

# **Mountain Valley Pipeline Project**

**Docket No. CP16-10-000**

**Attachment DR4 General 3b3**



February 23, 2017

U.S. Forest Service  
ATTN: Joby P. Timm  
5162 Valleypointe Parkway  
Roanoke, VA 24019

Re: Forest Service Comments on the Draft Environmental Impact Statement  
OEP/DG2E/Gas3  
Mountain Valley Pipeline, LLC  
Docket No. CP16-10-000

Dear Mr. Timm:

Please see the following response by Mountain Valley Pipeline, LLC (Mountain Valley or MVP) in regards to the United States Forest Service's (USFS) December 20, 2016 comments on the Federal Energy Regulatory Commission (FERC) Draft Environmental Impact Statement (DEIS) for the proposed Mountain Valley Pipeline Project (Project):

**USFS Comment No. 1:** Under Jefferson National Forest: The Forest Archaeologist and LEI have strong concerns involving the increase in looting of cultural resources and potential ARPA –NAGPRA violations due to the ease of access created by a pipeline corridor. This corridor would create the need for constant monitoring of cultural resources to limit detrimental activity to archaeological resources located within or immediately adjacent to the proposed construction corridor.

**Mountain Valley Response No. 1:** Mountain Valley will address this issue within the Law Enforcement Management Plan which will be included within the forthcoming Plan of Development (POD). Mountain Valley will continue to coordinate with USFS on Law Enforcement issues throughout the course of the Project.

**USFS Comment No. 2:** DEIS states: "As stated above, the MVP would cross Craig Creek four times." And then goes on to describe modifications, specifically, that it would cross only 1 time, but the feasibility study is not complete. This needs to be completed for an accurate effects analysis.

**Mountain Valley Response No. 2:** An alternatives analysis in the area of Craig Creek was filed with FERC on February 23, 2017 as Attachment DR4 Land Use 17. Please reference that attachment.

**USFS Comment No. 3:** Pages 4-106 and 4-114 state "Within the Jefferson National Forest, the MVP would require 27 waterbody crossings" and lists those in table 4.3.2-11, while page 4-175 states "Within the Jefferson National Forest, the MVP would cross nine waterbodies." The difference between 27 and 9 is significant. Please correct the inaccuracy.

**Mountain Valley Response No. 3:** Mountain Valley identified 12 streams on USFS property that will be crossed by the Project. This information is included in Mountain Valley's Aquatic Resource Report, which was filed with FERC on February 23, 2017.

**USFS Comment No. 4:** The second paragraph states: "Mountain Valley has developed a Landslide

Mitigation Plan...” We have not seen the Landslide Mitigation Plan, and it is not included as an Appendix in DEIS. Submit the Landslide Mitigation Plan to Forest Service as soon as possible.

**Mountain Valley Response No. 4:** Mountain Valley submitted the Landslide Mitigation Plan to the USFS in the December 22, 2016 filing. An updated plan will be included as an appendix to the revised POD.

**USFS Comment No. 5:** In review of section 4.1.2.9, the Forest Service provided several pages of edits that were to have been incorporated into the DEIS. The information provided by the Forest Service assessed 1) potential impacts of project-induced landslides and risks to public safety, resources, and infrastructure; 2) potential impact of natural landslides on the pipeline project; and 3) mitigation measures for project-induced landslide hazards and natural landslide hazards. Those edits should be added to or addressed specifically in the Landslide subsection at the beginning of section 4.1.2.9. These particular edits can be considered comments on what is lacking in the DEIS and needs to be addressed in FEIS. This information is needed to assess potential project effects on NFS lands. This information will also support the Forest Service’s decision.

**Mountain Valley Response No. 5:** Mountain Valley submitted a Site-Specific Slope Stability Analysis for the Jefferson National Forest (JNF) and updated Landslide Mitigation Plan for the project to USFS on December 22, 2016, that addressed the USFS’s concerns regarding project-induced landslides, natural landslides and mitigation measures.

**USFS Comment No. 6:** On October 24, 2016, the Forest Service submitted a Request for Site-Specific Design of Stabilization Measures in Selected High- Hazard Portions of the Proposed Mountain Valley Pipeline Route. Include information about the Site-Specific Design of Stabilization Measures for the sites in section 4.1.2.9 of the FEIS.

**Mountain Valley Response No. 6:** Mountain Valley submitted a Site-Specific Slope Stability Analysis on December 22, 2016, that provided site-specific hazards and design stabilization measure for the six identified sites.

**USFS Comment No. 7:** Roanoke county aquifer nearest to MP 236.1 to 239.2 is missing descriptive information. Complete the table accordingly.

