, Mountain Valley received permission to use the Commission's pre-filing procedures (*see* 18 C.F.R. section 157.21). *See* FERC, "Letter responding to Mountain Valley Pipeline LLC's letter filed 10/27/14 re Approval of Pre-Filing Request for the planned Mountain Valley Pipeline Project under PF15-3," eLibrary no. 20141031-3001 (Oct. 31, 2014).

[3] Final EIS, p. 4-138.

[4] *Id.* at ¶ 7.

7. The approved route for the MVP Project traverses steep, mountainous terrain:

> As shown in the final EIS, 46 percent of the MVP project slopes are high erosion hazards and 22 percent are moderate erosion hazards. In Virginia and West Virginia, the MVP Project crosses 22.3 miles of slopes ranging from 15 percent to 30 percent and 75.4 miles of slopes greater than 30 percent. … Soils on the highest ridges are mostly stony, gravelly, or sandy. Lower limestone ridges, where Mountain Valley is most active, are clayey, erodible, plastic, and slip prone.[5]

8. Despite the difficult terrain, the Commission, relying on the final EIS, found that the MVP Project would "provide a safe, reliable means of transporting gas." Certificate Order, ¶ 279. It stated that Mountain Valley would be obligated to design, construct, operate, and maintain project facilities "to meet or exceed the [Department of Transportation's (DOT's)] Minimum Federal Safety Standards and other applicable federal and state regulations. These regulations include specifications for material selection and qualification; minimum design requirements; and protection of the pipeline from internal, external, and atmospheric corrosion."[6]

9. On December 26, 2017, the District Engineer for the Norfolk District of the U.S. Army Corps of Engineers (Norfolk District) issued verification authorizing the MVP Project to proceed under Nationwide Permit 12 (NWP-12) rather than obtain an individual Department of the Army Permit under Clean Water Act (CWA) section 404, 33 U.S.C. § 1344.[7] The verification states that the Norfolk District may reconsider the verification based on material new information or changed circumstances.[8] The Huntington and Pittsburgh Districts of the U.S.

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[5] Declaration by Kirk A. Bowers, P.E. (Sept. 3, 2019) (Attachment 1 (Bowers Declaration)), ¶15-16.

[6] Certificate Order at ¶ 278; *see also id.* at ¶ 162 ("Mountain Valley would remain under an obligation to comply with all relevant DOT Pipeline and Hazardous Materials Safety Administration (PHMSA) safety requirements for existing pipelines.").

[7] Letter from William T. Walker, Norfolk District, to Mountain Valley (Dec. 26, 2017) (providing NWP-12 Verification).

[8] *Id.* at 3.

Army Corps of Engineers issued similar verification letters under NWP-12 for portions of the MVP Project within their respective jurisdictions.[9]

10. Despite these findings and verifications, the MVP Project has experienced numerous issues related to management of stormwater discharge, including erosion and sedimentation, during storm events.

11. On August 3, 2018, the Commission issued a stop work order following the U.S. Court of Appeals for the Fourth Circuit's decision vacating the Bureau of Land Management and the U.S. Forest Service's authorizations for the MVP Project to cross the Jefferson National Forest.[10] The Fourth Circuit's decision was based in part on the Forest Service's failure to explain its finding that Mountain Valley's erosion and sedimentation control measures could reduce sedimentation caused by the project by 79% when it previously had rejected this estimate as much too high.[11] The Commission's Office of Energy Projects (OEP) staff subsequently modified the stop work order to resume construction activities between mileposts (MP) 0 and 77 and permitting "stabilization" measures along the entire route.[12]

12. On September 21, 2018, Mountain Valley filed Variance Request No. MVP-006 with the Commission, which sought to modify the method for several waterbody crossings

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[9] *See* letter from Teresa D. Spagna, Huntington District, to Shawn Posey, Mountain Valley (Dec. 22, 2017); letter from Jon T. Coleman, Pittsburgh District, to Robert Cooper, Mountain Valley (Oct. 19, 2018) (referencing prior verification letters).

[10] Letter from Terry L. Turpin, FERC, to Matthew Eggerding, MVP, eLibrary no. 20180803-3076 (Aug. 3, 2018).

[11] *Sierra Club, Inc. v. United States Forest Serv.*, 897 F.3d 582, 596 (4th Cir. 2019), *reh'g granted in part*, 739 F. App'x 185 (4th Cir. 2018).

