

November 30, 2016

Mr. Troy Anderson
U.S. Fish & Wildlife Service
Virginia Field Office
6669 Short Lane
Gloucester, VA 23061

Received

DEC 08 2016

Virginia Field Office

Dear Mr. Anderson: FERC Docket Nos: CP16-10-000 and CP16-13-000

My name is (b) (6) My telephone number is (b) (6) I have written you recently about the Mountain Valley Project pipeline (FERC Docket Nos: CP16-10-000 and CP16-13-000) covering the Giles County Seismic Zone (St. Clair Fault) and our steep slopes/side slopes, landslides and slip-prone soils. This DEIS comment paper is about our water and about cumulative environmental hazards. Monroe County is part of the Greenbrier limestone basin. Greenbrier limestone hosts the largest, deepest, and most complex caves, the largest karst basins, the largest number of caves, and the largest karst springs in West Virginia (Dasher, 2002).

Included in this DEIS comment is part of a scoping comment paper mailed to FERC on June 2, 2015 describing the Hydrogeology and geochemistry of the Peters Mountain Aquifer. One study of the Peters Mountain Aquifer located 221 springs. The DEIS @ Table 4.3.1-2 "identifies springs and swallets (karst features) that were identified during the assessment as being crossed by or within 500 feet of the MVP. Groundwater in karst terrain is present along the MVP pipeline route in Summers and Monroe Counties of West Virginia, as well as in Giles and Montgomery Counties of Virginia". No Monroe County springs were identified and included in DEIS Table 4.3.1-2

Also enclosed is a copy of a letter mailed to FERC on November 14, 2014 regarding the Mountain Valley Project pipeline. This letter includes parts of a 2009 Monroe County Comprehensive Plan developed for our Monroe County Commission by a Monroe County Planning Commission in regard to Monroe County springs and karst.

Cumulative geologic hazards and environmental consequences are described in DEIS 4.1.2 and 4.1.1.5 They include **Seismic activity, Landslides, Steep topography, Shallow Bedrock, Karst Terrain, Soil Liquefaction, Flash flooding, Slip-Prone Soils and Blasting. All of these cumulative geologic hazards and environmental consequences are located between MP 165 to MP 230.** MVP should not be allowed to cross **MP 165 to MP 230** due to multiple cumulative hazards. This area covers part of Summers County, West Virginia, all of Monroe County, West Virginia, all of the Jefferson National Forest, all of Giles County, Virginia and part of Montgomery, Virginia. Documentation **DEIS 4.1.2, 4.1.1.5, 4.1.2.3, 4.1.2.4, 4.1.1.7, 4.2.2.4, 4.1.1.2, 4.1.2.5,**

This DEIS is missing a lot of information. FERC has recommend that: • Prior to construction, Mountain Valley and Equitrans should file with the Secretary the location of all water wells, springs, swallets, and other drinking water sources within 150 feet (500 feet in karst terrain) of the pipeline and aboveground facilities. There are other "Prior to construction" recommendations that should have been "Prior to a certificate" recommendations. The health and safety of citizens living between **MP 165 to MP 230** are at great risk if this 42" pipeline is installed.

Thank you.

Sincerely,

(b) (6)

No internet or e-mail - service too slow

MVP should not be allowed to cross **MP 165 to MP 230** due to multiple cumulative hazards listed below. This area covers part of Summers County, West Virginia, all of Monroe County, West Virginia, all of the Jefferson National Forest, all of Giles County, Virginia and part of Montgomery, Virginia. **MP 165 to MP 230** have the following cumulative geologic hazards and environmental consequences as described below in DEIS 4.1.2 and 4.1.1.5

Seismic activity	Surface Faults
Landslides	Soil Liquefaction
Steep topography	Flash flooding
Shallow Bedrock	Slip-Prone Soils
Karst Terrain	Blasting

DEIS 4.1.2 Environmental Consequences 4-41 Geology Geological hazards, such as seismic activity or landslides, may affect the integrity of the pipelines. The crossing of steep topography would present construction challenges; as would the crossing of shallow bedrock, acid producing rocks, and karst terrain.