**Mountain Valley Response No. 7:** Table 4.3.1-1 in the FERC DEIS should include the following:

Project/State/ County	Nearest Project MP(s)	Major Aquifer System Name	Bedrock Unit(s)	Dominant Lithology
Roanoke	236.1 to 241.2	Valley and Ridge	Cambrian-Ordovician aquifer system	Sandstone, shale, limestone, dolomite
Roanoke	241.2 to 246.5	Valley and Ridge	Cambrian-Ordovician aquifer system	Sandstone, shale, limestone, dolomite

**USFS Comment No. 8:** Aquifers- MVP: There is no data presented by aquifer to disclose existing condition of ground water quality or quantity. Provide water chemistry data (i.e., Conductivity, pH, etc.), depth to ground water, average volumes, recharge zones, etc. Numerous wells with data that can be summarized for basic characterization of aquifers. There must be discussion and disclosure of how surface water recharge interacts with ground water aquifers. Without proper disclosure of existing condition of groundwater, there is no data to support impact analysis from the project on NFS lands.

**Mountain Valley Response No. 8:** There are no publicly available data for water quality at private water supplies in West Virginia and Virginia. As discussed in Resource Report No. 2, there are ongoing efforts

in both states to improve characterization and documentation of water resources. For example, the West Virginia Department of Health and Human Resources (DHHR) has years of water well data, but the aquifers have not been characterized, the wells have not been mapped, and the potential maximum withdrawal rates have not been established for the state's groundwater aquifers. In Virginia, in response to impacts experienced by many localities, businesses, and domestic well users during the drought of 2002, the Virginia Department of Environmental Quality (VDEQ) is in the process of compiling a GIS database of historical water well construction, withdrawal, and water quality data. However, this dataset is not yet available.

The U.S. Geological Survey (USGS) provides data on groundwater level monitoring at wells in the region of the proposed alignment. In West Virginia, USGS wells are located in Harrison County at latitude 39°10'17.4", longitude 80°24'43.5", 218 feet deep, Pennsylvanian aquifer, Conemaugh Formation;<sup>1</sup> Webster County at latitude 38°20'08", longitude 80°29'28", 80 feet deep, Pennsylvanian aquifer, Kanawha Formation;<sup>2</sup> and in Nicholas County at latitude 38°20'08", longitude 80°29'28", 80 feet deep, Pennsylvanian aquifers, Kanawha Formation.<sup>3</sup> In Virginia, there are three wells: Craig County at latitude 37°22'23.34", longitude 80°23'47.99", 152 feet deep, Valley and Ridge Aquifer, Knox Dolomite;<sup>4</sup> Roanoke County at latitude 37°16'53", longitude 79°55'21", 55 feet deep, Valley and Ridge aquifer, Rome Formation;<sup>5</sup> Montgomery County at latitude 37°08'12", longitude 80°26'19", 450 feet deep, Valley and Ridge aquifer, Elbrook Formation.<sup>6</sup> Water quality data were not available for these wells.

**USFS Comment No. 9:** Aquifers – Valley and Ridge Expand on karst features and how surface water recharge interacts with groundwater quality and quantity in relation to the project impacts. For example, how close to the surface and in proximity to MVP will this aquifer be? Will trenching impact this aquifer? Disclose the full condition of groundwater aquifer, chemistry, volume, and ecological processes. Without data, cannot support impact analysis from the project.

**Mountain Valley Response No. 9:** Karst hydrogeology was evaluated in Resource Report Number 6 and in the Karst Hazards Assessment (included as an appendix to Resource Report No. 6). Alignment adjustments were proposed to avoid sensitive karst features and limit the potential risks to underlying primary aquifers. See the discussion presented above for water level data in State Observation wells, noting that the Virginia wells are completed in carbonate (karst) aquifers. Also note that water quality data for private or public groundwater sources is not readily available. There is minimal risk to karst aquifer recharge posed by this narrow, shallow construction project. In addition, with minimal risk to karst hydrology, there is minimal risk to the associated karst ecosystem. As noted herein, and presented in the Water Supply Identification and Testing Plan (Resource Report No. 2), Mountain Valley will contact all private and public water supply owners in the vicinity of the proposed pipeline to address concerns and implement pre-construction water quality testing. Mountain Valley is committed to protecting groundwater aquifers and the water supplies affected by groundwater aquifers along the proposed alignment.

**USFS Comment No. 10:** Surficial Aquifer System –There is no data presented for surficial aquifers to disclose existing condition of ground water quality or quantity. Provide water chemistry data (i.e., Conductivity, pH, etc.), depth to ground water, average volumes, recharge zones, etc. Disclose how surface water recharge interacts with surficial groundwater quality and quantity in relation to the project impacts.

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<sup>1</sup> See <https://groundwaterwatch.usgs.gov/AWLSites.asp?mt=g&S=391020080244101&ncd=awl>.

<sup>2</sup> See <https://groundwaterwatch.usgs.gov/AWLSites.asp?mt=g&S=382008080292801&ncd=awl>.

<sup>3</sup> See <https://groundwaterwatch.usgs.gov/AWLSites.asp?mt=g&S=382008080292801&ncd=awl>.

<sup>4</sup> See <https://groundwaterwatch.usgs.gov/AWLSites.asp?mt=g&S=372223080234801&ncd=awl>.

<sup>5</sup> See <https://groundwaterwatch.usgs.gov/AWLSites.asp?mt=g&S=371653079552101&ncd=awl>.

<sup>6</sup> See <https://groundwaterwatch.usgs.gov/AWLSites.asp?mt=g&S=370812080261901&ncd=awl>.