[12] Letter from Terry L. Turpin, FERC, to Matthew Eggerding, Mountain Valley, "Re: Stop Work Order Modification," eLibrary no. 20180815-3057 (Aug. 15, 2018); Letter from Paul Friedman, FERC, to Matthew Eggerding, Mountain Valley, "Re: Limited Construction Approval," eLibrary no. 20180820-3036 (Aug. 20, 2018).

approved in the Certificate Order.[13] Mountain Valley asserted the change was necessary because the desktop analyses it undertook in preparing its Vertical Scour and Lateral Channel Erosion and Analysis did not consider actual conditions at the proposed crossings.[14] In support of the request, Mountain Valley stated:

> The original Vertical Scour and Later [sic] Channel Erosion and Analysis was a theoretical desktop analysis and did not take site-specific constructibility issues (elevations, terrain, and workspace) into account. During its subsequent field reviews, Mountain Valley determined that execution of the mitigation measures, as written, would pose increased environmental or landslide risks, or be unsafe or impractical due to terrain or geology. MVP also would not have adequate workspace to store the soils required to meet the proposed burial elevations. In the updated plan, Mountain Valley added another mitigation measure of monitoring lateral channel erosion.[15]

13. Mountain Valley did not provide additional analysis of changes to peak stormwater discharge caused by upland construction or potential scour in support of the variance. It did not comply with the Commission's lead environmental contractor's recommendation to provide site-specific analyses and plans for each of the stream crossings where Mountain Valley proposed to bury the transmission lines at shallower depths.[16] Commission staff, without explanation, approved the request one day after it was posted to the electronic docket.[17]

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[13] Letter from Matthew Eggerding, Mountain Valley, to Kimberly D. Bose, FERC, "Re: Variance Request Nos. H-9 and MVP-006," eLibrary no. 20180921-5228, (Sept. 21, 2018).

[14] *See id.* at 18/61 in PDF.

[15] *Id.*

[16] Email from Lavinia DiSanto, Cardno, to Megan Neylon, Mountain Valley, (May 11, 2018) ("Revise Appendix C to provide a site-specific scenario (such as was provided for Second Big Run and Stony Creek) for each location that would receive mitigation as described in section 5.2.2 versus mitigation as described in section 5.2.1."). The lead inspector's request followed comments previously filed by other experts regarding Mountain Valley's failure to accurately calculate stormwater discharge pre- and post-construction. *See, e.g.,* Pamela C. Dodds, "Notice of Objection to the Draft Record of Decision for the Mountain Valley Project Land and Resource Management Plan Amendment for the Jefferson National Forest, Monroe County, West Virginia and Giles and Montgomery Counties, Virginia," eLibrary no. 20170807-5080 (Aug. 7, 2017).

[17] Letter from Paul Friedman, FERC, to Matthew Eggerding, Mountain Valley, "Re: Approval of Variances MVP-006 and H-9 ," eLibrary no. 20180925-3015 (Sept. 25, 2018).

14. On October 2, 2018, the Fourth Circuit issued a decision in *Sierra Club v. U.S. Army Corps of Engineers*, which found that the Huntington District violated the CWA when it verified that construction of portions of the MVP Project located within West Virginia could proceed pursuant to NWP-12. The Norfolk and Pittsburgh Districts subsequently suspended their respective verifications as well.[18] To our knowledge, Mountain Valley has not undertaken construction at waterbody crossings since the verifications were suspended.

15. On April 11, 2019, PHMSA issued an advisory bulletin: "Pipeline Safety: Potential for Damage to Pipeline Facilities Caused by Flooding, River Scour, and River Channel Migration," 84 Fed. Reg. 14715. According to the bulletin, "[s]evere flooding, river scour, and river channel migration are the types of unusual operating conditions that can adversely affect the safe operation of a pipeline and require corrective action under the Federal pipeline safety regulations." *Id.* To our knowledge, the Commission and PHMSA have not required Mountain Valley to address this new guidance. There is no indication on the record that the PHMSA has reviewed Mountain Valley's peak stormwater discharge calculations on its own initiative.

16. On August 15, 2019, Mountain Valley notified the Commission that it was "voluntarily" suspending construction activities "associated with stream crossings within any watershed area draining to a stream or river segment that is known or assumed to contain Roanoke logperch, candy darter, or proposed critical habitat for the candy darter."[19] Then, on August 28, 2019, OEP Staff asked to reinitiate consultation with the Fish and Wildlife Service (FWS) under the federal Endangered Species Act and implementing regulations given the new

[18] Letter from Jon T. Coleman, Pittsburgh District, to Robert Cooper, Mountain Valley, (Oct. 19, 2018).

[19] Letter from Todd Normane, Mountain Valley, to James Martin, FERC, eLibrary no. 20190815-5160 (Aug. 15, 2019), p. 2.

listing of the candy darter[20] and new information related to project impacts from sedimentation: "[a]ccordingly, and based on 50 C.F.R. §402.16(b), we are requesting to reinitiate consultation so that impacts on the candy darter, Roanoke logperch … can be properly assessed based on the new listing and new information,"[21] including "new information regarding impacts from sedimentation and slips."[22] The request for reinitiation of consultation was prompted in part by the FWS's request for additional information regarding Mountain Valley's erosion and sediment analysis.[23] For example, the FWS requested information regarding whether effects to Roanoke Logperch from upland sedimentation were considered in the biological opinion issued by the FWS on November 21, 2017.[24]

II.
ARGUMENT

17. Mountain Valley's failure to properly calculate peak stormwater discharge pre- and post-construction does not comply with the Certificate Order, PHMSA regulations and guidance, or the NWP-12 verifications issued by the Army Corps.