DEIS 4.1.1.5 Geologic Hazards 4-21 Geology Geologic hazards including seismicity (e.g., earthquakes), surface faults, soil liquefaction, landslides, flash flooding, karst terrain and subsidence, shallow bedrock, acid producing rocks and soils, and blasting were evaluated for the proposed projects. (Another geological hazards needs added in the DEIS; Slip-Prone Soils). The MVP would affect about 17.5 acres of the soils and complexes of these soils between MP 172 and 196. The Mountain Valley pipeline would go from mile marker 173.4 to 195.4 in Monroe County, W.V.

Only one area contains all of the geological hazards underlined above. That area is from **MP165 to MP 230**. This area covers part of Summers County, West Virginia and all of Monroe County, West Virginia and all of the Jefferson National Forest and Giles County, Virginia and part of Montgomery, Virginia. Following is documentation from the DEIS.

4.1.2.3 Seismicity and Potential for Soil Liquefaction Mountain Valley Project Geology 4-44

The majority of the MVP is sited in an area with low probability of localized earth movements. However, in the area of the GCSZ (Giles County Seismic Zone), between about **MPs 165 to 230**, peak ground accelerations approach 14 percent of the force of g, and the potential for a magnitude 5.8 earthquake exists.. *4-45 Geology* The potential for soil liquefaction exists mainly in the area of the GCSZ between **MPs 165 and 230**

4.1.2.4 Slopes and Landslide Potential Geology 4-46 The potential for landslides or slope failure could be triggered by seismicity from the GCSZ (**Mps 165 to 230**) or from intense and/or prolonged rainfall events. *4-41 Geology* The areas that would be crossed within the Jefferson National Forest by the MVP contain slopes greater than 30 percent and the potential for landslides within the Jefferson National Forest would be moderate to high.

4.1.1.7 Jefferson National Forest Geology 4-40 The largest known landslides in eastern North America are on the south flank of Sinking Creek Mountain (see section 4.1.2.4) where the pipeline route would cross the Jefferson National Forest (Schultz et al., 1986; Schultz and Southworth, 1989).

4.2.2.4 Slip-Prone Soils Soils 4-68 Certain soil types such as shale or clay soils are more prone to slipping than other soils. Due to this increased potential for slipping, the probability of landslides is increased when constructing through slip prone soils. The Gilpin-Peabody complex, 35 to 70 percent slopes, Carbo, Faywood, Frederick,

Nolichucky, Poplimento, and Sequoia soils are considered to be slip-prone. The MVP would affect about 17.5 acres of the soils and complexes of these soils between MP 172 and 196. In Virginia 290.2 acres of these soils and complexes of these soils would be affected from approximately MP 196 to 235. Therefore, slip-prone soils from **MP 172 to MP 235** are more prone to slipping and that increases the probability of landslides when constructing through slip prone soils. This area covers part of Summers County, West Virginia and all of Monroe County, West Virginia and all of the Jefferson National Forest and Giles County, Virginia and part of Montgomery, Virginia.

4.1.1.2 Bedrock Geology Mountain Valley Project 4-5 Geology

Karst terrain also occurs in the carbonate (limestone and dolostone) rocks found in the project area from approximate **MPs 170 to 237**.

4.1.2.5 Karst Terrain Mountain Valley Project Geology 4-48

Karst features, such as sinkholes, caves, and caverns can form as a result of the long-term action of groundwater on soluble carbonate rocks (e.g., limestone and dolostone). The risk of the development of sinkholes along the pipeline is relatively high between about **MPs 171 and 237**.

Blasting 4-39 Geology

The potential for blasting exists at all locations where shallow bedrock may be encountered. The use of blasting in shallow bedrock can create a negative impact on water wells, springs, wetlands, steep slopes, paleontological resources and nearby aboveground facilities. Following is a chart by county indicating where shallow bedrock exists and where blasting might occur.