For example, how close to the surface and in proximity to MVP will this surficial aquifer be? Will trenching impact this aquifer? Must disclose full condition of surficial aquifer, chemistry, volume, and ecological processes. Without proper disclosure of existing condition of surficial groundwater, there is no data to support impact analysis from the project.

**Mountain Valley Response No. 10:** An extensive discussion related to the character of aquifers in the area of the Project, as well as documentation of agency statements regarding the need for the states to gather additional data on aquifers was provided in Section 2.1.1 of Resource Report Number 2. As stated, there are no available public sources of detailed information regarding specific mapping of surficial aquifers in the area of the Project on JNF lands, including confining layers. Aquifers in the area of the Project are typically limited in both vertical and horizontal extent and are not “regional” aquifers that cover large areas.

Section 6.1.1 of Resource Report Number 6 provided a discussion of the general surficial and topographic characteristics of each physiographic province. Additional discussion was provided in response to previous data requests. As discussed in Section 6.1.2 of Resource Report Number 6, surface geology mapping is not available from geological surveys. Surface geology is generally limited to river valleys and alluvial deposits. However, these are not specifically mapped in the Project area.

Colluvial deposits are observed on National Forest lands, primarily on upland slopes. These deposits are discontinuous both in extent and hydrogeologic characteristics and for those reasons are not commonly considered as aquifers. In the vicinity of National Forest lands, a surficial aquifer is present in the form of the Craig Creek channel deposits near MP 219.4 to 219.7. Surficial aquifers have not been mapped by state agencies or otherwise documented in the area of the proposed Project due to limited value as a groundwater resource. In addition, it is noted that this shallow alluvial deposit aquifer is not likely suitable as a potable drinking water aquifer due to surface water influences.

Generally speaking, alluvium in broad valleys may reach sufficient thickness to yield moderate supplies of water; however, this water is not considered potable due to surface influence. Alluvial deposits associated with Craig Creek on the valley floor between Brush Mountain and Sinking Creek Mountain near MP 219.4 and MP 219.7 appear to be the only surficial aquifer within the portion of the Jefferson National Forest JNF traversed by the October 2016 Proposed Alignment of the Project. In the vicinity of MP 219.4 to 219.7, outcrops of Devonian age shale (on the flanks of the Craig Creek valley) suggest that the alluvial sediments are limited in depth, constrained mostly in the stream channel hosting Craig Creek. The alluvial surficial aquifer in the vicinity of the proposed alignment discharges to Craig Creek and is primarily fed by direct precipitation, surface water derived from upland drainages, groundwater discharging from bedrock that is recharged by upland slopes of the ridgelines, or by flooding of Craig Creek during periods of excessive precipitation. Mountain Valley plans to cross Craig Creek and the surficial aquifer in the area of MP 219.4 to 219.7 using a dry-cut method, which will not affect groundwater discharge to Craig Creek.

The remaining extent of National Forest lands traversed by the proposed alignment are ridgelines and mountain slopes (Peters Mountain, Sinking Creek Mountain, Brush Mountain) that are underlain by a relatively thin overburden mantle or, in some areas, thicker colluvial deposits or ancient debris flows. We do not consider these veneer deposits on the mountain slopes to constitute a surficial aquifer(s) because they do not typically retain water, but rather simply allow precipitation relatively unimpeded downward migration to underlying sedimentary bedrock interface where infiltration to the deeper primary bedrock aquifer occurs via secondary porosity (joints, fractures, bedding planes) in the shale, siltstone, and sandstone (with minor limestone beds).

Regarding Craig Creek water quality, which is affected by recharge from the alluvial aquifer, it is generally understood that suspended sediment (turbidity) and fecal coliform bacteria are common contaminants in Craig Creek, derived from unpaved roads, unstable streambed and channel, and human and animal waste.

This situation has been understood by USFS as far back as 1972 (Jefferson National Forest Unit Management Plan, 1972), and obviously pre-dates Mountain Valley construction. Mountain Valley has addressed construction practices to prevent surface water and groundwater impacts in several documents submitted to the FERC.

In summary, shallow groundwater in upland areas that recharges the surficial aquifer (Craig Creek alluvium) will not be intercepted by pipeline construction. Groundwater is found deeper in the primary bedrock aquifer. In the unconsolidated overburden deposits, subsurface seepage may be encountered, but Mountain Valley will manage this seepage by conducting it out of the pipe trench as soon as practical and allowing this water to continue its natural flow characteristics, either recharging the bedrock aquifer or recharging Craig Creek.

**USFS Comment No. 11:** Surficial Aquifer System – The public has raised concern about trenching and blasting that could affect surficial aquifers and water quality. I believe this is the appropriate section to address these issues. See Hydrogeological Assessment of Watershed Impacts caused by constructing the MVP through Summers and Monroe Counties, WV (Dodds 2016). An excerpt from p7 says “Groundwater from the hillside would flow toward the pipeline trench. However, MVP provides no discussion concerning the interception of groundwater on cutslopes/hillsides. Disclose existing condition of surficial aquifers, in order to address potential impact analysis of the project. Significantly expand the rationale and data from literature on Surficial Aquifer Systems.