18. In issuing the Certificate Order, the Commission found that the MVP Project would be in the public interest and would not significantly impact the environment or landowners.[25] This finding was based, in part, on Mountain Valley's obligation to comply with

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[20] Letter from James Martin, Ph.D., FERC, to Cindy Shulz, FWS, eLibrary no. 20190828-3057 (Aug. 28, 2019), p. 1.

[21] *Id.* at 2.

[22] *Id.* at 1.

[23] Letter from Kyla Hastie, FWS, to Kimberly Bose, FERC, eLibrary no. 20190412-5164 (Apr. 12, 2019), p. 1.

[24] *Id.* at 2.

[25] Certificate Order, ¶ 308.

PHMSA regulations for safe pipeline construction and operation. The Commission has continuing authority over the construction and operation of the pipeline to ensure compliance with the Certificate Order and as necessary to protect the public interest and safety.[26]

19. PHMSA's regulations for construction of transmission lines provide, in part: "[t]he operator must take all practicable steps to protect each transmission line or main from washouts, floods, unstable soil, landslides, or other hazards that may cause the pipeline to move or to sustain abnormal loads.…"[27]

20. PHMSA has issued several bulletins in support of its regulations for construction of transmission lines that describe actions operators should take to address risks related to flooding and high flows at pipeline locations. In a bulletin from 2015, PHMSA stated:

> river bottom scour and channel migration may occur due to seasonal flooding, increased stream velocities, and man-made and natural river bank restrictions. River scour and channel migration may damage a pipeline as a result of additional stresses imposed on the pipe by undermining underlying support soils, exposing the pipeline to lateral water forces and impact from waterborne debris. Lateral water forces may cause excessive bending loads that lead to pipeline failures, and possible impact forces from debris in the river or harmonic vibrations from water rapidly passing over pipelines can also increase the potential for pipeline failures.[28]

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[26] *Id.* at App. C, Environmental Condition 2.

[27] 49 C.F.R. § 192.317(a).

[28] PHMSA, "Pipeline Safety: Potential for Damage to Pipeline Facilities Caused by Flooding, River Scour, and River Channel Migration," 80 Fed. Reg. 19114 (Apr. 9, 2015). The bulletin listed several examples of pipeline failure caused by flooding. *Id.* at 19114-19115. For example,

> On July 1, 2011, ExxonMobil Pipeline Company experienced a pipeline failure near Laurel, Montana, resulting in the release of 63,000 gallons (1,500 barrels) of crude oil into the Yellowstone River. According to the results of PHMSA's accident investigation, the rupture was caused by channel migration and river bottom scour, leaving a large span of the pipeline exposed to prolonged current forces and debris washing downstream in the river. Those external forces damaged the exposed pipeline.

Id. at 19114.

21. The actions operators should take to prevent pipeline damage and/or failure include, but are not limited to, the following:

> 1. Utilize experts in river flow, such as hydrologists or fluvial geomorphologists, to evaluate a river's potential for scour or channel migration at each pipeline river crossing.
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> 2. Evaluate each pipeline crossing a river to determine the pipeline's installation method and determine if that method (and the pipeline's current condition) is sufficient to withstand the risks posed by anticipated flood conditions, river scour, or river channel migration. In areas prone to these conditions and risks, consider installing pipelines using horizontal directional drilling to help place pipelines below elevations of maximum scour and outside the limits of lateral channel migration.
>
> 3. Determine the maximum flow or flooding conditions at rivers where pipeline integrity is at risk in the event of flooding (e.g., where scour can occur) and have contingency plans to shut down and isolate those pipelines when those conditions occur.
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> 4. Ensure that pipeline controllers are aware of which pipeline sections are experiencing flooding or high flow conditions, and are familiar with the contingency plans to safely and quickly shut down and isolate the affected sections.…[29]

22. PHMSA has authority to inspect pipelines to ensure they comply with its regulations.[30] It also has authority to issue corrective orders and civil penalties for violations.[31] The administrative record maintained by the Commission does not show that PHMSA has reviewed Mountain Valley's peak stormwater discharge calculations or otherwise inspected

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[29] PHMSA, "Pipeline Safety: Potential for Damage to Pipeline Facilities Caused by Flooding, River Scour, and River Channel Migration," 84 Fed. Reg. 14715, 14716 (Apr. 11, 2019). The risks of pipeline failure are not limited to spills. Paul Rubin previously provided expert testimony regarding the potential impacts of failure of a highly-pressurized natural gas pipeline, which could cause loss of life and severe damage to the environment and property. "Giles and Roanoke Counties' Supplemental Comments Regarding the Potential Impacts of Construction and Operation of the Mountain Valley Pipeline Project In Karst Terrain," eLibrary no. 20170602-5147 (June 2, 2017), Attachment 1.

[30] 49 U.S.C. § 60117; *see also* PHMSA, "Enforcement Activity," *available at* https://primis.phmsa.dot.gov/comm/reports/enforce/Enforcement.html?nocache=6049.

