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 FEDERAL ENERGY  
 REGULATORY COMMISSION

Nathaniel J. Davis, Sr., Deputy Secretary  
 Federal Energy Regulatory Commission  
 888 First Street NE, Room 1A  
 Washington, DC 20426

Re: Mountain Valley Project and Equitrans Expansion Project Draft Environmental Impact Statement; Pennsylvania, West Virginia, and Virginia; September 2016 (FERC Docket Nos. CP16-10-000 and CP16-13-000; CEQ# 2016-0212)

Dear Deputy Secretary Davis:

ORIGINAL

In accordance with the National Environmental Policy Act (NEPA) of 1969, Section 309 of the Clean Air Act and the Council on Environmental Quality (CEQ) regulations implementing NEPA (40 CFR 1500-1508), the U.S. Environmental Protection Agency (EPA) has reviewed the Draft Environmental Impact Statement (DEIS) for Mountain Valley Pipeline, LLC and Equitrans, LP's (Mountain Valley and EEP respectively, or the applicants) Mountain Valley Project and the Equitrans Expansion Project (MVP and EEP respectively). The Federal Energy Regulatory Commission (FERC) is the lead Federal agency in the NEPA study and has prepared the DEIS. The applicants propose to construct and operate MVP, which includes about 301 miles of 42" pipeline and three new compressor stations in West Virginia and Virginia, and EEP, which includes about eight total miles of various diameter pipeline and one new compressor station in Pennsylvania and West Virginia. The proposed projects will transport a combined 2.4 Bcf/d. EPA is a cooperating agency for this DEIS.

EPA has concerns regarding the purpose and need, alternatives analysis, and a number of important topics for which information is incomplete. EPA concerns focus on the direct, indirect and cumulative impacts of the proposed action on the environment and public health, including impacts to terrestrial resources such as interior forests, aquatic resources, geology and geohazards, and rare, threatened and endangered species. This letter contains a brief summary of the principal issues; a more detailed discussion of the project, impacts and issues, and our recommendations to improve the analysis, is presented in the enclosure.

### **Purpose and Need, Alternatives and Incomplete Information**

The stated purpose of the proposed projects is to transport natural gas produced in the Appalachian Basin to markets in the Northeast, Mid-Atlantic, and Southeast. Additionally, the DEIS states (later in the document) that the purpose of the MVP pipeline is to extend an

interconnect to the Transco system from the natural gas production areas in West Virginia. The EIS articulates that it does not address in detail the need or public benefits of either MVP or EEP. The Commission will more fully explain its opinions on the project benefits and need in its Orders for the proposed projects. The Commission bases its decisions on technical competence, financing, rates, market demand, gas supply, environmental impact, long-term feasibility, and other issues concerning a proposed project. As the purpose of NEPA is to inform decision-making, using relevant information and public engagement, EPA is concerned that deferring evaluation of need may compromise the NEPA process. EPA recommends that the EIS include a more thorough discussion of the purpose and need or public benefits of the project. Including this information in the EIS goes toward transparency and disclosure to the public, to afford the public the opportunity to provide comment; and to assess and compare alternatives' ability to meet project need.

The DEIS does not analyze alternatives beyond the applicant's preferred alternative in detail. EPA recommends that FERC provide detailed analysis on system and route alternatives, and further consider collocation opportunities and develop alternatives which further avoid and minimize impacts to important project area resources. Without additional analysis of alternatives, it is not clear that the preferred alternative is the only one that can meet the stated purpose and need. Additional recommendations on specific system and route alternatives are provided in the enclosures to this letter. An expanded discussion would help the decision maker and the public understand and explore viable alternatives which may have less impacts than the preferred.

EPA is aware that Mountain Valley has filed additional documentation to the FERC docket (number referenced above). Revised materials include updated EIS tables, figures and appendices, as well as additional route modifications, surveys and reports. EPA understands that FERC has requested the applicants file materials at various points after the release of the DEIS. Although this information has been or will be posted to the docket which is publicly accessible, EPA is concerned that without official notification, the public may not have had an opportunity to fully comment on this material. It is not apparent within the EIS how FERC intends to include public participation and comment on these subsequent filings. We urge FERC to make clear what materials the public will have an opportunity to comment on, how/if FERC intends to provide responses to those comments, and clarify the timeframes during which FERC will accept comments. Without this process clearly articulated, it appears that the EIS is a 'rolling' document providing just a snapshot in time. This creates a considerable challenge for stakeholders and members of the public to follow the documentation provided, or know which material is most current in order to provide the most relevant comments. It may be appropriate for FERC to consider fully incorporating revised and new materials into the EIS and provide it for public comment in the form of a supplemental EIS or revised EIS. EPA is interested in discussing this with FERC at your convenience.

### **Impacts to the Environment and Public Health**

EPA is concerned that the preferred alternative may result in significant adverse environmental impacts. The DEIS concludes that impacts to forests would be significant. The DEIS finds that construction of the MVP and the EEP would affect about 4,856 acres of upland forest. Additionally, the DEIS finds that MVP would impact about 2,485 acres of contiguous

interior forest in West Virginia, and 938 acres of High to Outstanding quality contiguous interior forest in Virginia.

Construction of the MVP and the EEP results in impacts to aquatic resources totaling 39.3 acres of wetlands and 1,021 waterbody crossings. These systems provide habitat and valuable ecological services for the region. Mountain Valley is proposing to use the wet open-cut method to cross three major waterbodies. EPA recommends that the potential for on-site and downstream effects of these flow perturbations be quantified and assessed, and that the information be shared in the NEPA process. It is not clear in the study that aquatic impacts have been fully avoided to the greatest extent possible or if appropriate mitigation has been proposed.

Other potential impacts of the proposed pipeline construction are associated with geological and hydrogeologic hazards, which have not been fully assessed in the DEIS. EPA recommends that FERC evaluate potential construction impacts relative to landslides, karst landscape, subsidence, flash flooding and potential blasting impacts to water wells, springs, and wetlands.

Much of the data and analysis remain incomplete; including endangered species surveys, wetland and stream resources, landslide vulnerabilities, karst topography. EPA recommends that FERC fully assess project impacts to natural resources with more complete information. The DEIS references and relies heavily on construction, management, restoration, and mitigation plans (plans listed in Table 2.4-1) many of which are not included in the EIS. It is not clear if the plans have been completed. We recommend that the plans be included as Appendices to the document or clear links to these documents should be provided. Without having access to these and other information, EPA finds the information provided insufficient to determine if impacts, particularly to surface water and aquatic life, are temporary and minimal. In addition to completing and providing survey data, EPA recommends that FERC consider ecosystem services and conduct an aquatic resource functional analysis. This information could improve FERC and stakeholders' understanding of the potential impacts of the project, indicate areas where reducing environmental impacts is critical and better inform selection of appropriate compensatory mitigation for adverse impacts to natural resources.

The DEIS contains estimates of GHG emissions from construction and the operation of the proposed compressor stations. Although the estimated total annual emissions of GHG based on the total project capacity of 2.4 Bcf/d was included in the DEIS, it is not clear how this calculation was made. Of concern is the comparison of project construction and operation emissions to global emissions, which minimizes the potential significance of impacts. EPA continues to recommend that FERC estimate the GHG emissions from the development and production of natural gas being transported through the proposed pipeline as well as from product end use, due to the reasonably close causal relationship of this activity to the project. We recommend that the DEIS also consider mitigation opportunities, especially approaches to reducing leakage of methane along the proposed pipeline; please see the following website for more information: <https://www.epa.gov/natural-gas-star-program>.

### **Cumulative Impacts**

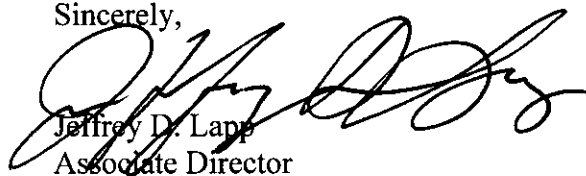
The cumulative impact assessment narrowly identifies past, present and reasonably foreseeable actions as well as uses a narrow geographic and temporal scope to assess impacts.

EPA's detailed recommendation on the scope of the analysis, provided in the enclosure to this letter, emphasizes the need to improve public understanding of cumulative impacts. EPA recommends that FERC describe the inter-related network of existing and proposed pipelines and associated impacts. We recommend that the cumulative impact analysis be expanded to provide a more comprehensive consideration of impacts from natural gas production, transmission and use.

For the reasons stated here and in the attached technical comments, EPA has concerns regarding the potential impact of the proposed project on water quality, air quality, and terrestrial resources. EPA has rated the DEIS preferred alternative as EC-2 (Environmental Concerns, Insufficient Information). A description of our rating system can be found at: [www.epa.gov/nepa/environmental-impact-statement-rating-system-criteria](http://www.epa.gov/nepa/environmental-impact-statement-rating-system-criteria)

We would appreciate the opportunity to discuss the comments provided in this letter and the enclosure and answer any questions you may have, at your convenience. Please contact Ms. Barbara Rudnick, NEPA Team Leader at (215) 814-3322 or [Rudnick.barbara@epa.gov](mailto:Rudnick.barbara@epa.gov), or the staff contact for this project Ms. Alaina McCurdy at (215) 814-2741 or [mccurdy.alaina@epa.gov](mailto:mccurdy.alaina@epa.gov).

Sincerely,

A handwritten signature in black ink, appearing to read 'Jeffrey D. Lapp', is written over the typed name.

Jeffrey D. Lapp  
Associate Director  
Office of Environmental Programs

Enclosure (1) Technical Comments

Enclosure–Technical Comments  
MVP and EEP DEIS

Technical Comments are on the following topics:

- 1) Background/Description
- 2) Purpose and Need
- 3) Alternatives
 

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  - a. System Alternatives
  - b. Route Alternatives
  - c. Compressor Stations

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- 4) Geology and soils
- 5) Streams and Wetlands
 

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  - a. Hydrologic Alternations and Water Withdrawals
  - b. Karst Stream Crossings
  - c. HDD and Streams

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- 6) Groundwater and Drinking Water Protection
- 7) Vegetation, Wildlife
- 8) Rare, Threatened and Endangered Species
- 9) Land Use and Visual
- 10) Environmental Justice and Health
- 11) Air Emissions and Impacts
- 12) Climate Change
- 13) Cumulative Impacts
 

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  - a. Scope
  - b. Trends
  - c. Cumulative Impacts to Groundwater and Surface Water
  - d. Cumulative Impacts to Vegetation and Wildlife
  - e. Focused Analysis on Oil and Gas Activities

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### 1) Background/Description

The project purpose of both the MVP and the EEP is to transport natural gas produced in the Appalachian Basin to markets in the Northeast, Mid-Atlantic, and Southeastern United States. Specifically, the MVP would deliver the identified gas volumes (2 Bcf/d) to five contracted shippers via a pooling point at Transco Station 165 in Pittsylvania County, Virginia; while the EEP would deliver contracted volumes of 0.4 Bcf/d (with potential for an additional 0.2 Bcf/d) to various end users via a connection with the MVP in Wetzel County, West Virginia. The MVP and the EEP combined would consist of about 309 miles of natural gas transmission pipelines. Aboveground facilities would consist of four new compressor stations; one existing compressor station to be decommissioned; 11 new M&R stations, interconnects, and taps; seven pig launchers and receivers; and 36 MLVs for the MVP. The MVP and the EEP would collocate their pipeline facilities adjacent to existing rights-of-way for about 29 percent and 20 percent of the routes, respectively.