Shallow Bedrock Mountain Valley Project Geology 4-38

TABLE 4.1.1-14		TABLE 4.1.1-14	
Summary of Shallow Bedrock along the MVP		Summary of Shallow Bedrock along the MVP	
State/County	Miles of Shallow Bedrock	State/County	Miles of Shallow Bedrock
West Virginia	88.8	Virginia	29.9
Wetzel	11.8	Giles	3.6
Harrison	20.1	Craig	0.4
Doddridge	8.3	Montgomery	11.9
Lewis	21	Roanoke	3.2
Braxton	5.5	Franklin	10.8
Nicholas	4.6		
Greenbrier	4.1		
Summers	4		
Monroe	9.4	Mountain Valley Project Total	118.0

4.1.2.5 Karst Terrain Mountain Valley Project Geology 4-48

Karst features, such as sinkholes, caves, and caverns can form as a result of the long-term action of groundwater on soluble carbonate rocks (e.g., limestone and dolostone). The risk of the development of sinkholes along the pipeline is relatively high between about **MPs 171 and 237**.

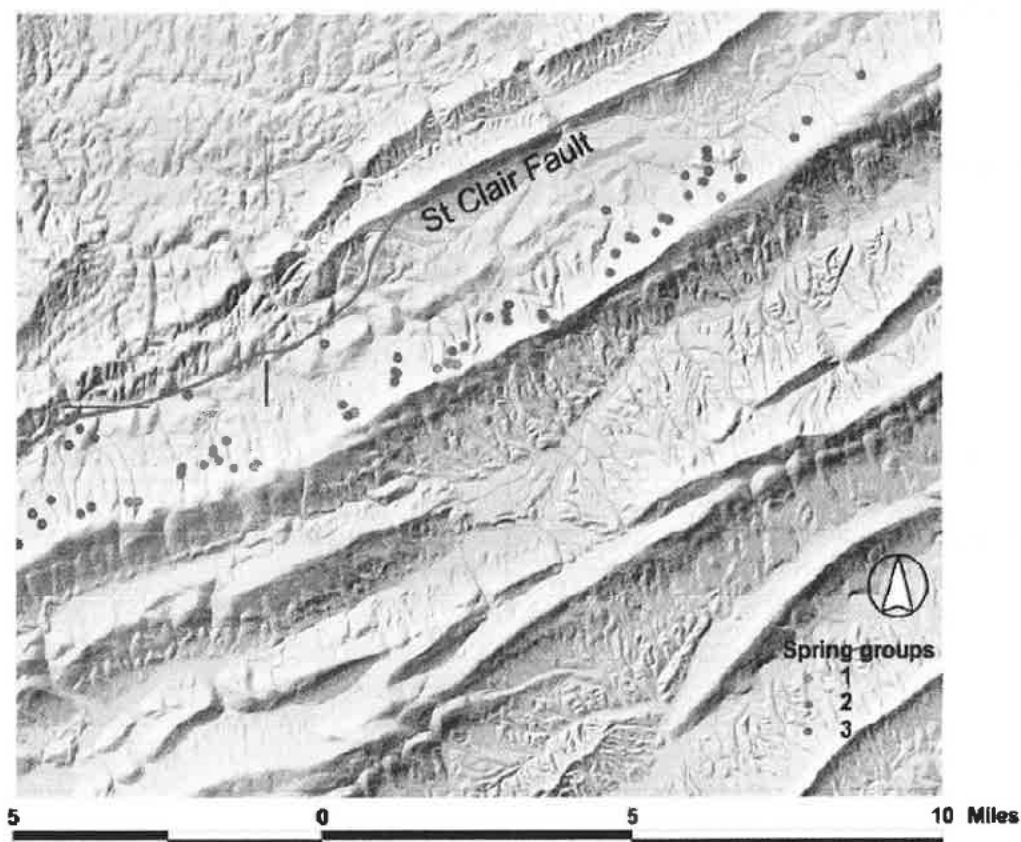
Monroe County has 9.4 miles of shallow bedrock along the MVP where the potential for blasting may occur.

Blasting Mountain Valley Project 4-39 Geology

Blasting in areas of karst topography can create fractures in the rock, potentially changing groundwater flow, creating the potential for groundwater contamination, and temporarily affecting yield and increasing turbidity in nearby water wells and/or springs. Potential impacts on water wells, springs, wetlands, steep slopes, paleontological resources, nearby aboveground facilities, and adjacent pipelines and utility lines could result from blasting.