[31] 49 U.S.C. §§ 60118, 60122; PHMSA, "Enforcement Activity," *available at* https://primis.phmsa.dot.gov/comm/reports/enforce/Enforcement.html?nocache=6049; *see also*, letter from Robert Burrough, PHMSA, to Brian Sheppard, Dominion Energy Transmission, Inc., (July 25, 2019) (Attachment 3).

project construction to date despite numerous issues related to Mountain Valley's management of peak stormwater discharge.

23. The NWP-12 also includes a condition for "Management of Water Flows," which requires that waterways be maintained in pre-construction condition: "[t]o the maximum extent practicable, the pre-construction course, condition, capacity, and location of open waters must be maintained for each activity" unless alterations would benefit the aquatic environment.[32] It also requires that the pipeline be "constructed to withstand expected high flows."[33] The specific verification issued by the Norfolk District provides for suspension or revocation of the verification if the information provided by the permittee is revealed to be incorrect or incomplete: "[i]f subsequent to notification by the Corps that a project qualifies for this permit, such information and data prove to be materially false or materially incomplete, the authorization may be suspended or revoked, in whole or in part, and/or the Government may institute appropriate legal proceedings."[34]

24. The record does not show that Mountain Valley or the federal agencies have calculated the peak stormwater discharge pre- and post-construction for watersheds that will be crossed by the pipeline in accordance with accepted scientific methods. Without this information, there is an inadequate basis to show that changes in peak stormwater discharge will not degrade downstream waterways to the detriment of aquatic habitat and public safety.

25. The widespread failures in erosion and sedimentation control measures during storm events since construction started is evidence that Mountain Valley has not accurately

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[32] Army Corps, Nationwide Permit 12, General Condition 9 (Mar. 19, 2017), *available at* https://www.nao.usace.army.mil/Portals/31/docs/regulatory/NationwidePermits/Nationwide_Permit_12.pdf.

[33] *Id.*

[34] Letter from William T. Walker, Norfolk District, to Robert Cooper, Mountain Valley (Dec. 26, 2017), p. 3.

calculated peak stormwater discharge. The failure to correctly calculate changes to peak stormwater discharge affects Mountain Valley's analysis of scour at proposed stream crossings. As reported above, Mountain Valley has sought to rely on desktop analysis without field verification of actual conditions at proposed waterbody crossings. However, it is not possible to reliably predict scour at waterbody crossings based on desktop analysis if peak stormwater discharge for the contributing watershed has not been correctly calculated. Because Mountain Valley has not correctly calculated peak stormwater discharge, it cannot accurately predict scour at waterbody crossings, and so there is no assurance that pipeline burial depths it has derived from existing calculations are accurate. If the pipeline is not buried deep enough to prevent exposure or movement, the pipeline is vulnerable to storm-related failures that could jeopardize public safety and the environment.

A. Mountain Valley's Consultant Did Not Follow the Established Methods for Calculating Peak Stormwater Discharge.

26. Mountain Valley's consultant, Tetra Tech, stated that it used the Natural Resources Conservation Service's (NRCS) Technical Release 55 (TR-55) Method to calculate peak stormwater flow rates and runoff volumes using drainage area, design storm precipitation data, curve numbers, and time of concentration flow paths.[35] Based on our review of the record, Tetra Tech did not purport to use the TR-55 Method or undertake any other calculations to quantify the changes in stormwater discharge in West Virginia.[36]

[35] Attachment 1 (Bowers Declaration), ¶ 35 (quoting Mountain Valley, "Project Specific Standards and Specifications for Virginia" (revised June 2017), § 4.4); Attachment 2 (Dodds Declaration), ¶ 7.

[36] Attachment 2 (Dodds Declaration), ¶ 8.

27. The TR-55 Method requires several inputs – drainage area (watershed), runoff curve numbers for pre- and post-construction/development, Hydrologic Soil Group, precipitation amount, and time of concentration.[37] If the inputs are incorrect, the TR-55 Method will not yield accurate results.[38] Mountain Valley did not use correct inputs for at least two of the key parameters: drainage area and runoff curve numbers.[39]

(1) Errors in the Watershed Delineations

28. One of the first steps in using the TR-55 Method is to delineate the affected watersheds, that is to describe the drainage areas affected by the proposed development.[40] The term "watershed" refers to a "defined land area drained by a river or stream, karst system, or system of connecting rivers or streams such that all surface water within the area flows through a single outlet."[41] "A watershed can refer to the overall system of streams that drain into a river or can pertain to a smaller tributary."[42]

29. Tetra Tech erred in delineating the watersheds affected by the MVP Project. Tetra Tech started with Hydrologic Unit Code (HUC)-12 designations. HUC designations, created by the U.S. Geological Survey, divide the country into progressively smaller hydrologic units, starting with regions (HUC-2) going down to sub-watersheds (HUC-12).[43] Tetra Tech

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37 *Id.* at ¶ 9.

38 *Id.*

39 *Id.* at ¶¶ 9-18.

40 *Id.* at ¶ 10.