EPA recommends that a more comprehensive description of existing natural gas conveyance and pipelines would assist the reader in understanding the infrastructure system, the

existing impacts, and other active proposals (such as Atlantic Coast Pipeline and Mountaineer Xpress Pipeline). Updates to the project components have been filed with FERC and are available on the eLibrary. EPA recommends this information be added to the EIS.

## **2) Purpose and Need**

EPA recommends that the EIS include a more thorough discussion of the purpose and need or public benefits of the project. We recommend that FERC include available information in the EIS on the purpose and need or public benefits of the project, such as meeting unserved demand, eliminating bottlenecks, access to new supplies, lower costs to consumers, providing new interconnects that improve the interstate grid, providing competitive alternatives, increasing electric reliability, or advancing clean air objectives.

Establishing a project need is critical to help determine alternatives that should be studied and the degree to which the proposed action or other alternatives may meet the stated purpose and need. EPA recommends FERC assess and compare alternatives' ability to meet project need to address issues on the possibility of overbuilding, unnecessary disruption of the environment, and unneeded exercise of eminent domain. Although the EIS contains limited information that peripherally speaks to need or public benefits, such as expanding capacity, increasing system reliability, efficiency, and operational flexibility, EPA recommends expanding this discussion to explain, for example, how much reliability or efficiency is being sought. FERC could then provide information on how proposed alternatives meet these needs by examining how much reliability or efficiency is provided. This gives a much stronger basis on which to evaluate alternatives.

Establishing a project need is critical to help determine alternatives that should be studied and the degree to which the proposed action or other alternatives may meet the stated purpose and need. EPA is concerned that the purpose to provide transport ability of 2.4 Bcf/d natural gas may be narrow and limit the range of available alternatives. Specific dekatherm capacities are provided, although it is unclear how these units were determined or generated. In the absence of this type of supporting documentation (markets, rates, gas supply, existing facilities and service, long-term feasibility information, unserved demand, bottlenecks, problems with interstate grid, high consumer costs, etc), it is unclear if the stated purpose and need is too narrow thereby limiting the available range of alternatives. If the additional information supports a broader purpose and need statement, a broader range of alternatives could be considered in the EIS. For example, alternatives which include a lesser diameter pipe, a different capacity, different corridor, share use of existing infrastructure or right-of-way (ROW), etc.

Market demands are briefly mentioned on page 1-8. It is also stated that the MVP would alleviate some of the constraints on this natural gas production by adding infrastructure to transport lower-priced natural gas from the Appalachian Basin to industrial users and power generators in the Mid-Atlantic and Southeastern United States, as well as to local distribution companies (LDC). These statements begin to give the reader some indication of project need. In order to expand this discussion and provide further clarity to the public, specific constraints could be detailed and it could be explained how the proposed project will alleviate constraints.

EPA appreciates that FERC has identified the five MVP shippers who are contracted with for 2.0 Bcf/d as well as the identification of the MVP terminus as Transco CS 165 and some rationale for the selection of this location. Page 3-2 states that shippers requested that Transco CS 165 be the delivery point to meet the demands of the market. This location was generally used at the terminus point for MVP since Transco CS 165 is the existing pooling point for Zone 5 on Transco's system and a gas trading hub for the Mid-Atlantic Market. This information is useful for the public to understand how the terminus was selected and why it is being used in the alternatives analysis. This discussion could be expanded to address other hubs that could be considered, and to provide a map of Zone 5, the pooling point, and other potential hubs or pooling points. EPA suggests discussing the feasibility of utilizing any of these alternative points and identifying the end users for the 0.4 Bcf/d associated with the EEP, and the rationale for its terminus.

### **3) Alternatives**

The DEIS considers the no action alternative, alternative modes of natural gas transportation, system alternatives, route alternatives, route variations, and compressor station equipment alternatives. Alternative means of transportation included ships, trucks, and rail to transport liquefied natural gas (LNG); none of these alternatives were retained for detailed analysis.

#### **a. System Alternatives**

System alternatives would use existing or proposed natural gas transmission systems, making it unnecessary to construct all or part of the proposed MVP and EEP projects. The DEIS considers utilizing the existing pipeline systems operated by Texas Eastern, East Tennessee Natural Gas, Columbia, Transco, and Dominion. The DEIS considers utilizing proposed pipeline systems including the Atlantic Coast Pipeline and the WB Xpress pipeline.

The DEIS concludes that existing system alternatives do not have the capacity to handle the additional volumes proposed for MVP, systems do not have existing capacity or operating pressure, systems' capacity is currently contracted, and that other systems would not connect or be located near the proposed terminus, receipt or delivery points of MVP. While we understand that FERC considers environmental matters separately from market needs and capacity, we encourage FERC to include some of the information considered for market or capacity analysis in the EIS. In this instance, providing some basic information on system capacities, whether there is any additional capacity and the amount, and clarifying if zero capacity exists or if capacity is insufficient to accommodate the entire proposed MVP. This could allow the public and stakeholders to have greater confidence in moving forward without considering these alternatives further in detail.

FERC describes modifications to these systems that would have to be made to accommodate the proposed projects capacity and be a reasonable alternative. In some instances, the DEIS states that the construction of additional facilities would be nearly equal to the construction of MVP, such as East Tennessee pipeline system alternative; or would involve construction similar to or greater than the proposed MVP, such as Columbia pipeline system

alternative. EPA acknowledges the approach to consider alternatives to MVP. We suggest that FERC present these alternatives equally, using the same terms for considering the construction of other system alternatives. We suggest that FERC expand on this discussion to further demonstrate that the proposed system alternatives should not be carried forward for detailed evaluation. It should be recognized that not all resources provide the same functions, values or are of the same quality. Without more detailed consideration of the system alternatives and the effected resources, it is difficult to determine if alternatives which are stated to have similar construction impacts, have equivalent loss of resource functions and values.

FERC also presents system alternatives utilizing proposed pipelines under review by FERC, including Atlantic Coast Pipeline (ACP). The ACP “one pipe - one route” alternative considers combining MVP volumes with ACP volumes into a single pipeline along the ACP route, requiring the construction of multiple laterals to serve MVP receipt and delivery points. The challenge of moving the combined total of 3.44 Bcf/d in a single pipeline is mentioned. It is stated that this would require additional compression resulting in air quality impacts. EPA recommends that the EIS document and reference more detailed information on how this determination was made and what calculations were used. Page 3-14 states that the total length of pipeline under the one pipe - one route” “would certainly be much shorter overall (and would have much less environmental impacts) than two separate MVP and ACP Projects following different routes.” As the EIS recognizes the potential environmental advantages to this alternative, it may be appropriate to evaluate and weigh impacts from this alternative within the EIS and not, for example, eliminate the alternative on the basis of air impacts without considering its potential to reduce environmental impacts to other resources.

We recommend FERC discuss potential modifications that could be made to increase the efficiency of the one pipe option, particularly which may allow for the combination of volumes into the currently proposed 42-inch diameter pipe. The use of the proposed 42-inch line (instead of 48-inch) would reduce impact of additional temporary workspace and increased construction ROW width. Although FERC concludes that this alternative may not be reasonable or practicable, EPA suggests FERC further consider ways to increase efficiency to order to utilize the a 42-inch pipe for the one pipe alternative.

#### **b. Route Alternatives**

The DEIS also considers route alternatives and variations. EPA appreciates efforts made by FERC and Mountain Valley to adopt at least eleven route revisions and at least 571 minor route variations into the proposed route to avoid and/or minimize project impacts. Highway collocation alternative, Alternative 1, and the Northern Pipeline Alternative – ACP Collocation were major alternative route concepts that were not evaluated in detail. Page 3-20 states “Alternative 1 would be located adjacent to an existing powerline for 101 miles (approximately 31 percent). The Northern Pipeline Alternative – ACP Collocation , would be generally located adjacent to the proposed ACP route.” The Northern Pipeline Alternative is also referred to as the “two pipelines – one route” alternative.

We appreciate that FERC requested the applicant to explore a route alternative that followed highways. Increasing the amount of collocation with highways is one way that



environmental impacts associated with the proposed action could be reduced or minimized. This route would be over 95 percent collocated with existing highways, compared to only about 7 percent of the proposed route. Some general impact information is presented on Page 3-18, however this information appears to be incomplete and it is not clear to EPA that the highway alternative could not provide an environmental advantage. The discussion of the highway alternative in the DEIS does not consider that resource impacted may not have the same quality or condition. For example, forest impacted by the highway alternative would likely be edge habitat, and forest impacted by the proposed action would likely contain a greater proportion of high quality interior forest. These types of differences are not considered. Further, the DEIS does not explain or consider the possibility of partial use of the highway collocation alternative. EPA recommends that FERC revisit the highway collocation alternative, evaluate in greater detail the potential environmental affects and present options for areas of selected highway collocation. If this analysis had been done, please provide a link or reference where the existing information may be found.

It is unclear why Alternative 1 and the “two pipelines – one route” alternative were dismissed from further consideration. After consideration of several factors as presented in Table 3.4.2-1, including U.S. Forest Service (USFS or FS) lands, National Register of Historic Places (NRHP)- designated lands, interior forest, total length, length of wetland crossings and the amount of perennial waterbody crossings, miles of steep slope and side slope, the DEIS concludes that Alternative 1 does not offer a significant environmental advantage when compared to the corresponding route. It is unclear exactly what factors lead to this determination. Without further information, it is unclear to EPA whether this route should be eliminated from further consideration.

### **c. Compressor Stations**

Section 3.6.1.1 discusses the use of electricity to power the compressors at the MVP’s Bradshaw, Harris, and Stallworth Compressor Stations as an alternative to the proposed natural gas-fired reciprocating engines and natural gas-fired turbines. The DEIS concluded that the use of electric-driven compressors at Mountain Valley’s proposed compressor stations does not offer a significant environmental advantage when compared to the use of natural gas-fired compressors. EPA is concerned that the analysis presented is inconclusive.

The analysis estimated the hypothetical regional CO<sub>2</sub>, CH<sub>4</sub>, and N<sub>2</sub>O emissions that would occur if electric-driven compressor units were installed rather than natural gas-fired compressor units. While emissions estimates were provided for CO<sub>2</sub>, CH<sub>4</sub>, and N<sub>2</sub>, no determination is made on the impact of these emissions. Additionally, the analysis does not determine reduction of criteria pollutants such as NO<sub>x</sub>, CO, PM, and air toxics resulting from the use of electricity versus natural gas to operate the compressors. The analysis uses EPA software known as EGRID, which provides a theoretical estimate and is limited to the GHG pollutants. In addition, the FERC analysis relies on a subjective statement that natural gas is more reliable than electrification; references have not been provided in the DEIS to support the statement. EPA recommends FERC consider the Energy Information Agency annual records of power plant energy production and the distribution of the types of fuels used to produce energy annually and the resultant pollution. This could be used to inform a decision on compressor station power

analysis to determine if there is value in electrification in reducing the criteria pollutants and potentially mitigating the emissions impact of the two projects.

#### 4) Geology and Soils

Challenging geologic conditions are likely to be encountered during project construction. The MVP pipeline route would be within 0.25-mile of 62 mines and 233 oil and gas wells. The EEP would be in proximity to 19 inactive mines and 42 active oil and gas wells. About 30 percent of the MVP pipeline route, and 48 percent of the EEP pipelines would cross topography with slopes greater than 15 percent grade. About 67 percent of the MVP pipeline route, and all of the EEP pipelines, would cross areas susceptible to landslides. MVP would cross 51 miles of karst terrain. Construction of the MVP would disturb about 4,189 acres of soils that are classified as having the potential for severe water erosion. Construction of the EEP would affect about 126 acres of soils rated as being prone to erosion by water.