Following is part of the scoping information mailed to FERC on June 2, 2015 regarding our water in Monroe County.

A. Hydrogeology and geochemistry of Peters Mountain Aquifer Geoff Richards & Joe Donovan, WVU Presented by Tammy Vandivoort, WVU Water Research Institute (see attachment #2) Study Area - The study examined groundwater occurrence in Peters Mountain between the towns of Centennial and Zenith. From May-Aug 2004, **221 springs were located**; Peters Mountain lies on the leading edge of the Allegheny front thrust fault complex and forms the VA-WV border for several miles..... The groundwater is very high in chemical quality, supporting a public service district, bottled water company, and local communities. The remote mountain recharge setting means water is relatively pristine and not currently subject to risk of contamination.



Our karst terrain, cave systems, sinkholes, earthquake faults, steep slopes and slip-prone soils creates insurmountable risks to our land and water if this project (MVP) is allowed.

B. Karst habitat and water The Monroe County Comprehensive Plan shows great appreciation for our water. "Water: Based on surveys conducted by the Exploratory Committee on County Planning, water resources are considered very important by many residents of the county. This is perhaps not surprising, since county assets in this regard are somewhat **unique**. Dozens of deep springs in the county bring forth water which has in some cases been underground for decades, and often, is exceptionally pure. Several mineral springs exist within the county. Some are true "warm springs" and are naturally carbonated. An unusually high percentage of local residents still use private sources (springs or wells) for household water." Our karst habitat includes many networks of caves, some identified and mapped and others unknown.

Following is information mailed to FERC on November 14, 2014 regarding our springs and karst.

Date: November 14, 2014

From: (b) (6)

To: Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

Re: Mountain Valley Pipeline DOCKET #PF 15-3

Please register our opposition to the Mountain Valley Pipeline #PF 15-3. We own a home and live full time in Monroe County, West Virginia. Our water comes from a spring about 3,500 feet up on Peter's Mountain. We have an agreeable self-made container system that links 7 homes to this one spring. We rely on this spring for all our water needs. This water is ice cold coming out of the mountain and the taste of Peter's Mountain water has been judged best tasting water in the world.

Our water is being threatened by the placement of a 42 inch pipeline through Monroe County and up the side of our Peter's Mountain (PF 15-3). Next will come fracking-another threat to our water.

The Monroe County Commission appointed a Monroe County Planning Commission in 2006 to develop a Comprehensive Plan for Monroe County, West Virginia. The following statements are included within this 2009 Comprehensive Plan in regard to Monroe County springs and karst:

page 6 Peter's Mountain, running along the southeastern border of the county, contains thousands of these springs and is the source for most of the county's drinking water. Development cannot come at the cost of the integrity of their water or their quality of life.

page 15 A significant portion of Monroe County is underlain by geology and landforms generally defined as "karst," typified by limestone outcrops, caves, sinkholes and springs. Because these features often provide direct conduits from the surface to groundwater, runoff contaminants dramatically increase the risk of widespread health and environmental impacts.¹ Underground karst aquifers can contain complex, dendritic channels and tunnels, creating large fluctuations in water levels in springs and wells. (footnote) West Virginia State Code §22-12-4. This code provides the WV Environmental Quality Board (and subsequently WVDEP) with the authority to "set standards more restrictive than the maximum contaminant levels where it finds that such standards are necessary to protect drinking water use where scientifically supportable evidence reflects factors unique to West Virginia or some area thereof, or to protect other beneficial uses of the groundwater."

page 18 Peter's Mountain aquifer is of considerable importance; currently supplying three public water systems, two commercial water operations, and many households through use of private springs.

page 19 Many county residents still utilize wells or springs as private sources of household water. The susceptibility of karst to contamination, and the uncertainty of the direction and interconnections of underground flow, create particular vulnerability in regard to the county's central limestone belt.

page 30 Compared to many areas, water quality, air quality, and general condition of the environment are considered favorable within Monroe County as evidenced by the county being placed on lists as one of the most desirable counties in which to live.