41 9 Va. Admin. Code (VAC) 25-870-10; *see also* Attachment 2 (Dodds Declaration), ¶ 10.

42 Attachment 2 (Dodds Declaration), ¶ 10.

43 "[T]here are six levels in the hierarchy, represented by hydrologic unit codes from 2 to 12 digits long, called regions, subregions, basins, subbasins, watersheds, and subwatersheds." Wikipedia, "Hydrologic Code," *available at* https://en.wikipedia.org/wiki/Hydrological_code.

then "truncated" the HUC-12 designated watersheds "by considering only the portions of the drainage areas … that are within the MVP Project's limits of disturbance. In other words, Tetra Tech did not calculate how much surface water drained to a particular stream; it calculated only a portion of the contributing drainage area."[44] The problem is that the limits of disturbance have no correlation to the hydrology of the terrain. Thus, Tetra Tech's decision to restrict the calculation to the Project's limits of disturbance was arbitrary for purposes of implementing the TR-55 Method.

30. A second problem with Tetra Tech's use of HUC-12 designated sub-watersheds as a starting point is that these areas are still quite large, being 10,000 to 40,000 acres. HUC-12 sub-watersheds are too large to accurately assess the impacts of construction within smaller, headwater streams (e.g., first-, second-, and third-order streams) that the MVP Project crosses.[45]

31. Tetra Tech also erred by not considering groundwater intercepted and diverted to the ground surface in its stormwater discharge calculations.[46] This does not comply with standard requirements for stormwater management, and more specifically with requirements in Virginia, which require that "**[a] stormwater management plan shall consider *all sources of surface runoff and all sources of subsurface and groundwater flows converted to surface runoff*** …."[47] The errors in delineating the drainage areas are exacerbated by the mountainous nature of the terrain crossed by the MVP Project.[48]

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44 Attachment 2 (Dodds Declaration), ¶ 30.

45 *Id.* at ¶ 12.

46 *Id.* at ¶¶ 32-33.

47 *Id.* at ¶ 33 (quoting 9 VAC 25-870-55.A.2; emphasis added).

48 Attachment 1 (Bowers Declaration), ¶ 12.

(2) Errors in the Energy Balance Calculations

32. Tetra Tech next erred in its characterization of groundcover conditions in the affected drainage areas for purposes of runoff rate calculations used to determine erosion impacts of the resulting peak flow rates and runoff volumes on natural stormwater conveyance systems downstream.[49] Calculation of stormwater runoff – including changes to timing, velocity, and volume of runoff – depends in part on the land surface over which the runoff flows. Impervious surfaces convey more runoff more quickly than vegetated and/or undisturbed groundcover.[50] Thus, increases in stormwater discharge in developed watersheds can be more damaging than increases in undisturbed watersheds.[51]

33. Tetra Tech characterized post-construction groundcover in the affected watersheds as meadow or brush in good condition rather than as disturbed or "functionally

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[49] *Id.* at ¶¶ 32 – 37; Attachment 1 (Dodds Declaration), ¶ 31; *see also* 9 Va. Admin. Code 25-840-40. The Energy Balance method is a criterion for determining if a downstream channel is adequate to convey predicted stormwater runoff.

[50] As highlighted by Dr. Dodds, the Virginia Department of Environmental Quality Stormwater Management Handbook states that increases in stormwater discharges can have more severe consequences in developed watersheds as compared to undeveloped ones:

> "Increased peak discharges for a developed watershed can be two to five times higher than those for an undisturbed watershed. As runoff velocities increase, it takes less time for water to run off the land and reach a stream or other water body (time of concentration). Streams in developed areas are often characterized as very 'flashy' or 'spiky' because of their response to these altered runoff characteristics. This characterization translates into the sharp peak and increased size of the post-development hydrograph … *The combination of greater volumes of runoff more often and at higher flow rates can create altered stream flows, localized flooding, stream channel degradation and property damage, even in small storm events*." (emphasis added).

Attachment 2 (Dodds Declaration), ¶ 20.

[51] *Id.*

impervious."[52] The values for meadow or brush in good condition are the same as those for pre-construction undisturbed forest.[53]

34. The evidence in the record for the certificate proceeding shows that the post-construction soils and groundcover will not be the same as undisturbed forest.

> Prior to construction, native vegetation intercepts precipitation or evapotranspirates the portion that has infiltrated into the ground back into the atmosphere. Pipeline construction removes trees and shrubs, thereby reducing the site's pre-developed evapotranspiration and infiltration rates, and increasing stormwater runoff rates and volumes, downstream flooding, stream channel erosion, and scouring. The right-of-way is exposed to rainfall and the concentration of stormwater increases greatly with no canopy to protect the ground surface. Construction activities using heavy equipment compacts the soil and diminishes its infiltration capacity, resulting in increased runoff rates and volumes of stormwater runoff. In addition, clearing and grading remove surface depressions that store rainfall.[54]

35. The final EIS acknowledged that construction would compact soils: "[t]he use of heavy equipment for construction causes compaction of near-surface soils, an effect that could result in increased runoff into surface waters in the immediate vicinity of the proposed construction right-of-way."[55] It also acknowledged that project construction would permanently remove forest: "[r]estoring the temporary construction areas to forest habitats could take 30 years or longer, depending on site-specific conditions such as rainfall, elevation, grazing, and weed introduction. Forest would be permanently removed within the operational right-of-way."[56] It is

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[52] "When soil is disturbed by grading, stockpiling, and heavy equipment traffic, the soil becomes compacted, structure is lost and porosity decreases … The result is a surface that is *functionally impervious.*" Attachment 2 (Dodds Declaration), ¶ 17 (quoting Virginia Stormwater Management Handbook (2013)).