Blasting, in combination with steep slopes, karst topography, and active or abandoned mines and quarries, has the potential to result in adverse impacts that were not considered or fully evaluated in the EIS. At this time, it is unclear if the data presented is complete or surveys are completed or ongoing. We recommend clarifying this information in the EIS. We also recommend evaluating the potential effects of these geologic hazards, including mining-related subsidence, landslides and flash flooding, on pipeline construction and operation. We recommend that impacts, especially in high risk areas, be evaluated specific to this project. EPA recommends that FERC evaluate the locations with high susceptibility to landslides to determine their proximity to streams. Landslides have significant ecological and surface water effects and high risk areas near waterbodies should be disclosed. Further avoidance and minimization of impacts to affected lands might be appropriate; we recommend making such contingencies clear in the NEPA analysis.

We recommend that the EIS describe the nature, extent, frequency of potential blasting impacts to water wells, springs, wetlands, resources of special concern, nearby aboveground facilities, and adjacent pipelines and utility lines. It was difficult to fully evaluate the potential effects of blasting as the EIS did not include the blasting plan that is referenced throughout the document. Changes to geology resulting from blasting may directly and indirectly affect hydrology, wildlife and local residents, which we recommend considering within the scope of the EIS.

The proposed pipeline route crosses about 119 miles exhibiting shallow depth to bedrock. We recommend explaining how methods needed in shallow bedrock areas (such as blasting) may impact soil moisture capacity, revegetation potential, or prime farmland soil conditions. Alteration of shallow bedrock may modify hydrologic pathways and storage potential of aquifers. These impacts may not be consistent over the entire length of the pipeline and may need to be evaluated on a case-by-case basis where groundwater resources are used for farming practices or drinking water-supply.

FS submitted a filing to FERC dated October 24, 2016, which raised concerns whether pipeline construction within the Jefferson National Forest (JNF) was without undue risk of

resource damage. FS requested that MVP develop site-specific stabilization designs for challenging terrain. EPA supports FS requests in order to reduce resource risk. EPA further questions whether such measures should be implemented in similar challenging terrain outside of JNF. EPA recommends that FERC encourage the applicant to adopt recommendations made by the FS to minimize impacts within the JNF for areas outside of forest lands.

EPA recommends that the EIS study look at recent pipeline construction project to evaluate “lessons learned” and impacts, which could include construction, especially with respect to geohazards such as steep slope, karst terrain, etc, operation and implementation of mitigation. This information can be incorporated into direct, secondary and cumulative impact analysis, and provide recommendation for best management practices (BMPs) and other mitigative approaches for impacts. We recommend that FERC present and evaluate where failures during construction and operation of pipelines have occurred (for instance that lead to erosion and sediment control issues, turbidity in streams, impact to surface or ground water supply, introduction of invasive species). Consider if work stoppages were/will be needed; consider contractor rewards for exemplary work and penalties for noncompliance with best practices.

Please consider specific comments on the DEIS compiled on the topics of geology and soils:

- Page 4-22: The seismic hazard modeling conducted by D.G. Honegger Consulting cannot be found in Appendix D of Resource Report 6 in the docket. Please provide a direct link to Appendix D or the modeling report.
- Page 4-22: Understanding that there is a low probability for the occurrence of an earthquake exceeding magnitude 6.0 and a 4 percent probability of occurrence for an earthquake exceeding magnitude 5.0 within 50 kilometers of the MVP over a 50-year time period, it is recommended the EIS provide the probabilities of lower magnitude earthquakes occurring in the area that have the ability to significantly displace land. Please present analysis of potential impacts and recommended best management practices.
- Page 4-46: Please discuss if the landslide events mentioned in section 4.1.2.4 were linked to seismic events. If so, please report what magnitude events were associated with the landslide. These locations should be identified in a table or map.
- Page 4-46: It is recommended that more information on past landslides in the vicinity of the project be included in the EIS. Information on past events such as rainfall data, percent slope, bedrock type, soil type in the corresponding area would be helpful to identify and avoid potentially hazardous locations.
- Page 4-47: Table 4.1.2-1 should indicate the duration of time that monitoring and inspection will take place after construction.
- Page 4-47: The Landslide Mitigation Plan and Karst-specific Erosion and Sediment Control Plan cannot be accessed through ascension number 20160226-5404 nor can the corresponding filing from February 26, 2016 be accessed from the docket on the FERC eLibrary. Please provided direct links to the missing filings or correct the references.
- Page 4-47: An analysis of slope hazards at the GCSZ should be included in the revised Karst Mitigation Plan.

- Page 4-66 states that topsoil and subsoil compaction tests would be conducted in agricultural and residential areas by Mountain Valley, and that decompacting activities such as tiling would be conducted as necessary. Please clarify if compaction is addressed in any written plans submitted to FERC; it is currently unclear how this information would be captured or memorialized. We recommend that the plan include testing methodologies and test frequencies. It appears that Mountain Valley is only proposing to address compaction in agricultural and residential areas. Please clarify how compaction will be addressed in forested areas and wetlands, especially as it is recognized in the EIS that soils with moderate moisture content would be more prone to compaction. Soil compaction in these areas could inhibit plant growth, successful revegetation, and change surface hydrology. We recommend that FERC address compaction of forested and wetland areas throughout the proposed construction work area and evaluate the impact of soil compaction to these locations.
- Page 4-66 states that additional topsoil for residential and agricultural lands would be locally sourced to prevent introduction of foreign (or invasive) species. Was this practice also considered for topsoil being placed in other areas within the construction ROW, such as forests and wetlands? Please provide the rationale for where this practice will be conducted.
- Excess stone/rock disposed of within the construction ROW should not be placed in waters of the United States. If no practicable alternative location is available, appropriate permits or approval should be provided.
- Mountain Valley would follow procedures put forth in its *Unanticipated Discovery of Contamination Plan* should contamination be discovered during construction. We recommend clarifying if the *Plan* addresses how testing for contamination would be done and any associated methodology. Clarify if Mountain Valley proposed to conduct soil or groundwater testing.
- Page 4-68 states that there is potential for ground heaving to temporarily affect early revegetation success along steep slopes. We recommend FERC consider these affects in combination with other geologic hazards.
- Two tone construction in steep terrain is mentioned on page 4-206. Is this construction methodology proposed? What is involved? If this is being done in steep slopes already, how does this affect statements made earlier about dismissing alts because of terrain?

## 5) Wetlands and Streams

The EIS reports that construction of the project would impact about 39.3 acres of wetlands, including 10.3 acres of forested wetlands, 26.9 acres of emergent wetlands, and 2.1 acres of shrub-scrub wetlands. The MVP would result in 986 waterbody crossings and the EEP would result in 35 waterbody crossings. The MVP would cross 33 waterbodies classified as fisheries of special concern. The project would cross 39 impaired waterbodies. The project would cross four National Rivers Inventory (NRI) waterbodies, including Left Fork Holly River, Elk River, Greenbrier River, and Craig Creek. EPA recommends that additional information on aquatic resources be included in the EIS and made publicly available prior to any issuance of Certificate approval by FERC, including complete field delineation information, impact breakdowns and specific construction techniques for each waterbody crossing, detailed stream

and wetland assessment data on the quality or functions of the systems, and detailed, or at a minimum conceptual, compensatory mitigation plans.

At this time, the entire proposed project corridor has not been surveyed. It is stated that Mountain Valley was unable to survey all parcels; therefore, the total wetland acreages were based on a combination of field surveys and the review of NWI (National Wetland Inventory) maps. It is unclear how much of the corridor has been field surveyed. While EPA recognizes that without a FERC Certificate the applicants may not gain access to complete surveys without landowner permission, EPA recommends that these surveys be completed and verified as soon as they become available, if possible prior to the issuance of a FERC Certificate. EPA recommends consideration of remote data including aerial information or GIS to support analysis of NWI maps.

EPA recommends that FERC provide baseline information for the potentially impacted areas. If the information is in the appendices, we suggest references be provided. We also recommend that the applicant use an appropriate functional assessment to evaluate the impacts, both temporary and secondary, to the aquatic ecosystem. Using an appropriate assessment will ensure that functions and values are accounted for in the impact assessment and that the proposed compensation plan is adequate to offset the loss, including temporary loss, of aquatic resource functions. Without completed surveys and a functional assessment of the aquatic resources, it is unclear if sufficient wetland and stream information has been collected to support informed decision-making.

The proposed project would likely require Clean Water Act (CWA) Section 404 permits from the U.S. Army Corps of Engineers (USACE). Page 4-129 states that the Norfolk District of the USACE indicated that it will not consider Mountain Valley's application complete until several items have been completed, including a complete delineation and preliminary jurisdictional determination, FERC's FEIS, documented completion of Section 7 Endangered Species Act consultations, and documented completion of consultation and compliance with Section 106 of the National Historic Preservation Act. More complete and detailed information will likely be necessary to fully determine if the proposed impacts have been fully avoided and minimized or if the functions lost will be appropriately compensated through compensatory mitigation. Page 4-89 states that prior to construction, Mountain Valley should file site specific plans and details related to construction etc. EPA suggests that the information is important to the NEPA analysis and the application for the CWA Sec 404 permit decision.

EPA is concerned about direct, secondary and cumulative impacts to aquatic resources including wetlands, streams, groundwater and surface water quality. Aquatic resources have the potential to be impacted by many activities, including waterbody crossings, clearing, blasting, and water withdraws for hydrostatic testing. Aquatic resources within the project have ecological and recreational importance. The full assessment of these simultaneously occurring impacts to resources needs to be conducted. With the potential for complex impacts to occur, such as changes in recharge patterns and flow status, additional avoidance and minimization measures may be necessary to protect the aquatic ecosystem. EPA recommends that the same parameters used for streams and waterbodies within the Jefferson National Forest be used for

those resources outside of the Forest. In addition, we suggest that all agreements with the Forest Service be provided in the FEIS.

**a. Hydrologic Alteration and Water Withdrawals**

Mountain Valley estimates about 60,283,880 gallons of water would be needed for hydrostatic testing. The volume of water projected for use is considerable, with surface water sources being of concern because of the potential effects of hydrologic alteration. More detailed information should be provided for each test segment, including locations of water withdrawals and discharges, medium of discharge (overland or in water), waters used consumptively or waters being transferred between basins, withdrawal rates, and discharge rates.

The DEIS also estimates that approximately an additional 55,000 gallons per day (gpd) will be used for dust management. We recommend that Mountain Valley prepare a Dust Suppression Plan, which could include locations, rates, withdrawals volumes, and anticipated frequency. The plan could clarify if the estimate of 55,000 gpd for dust suppression in one location or spread over multiple locations; and provide additional information and evaluation on the use of surface water for this purpose. This withdrawal could cause significant impacts especially when considered along with hydrostatic testing withdrawals. Estimates of withdrawal volumes and rates (while difficult) for Horizontal Directional Drilling (HDD) are also useful to this analysis to evaluate potential impacts of cumulative hydrologic alteration and directs a decision if water management plans should be developed to specify withdrawal locations, quantities, study impacts and propose best practices to minimize or mitigate impacts. Testing of discharge water quality should also be specified.

EPA finds the level of information on withdrawals and discharges to be insufficient to complete a thorough review. We recommend that a clear timeframe be provided for when these details will be available for review. EPA recommends FERC evaluate the impacts from hydrologic alteration to ensure that the withdrawals are consistent with EPA-approved State Water Quality Standards, including recreation, aquatic life, and other designated uses as well as numeric and narrative criteria. Further, the locations, volumes, and rates of water withdrawals and discharges should be examined to determine if the withdrawal will contribute to existing impairments or impact threatened and endangered species. Additionally, clarify the duration of hydrostatic testing and if all withdrawn water is stored or if water is directly pumped from stream to pipeline.