**Mountain Valley Response No. 11:** Mountain Valley does not anticipate any long-term negative impacts to groundwater in the surficial aquifer or the underlying bedrock aquifer as a result of pipeline construction and operation. As an analog to the Mountain Valley construction on and near National Forest lands, Moyer and Hyer (2009) reported the results of a USGS water quality monitoring study during construction of the East Tennessee Natural Gas’ Jewell Ridge Lateral pipeline. This water quality monitoring study indicated that pipeline construction did not adversely alter long-term water-quality conditions (short-term turbidity increases did occur downstream but the increases were shown to be minimal compared to the turbidity values measured during natural runoff events). Mountain Valley has vast experience in the construction of natural gas pipelines and has prepared multiple layers of plans and contingencies to ensure to the extent practical that no negative impacts to groundwater or surface water quality will results from pipeline construction and operation.

As noted above, shallow groundwater in upland areas that recharges the surficial aquifer (Craig Creek alluvium) will not be intercepted by pipeline construction; this groundwater is found in the primary bedrock aquifer on the National Forest lands. In the unconsolidated overburden deposits, subsurface seepage may be encountered, but Mountain Valley will manage accumulation of water by pumping it from the trench and managing it in an approved manner and allowing this water to continue its natural flow characteristics, recharging either the bedrock aquifer or Craig Creek.

Mountain Valley considers there to be negligible risk that the scale of this construction project (i.e., an excavation typically less than 10 feet deep) will have any effect on groundwater aquifers (surficial or bedrock), recharge zones, or watersheds as a whole. Construction will be conducted in a timely manner to limit the amount of time that the excavation is exposed to precipitation and potential impacts on the subsurface. Furthermore, trench breakers and other construction best management practices (BMPs) will be implemented to manage long-term subsurface seepage into the pipeline bedding and directed to exit the trench and resume the natural flow direction and rate. There is negligible risk to aquifer recharge posed by this narrow, shallow construction project since reclamation and revegetation of construction areas will be completed in a timely manner, thereby minimizing higher than typical infiltration of precipitation. As noted in the Water Supply Identification and Testing Plan (Resource Report Number 2), Mountain Valley will contact all private and public water supply owners in the vicinity of the proposed pipeline to address

concerns and implement pre-construction water quality testing. Mountain Valley is committed to protecting groundwater aquifers and the water supplies affected by groundwater aquifers along the proposed alignment.

**USFS Comment No. 12:** Foot note from table: a/ Information on privately owned springs is not publically available for West Virginia, Virginia, and Pennsylvania. Therefore, springs on private property may not be represented in this table. All springs encountered during the wetland surveys, private or public, should be disclosed. Basic characterization of the water sources should also be provided in this table – such as water chemistry data, average flow volume, etc. Wetland survey information should be utilized in this section of the document to fully disclose the existing condition/affected environment and thus potential impacts.

**Mountain Valley Response No. 12:** Springs listed in Table 4.3.1-2 of the DEIS were identified by civil survey (footnote c, Holland) or from the Karst Hazards Assessment (footnote d, Draper Aden Associates). The Karst Hazards Assessment included desktop review of mapping, publicly available and proprietary data, and field confirmation where property owners allowed access to the property. The footnote reference in the table was intended to convey that these privately held springs do not have readily available or publicly accessible data for water quality or flow. Wetland survey information was accounted for in the assessment of springs. Mountain Valley will be contacting property owners that may have a water supply for pre-construction testing and will request information from the property owners on any potable or non-potable water sources on their property. (See Water Supply Identification and Testing Plan; Resource Report Number 2). This process may elucidate additional springs that could not be previously accounted. If any additional spring are identified, Mountain Valley will request permission from the private spring owners to conduct pre-construction sampling of the springs.

**USFS Comment No. 13:** Water Supply Wells, Springs, and Swallets – This section should be separated. Water supply wells – public and private – should be exclusively and extensively disclosed in detail with well data to indicate water quality, etc. What parameters will be tested? What is the monitoring plan for water supply wells? Disclose this information in text or cite in an appendix. Any water wells tested should have existing water quality lab results disclosed (can be reported without site specific location). Conclusions about potential effects from the project should be supported by data of the existing condition. Data such as well depth, formation, well age, average volume of water used, etc. are equally important to understand the existing condition and potential impacts to water quality and supply.

**Mountain Valley Response No. 13:** Mountain Valley is committed to taking all necessary precautions for protecting water supplies during construction and operation. Mountain Valley addressed private and public water supply identification and testing in the February 2017 update to the Water Supply Identification and Testing Plan (originally submitted with Resource Report Number 2) was uploaded to the docket as Attachment DR4 Water Resources 5. Swallets were identified within a 0.25-mile buffer on either side of the proposed alignment as part of the Karst Hazards Assessment (Resource Report Number 6). The target analytes for water supply testing are identified in the Water Supply Identification and Testing Plan. Mountain Valley is already working directly with public water suppliers to address their concerns on a case-by-case basis. For private water supplies, there is not readily available source of water quality or quantity data. Mountain Valley will be collecting these data as part of the Water Supply Identification and Testing Plan and will make them available to the private water supply owners, if requested.