[53] Attachment 2 (Dodds Declaration) at ¶ 18; *see also* Attachment 1 (Bowers Declaration), ¶ 33 ("It was assumed that the curve numbers (CN) in the post construction condition for forested areas is equal to or less than curve numbers in the pre-construction condition").

[54] Attachment 1 (Bowers Declaration), ¶ 18.

[55] Final EIS, p. 4-137; *see also* Attachment 1 (Bowers Declaration), ¶ 14.

[56] Final EIS, 4.5.2 Environmental Consequences, p. 4-200.

plain that land disturbance on this scale– the "clearing and grading of 4,751 acres of vegetated communities in Virginia, including 4,453 acres of Upland Forests" – will increase the imperviousness of land surfaces, thereby increasing stormwater runoff rates.[57] If this increase is not properly calculated or addressed, the runoff will destabilize downstream stream channels in affected watersheds.[58]

36. "Prompt reforestation is required to prevent stream channel erosion in downstream water bodies;" however, as acknowledged in the final EIS, the MVP Project will take decades to re-establish forested areas which is why the removal of forested lands was considered permanent in the final EIS.[59] Thus, "[a]s a result of clearing and grading of large forested areas and compaction of soils during construction by heavy equipment, stormwater runoff rates and volumes increase substantially for longer periods of time compared to pre-development rates."[60] Reduced time of runoff concentration on cleared land areas also will increase stormwater runoff rates.[61]

37. Accordingly, Tetra Tech's assumption that runoff curve numbers are "'*less than or equal to that of woods*' in the post construction condition is inaccurate and incorrect."[62]

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57 Attachment 1 (Bowers Declaration), ¶ 19;

58 *Id.* at ¶ 26, ¶27 ("Changes to the land surface associated with construction activities bring about changes to a downstream channel's natural equilibrium."), ¶ 28 ("A typical stream channel is destabilized as stormwater runoff increases.").

59 *Id.* at ¶ 19.

60 *Id.*

61 *Id.* at ¶ 42.

62 *Id.* at ¶ 39 (italics in original).

B. The Failures in Erosion and Sedimentation Control Measures During Storm Events Are Evidence that Mountain Valley Has Not Accurately Calculated Changes to Stormwater Discharge Caused by the MVP Project.

38. Accurate "[s]tormwater discharge estimates are necessary to properly size [best management practices (BMPs)]."[63] Mountain Valley proposed, and the Certificate Order approves, BMPs to manage stormwater discharge.[64] However, Mountain Valley has not provided stormwater discharge calculations to show that the BMPs it has implemented have been properly sized or are otherwise appropriate.[65] The flaws in Mountain Valley's peak stormwater discharge analysis are evidenced by the number of problems related to increased stormwater discharge such as erosion, sedimentation, and scour along the active construction spreads.

39. The Virginia Department of Environmental Quality (DEQ) and West Virginia Department of Environmental Protection (DEP) have cited Mountain Valley for numerous deficiencies in erosion and sedimentation controls, many of which have failed—some repeatedly—during storm events. For example, on April 19, 2019, the West Virginia DEP served Mountain Valley with the "Consent Order Issued under the Water Pollution Control Act, West Virginia Code, Chapter 22, Article 11," which cited Mountain Valley with over 42 erosion and sediment control failures over the period between April 3, 2018 and November 30, 2018, leading to 26 Notices of Violations.[66] "Specific observations noted failures to construct BMPs, failures to properly construct BMPs, and ineffectiveness of the Storm Water Pollution Prevention Plan to achieve the general objectives of controlling sediment releases in stormwater

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63 Attachment 2 (Dodds Declaration) at ¶ 47.