It is stated that Mountain Valley would purchase water in the event that a waterbody is not capable of supplying the requisite volume of water, however it is not clear how or when this determination will be made. Please clarify if this statement is referring to maintaining stream base flow or if it is referring to providing the desired amount of water. We recommend additional information be provided describing how “capability” of supplying the water is determined and the impact of withdrawing water. Please provide the definition of capable of supplying water. EPA recommends that FERC evaluate the capability of proposed withdrawal sources at this stage and evaluate the potential effects of withdrawing the proposed volumes from waterbodies. Mountain Valley should list the base level, or mean annual flow, of surface waters that are planned to be used to withdraw water for hydrostatic testing purposes and also monitor

discharge of these waterbodies throughout withdrawal so that Mountain Valley will be able to determine when a waterbody is no longer capable of supplying the requisite volume of water without adversely impacting aquatic life.

If the volumes included in the DEIS are to be withdrawn at a given location in a single day or less, the withdrawals could range, for example, upwards of 9 million gallons per day (mgd) in the tenmile creek watershed. These rates are not insignificant, perhaps more so in smaller water bodies, and may represent a considerable portion of stream flow. Among other factors, the impacts of this hydrologic alteration will depend on the size of stream, making exact locations critical for analysis. Clarify Table 4.3.2-10, which includes the mile posts (MP) in “Proposed Water Source” and “Proposed Test Water Location”; it is not clear which are the points of water withdrawal. EPA suggests clarifying if all test water withdrawal and discharge locations will be at pipeline stream crossings. This hydrologic alteration could impact recreation and aquatic life.

The WV Water Withdrawal guidance tool mentioned is limited in its application and is not sufficient alone to minimize impacts of hydrologic alteration. We recommend clarifying the basis for this tool; as the DEIS suggests, it is based on mean annual flow yet the tool website suggests it is based on summer base flow. The DEIS states, “The guidance is based on percentages of mean annual flow, based on a 10-year period that affords an appropriate flow to protect aquatic habitat.” The guidance section from the tool website states: “This guidance is based on summer base flow for the period of record, which should afford an appropriate flow to protect the aquatic habitat.” The tool may be helpful in identifying potential areas where flow may be compromised, indicating areas to minimize impacts, but FERC should recognize its limitations, which do not consider other withdrawals or propose an acceptable withdrawal volume or rate. Many withdrawals already exist in the heavily fracked watersheds. Information in the DEIS does not clearly illustrate that withdrawals can be safely done to protect summer flow. We are concerned that not enough information has been provided to determine an acceptable withdrawal volume rate.

State surface water withdrawal programs are insufficiently discussed in the DEIS; it is unclear if the hydrostatic water withdrawals will require state water withdrawal permits and it is unclear if those permits would be protective of state water quality standards. If state water withdrawal standards and thresholds are not ecologically based and will not protect EPA-approved state water quality standards, FERC should employ the presumptive standard that 90% of daily flow should be protected (Richter et al.)<sup>1</sup>. The state’s water permitting programs should be discussed and compared to evaluate potential impacts of hydrologic alteration; the goals of each program may be different and may not be associated with protection of EPA-approved state water quality standards. We recommend that FERC consider appropriate state water withdrawal thresholds, such as the WV threshold of 750,000 gpd.

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<sup>1</sup> Richter, et al.; *A Presumptive Standard For Environmental Flow Protection*; [https://www.researchgate.net/publication/227676154\\_A\\_Presumptive\\_Standard\\_For\\_Environmental\\_Flow\\_Protection](https://www.researchgate.net/publication/227676154_A_Presumptive_Standard_For_Environmental_Flow_Protection)

To ensure minimization of hydrologic alternation impacts, EPA recommends the development and use of a water management plan for hydrostatic testing and HDD water withdrawals. This could include protective measures such as avoiding the transfer aquatic plants, algae, and aquatic life, thoroughly cleaning water withdrawal equipment prior to use, draining and/or disinfecting any residual water in the equipment, using backflow prevention mechanisms; monitoring streamflow's prior to discharge and comparing to a protective threshold, limitations on withdrawal location, volume, and rate based on WV Water Withdraw tool and supplemental information, and measures to protect the spread of invasive species. It should also require reporting of location, volume, and rate of water withdrawal. A water management plan could also include standardized monitoring requirements for hydrostatic testing discharges, which may be different between states or, explanation should be provided on how the differing requirements are protective of water quality standards.

The DEIS notes that construction of the projects identified in Appendix U (projects planned in the area) and the MVP and the EEP could result in cumulative impacts on waterbodies and fisheries, especially if constructed on the same waterbody in a similar timeframe. EPA recommends that the EIS and a water management plan address whether and how any downstream users (e.g., National Pollution Discharge Elimination System (NPDES) permittees, any authorities withdrawing for water supply, any other water withdrawal permittee, oil and gas construction, etc.) will be notified of the construction period and temporary withdrawal amounts and timing to minimize these effects.

#### **b. Karst Stream Crossings**

EPA appreciates the special consideration that crossing karst streams has received in the DEIS. However, the DEIS does not discuss the potential aquatic life or surface water impacts that could occur to karst ecosystems due to construction (including blasting) of the pipeline or water withdrawals. The DEIS Section 4.3.2.1 on karst impacts states that potentially affected surface waters may impact groundwater supplies. EPA recommends that a discussion should be included addressing how surface waters could be affected. Most of the discussion on impacts to karst ecosystems is centered on mitigation plans, not on the avoidance of impacts. Since pipeline construction activities could alter sediment flushing, intersect active ground-water conduits and phreatic loops, or cause their blockage, EPA is concerned that impacts to surface water and aquatic life may not be insignificant.

USGS has provided some insight into the potential adverse effects on karst systems, habitat and biota:<sup>2</sup>

“Ground-water withdrawal and diversion of surface water may cause aboveground and underground hydrologic systems to dry up. Water-bodies, which may be inhabited by small, site-endemic fish and snail species, will disappear with them, the species. Alterations of flow volumes and patterns and the availability of nutrients can

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<sup>2</sup> Potential Environmental Impacts of Quarrying Stone in Karst- A Literature Review; <https://pubs.usgs.gov/of/2001/ofr-01-0484/ofr-01-0484so.pdf>



profoundly change the limestone environment and may lead to the extinction of whole communities (Vermeulen and Whitten, 1999). Lowering the water table will increase the thickness of the unsaturated zone, which can change the pH of the water in the unsaturated zone, which will change the biotic environment in small voids in the rock, which will kill species that live there.

Blasting can negatively affect karst habitat and biota. Blast-induced vibrations and shock waves can cause cave roofs to crack or collapse, and karst environmental conditions can be altered by just one new crack. Light may enter an otherwise dark cave or passage, or streams and ponds may suddenly drain into a new crack in the floor. Either situation can result in the death or displacement of cave communities (Vermeulen and Whitten, 1999).”

The DEIS notes that blasting in karst can potentially change groundwater flow, create contamination, and affect yield and turbidity. It is also noted that potential impacts on water wells, springs, wetlands and other resources could occur. Although the DEIS states that Mountain Valley is aware of possible changes or loss to surface water and will use specialized construction techniques, EPA is concerned that there is insufficient information to conclude that karst blasting and other construction activities would only result in temporary, insignificant impacts. Changes in the geology, even just cracks and fissures, can alter flow patterns, permanently impacting aquatic life and water chemistry. EPA recommends that FERC conduct a fracture trace/lineament analysis at all karst stream crossings and potential blasting areas along the route; additional monitoring or modifications of route should be proposed to avoid permanently altering flows and impacting biology in interconnected karst voids and cave systems. The impacts on groundwater and surface water are intertwined in karst ecosystems and that point should be elaborated; contaminating groundwater could lead to surface water contamination and altering subsurface flows could affect surface flows.

We recommend that FERC separately describe potential effects of the pipeline on aquatic life and surface water in order to evaluate if impacts will be minimal, even with the Karst Mitigation and Sediment Control Plans. Additionally, impacts to karst ecosystems and surface water should be evaluated in the in context of multiple geologic hazards (landslide potential, seismic risk) that occur in mountainous karst regions. EPA recommends an appropriate monitoring plan be developed to monitor these types of potential impacts. EPA supports the recommendation that Mountain Valley investigate route variations to avoid or reduce impacts on Canoe Cave and the Mount Tabor Sinkhole Plain.

The DEIS states (pg 4-79) erosion controls would be installed to provide a minimum 100 foot-natural vegetated buffer around a waterbody or karst feature; and that refueling, hazardous materials storage, and overnight equipment parking with 100 feet of karst features would be prohibited. Please provide the basis for the 100-foot buffer determination. The Fish and Wildlife Service (USFWS) recommend a 300 feet buffer for Karst Areas in the Ozarks, and EPA is concerned a 100-foot buffer will not adequately prevent impacts.<sup>3</sup> EPA also recommends

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[https://www.fws.gov/southwest/es/oklahoma/documents/te\\_species/best\\_mgmt/bmp%20for%20karst%20features%201.23.2007%20dbf.pdf](https://www.fws.gov/southwest/es/oklahoma/documents/te_species/best_mgmt/bmp%20for%20karst%20features%201.23.2007%20dbf.pdf)

clarify the definition of karst development, which is referred to on Page 4-35 as occurring from MPs 171 to 175.

### **c. HDD and Stream Crossing**

Equitrans proposes to Horizontal Directional Drilling (HDD) under two waterbodies for EEP, the Monongahela River and South Fork Ten Mile Creek; other streams would be crossed using dry crossing methods. Mountain Valley is not proposing any HDD crossings, however several stream crossings are proposed using the wet open-cut method, including the Elk River (MP 87.4); Gauley River (MP 118.6); Greenbrier River 1,841 crossing length (MP 170.6). The Pigg River is also being evaluated as a wet crossing; turbidity and sediment modeling will be conducted. FERC has requested the results of the quantitative modeling assessment for the Elk, Gauley, and Greenbrier Rivers. EPA recommends that assessment of the impacts associated with the proposed wet-cut crossings and the results of quantitative modeling for turbidity and sedimentation at the major river crossings be presented in the EIS. The DEIS states that impacts would be assessed prior to construction. We suggest the rationale for the waterbody crossings be provided in the EIS and an explanation of why alternate methods are not feasible. Please clarify if dry open-cut were considered for these crossings. Also, it is recommended that the geotechnical evaluations used to assess the feasibility of HDD at waterbody crossings, and the HDD lengths from point of intersection to point of intersection of the locations selected for the HDD geotechnical evaluation, be provided in the EIS. HDD is generally recognized as more protective of resources.

EPA appreciates the consideration of HDD as an alternative crossing method for six major waterbodies and the Appalachian National Scenic Trail. It does not appear that HDD was considered for other sensitive waterbodies, such as impaired waters, high quality waters (such as high quality trout streams), or waters with threatened and endangered (T&E) species. EPA recommends that FERC clarify the rationale for considering HDD at other sensitive waterbodies, consider expanding the use of HDD, and where HDD was considered clarify if any factors made HDD unfeasible, such as general topography. MVP proposes to cross Craig Creek, an NRI stream which supports endangered mussels, four separate times. It is stated that coordination with the USFS is ongoing to potentially reduce the number of crossings. EPA supports reducing the impacts on sensitive waterbodies, such as Craig Creek, and urges FERC and the applicants to adopt FS recommendations. Additional efforts should be made to avoid impacts to Craig Creek and other aquatic resources that contain listed species. Please provide additional information regarding avoidance and minimization to all of these waterbodies. Provide documentation as to how the project will be modified to address Forest Service concerns.