Water: Based on surveys conducted by the Exploratory Committee on County Planning, water resources are considered very important by many residents of the county. This is perhaps not surprising, since county assets in this regard are somewhat unique. Dozens of deep springs in the county bring forth water which has in some cases been underground for decades, and often, is exceptionally pure. Several mineral springs exist within the county. Some are true "warm springs" and are naturally carbonated. An unusually high percentage of local residents still use private sources (springs or wells) for household water.

page 38 Protect surface water resources. A high priority of many Monroe residents is the protection of water quantity

from both surface and groundwater sources. Streams and rivers in Monroe are an essential component of the local economy and culture. For multiple generations, streams in Monroe have been utilized for agricultural operations, historic mills, and as a source for public drinking water. The value of these resources cannot be overstated.

page 43 Utilize existing Monroe County Voluntary Farmland Protection Program (FPP). Farmland protection boards, as noted in a previous chapter, have the authority and management systems in place to develop specific conservation easements. Since prime farmland is often found on karst terrain and contain springs and seeps, several of the existing county boards already identify the potential for water resource protection as a prioritization criterion.

page 44 Public feedback has indicated that there is concern with the potential impact of oil and gas drilling activities as a result of Marcellus Shale gas production. This is a legitimate concern in that there have been a number of environmental problems associated with drilling in other areas of the country. The process of drilling and recovering natural gas in this activity requires the usage of millions of gallons of water per well and the contamination of that water with byproducts which may be potentially hazardous.

page 82-83 Red Sulphur Public Service District (PSD) Water is obtained from three springs arising near the base of Peters Mountain. Union uses a Peters Mountain spring located about 8 miles east of the town, and also a local well. The Gap Mills Public Service District provides water-only service to the residents of the Gap Mills community. Its source is also a Peters Mountain spring at the headwaters of Second Creek.

page 86 Planning for Future Infrastructure Development In regard to public water and sewer, countywide public service may not be particularly suitable to local terrain; water quality may not equal that already available from private sources; and countywide service would likely be counterproductive in regard to established goals of limited sprawl and maintenance of rural character. Expansion of infrastructure should be undertaken with the utmost sensitivity to scenic viewsheds, ecosystems, and established goals of preservation of rural atmosphere and open space.

page 88 Priorities Priority should be given to assessing immediate risks to adequate electric, telephone, water, and emergency communications services, and taking what actions are available to minimize such risks.

page 108 Promote the creation of additional recreational opportunities for county residents and visitors, and encouraging growth of the tourism industry as a means of economic opportunity. Monroe is blessed with an abundance of pastoral and mountain landscapes, clean streams, and historic structures. All of these Characteristics lend themselves to recreation and tourism opportunities.

page 115 Existing state and local regulations pertaining to clean water, litter control, and public eyesores (abandoned cars, dumps, derelict buildings) are also important. One great potential draw for tourists considering a visit to Monroe County is the area's pristine natural character. Clean streams, and clean farmland and woodland also enhance potential of enjoyment for local recreationists.

page 124 (1) Hard Infrastructure: ◇ Water, including treatment, distribution, and supply
◇ open space and recreation. (3) Green (natural) Infrastructure: ◇ soils ◇ topography ◇ geology ◇ water ◇ climate ◇ flood and drainage If a community's environment is degraded it becomes less livable and less marketable.

page 125 Manage environmental impacts of development at the local level to promote health and safety and adequate living conditions of all residents.

As discussed throughout the Comprehensive Plan, protection of natural resources, and particularly water resources, are of primary concern of Monroe residents.

Home ownership in Monroe County is 84.5%, probably one of the highest percentages in the United States. This indicates a stable, viable community.

page 54 West Virginia has the highest rate of homeownership in the country. In addition, the number of residents that own their homes in Monroe County is significantly higher than the state average: 84.5% to WV's 75.2%. The high rate of homeownership in Monroe can be attributed in part to its rural character and a culture centered strongly on agriculture and a sense of place.