64 Final EIS, p. 4-622; Certificate Order, Ordering ¶ (C).

65 Attachment 2 (Dodds Declaration), ¶ 47.

66 *Id.* at ¶ 49; *see also id.* at Attachment 2.4.

discharges."[67] Although Mountain Valley signed the Consent Order on May 6, 2019, West Virginia DEP issued Notices of Violations for the same or similar deficiencies on May 13, 2019, May 24, 2019, May 29, 2019, May 30, 2019, June 5, 2019, June 12, 2019, and June 19, 2019.[68]

40. On July 9, 2018, Virginia DEQ issued a "Notice of Violation to Mountain Valley" for deficiencies in BMP installations, failure to correct those deficiencies, and resulting discharge of sediments into downstream waterbodies.[69] On December 7, 2018, the Virginia DEQ and the Virginia State Water Control Board sued Mountain Valley for more than 300 violations related to improper erosion control and stormwater management observed between May 21, 2018 and November 15, 2018.[70]

41. These violations are directly traceable to Mountain Valley's failure to correctly calculate the changes in peak stormwater discharge caused by construction of the MVP Project. As explained by Dr. Dodds:

> Stormwater discharge calculations constitute the basis for determining the amount of stormwater runoff in order to determine the number of specific BMPs required. Most of the failed BMPs noted in the West Virginia DEP Consent Order, West Virginia DEP Notice of Violations, Virginia DEQ Field Inspection Reports, and the VADEQ/SWCB lawsuit were silt fence and waterbars, both of which require peak stormwater discharge calculations in order to be properly sized and located.[71]

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67 *Id.* at ¶ 49.

68 *Id.* at ¶¶ 50.

69 *Id.* at ¶ 51, Attachment 2.5.

70 *Id.* at ¶ 51, Attachment 2.6.

71 *Id.* at ¶ 55; *see also* 9 Va. Admin. Code 25-840-40 (requiring sediment traps and sediment basins to be constructed as a first-step and made functional prior to upslope land disturbance and requiring traps and basins to be designed and constructed based upon the total drainage area to be served by the trap or basin).

42. The inaccuracies in peak stormwater discharge calculations and inadequacies of the erosion and sedimentation control measures is demonstrated by the failure of the streambank on Teels Creek as it crosses the Bernard property on Grassy Hill Road in Franklin County, Virginia.[72] "Prior to construction of the MVP Project, there were no stream bank erosion problems."[73] However, during project construction, "[i]ncreased stormwater runoff from the MVP Project construction corridor flowed to the bank of Teels Creek and scoured a channel out of the bank."[74] Mountain Valley's contractor installed a plastic liner to try to prevent further erosion and scouring of the stream bank, but photographs plainly show the collapsed bank and Teels Creek running reddish brown due to sediment-laden runoff.[75]

43. MVP Project construction has similarly increased stormwater runoff and destabilized the bank on Teels Creek as it crosses Four Corners Farm in Franklin County.[76] Photographs "show that the fence posts that were at least six feet from the creek bank prior to construction are now suspended only by the fence wires by June 18, 2019. The creek bank has eroded several feet beyond where the posts originally were buried in the soil."[77]

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72 Attachment 1 (Bowers Declaration), ¶¶ 21-22.

73 *Id.* at ¶ 22.

74 *Id.*

75 Attachment 1 (Bowers Declaration), ¶ 22, Figure 1.

76 *See id.* at ¶¶ 23-24; *see also* Declaration of Betty B. Werner (Aug. 14, 2019) (Attachment 4) (originally filed as "Exhibit S" to Wild Virginia et al.'s, "Joint Petition for Review," eLibrary no. 20190813-5049 (Aug. 12, 2019)).

77 *Id.* at ¶ 24, Figures 2-4; *see also* Attachment 3 (Werner Declaration).

44. Accurate stormwater discharge calculations are necessary to Mountain Valley's selection of appropriate BMPs and effective implementation of those BMPs to avoid or minimize the number of failures that have been cited by Virginia DEQ and West Virginia DEP.

C. Errors in Peak Stormwater Discharge Calculations Impact Analysis of Potential Scour at Waterbody Crossings and Appropriate Pipeline Burial Depths.

45. As discussed in ¶ 21, *supra*, PHMSA has identified specific actions pipeline operators must take to prevent pipeline damage and failure related to high flows and flooding. The record does not show Mountain Valley has undertaken these actions.

46. Errors in peak stormwater discharge calculations affect calculations regarding vertical and lateral scour, and assumptions regarding adequate pipeline burial depth derived from those calculations. As discussed above, the record demonstrates errors in Mountain Valley's and its consultants' implementation of peak stormwater discharge analytical methods, and in particular, errors in characterizing drainage areas for smaller, headwater streams impacted by MVP Project construction and post-construction groundcover. Due to these errors, the peak stormwater discharge as predicted by Mountain Valley is less than actual conditions, as demonstrated by numerous and repeated failures in stormwater management measures. Due to Mountain Valley underestimating peak stormwater discharge, the scour depth at waterbody crossings will be deeper than Tetra Tech calculated. Thus, Mountain Valley cannot demonstrate that proposed pipeline burial depths at waterbody crossings will be safe because its predictions regarding stormwater discharge and scour depth are not supported by accurate scientific evidence.[78]

[78] Attachment 2 (Dodds Declaration), ¶ 41.