FERC requested the applicant look at trenchless (HDD) crossings on the Left Fork of the Holly River; Elk River; Gauley River; Greenbrier River; Blackwater River (crossed twice); and the Pigg River. The Blackwater and Pigg Rivers are on the Virginia Significant Rivers List. These are high quality waterbodies that are protected for the benefit and enjoyment of future generations. A description of how these waterbodies may be impacted by the project would benefit decision-making, as these waters are highly sensitive to changes in chemistry, temperature, turbidity, and sedimentation. EPA encourages FERC to select the least impactful crossing method.

Other stream crossings are proposed; it would be beneficial to provide the explanations for the water crossing methods chosen. While some waterbodies are small and not flowing all the time, their functions and the impact of the proposed crossing design should be evaluated, and impacts minimized. Some of these areas may be headwater streams and impacts may reach further downstream. EPA recommends that FERC evaluate the combined effects of water crossings and water withdrawal. Several streams that will be crossed are also proposed as withdrawal locations, such as the combined total of 9.89 million gallons from the Blackwater River, 6.08 million gallons from the Elk River, and 5.7 million gallons from the Greenbrier River.

While consideration of sedimentation is important for the proposed wet open-cut crossings, EPA also recommends that sedimentation resulting from the combined effects of multiple stream crossings and other activities discussed in Appendix U be considered as impacts; this may be significant and potentially cause water quality impairments. FERC may wish to focus this evaluation downstream of smaller stream systems, particularly in watersheds with the highest numbers of stream crossings. It is recommended that additional information describing the sedimentation impacts be provided in the FEIS. It is stated in the DEIS that “The extent of the impact would depend on sediment loads, stream velocity, turbidity, bank composition, and sediment particle size. These factors would determine the density and downstream extent of the turbidity plume.” We recommend estimates of these factors be provided so that a plume size can be modeled/estimated.

Please consider specific comments on the DEIS compiled on the topics of streams and wetlands:

- Please address the wetland survey omissions that had been filed on April 15, 2016 under ascension number 20160415-5163.
- EPA recommends that consideration of wetland impacts include resource conversion and temporal loss. In the event that appropriate wetland and stream credits are not available to offset project impacts, the applicants may need to consider other means of offsetting impacts to resources.
- Page 4-88 states that 108 culverts would be installed within waterbodies along permanent access roads. The size and installation methods would vary depending on waterbody classification. Please provide additional information related to the culverts. Provide a table with corresponding diameters and map of locations at all 108 proposed culvert installations within waterbodies along permanent access roads. In order to minimize unavoidable impacts, we recommend culverts natural bottom and additional consideration be given to sizing to allow for passage of terrestrial and aquatic life. Continue coordination the appropriate state and federal agencies.
- Page 4-89 states that Mountain Valley is evaluating permanent fill in 44 wetlands along the permanent access roads. Provide additional information related to this activity as well as avoidance and minimization measures. It should not be assumed that filling wetlands and other waters of the U.S. will be permitted.
- Page 4-95: The DEIS is missing other exceptional waterbodies and tributaries designated as Tier III streams and Wild Natural Trout Streams. Notably Bottom Creek in Virginia.

Please provide a more comprehensive analysis of exceptional waters that would be impacted by the project.

- Page 4-108: The DEIS fails to address potential thermal impacts as a result of riparian clearing. While this section mentions other potential impacts it does not provide discussion for avoidance and minimization of impacts. Please expand this analysis.
- Page 4-110: Please provide additional information on when blasting for waterbody crossings is being proposed and why. Consider alternatives to blasting. To allow public and agency comment, we suggest the blasting plans be available for review during the NEPA process in the event it is determined blasting is necessary.
- Page 4-111: We suggest the updated scour analysis be provided in the FEIS.
- Page 4-112: Please expand the Karst Terrain section to include the qualifications of the karst specialist as well as the stabilization measures that would be implemented.
- Page 4-113: We suggest the impacts associated with the modification procedures be evaluated in the FEIS.
- Page 4-114: Please provide additional information describing the additional temporary workspace (ATWS) locations that are within 50 feet of waterbodies and wetlands that will be used for staging. Also, it appears the Table that is referenced may be incorrect.
- Page 4-116: Please expand the conclusion to discuss the analysis of potential impacts. Stating that there would be no long term or significant impacts is not sufficient.
- The DEIS fails to evaluate the direct, indirect, cumulative and temporal loss related to wetlands. Please provide additional analysis and references if this information is in appendices. Tables with impact numbers is not sufficient for describing these impacts. Additionally, it is unclear if the entire wetland complex was considered when impact acreages were assessed. Consideration should be given to situations where portions of wetland loss may result in loss to the entire wetland.
- Page 4-126: It is unclear why a 75 foot right of way is necessary through wetlands. Please consider a narrower footprint.
- Please explain how invasive species will be addressed in wetlands and other habitats.
- To date the DEIS does not contain all of the information necessary for evaluation such as increasing the right of way through wetlands, avoidance and minimization, etc. This applies to many of the other resources too. It is important that this information is available for public and agency review in the NEPA process.
- Page 4-129: Please note that agencies other than the COE are involved in the permitting of aquatic impacts. All impacts are considered as part of this process, not only permanent. Temporal loss is also a consideration. While some of the habitats may eventually come back it could be a period of years and may need to be mitigated. Cumulative and secondary impacts are also considered.
- EPA recommends using additional precautions to cross streams in the construction ROW that have been identified as high quality or trout streams. EPA is concerned that the proposed dry crossing method with mitigation methods may be inadequate to protect these high quality aquatic resources.
- Planned crossings of high quality trout streams should consider the use of HDD as the most environmentally protective methodology.

- The proposed in-stream approach will disturb the riparian habitat, adjacent wetlands plus cause harm to the in-stream aquatic habitat on the short-term and potential long term. According to Eastern Brook Trout Joint Venture<sup>4</sup>, “since 2006, the U.S. Fish and Wildlife Service (FWS) has provided the EBTJV with \$2.5 million in funding support for 67 brook trout conservation projects spread among 14 states. Partners contributed an additional \$13.6 million in matching funds for these projects” [projects referring to restoring in-stream and riparian habitat at trout stream]; these efforts could be undermined or additional investments might be needed to mitigate for potential impacts of the pipeline to high quality streams using dry crossing methods. EPA encourages FERC to consider using HDD crossing method for sensitive waterbodies in addition to major waterbodies.

## 6) Groundwater and Drinking Water Protection

EPA strongly encourages FERC to make the prevention of negative impact to drinking water sources, such as aquifers and surface waters, during construction a priority. The DEIS identifies two public water supplies within 0.1 mile of the MVP. To prevent impacts on public water supplies, EPA recommends that pipeline routes also avoid state-defined wellhead protection areas (WHPAs) or source water protection areas where possible.

In regards to private wells, field surveys have not been completed to identify private wells and springs within 150 feet of construction workspaces (500 feet in karst terrain) due to the lack of access. In the event that a public or private well or spring is identified, the Applicants would flag the wellhead, notify the owner or operator of the resource, and offer pre-construction water quality and water yield monitoring. However, post-construction monitoring is only being conducted if a complaint is lodged after construction. EPA recommends that interested landowners be offered post-construction monitoring as part of their water testing programs. Additionally, Equitrans’ water testing program includes oil and grease, volatile organic compounds, and hydrocarbons. It is recommended that Mountain Valley include these parameters as well to help assess any potential impacts from accidental spills or releases.

Complaints or damage associated with the construction projects will be evaluated and a suitable settlement with the landowner will be identified. EPA recommends that the DEIS provide more clarity and context for the process of evaluating whether or not activities have impacted a well or water supply. Well testing alone may be insufficient to determine whether activities have impacted a water supply. A full hydrogeological assessment conducted by a qualified professional may be required.

Equitrans plans to use the horizontal directional drilling (HDD) method at two waterbody crossings. Trenchless construction methods such as HDD, which may be conducted at depths much greater than trench methods, have a potential of creating a groundwater flow pathway which did not exist prior to construction (i.e. a preferential flow pathway). Such a preferential flow pathway has the potential to move groundwater and/or contaminants from one location to another, thereby spreading contamination or dewatering an aquifer. While the DEIS does

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<sup>4</sup> [http://easternbrooktrout.org/news/newsletters/2013-ebtjv-newsletter/ebtjv-newsletter-april-2013/at\\_download/file](http://easternbrooktrout.org/news/newsletters/2013-ebtjv-newsletter/ebtjv-newsletter-april-2013/at_download/file)

mention this potential impact, EPA recommends FERC identify steps to prevent water movement along the alignments wherever trenchless construction methods will be used below the seasonal high water table.

To prevent impacts on public water supplies, the pipelines should avoid state-defined source water protection areas (SWPAs) where possible, especially those where the project crosses Zones of Critical Concern. The proposed pipeline alignments include a number of crossings over or near drinking water supply streams, rivers and reservoirs. Tables 4.3.2-3 and 4.3.2-4 identify source water protection areas within .25 miles of the MPV and public water supply intakes with three miles of the MVP, respectively. Table 4.3.2-5 identifies public water supply intakes and source water protection areas within three miles of the EEP. The DEIS states that Mountain Valley should file with the Secretary contingency plans outlining measures that would be taken to minimize and mitigate potential impacts on public surface water supplies. It is recommended that Equitrans file similar contingency plans for the EEP.

Furthermore, the DEIS does not describe the applicant's plans for monitoring surface water sources of drinking water. It should be clarified whether surface water monitoring is part of their water quality testing plans. EPA recommends pre-, during and post-construction monitoring to help evaluate whether or not the applicant's activities have impacted a surface water supply.

In addition to the proposed pipeline, there will be permanent access roads, culverts, aboveground facilities and contractor yards for both the MVP and EPP. EPA recommends the location of these facilities and the water resources that may be impacted be identified. They should also include information on the construction, operational impacts and mitigation for these facilities.

Please consider specific comments on the DEIS compiled on the topics of groundwater and drinking water:

- Page 4-75: When private well surveys have been completed, MVP should identify and notify any landowners who have private wells within karst systems of the potential impacts on their water supply and offer compensation should significant impacts such as spills or excessive drawdown occur.
- Page 4-75: EPA also recommends that the Applicants file the location of private water wells and springs within 150 feet of the construction workspaces (500 feet in karst terrain).
- Page 4-76: The applicants should notify and coordinate with Rainelle Water Department in Greenbrier County, West Virginia to evaluate potential impacts on the department's water supply.
- Page 4-76: Existing contaminated groundwater resources may be encountered during construction. Blasting in these areas should be avoided, especially if these areas are within karst systems that serve as a drinking water supply, in order to prevent the spread of a contaminant plume into surrounding groundwater.

- Page 4-78: If dewatering of the pipeline trench is to require pumping of groundwater, residents with drinking water supplies in the area should be notified in advance of the pumping.
- Page 4-80: EPA recommends that the results of the fracture trace/lineament analysis be filed with the Secretary prior to trenching in karst areas.
- Page 4-82: Construction in areas of known contaminated groundwater should be tested for contaminants during and after construction, beyond an environmental inspector looking for a “visible sheen” on exposed soils.
- Page 4-83: If groundwater is to be used for dust suppression, Mountain Valley should notify affected landowners and those who rely on the groundwater for drinking water.
- Page 4-91: Please state if Mountain Valley has consulted with each affected public supply district in source water protection areas within .25 miles of the project ROW.
- Page -91: All affected public supply districts and water companies should be provided with results of turbidity and sedimentation analyses in the waterbodies in which their intakes are located.
- Page 4-94: The EIS should describe how Mountain Valley waterbody crossings impact waterbodies that do not meet designated uses. Specifically waters impaired by common causes such as elevated concentrations of metals (eg. iron, manganese, mercury). Has Mountain Valley considered mitigation of these potential impacts?
- Page 4-94: Please state if supply districts in the three source water protection areas crossed by the EEP been consulted.