Some other areas of concern include public highways, rare/endangered species, St. Clair fault line and erosion

and slope slide.

page 63 Public Highways Lane width on the county's primary routes is not adequate to comfortably accommodate the size of modern commercial trucks

page 63-64 The county contains one designated WV Scenic Byway, the Farm Heritage Road, which incorporates portions of WV Routes 12, 122, 3, 311, and U. S. 219. A WV Scenic Backway, the Mountain's Shadow Trail, was established concurrently with the scenic byway. This latter route generally follows the base of Peter's Mountain from Peterstown to Gap Mills, and incorporates portions of Rich Creek Valley Road, Watson Mill Road, Painter Run Road, Back Valley Road, and Zenith Road.

page 75 Small rural country roads have a value and charm of their own, and local examples contribute to the overall atmosphere of the county. Narrow, winding roads also contribute to slower driving speeds, and in most cases, accidents which do occur on such roads are less severe than on major highways.

page 33 Wildlife: A rich diversity of wildlife is found within the borders of Monroe County, including some rare or endangered species such as the Northern Flying Squirrel, James River Spiny Mussel, Bald and Golden Eagle, and various bat species. Occasional sightings of the Eastern Cougar are reported, but the presence of this species has never been officially confirmed. (my note: my husband and I have seen a mountain lion about 2 miles from where we live. It looked like an African lion.)

The St. Clair fault line is at the base of Little Mountain which runs parallel to Peter's Mountain.

The following includes concern about erosion and slope side development.

page 23 Development on steep slopes can have a significant detrimental affect on soils and water quality. Development on slopes from 15%-25% should be monitored closely particularly in karst terrain, and regulated as needed; development on slopes greater than 25% should be prohibited altogether.

MVP states that they will not cross any EPA designated Sole Source Aquifers or any state designated aquifers. Monroe County should qualify by the EPA as a Sole Source Aquifers defined as a principal source aquifer area that supplies at least 50 percent of the drinking water consumed in the area overlying the aquifer. See below from the DEIS.

4.3.1.2 Environmental Consequences Aquifers 4-77 *Water Resources* Neither the MVP nor the EEP would cross any EPA-designated SSAs or any state designated aquifers. Therefore, the projects would not affect these resources.

Groundwater, Surface Waterbody Crossings, and Wetlands Neither of the projects would cross any designated sole source aquifers, and no state-designated aquifers have been identified in the project area. The MVP would cross one Source Water Protection Area (SWPA); however, the EEP would not cross any SWPAs. *Executive Summary ES-4*

Sole Source Aquifers The EPA defines a sole source aquifer (SSA) or principal source aquifer area as one that supplies at least 50 percent of the drinking water consumed in the area overlying the aquifer. The EPA guidelines for SSAs stipulate that these areas can have no alternative drinking water source(s) that could physically, legally, and economically supply all those who depend upon the aquifer for drinking water (EPA, 2015a). Neither the MVP nor the EEP would cross any EPA-designated SSAs. *Water Resources 4-72*

State Designated Aquifers

In addition to the EPA-designated SSA program, individual states may enact regulations protecting significant aquifer recharge areas, critical areas where excessive use of groundwater poses a threat to the long-term integrity of a water supply source, or preservation areas to protect natural resources including public water supply sources. The MVP and the EEP would not cross any state designated aquifers. *Water Resources 4-72*

MVP is not concerned with any fossils that are not on federal lands (see below). Areas with shallow bedrock have the potential for containing paleontological resources. Monroe County has 9.4 miles of shallow bedrock within the designated MP area.

4.1.1.6 Paleontological Resources

Paleontological resources including plant, invertebrates, and vertebrate fossils may be found in a variety of geologic formations. Typically, fossils are found in bedrock; therefore, areas with shallow bedrock, mentioned above, have the potential for containing paleontological resources. Those resources may be impacted by construction activities, including trenching. **The Antiquities Act of 1906 and the Paleontological Resources Preservation Act of 2009 protect objects of antiquity and fossils, respectively, on federal lands. No such protection for paleontological resources exists in laws or regulations for non-federal lands.**