**USFS Comment No. 14:** Water Supply Wells, Springs, and Swallets – Persons attending meetings with the Forest Service have had considerable concern expressed over protection of drinking water. Therefore, this section is insufficient. Data needs to be supplied about surveyed water sources and characterization. Field surveys to identify private wells and springs must be completed PRIOR to DEIS not prior to construction. Affected environment must be disclosed and appropriate mitigation measures identified for the DIES. Only identifying private wells or springs in proximity of 150ft is insufficient. Please identify

appropriate recharge and protection zones. Please provide literature reference of regulation that indicates 150ft feet or 500ft (in karst) is adequate. Please follow EPA and state source water protection delineation guidance. Typically identifying wells and water sources within a 1mile radius of proposed projects. Also, disclose the characterization of the ground water sources and/or formation. Are the water sources mentioned in this section from confined aquifers or unconfined; located in fracture-flow or karst aquifers? Basin delineation or hydrogeological mapping is critical to disclose potential impacts by the pipeline and necessary mitigation measures.

**Mountain Valley Response No. 14:** The buffer distance of 150 feet on either side of the alignment was selected by Mountain Valley for water supply identification because this exceeds the 125-foot buffer requested by FERC under conditions where blasting is occurring near an active well. In karst terrain, the buffer was increased to a minimum of 500 feet on either side of the alignment, but, where conditions warranted, Mountain Valley extended that buffer to capture sensitive water sources (see Karst Hazards Identification Plan, Resource Report Number 6). The buffer was expanded greatly for public water supplies included in the testing program. If a public surface intake is located within three miles downstream of a Project component, or within a HUC-10 watershed (which can encompass hundreds of thousands of acres) where a Project component is located, that public supply was contacted by Mountain Valley under the terms of the Water Supply Identification and Testing Plan.

Regarding identification of recharge zones, the only public water supply near the proposed alignment is the Red Sulphur Public Service District (PSD), which utilizes spring discharges (and a stream intake) as its primary sources, and the recharge zone for the springs providing water to this PSD is essentially the northwest side of Peters Mountain. There are no direct data available to characterize the recharge zone for private water wells, particularly regarding the specifics of confined or unconfined aquifers or fracture flow. However, as part of Mountain Valley's water supply outreach program that was discussed above, the general boundary and characteristics of recharge areas for private water supplies will also be evaluated during the pre-construction testing program. Mountain Valley has retained an engineering consulting firm and is working with RSPSD to develop a Water Supply Contingency Plan.

**USFS Comment No. 15:** Water Supply Wells, Springs, and Swallets – This section has no information about springs. It is critical to disclose information about springs, particularly used for public or private drinking water supply, but also undeveloped springs. Much of the pipeline is crossing headwater areas, in which changes to flow or water chemistry can have long-term and detrimental impacts on private users, geomorphology and aquatic biota. Disclose data on spring sources – such as water chemistry, discharge average volume, etc. Without proper disclosure of existing condition and beneficial uses of springs, there is no data to support impact analysis from the project.

**Mountain Valley Response No. 15:** Mountain Valley has identified all public water supplies along the proposed alignment and will continue to identify private water supplies (including springs) along the alignment in accordance with the Water Supply Identification and Testing Plan. This information will be documented through property owner discussions related to baseline sampling efforts. Given the shallow nature of this project, Mountain Valley anticipates no impacts to springs due to construction near topographic headwater drainages. There are no data readily available to the public regarding private spring water quality and flow characteristics. Mountain Valley is working directly with public water suppliers that utilize springs (e.g., Red Sulphur PSD).

**USFS Comment No. 16:** Water Supply Wells, Springs, and Swallets –This section has no information about swallets. Must disclose survey data and characterization of swallets. Disclose recharge and discharge zones, depth to ground water, etc. Without proper disclosure of swallets existing condition, there is no data to support impact analysis from the project.

**Mountain Valley Response No. 16:** Swallets were identified within a 0.25-mile buffer on either side of the proposed alignment as part of the Karst Hazards Assessment. The Assessment also included and described avoidance measures to address surface water management/prevention toward these Karst features. Furthermore, the Karst Mitigation Plan specifies avoidance and mitigation measures, if required, during construction.

**USFS Comment No. 17:** Wellhead and Source Water Protection Areas - Provide further disclosure of existing condition for the Rainelle Water Department, Greenbrier County, WV source water area. It is not enough to say 0.1 miles upgradient, especially if the source is pulling from a ground water source that could have a large recharge area or aquifer system. Reference the SWAP plan: (www.wvdhhr.org/oehs/eed/swap/get.cfm?id=3301302). Please disclose the source, recharge and protection zones, and sufficiently document the rationale for source water area protection. Without proper disclosure of SWAP existing condition, there is no data to support impact analysis from the project.