## 7) Vegetation and Wildlife

The EIS recognizes that forest habitat impacts could include fragmentation and edge effects. The EIS concludes that MVP would result in significant impacts to upland forest. Construction of the MVP and the EEP would affect about 4,856 acres of upland forest. The MVP would impact about 2,485 acres of contiguous interior forest ranging from Small Core (less than 250 acres) to Large Core (greater than 500 acres) forest areas in West Virginia. In Virginia, the MVP would impact about 938 acres of contiguous interior forest during construction classified as High to Outstanding quality. Although maps of core forest areas and ecological core areas were provided, EPA recommends estimating the number of interior forests bisected, acreage affected, interior forest permanently eliminated and converted to forest edge habitat, and address reduced core and forest block sizes in the EIS.

Discussion on page 4-146 asserts that the impacts at the ecoregion level would be small. This discussion has the effect of trivializing forest impacts by comparing project impacts to total forest amounts within five ecoregions, including the Western Allegheny Plateau, Central Appalachians, Ridge and Valley, Blue Ridge Mountains, and Piedmont. EPA recommends that this language be removed to revised to reflect more meaningful analysis of forest impacts. We recommend that assessment of ecosystem service of forest be included in the EIS. This would include evaluating mitigation for lost services, such as carbon sequestration.

FERC determined that impacts on vegetation would be adequately minimized, however the avoidance and minimization of impacts to interior forests or consideration of these resources

during pipeline routing, beyond utilizing collocation, is not apparent in the EIS. If measures have been taken, please describe and discuss them in the EIS. At this time no mitigation plan has been developed to address long-term and permanent upland forest impacts. EPA is concerned that values of forest resources and the indirect impacts to forests, particularly interior forests, may not be fully accounted for in the mitigation plan that has yet to be prepared.

EPA recommends the FERC consider quantifying the carbon sequestration implications of the proposed project and analyze biogenic carbon dioxide sources and associated carbon stocks. We recommend providing mitigation for these losses. As the proposed project will remove about 4,856 acres of upland forest, and permanently release the carbon stocks therein, we recommend that FERC discuss the feasibility of tree-planting and revegetation mitigation, including quantifying the sequestration value of the mitigation, the timescale needed to reach fruition, and quantifying other resources requirements (land area, water supply, maintenance) necessary for the mitigation measure to succeed.

As stated on page 4-166, FWS requested the avoidance of fragmenting large continuous blocks of forest and ecologically important land to ensure impacts on migratory birds were avoided and minimized to the maximum extent practical. It is not apparent what efforts have been taken to accommodate this request. EPA recommends the DEIS clearly describe the long-term and short-term impacts on migratory bird habitat, as well as how impacts have been avoided and minimized and how impacts will be mitigated. Some tree clearing is proposed by EEP within certain mile markers during the migratory bird nesting season. Mountain Valley proposes to assign an avian survey team to spread clearing during the nesting season. While this proposal may address direct mortality to nests found by the avian survey team, EPA is concerned that this may not be sufficient to address disruption outside of the cleared construction ROW.

Please consider specific comments on the DEIS compiled on the topics of vegetation and wildlife:

- Page 4-136 states that surveys conducted by Mountain Valley did not identify any smooth coneflower. It is unclear if these surveys followed proper procedure and if the results had concurrence with the appropriate agencies. Please provide additional information.
- Page 4-139: In addition to revegetation to avoid the spread of invasive species, please implement other measures such as washing vehicles and equipment. Please provide additional information describing these measures and how the monitoring post-construction will work. We suggest an invasive species management plan be provided that clearly explains the next steps if monitoring indicates species present. If such a plan exists please include the reference as an appendix to the EIS.
- Page 4-144: Please provide additional information describing revegetation efforts which includes revegetating slopes and rationale for monitoring only the first and second growing season. This may not be adequate especially for forested areas.
- Page 4-145 states that the landscape along the route has already been fragmented in some places by existing infrastructure. This may imply to some that the project will not cause new impacts. Please include a discussion of cumulative impacts to balance this section.



- Page 4-146: Please consider additional opportunities to collocate this project in order to minimize fragmentation and other impacts.
- The DEIS concludes that significant impacts would occur on upland forests; however, it is concluded that impacts on most non-special status species would not result in long-term or significant population level effects. It is not clear that this conclusion has been supported in the DEIS.
- Page 4-147: While we support avoiding Special Areas, please evaluate impacts associated with modifications to the alignment.
- Page 4-147: Please provide additional information and concurrence for all surveys related to any species. For example, it is stated that surveys conducted by Mountain Valley during the flowering period did not observe purple fringeless orchid or its habitat. It is recommended that information on protocol used, the qualifications of those conducting the survey, and concurrence obtained by agencies be included in the EIS.
- Page 4-148: Based on the information provided, it is not clear how coordination on the Jefferson National Forest is progressing. Documentation of any agreements should be included in the FEIS. Please continue coordination with the Forest Service and avoidance and minimization measures.
- Page 4-149: Please include washing machinery and equipment to the list of protective measures against the spread of invasive species. It is also unclear how any invasive will be treated if they are found during monitoring. Please explain the rationale for the duration of the monitoring. It is not clear that two years will be sufficient for invasive species control.

#### **8) Rare, Threatened and Endangered Species (RTE)**

Surveys on the proposed alignment have not been fully completed, approximately 50 miles of MVP remain. Based on the information provided, this section is incomplete. Table 4.7.1-1 indicates that several surveys have not been conducted. Based on the results and the ongoing coordination for these and other species, there could be large implications for the project. We suggest that the outstanding information be used and provided in the EIS to inform the FERC's decision. Please use this information in the decision of a preferred alternative and allow for public comment. In addition, this information is needed for the Section 404 permit application.

EPA is concerned that the conclusions presented in this section are not fully supported and the basis for these conclusions is not supported. EPA recommends that FERC provide additional justification to support that FERC's Plan and Procedures and other documents would prove sufficient protection for West Virginia's Priority 1 species and Virginia's Tier 1 species. Conclusions presented related to State-listed or other sensitive species should also be addressed. Additionally, EPA recommends FERC support the conclusion that Mountain Valley's Plan and Procedures and other documents would provide adequate protection for FS Locally Rare and Management Indicator Species.

Coordination and concurrence from FWS and other agencies is not recorded in the EIS. For example, it is unclear if the FWS and other agencies concur with the findings of the applicant's conclusions regarding the listed species. Additionally, it is not clear if the Forest

Service concurs with the conclusions relating to endangered, rare and other species present in the forest. EPA recommends that additional explanation and information be provided. Please continue coordination with the appropriate state and federal agencies regarding listed species and species of concern and provide documentation in the FEIS. Please continue efforts to avoid and minimize impacts on rare, threatened and endangered species.

The DEIS states, “Further, because protection of threatened, endangered, and other special status species is part of the various state permitting processes or resource reviews, cumulative impacts on such species would be specifically considered and reduced or eliminated through conservation and mitigation measures identified during those relevant processes and consultations. Consequently, we conclude that projects in the geographic scope in combination with the MVP and EEP projects would have minor cumulative effects to special status species.” EPA recommends that all consultations be included in the EIS or have website accessible to the public.

The DEIS discusses state requirements for mussel surveys, but does not relate those requirements to the pipeline construction. EPA recommends FERC clarify if and where those surveys will be performed for the pipelines, and if mussel re-location will occur if found in streambeds being temporarily impacted. EPA also recommends that the basis for no effect on the gray bat and Virginia big-eared bat be included in the EIS. While the DEIS mentions bat maternity roosts, consideration should be given to the loss of food sources and other life requirements.

The DEIS states, “First-order Streams - We received a comment regarding potential project-related impacts associated with the crossing of first-order streams. A first-order stream is the source (or headwaters) of a waterbody; the order level increases (i.e., second-order, third-order, etc.) downstream at each confluence with another waterbody (Strahler, 1952). The Applicants would minimize impacts on first-order streams by adhering to the Mountain Valley and Equitrans Procedures.” EPA requests clarification on those procedures and that lower order streams be included in cumulative impact analyses. Please state how impacts to first-order streams would be minimized and inform where the procedures can be found. EPA would be pleased to provide more information on the ecological importance of headwater streams.

The references to the various documents are confusing. For example, FERC’s Plan and Procedures and Mountain Valley’s Plan and Procedure are mentioned. It is unclear if these are the same document. We suggest all referenced documents in the EIS be included and cited.

## **9) Land Use, Visual and Cultural Impacts**

Please consider specific comments on the DEIS compiled on the topics of land use, visual and cultural impacts:

- The EIS notes the number of residential structures within 50 feet of the construction work area and notes the number which have been purchased by Mountain Valley. As the number of structures may not correspond to the number of parcels affected, please clarify how many parcels and acres have been purchases.

- Nine key observation points were rated as having high visual impacts. Mitigation for visual impact should be considered.
- Discussion on page 4-260 estimates the amount of long-term impact within several JNF units and equates the loss to the percent of total suitable timber production areas within the entire forest. We recommend revising this language to include more meaningful discussion of impacts. JNF has stated that if the ROW Grant were approved, the Forest Plan would require two types of amendments, including plan level amendments to change land allocations and project-specific amendments to allow construction to exceed restrictions on soil and riparian corridor conditions, allow the removal of old-growth trees, and allow the crossing of the Appalachian National Scenic Trail on Peters Mountain.
- The Peters Mountain Wilderness Area is mentioned in the DEIS, and would be located within 0.25 miles from the pipeline route. While the route avoids the Wilderness Area directly, the route does cross the larger Peters Mountain area. Peters Mountain is discussed in the context of cultural attachment; however, it is not clear what conclusion is drawn with regarding to impacts to cultural attachment. Consider mitigation as appropriate. Page 4-371 states that a 50 ft wide easement would be permanently kept clear of trees. Please consider options to reduce impacts to these areas, which may include maintaining a reduced permanent maintenance width.
- The DEIS concludes that the character of the Peters Mountain rural historic landscape would not significantly altered by MVP. This conclusion appears to be based on the rationale that since three miles are collocated with other utilities, the landscape is therefore not pristine. Using this same rationale, the remaining three miles should be considered pristine as they are not collocated. It is unclear how FERC has determined that there will be no significant alternations to these areas. EPA encourages FERC to address comments made by the public and stakeholders regarding this resource.
- Page 4-330 states that of the 19 requests to be consulting parties to the Section 106 compliance process, only 3 entities were granted status and all other requests were denied. It is stated that other requests were denied “because our existing procedures allow for comments on cultural resources without consulting party status.” It is unclear why FERC procedures that allow for comment without consulting party status would result in the denial of 16 requests to be consulting parties. EPA requests additional clarification for the rationale for these denials.
- Page 4-347 states that FERC cannot make the final determination on the Greater Newport Rural Historic District until VDHR’s opinion is available. EPA encourages FERC to address concerns raised by stakeholders and the public, as well as continue coordination with VDHR.

## **10) Environmental Justice and Health**

The Environmental Justice (EJ) assessment should consider all of the impacts and benefits that may occur during construction and operation of the project in the study area or adjacent to it, that may reasonably be anticipated to have an impact upon minority and/or low-income populations. The localization, proximity, and magnitude of those impacts need to be taken into account. The EIS should analyze if a disproportionate number of EJ communities

have construction-related displacements, construction-related truck traffic, potential surface water sedimentation in areas that are used for subsistence fishing, etc.