47. Again, the consequences of these errors are exacerbated by the mountainous terrain crossed by the MVP Project:

> The effects of stormwater runoff are greatest in mountain regions where, normally dry intermittent streams that drain upland watersheds produce flash floods that reach sufficient velocity with increasing gradient to scour and move large amounts of soil, litter, and fine debris downstream, adversely impacting streams and ultimately larger bodies of water. Steeper slopes increase runoff velocity, and greater soil compaction by heavy equipment increases runoff volume, producing ever greater force. The adverse impacts can take a very long time to dissipate (measured in months and years). A 16 year study of disturbed forest watersheds, due to tree harvesting and road construction in the Blue Ridge Mountains of North Carolina, resulted in "significant increase in stream sediment" with long term adverse impacts.[79]

[79] Attachment 1 (Bowers Declaration), ¶ 14.

III.
REQUESTED RELIEF

48. Movants request that the Commission, PHMSA, and the Army Corps direct Mountain Valley to undertake revised peak stormwater discharge calculations in accordance with the accepted scientific methods that were identified in Virginia's stormwater management regulations and Mountain Valley's *Project Specific Standards and Specifications for Virginia*, but not actually implemented by Tetra Tech. Specific recommendations for necessary revisions to the peak stormwater discharge analyses are provided in Attachments 1 and 2, and include:

- "[T]he entire watershed for all first-order (or second-order and third-order, as appropriate) streams must be incorporated into the TR-55 method of peak stormwater discharge analyses."[80]
- Stormwater management calculations should "show curve numbers for composite areas that reflect increases due to changed soil conditions."[81]
- "[T]ime of [runoff] concentration calculations should … reflect grading on pipeline right-of-way."[82]
- The assumptions used for runoff flow rate calculations should be reviewed, and such calculations should include existing and new access roads if they do not already do so.[83]

49. Further, "[t]o provide assurance that scouring of the pipeline stream channel crossing will not damage the pipeline, soil boring should be taken to determine the type of soil underlying the stream channel at each crossing. Using Manning's equation, flow velocity can be

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80 Attachment 2 (Dodds Declaration), ¶ 57.

81 Attachment 1 (Bowers Declaration), ¶ 49; *see also* Attachment 2 (Dodds Declaration), ¶ 57.

82 Attachment 1 (Bowers Declaration), ¶ 50.

83 *Id.* at ¶ 51.

calculated and compared to the maximum allowable velocity for the soil type in the stream channel."[84] "Field verification is needed to ensure that scouring will not occur."[85]

50. This work should be conducted immediately to prevent further environmental degradation and protect public safety. In addition, this work is responsive to the additional information request made by FWS for purposes of consultation under Endangered Species Act section 7, 16 U.S.C. § 1536, for the federally listed endangered candy darter and Roanoke Logperch.[86] The Commission and FWS cannot accurately predict, avoid, or mitigate impacts to listed aquatic species due to sedimentation and erosion if they have not first calculated changes to peak stormwater discharge in affected watersheds consistent with accepted scientific methods.

51. Construction activities should be suspended project-wide pending completion of these revised analyses. There is no basis for limiting a stop work order to specific waterbody crossings given that the impacts of upland construction affect entire watersheds. BMPs and other mitigation measures should be re-evaluated and updated based on the results of the revised analyses, and installed prior to resumption of construction.[87]

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84 *Id.* at ¶ 53.

85 *Id.*

86 Letter from Kyla Hastie, FWS, to Kimberly Bose, FERC, eLibrary no. 20190412-5164 (Apr. 12, 2019); *see also* Attachment 2 (Dodds Declaration), ¶¶ 21-28 (describing consequences of increased stormwater discharge on entire watersheds, including aquatic habitat.

87 *See* Attachment 2 (Dodds Declaration), ¶¶ 58-59.

IV.
CONCLUSION

Movants respectfully request that the Commission grant this motion and provide the requested relief.

Dated: September 3, 2019

Respectfully submitted,

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Roseanna Sacco
PRESERVE MONROE

/s/ Amy Cole South

Amy Cole South
THE BORDER CONSERVANCY

/s/ Stephen Miller

Stephen Miller, D.O.
SAVE MONROE

/s/ Susan Bouldin

Susan Bouldin
SUMMERS COUNTY RESIDENTS AGAINST THE PIPELINE

/s/ John Walkup III

John Walkup, III
GREENBRIER RIVER WATERSHED ASSOCIATION

/s/ Roberta M. Bondurant

Roberta M. Bondurant
PROTECT OUR WATER, HERITAGE, RIGHTS

/s/ Donna Pitt

Donna Pitt
PRESERVE GILES

DECLARATION OF SERVICE

Mountain Valley Pipeline, LLC's Mountain Valley Pipeline Project (CP16-10-000)

I, Tiffany Poovaiah, declare that I today served the attached "Motion by Preserve Craig, Indian Creek Watershed Association, Preserve Bent Mountain, Preserve Franklin, Preserve Montgomery County VA, Preserve Monroe, The Border Conservancy, Save Monroe, Summers County Residents Against the Pipeline, Greenbrier River Watershed Association, Protect Our Water, Heritage, Rights, and Preserve Giles For Revised Peak Stormwater Discharge Analysis For The Mountain Valley Pipeline Project " by electronic mail, or by first-class mail if no e-mail address is provided, to each person on the official service list compiled by the Secretary in this proceeding.

Dated: September 3, 2019

By:

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