**Mountain Valley Response No. 17:**

**The Rainelle Public Service District** (PWSID# WV3301309) is located in Greenbrier County, WV. According to the Rainelle Source Water Assessment Plan (SWAP),<sup>7</sup> the Rainelle Water Department Address is 309 Ohio Avenue, Rainelle, WV 25962. The Rainelle water system serves a population of approximately 1865 people. The supply is from three wells but only two are in use: Well #6 - primary; Well #3 - secondary; Well #5 - not in use. The groundwater-derived water source provides an average production of approximately 201,310 gallons per day from Appalachian Plateau Province geologic formations including nearly horizontal shales, sandstones, and coal. The aquifers may be porous or slightly fractured. The SWAP provides the following information:

Source of Rainelle PSD Drinking Water / Hydrogeologic Setting / Sensitivity  
Well 6 (Primary) / Appalachian Plateau / Moderate Sensitivity  
Well 3 (Secondary) / Appalachian Plateau / Moderate Sensitivity  
Well 5 (not in use) / Appalachian Plateau / Moderate Sensitivity

The estimated land area (approximately 1588 acres) that contributes water to the well is depicted in the Source Water Protection Area (SWPA) map presented in the PSD's SWAP.<sup>8</sup> The SWAP used a modified volumetric flow equation with hydrogeologic mapping to determine the source water protection area delineation.

Physical Integrity of Well or Spring: Well or Spring Name / Source Integrity  
Well 6 (Primary) / Constructed to Standard  
Well 3 (Secondary) / Construction Unknown (Grouting?)  
Well 5 (not in use) / Construction Unknown

Wells may vary in their construction characteristics and in the geologic rock types in which they occur. The lack of an effective grout and sanitary seals are avenues by which contaminants from nearby surface water bodies or overland runoff can percolate to wells. Based on onsite reviews and the ground water under the direct influence data the well integrity was rated generally satisfactory or good, with no visible problems existing during the visit. The State has determined that this well is GWUDI or Ground Water Under the Direct Influence of surface water.

Water Quality and Water Treatment Information: Well or Spring Name / Results

<sup>7</sup> See [www.wvdhhr.org/oehs/eed/swap/get.cfm?id=3301309](http://www.wvdhhr.org/oehs/eed/swap/get.cfm?id=3301309).

<sup>8</sup> See [www.wvdhhr.org/oehs/eed/swap/get.cfm?id=3301309](http://www.wvdhhr.org/oehs/eed/swap/get.cfm?id=3301309).

Well 6 (Primary) / Impacted  
Well 3 (Secondary) / Impacted  
Well 5 (not in use) / Impacted

Barium levels have been sporadically elevated since the 1980s. Most recent testing indicates results approaching one-half the MCL. Sodium, iron and manganese levels have been elevated especially from the late 1980s through the late 1990s. A result of 4.39 parts per million (ppm) of Tert-Butyl Alcohol (TBA) recorded in sampling conducted in 2001 and 2002 was found. The occurrence of this manmade chemical commonly associated with reformulated gasoline in your water supply indicates contamination of your water supply and is the cause of the impacted rating. There has not been an MCL established by the EPA. The State of California uses 12 ppm as their MCL. All drinking water including bottled water may reasonably be expected to contain small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk.

The inventory for Rainelle Water Department consists of approximately 49 significant Potential Contaminant Sources (PCS) of which 24 are considered higher threats to ground water (Table 2 of SWAP for locations of PCS in the SWPA).

Based on this summarized narrative and susceptibility review for each well, the overall susceptibility ranking for Rainelle Water Department indicates a higher susceptibility to the identified potential sources of contamination. It does not mean that these wells are currently contaminated or that these wells are going to be contaminated in the near future, but the potential does exist. The occurrence of TBA indicates at least one of the two sources used is impacted by a manmade chemical. A detailed risk assessment of PCS's by the SWAP was beyond the scope of what could be accomplished with available resources and data.

As part of the Mountain Valley Water Supply Identification and Testing Plan, Mountain Valley initially contacted the District on September 15, 2015, to discuss the Project. Mountain Valley will be conducting follow-up contacts with the District in mid-2017 to request permission to conduct pre-construction water quality testing at the Rainelle PSD primary and secondary groundwater supply wells and to gather detailed information on the water system beyond what is provided to the general public in the SWAP referenced here.

**Greenbrier Public Service District #2:** The Internet link provided in this comment was for the Greenbrier PSD #2 SWAP (PWSID# 3301302), not the Rainelle SWAP.<sup>9</sup> According to the Greenbrier County PSD #2 SWAP, the District Address is PO Box 225, Quinwood, WV 25981. The Greenbrier County PSD #2 water system serves a population of approximately 1335 people. Two gravity-feed intakes located in the New River Pocahontas No. 2 Mine, an abandoned coal mine, supply the source water. Specifically, water flows from the mined out Sewell Seam. The sources provide an average daily production of about 136,817 gallons per day. The coal mine areas consist of areas where underground mining of coal has occurred, leaving an underground void that will function as a ground-water drain for all of the permeable rocks above it. The mines may store a large quantity of water or may deplete surrounding ground water for an entire area if the mine is draining freely. The SWAP provides the following information:

Source of Greenbrier #2 PSD Drinking Water / Hydrogeologic Setting / Sensitivity  
Mine Intake1 / Coal Mine / High Sensitivity  
Mine Intake 2 / Coal Mine / High Sensitivity  
Backup well 1 / Appalachian Plateau / Moderate Susceptibility

The estimated land area (approximately 1751 acres) that contributes water to the well is depicted in the

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<sup>9</sup> See <https://www.wvdhhr.org/oehs/eed/swap/get.cfm?id=3301302>.