It is critical to identify all at-risk populations as accurately and inclusively as possible; and perform careful and inclusive outreach. This is done to allow meaningful and active participation of at-risk populations, and to be sure that their interests, needs and concerns are appropriately heard and taken into account in decision making. FERC should conduct meaningful engagement of EJ communities. The EIS notes that there were many opportunities for public involvement, but it is not clear EJ populations were taken into account or accommodated during this process. The DEIS does not disclose if any accommodations, such as an interpreter or providing literature/project information in other languages, were needed or made available for non-English speaking communities. Based on information provided in Table 4.9.1-12, it is indicated that some counties have non-English speaking households at rates higher than state averages, and that non-English speaking households make up greater than ten percent of the population in some counties. EPA urges FERC to consider these populations to ensure meaningful and appropriate participation in the NEPA process.

The DEIS states that none of the census tracts or blocks crossed by the project have minority populations exceeding 50 percent nor have minority populations meaningfully greater than the state minority populations. EPA recommends FERC clearly define the benchmark used for minority populations and also provide census tracts or block group data relating to minority populations. EPA has concerns with the use of 50 percent as the sole defined benchmark used to establish minority population in this assessment. EPA suggests re-evaluating the EJ impact assessment using more protective thresholds. The methodology we suggest for the calculation of the benchmark is taking the minority population percentage and then adding 20 percent of the value (for example,  $5\% \times 1.2$  (20 percent of 5)) = 6% a difference of 20%). This method is consistent, treating all populations the same way.

The DEIS identified 21 census blocks across the project area where more than 20 percent of the population lives below the poverty line. Table 4.9.1-11 presents data for these 21 census blocks; however, no data is presented on the remaining 39 census block groups. EPA recommends data for all block groups be provided. As a number of the block groups have significant populations living below the poverty level, EPA recommends these areas be considered as areas of potential EJ concern.

EPA appreciates FERC's effort to address Executive Order 13045, "Protection of Children from Environmental Health Risks and Safety Risks" as we recommended in our June 16, 2015 response to project Notice of Intent. Table 4.9.1-12 provides state and county level data for other vulnerable populations in the project area, including children, elderly, and non-English speaking households. Although it is stated that a review of census block data indicated that the number of children in affected block groups were similar to county levels, we recommend that these data be provided in the EIS. EPA urges FERC to continue to improve analysis and more fully consider children's health and the health of vulnerable populations.

EPA recommends that FERC consider whether it would be useful to employ elements of a health impact assessment to help define the services or interventions that may be activated to

help to prevent or mitigate health problems potentially associated with this type of project. This information could be presented to stakeholders and decision-makers during the NEPA process. For example, these inquiries could allow FERC to more fully consider health impacts that could result from potential contaminant mobilization into water and allow input from the public and other stakeholders. EPA is available for further discussion and guidance on this matter.

## **11) Air Emissions and Impacts**

The DEIS makes several conclusions regarding air impacts and the significance of the impacts. With respect to the air emissions impacts of this project, the DEIS concludes that "... approval of the MVP and EEP would have some adverse environmental impacts; however, these impacts would be reduced with the implementation Mountain Valley's and Equitrans' proposed mitigation measures, and the additional measures recommended by the FERC staff in this EIS." Further on Page 5-12, the DEIS concludes that criteria air pollutant emissions, Hazardous Air Pollutants (HAPs), and GHGs would be minimized, and that any emissions resulting from operation of the compressor stations would not result in significant impacts on local or regional air quality. EPA is concerned that these conclusions are not fully supported within the DEIS and emissions resulting from the proposed project may be significant.

Some facts within the body of the DEIS contradicts the conclusion regarding project emissions. For example, the DEIS discusses increased operating levels at compressor facilities, which leads to increased operating and fugitive emissions. The DEIS details a project with significant fugitive and operational emissions associated with 301 miles of new 42-inch-diameter pipeline; three new compressor stations totaling about 171,600 horsepower (hp) for MVP; four new meter and regulation stations and interconnections for MVP; associated facilities using gas from new taps and interconnections; five pig launchers and receivers for MVP; 36 mainline block valves for MVP; eight miles total of new various diameter pipelines in six segments for EEP; the new Redhook Compressor Station for EEP, producing 31,300 hp; four pig launchers and receivers for EEP. This represents a significant amount of emissions.

Conclusions presented regarding air impacts rely on state permitting requirements and other requirements to protect air quality. EPA urges FERC to include data and information that will be necessary as part of these approvals to evaluate the significance of air emissions and impacts and support the conclusions made within the DEIS. The New Source Review analysis described on page 3-391 shows how each individual compressor station will not trigger the Prevention of Significant Deterioration (PSD). While it may satisfy state and Federal requirements on a piecemeal basis, it does not address the overall emissions impacts of the projects. For instance, the table on page 4-392 shows the additional emissions from the new compressor stations but it does not show the emissions impact of the increasing operating levels of the existing compressor stations as a result of these projects.

### *Cumulative Impacts - Air Quality*

The DEIS also concludes that the construction of the proposed projects in combination with other projects would not result in a significant cumulative impacts on air quality. Table 4.13.2.1 in the DEIS shows that the proposed new and modified gas-fired compressor stations in

the geographic scope of analysis for these two projects comprise over 19 stations totaling 490,200 horsepower (1247 mmbtu/hr), which appears to be incomplete. The table does not include horsepower information on four compressor stations. EPA recommends FERC account for all the compressor station horsepower. EPA questions how the DEIS can conclude that emissions generated from new and existing compressor stations totaling 490,200 horsepower during operation of the pipeline portion of MVP and EEP can be characterized as minimal. The table below (source) shows the annual potential emissions represented by 490,200 horsepower. Additionally, the DEIS does not demonstrate how the actions associated with the proposed projects and in combination with other projects will reduce the emissions resulting from operation of the new and existing compressor stations.

|                   |         |      |
|-------------------|---------|------|
| NOx               | 17,314  | TONS |
| CO                | 210,827 | TONS |
| CO2               | 600,804 | TONS |
| SO2               | 3.21    | TONS |
| Methane           | 7,918   | TONS |
| VOC               | 65,423  | TONS |
| PM10              | 210     | TONS |
| PM2.5             | 210     | TONS |
| PM<br>Condensable | 54      | TONS |
| Acetaldehyde      | 42      | TONS |
| Formaldehyde      | 301     | TONS |
| Benzene           | 11      | TONS |

(The above table does not include fugitive emissions.) *Source: AP-42, Vol. 1, 3:2 Natural Gas-fired Reciprocating Engines; <https://www3.epa.gov/ttn/chief/ap42/ch03/final/c03s02.pdf>*

On page 4-512, the DEIS states that: “Operation of the MVP and EEP, oil and gas drilling activities, and other nearby projects would also contribute cumulatively to existing air emissions. Operation of residential development projects are not expected to contribute to air emissions in the geographic scope...we conclude that operation of the MVP and the EEP in combination with other projects would not result in significant cumulative impacts on air quality.” The DEIS does not consider expected significant contributions of facilities using the gas from the new interconnections and taps from the new mainlines which produce significant emissions, as commented on above. Without considering these facilities, it is not apparent that the conclusion that the operation of the MVP and the EEP in combination with other projects would not result in significant cumulative impacts on air quality has been fully substantiated.

## 12) Climate Change

We recommend deleting this sentence on page 4-516: “Currently, there is no standard methodology to determine how a project’s relatively small incremental contribution to GHGs would translate into physical effects on the global environment.” Although EPA disagrees that

there is no such methodology, we note that estimating the incremental impact is not called for in the NEPA analysis: calculation of the GHG emissions is sufficient.

In the DEIS, FERC compares the proposal's estimated GHG emissions to the global GHG emission inventory, stating that project emissions would be negligible in comparison. Such comparisons are not an appropriate method for evaluating GHG emissions, "because this approach does not reveal anything beyond the nature of the climate change itself: the fact that diverse individual sources of emissions each make a relatively small addition to global atmospheric GHG concentrations that collectively have a large impact."<sup>5</sup> EPA recommends that FERC follow the approach outlined by the CEQ's Guidance regarding the analysis of (GHG) emissions and climate change.

Table 4.13.2-1 provides total project GHG emissions of CO tons per year. This table states that emissions of CO, or carbon monoxide, rather than CO<sub>2</sub>, carbon dioxide, is quantified. EPA recommends that this table be revised to reflect emissions of carbon dioxide. The estimated total annual emissions of GHG based on the total project capacity of 2.4 Bcf/d was included in the DEIS, however it is not clear how this calculation was made. This table appears to reference an EPA tool the GHG Equivalencies Calculator<sup>6</sup>, which is used to translate abstract measurements into concrete terms, such as the annual emissions from cars, households, or power plants, and is used to communicate GHG reduction strategies, targets aimed at reducing GHG emissions. It is unclear how FERC used this tool to estimate emissions or which emissions this estimate includes. EPA recommends FERC provide the values and parameters used to develop the estimate provided, and clearly state what emissions are or are not included in the estimate.

While the estimated total annual emissions of GHG is presented, the DEIS does not estimate greenhouse gas (GHG) emissions that would be caused by changes in vegetative community type and impacts on carbon sequestration from loss of vegetation and soil disruption from the removal of an estimated 4,856 acres of upland forest, and the permanent release the carbon stocks in those forests. EPA recommends quantifying the GHG emissions caused by these changes. This approach is also supported by the CEQ guidance, "agencies should include a comparison of estimated net GHG emissions and carbon stock changes that are projected to occur."

The EPA recommends that FERC identify and consider measures to avoid or reduce GHG emissions associated with the project, and disclose the estimated GHG reductions. We also recommend that FERC estimate expected GHG emissions from pipeline leaks and consider potential BMPs to reduce methane leaks from the pipeline. EPA has compiled useful information on technologies and practices that can help reduce methane leaks, including specific information regarding emission reduction options for natural gas transmission operations<sup>7</sup>.

EPA has recommended that FERC consider additional alternatives beyond the applicant's preferred alternative. Should additional alternatives be retained for detailed study, we recommend that the EIS estimate the GHG emissions potentially caused by these alternatives.

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<sup>5</sup> CEQ Guidance, Page 11.

<sup>6</sup> <https://www.epa.gov/energy/ghg-equivalencies-calculator-calculationsand-references>.

<sup>7</sup> <http://www3.epa.gov/gasstar/methaneemissions/index.html>.

These emissions levels can serve as a basis for comparison of the alternatives with respect to GHG impacts.

### 13) Cumulative Impacts

#### a. Scope

EPA is concerned that the temporal and geographic scope of the study is narrow, which has led to a limited analysis of cumulative impacts. Defining the geographic and temporal framework is the starting point of a cumulative impacts analysis. EPA would be interested in discussing the selection of a more appropriate and inclusive boundary with FERC.

FERC considered other projects within the geographic scope on water resources, wetlands, vegetation, wildlife, and land use using the HUC 10 watersheds crossed by the proposed project. Permanent and long-term cumulative impacts to air quality used air quality control regions for the geographic scope; the scope used for air quality, noise and visual resources was 0.25 mile. Cultural resources were considered was done at the county level. The DEIS concludes that the effects of adding the impacts of the proposed projects with the impacts of other projects would not be significant.

Beyond presenting the percent of each watershed affected by other identified projects and by the proposed MVP, it does not appear that cumulative impacts were analyzed at the watershed or otherwise specified geographic scope. The information presented in Table 4.13.1-1 should be used as a starting place for analysis, giving the reader some consideration of scale. However, presenting the project as 0.1 percent of the impacts to more than 4.5 million acres across 33 HUC ten watersheds trivializes the direct and cumulative impacts of the proposed action. Again, stating the total amount of water available across the entire state of West Virginia is not informative.

Cumulative impact analysis included recently completed, ongoing, and planned projects in the project area, which appears to exclude past and reasonably foreseeable actions. Considering past, present and reasonably foreseeable actions is important as cumulative impacts can occur to resources even if impacts do not occur concurrently. Page 4-480 states that FERC considered other projects that were constructed within the last three years, which is the approximate time that would be needed to construction the proposed projects followed by vegetation restoration. Though some construction impacts can be short-termed, there are prolonged impacts, which cannot be adequately captured within the three-year timeframe given, for instance impacts associated with forest fragmentation, invasive species, as well as the temporal loss of forested habitat which can take decades to reach maturity. EPA recommends that FERC include additional time for the temporal scope of the cumulative analysis to account for the time beyond three years for forest growth back to maturity. These types of impacts from other past, present and reasonably foreseeable projects are essential to conducting a thorough cumulative effects analysis. We recommend FERC conduct the cumulative impact analysis broadly to consider projects that do not overlap geographically can contribute to cumulative impacts to streams, wetlands, forests, habitat, and other resources. We recommend FERC



consider expanding the cumulative impact study beyond what is currently considered in the DEIS.

### **b. Trends**

EPA appreciates FERC efforts to provide historic background on wetlands and urban land use. The cumulative impacts analysis reflects some historic losses of wetlands. Current estimates of wetland resources are also presented. This highlights the importance of putting resources into context, and highlights trends. Presented historic information on wetlands does not appear to have been used as part of the wetland cumulative impact analysis in Section 4.13.2.2. The lack of inclusion of past or historic information limits the analysis presented. Although page 4-474 states that the cumulative impact analysis relies on current environmental conditions as a proxy for the impacts of past actions, and states that FERC has considered the impacts of past projects within the resource-specific geographic scopes as part of the affected environment, no discussion of past or the current environmental condition has been included. A limited temporal scope for the cumulative impact analysis, in the case of wetlands, has resulted in the consideration of only a limited set of FERC-jurisdictional projects. The discussion asserts that a relatively small total of wetland acres would be affected by the proposed project and other projects. Without an evaluation of the cumulative effects of temporal loss of wetlands, particularly forested wetlands, EPA is concerned that cumulative impacts to wetlands may occur. EPA recommends FERC present cumulative impacts on the watershed scale identified as the geographic scope. Presenting information across the entire project area, makes it extremely difficult to ascertain the cumulative impacts specific to any one watershed, or put impacts into context with other past, present and reasonably foreseeable actions.

It is important to analyze the trends in resources, to identify if there have been repeated impacts or degradation of the resources. A thorough analysis of impacts could help guide the selection or placement of appropriate mitigation for MVP and EEP impacts or highlight areas where additional avoidance and minimization may be warranted. EPA recommends that FERC and the applicant present historic information beyond what is stated as part of the affected environment for each resource included in the cumulative impact analysis. EPA encourages FERC to consider resources at the watershed scale or other identified appropriate geographic scale.

### **c. Cumulative Impacts to Groundwater and Surface Water**

Groundwater is included in the cumulative impacts section, which concludes that the combined cumulative effects on groundwater would be less than significant. This section touches on spring disruption, amounts of water used and recovered in hydraulic fracturing wells, water use per day by Marcellus Shale development, karst terrain that may overlap with other FERC jurisdictional projects, however there is limited discussion on what the cumulative effects to groundwater may actually be. There is no discussion on the magnitude of impacts or the effects groundwater cumulative effects would have on other resources. No discussion on impacts at the watershed scale, despite this being the proposed geographic scope for the project, however some information was presented at the state scale, such as number of wells in Pennsylvania and West Virginia, the approximate water used per day and percentage of all water

withdrawn in Pennsylvania, despite the state not being defined as the part of the geographic scope of analysis.

Geology, or geologic hazards, and soils are not considered in the cumulative impacts analysis. Several reasons are cited including the site-specific nature of geologic resources and soils, the generally localized potential effects to these resources in relation to the projects as well as from other projects, and the utilization of the Plan and Procedures, including environmental inspections and monitoring during construction. FERC concludes that the impacts would be generally limited to the construction ROW and that these resources do not require further assessment for cumulative impacts. EPA is concerned that impacts associated with geohazards (such as water quality, turbidity, etc) have not been included in the cumulative impact analysis. Considering FS concerns mentioned above, it is unclear if the proposed project or others in similar geologic settings will be constructed to minimize or avoid geohazards. Without including or considering this within the DEIS, EPA is unsure whether it can be determined that no cumulative impacts resulting from geohazards will occur. EPA suggests that this topic be included as part of the cumulative impact analysis for aquatic resources.

EPA is concerned about cumulative impacts to aquatic resources and water quality. Contribution from contaminants can include turbidity, sediment, mobilized chemicals, hydrocarbons, etc. We recommend that the cumulative impact analysis of surface water be expanded, including cumulative impacts to water quality, headwater streams, high quality and/or sensitive aquatic resources. Aquatic resources have the potential to be cumulatively impacted by many factors, including waterbody crossings, change in recharge patterns, clearing, erosion, landslides, and other geohazards, blasting, and water withdraws for hydrostatic testing.

The DEIS concluded that the cumulative effect on surface waterbody resources would be temporary and minor. It is further stated that most of the impacts on waterbodies would be of short duration. The number of perennial surface water crossings affected by the proposed project was presented, as well as for other FERC-regulated projects within the HUC10 watersheds comprising the geographic scope of MVP and EEP, however it is not clear in this reflects perennial waterbodies or all waterbodies. The total land disturbance of the watersheds, both for the proposed projects and other projects located within the same watersheds is stated. The watershed with the maximum level of combined watershed disturbance is stated (Sand Fork watershed; approximately 11 percent), and the DEIS states that most estimates for watershed disturbance levels is below 5 percent. EPA recommends FERC clarify what this means in terms of the cumulative effects analysis. Without any context the statements made have little meaning. Please consider literature and modeling which provides estimates of thresholds/percent disturbance which begins to be associated with water quality degradation. What does the proposed project represent in terms of percent above existing, or how much does it increase or add to other presented projects. We suggest that analysis be presented for each watershed, or at a minimum selected watersheds of concern. It is unclear why information on only perennial waterbodies is stated.

The DEIS states that most of the construction impacts would be temporary and localized and are not expected to contribute to regional cumulative impacts. FERC considered construction and operational air emissions, noise impacts, and stream turbidity to possibly

contribute to cumulative impacts. The DEIS also states that the Applicants would limit any potential stream turbidity through the use of HDDs, in the case of EEP, and dry crossings. With respect to the limiting of turbidity through the use of HDD and dry crossings, EPA is concerned that as Mountain Valley is not proposing to use HDD, but is instead proposing to use the wet crossing method in several instances, that direct, indirect and cumulative impacts to streams, including turbidity, have not been fully evaluated.

#### **d. Cumulative Impacts to Vegetation and Wildlife**

The DEIS concludes that the incremental and cumulative effect to vegetation would be minor. Forests and interior forest are inconsistently addressed within this section. It is not clear if impacts to forest or interior forests have been fully considered and therefore it is not clear if the conclusion presented can be made. EPA recommends that forest and interior forest be specifically addressed in the cumulative impact analysis. Although the EIS seems to recognize the possible cumulative effect would be related to construction forest clearing, the cumulative impact analysis on vegetation seems to trivialize forest impacts. The discussion relies heavily on statements made that the amount of project impact is minor in comparison to the abundance of comparable habitat in the area. While other habitat may be present, no assessment on the quality of resource impacts has been conducted nor has any information on the quality of other habitats in the undefined area been made. It is also asserted that the large amount of undisturbed vegetation, including forest remaining in each watershed is a viable reason to determine that cumulative impacts to vegetation would be minor, although it is unclear to EPA how this mitigates or negates the cumulative impacts.

The DEIS cumulative impact analysis also considered other resources, including wildlife, fish and RTE species. Each of these sections had deficiencies similar to those previously described for groundwater, surface water, and vegetation. We recommend that FERC address these deficiencies.

The cumulative impact analysis relies on possible state and federal measures, restrictions and requirements for other past, present and reasonably foreseeable actions to minimize the potential for long-term resource losses, such as for aquatic resources, RTE, and land use. The EIS also relies on the Spill Prevention Controls and Countermeasures Plan, Erosion and Sediment Control Plan, project BMPs, and FERC Plans and Procedures to minimize and mitigate for resource-specific cumulative impacts. We recommend that the cumulative impact analysis consider potential cumulative impacts regardless of the various prepared or required plans to be implemented by the project or other actions, or permits or regulatory thresholds. While it may be appropriate to recognize or consider the relation to these, please keep in mind that this is not sufficient to determine potential effects of past, current and reasonably foreseeable future activities to resources or if project impacts can be mitigated.

#### **e. Focused Analysis on Oil and Gas Activities**

In areas where rapid natural gas development has the potential for cumulative impacts to occur, EPA recommends that a more detailed cumulative impact analysis in this area be conducted. FERC may wish to consider the Fishing Creek, Headwaters Middle Island Creek and

Middle West Fork River watersheds, which will be crossed by multiple FERC-jurisdictional projects. A more detailed consideration of cumulative impacts may include a more detailed breakdown of past, present, and reasonably foreseeable actions, consideration of additional avoidance and minimization efforts, as well as looking for additional opportunities to collocate. Presenting the collocation rate by county or watershed may be a useful way to begin considering avoidance and minimization efforts in areas with cumulative impact potential.

EPA is concerned by the potential cumulative impact which could result from the preferred alternative, Marcellus Shale development, and other FERC-regulated and non-jurisdictional actions. Natural gas and oil exploration and production, FERC-jurisdictional natural gas interstate transportation projects, non-jurisdictional natural gas gathering systems, mining projects, transportation projects, and other energy projects were identified as types of actions that would potentially cause a cumulative impact when considered with the MVP and EEP. Although, the DEIS considers these types of projects, it is not clear that their impacts have been fully accounted for in the cumulative impact analysis. While we recognize that FERC-jurisdictional projects may have the most information available and accessible for the purposes of this study, it is just as important to gather information to estimate the impacts for other types of projects in order to adequately evaluate the cumulative impacts. The list of projects identified in Appendix U Cumulative Impacts appears to be incomplete; the FERC-jurisdictional project Mountaineer Xpress Pipeline has not been included. Mountaineer Xpress also crosses the Fishing Creek and Headwaters Middle Island Creek Watershed, which are also crossed by the proposed project. Both of these watersheds will also be impacted by the Atlantic Coast Pipeline. EPA recommends FERC include Mountaineer Xpress in the cumulative impact analysis, and consider the cumulative impacts occurring from these projects within impacted watersheds.

We recommend that FERC consider adding similar analysis as was presented in the recent Atlantic Sunrise DEIS, Section 4.13.3.1, which estimated the number of wells permitted within 10 miles of the project, the rate that new wells could be added, and the number of wells required to provide quantities of gas to supply the project. These estimates do not necessarily have to include induced or indirect natural gas development or production; such estimations could be included more appropriately in the secondary effects analysis. We recommend the EIS estimate the number of wells required to supply the pipeline and the potential impact from these wells. This was done for land disturbance in Atlantic Sunrise, which estimated 9 acres per well pad. Impacts to other resources, including GHG estimates for climate change, can also be estimated.

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