Source Water Protection Area (SWPA) map presented in the SWAP.<sup>10</sup>

The SWAP used a modified volumetric flow equation with hydrogeologic mapping to determine the source water protection area delineation. Groundwater flow was determined from structural geology of coalmine maps where applicable. Mine maps and USGS 7.5 minute topographic maps were used in this process as well.

Physical Integrity of Well or Spring: Well or Spring Name / Source Integrity

Mine Intake1 / Constructed to Standard

Mine Intake 2 / Constructed to Standard

Backup well 1 / Constructed to Standard

Wells may vary in their construction characteristics and in the geologic rock types in which they occur. The lack of an effective grout and sanitary seals are avenues by which contaminants from nearby surface water bodies or overland runoff can percolate to wells. Based on onsite reviews and the ground water under the direct influence data the well integrity was rated generally satisfactory or good, with no visible problems existing during the visit. The State has determined that these sources are NOT GWUDI or Ground Water Under the Direct Influence of surface water.

Water Quality and Water Treatment Information: Well or Spring Name / Results

Mine Intake1 / Meets standards

Mine Intake 2 / Meets standards

Backup well 1 / Meets standards

This determination is limited by the sampling that is performed for the water system. There was a peak nitrate level of 0.62 mg/l in 2000. The MCL for nitrate is 10mg/l. Nitrates occur generally from fertilizer and are found in sewage and wastes from human and/or farm animals. Elevated levels of iron and manganese were reported in 1995. All drinking water including bottled water may reasonably be expected to contain small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk.

The inventory for Greenbrier County PSD #2 consists of approximately thirteen (13) significant Potential Contaminant Sources (PCS) of which nine (9) are considered higher threats to ground Water (Table 2 of SWAP for locations of PCS in the SWPA). A detailed risk assessment of PCS's by the SWAP was beyond the scope of what could be accomplished with available resources and data.

As part of the Mountain Valley Water Supply Identification and Testing Plan, Mountain Valley initially contacted the District on September 4, 2015, to discuss the Project. Mountain Valley will be conducting follow-up contacts with the District in mid-2017 to request permission to conduct pre-construction water quality testing and gather detailed information on the water system beyond what is provided to the general public in the SWAP referenced here.

**Source Water Protection and Mountain Valley Pipeline**

The source water protection zones for both the Rainelle and Greenbrier #2 PSDs are shown on the maps provided in the SWAPs for both PSDs. The Source Water Protection Areas for both PSDs fall within a HUC-10 (USGS) watershed that is traversed by the Project, and therefore these public water suppliers are included in Mountain Valley's direct outreach program to the suppliers to address concerns, gather detailed information on the water sources, and conduct pre-construction water supply testing. The Project will entail shallow, narrow construction activities for pipeline installation, so there is no reasonable expectation that the water supplies for Rainelle or Greenbrier PSD #2 would be impacted. Nonetheless, as stated, Mountain

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<sup>10</sup> See [www.wvdhhr.org/oehs/eed/swap/get.cfm?id=3301302](http://www.wvdhhr.org/oehs/eed/swap/get.cfm?id=3301302).

Valley is conducting direct outreach to public water suppliers (including these two PSDs) to ensure that their concerns are addressed and that no quality impact or service interruption occurs as a result of pipeline construction and operations. Based on these commitments by Mountain Valley and the nature of the public water supplies relative to the shallow, narrow construction planned for pipeline installation, there is negligible risk for impact to these water supplies.

**USFS Comment No. 18:** On p4-80, makes mention of another public supply - - Pittsylvania County, Virginia (the Robin Court Subdivision). Include this information here or explain why it is not mentioned here. Provide full disclosure of this resource brought forward here.

**Mountain Valley Response No. 18:** The Robin Court community water supply (PWSID 5143690) is owned and operated by the Pittsylvania County (Virginia) Public Service Authority. This community water system consists of one drilled 6-inch diameter well. The well was drilled to a depth of 425 feet and cased to a depth of 104 feet. No publicly available information on well yield is available. In 2016, Mountain Valley initiated pre-construction water quality testing along the approximately 40 southernmost miles of the proposed alignment (including Pittsylvania County). This process entailed contacting all property owners located within 150 feet of the proposed alignment to gather information on potential water supplies on these properties and to request permission to conduct pre-construction water supply testing. Public water suppliers with surface intakes located within three miles of a proposed waterbody crossing, or any public water supply located within a HUC-10 watershed that is traversed by the proposed alignment, were included in the water supply testing outreach. The Robin Court supply, and other water supplies within the Pittsylvania Public Service Authority, did not meet these criteria for pre-construction testing. Mountain Valley is committed to ensuring, through all reasonable and necessary actions, that no public water supply is impacted by pipeline construction and operations. It is important to note that the Robin Court water supply well appears to be nearly 800 feet from the proposed alignment and on the opposite side of Little Cheerystone Creek (likely a groundwater discharge zone, providing additional protection for the water supply well relative to the alignment construction right-of-way). It is a 425-foot deep well, with casing installed 140 feet below the ground surface. When considering that pipeline construction for the Project entails a narrow, 7- to 10-foot excavation, there is negligible risk to the Robin Court water supply from the Mountain Valley Pipeline.

**USFS Comment No. 19:** Wellhead and Source Water Protection Areas - Persons attending meetings with the Forest Service have stated considerable concern over protection of drinking water. This section of the document is insufficient and data needs to be supplied about field surveyed water sources and characterization. Field surveys to identify private wells or springs and surface water intakes must be completed PRIOR to the DEIS not prior to construction. Please disclose the affected environment and disclosed appropriate mitigation measures. Just because the State has completed only one source water assessment and protection plan (SWAP) for the Rainelle Water Department, Greenbrier County, WV does not mean other sources of water protection zones are not present. Source water areas can be developed by small subdivisions, home owners associations, or a consortium of water users in rural areas. Confirm that no other smaller source water areas have been identified via a reference of direct/personal communication with the state of WV and VA as documentation of due diligence. Often the efforts to develop a SWAP are community driven and take years to complete the planning and protection program. Research and document if on-going efforts exist but perhaps are not available (i.e., thus not posted to the state's websites).

**Mountain Valley Response No. 19:** Mountain Valley does not concur with the concerns expressed by the USFS regarding impact assessment on the referenced public water supply. Mountain Valley has identified public water supplies located within a HUC-10 watershed that is traversed by the proposed alignment and any public water intake located within three miles of a water body crossing. And, in West Virginia, this includes reviewing the Source Water Assessment Plans. This is a very conservative method (i.e., it maximizes the number of public water supplies assessed) for ensuring that public water supplies are

contacted, concerns are addressed, and pre-construction testing is completed. This also provides Mountain Valley with data on the water supplies beyond what is available to the general public. And, with this information and direct outreach to the public water supply owners, Mountain Valley can address their concerns on a site-specific, case-by-case basis in ways that will effectively address the owner's concerns and result in safeguards that will ensure no negative impacts to specific water supplies. In addition, Mountain Valley is contacting all property owners within 150 feet (500 feet in karst) to enquire if there are any private or public water supplies located within the buffer distance. Mountain Valley is committed to ensuring that no interruptions to public water supplies will result from pipeline construction and operation. The Water Supply Identification and Testing Plan details these efforts. Based on the actions being taken by Mountain Valley, the risk for impact to a public water supply is negligible.

**USFS Comment No. 20:** Even if the states have not developed SWAP, for the purpose of this impact analysis, based on data collected from private wells, wetland survey data for springs/swallets, disclosure of recharge and protection zones could be done following EPA and state source water protection delineation guidance. Typically identifying wells and water sources within a 1-mile radius of proposed projects, regardless of how many service connections or # of people serviced. Also, disclose the characterization of the water sources (ground water and surface water). Are the water sources mentioned in this section from confined aquifers or unconfined; located in fracture-flow or karst aquifers? Basin delineation or hydrogeological mapping is critical to disclose potential for impacts by the pipeline and necessary mitigation measures.

**Mountain Valley Response No. 20:** Identification and characterization of water supplies is addressed in the Water Supply Identification and Testing Plan. The minimum buffer distances within which water supplies were identified were determined by the designated environmental study corridor for the Project. Public water supplies located within the same HUC-10 watershed were included in the testing program (and Mountain Valley is working directly with these suppliers). Regional aquifers were discussed in Resource Report Number 6. Mountain Valley anticipates, and will take all appropriate and necessary action to ensure, no impacts to water supplies. Therefore, it would be inappropriate to require Mountain Valley to undertake a research-scale project to complete hydrogeological mapping and other activities designed to provide characterization of a natural water system where no measurable risk is associated with the Project.

**USFS Comment No. 21:** Contaminated Groundwater – MVP: The reference to the regulation that indicates sites within 200ft is adequate. Depending on topography, etc. there could be other potential locations outside of 200ft that could pose risk. One-quarter mile seems a more appropriate distance. The table indicates brine pits in proximity. Please disclose data on existing condition of pit, size, volume, location to project, lined/unlined pits, etc. to disclose and mitigate potential impacts from the project. A concern is the potential instability of close sites during blasting, but without full disclosure of existing conditions, there is no data to support impact analysis from the project.

**Mountain Valley Response No. 21:** An extensive discussion related to the character of aquifers in the area of the Project, as well as documentation of agency statements regarding the need for additional data on aquifers was provided in Section 2.1.1 of Resource Report Number 2. Aquifers in the area of the Project are typically limited in both vertical and horizontal extent; and are not “regional” aquifers that cover large areas. Although aquifers occur in geologic formations, these formations are not generally characterized as “regional” aquifers in the area of the Project. Discussions on the Valley and Ridge, and Karst aquifers were also presented to address earlier comments in this current submittal. Mountain Valley does not concur that identifying contaminated groundwater within 0.25 mile of a Project land disturbance area is necessary for avoidance or mitigation.

An updated General Blasting Plan was provided to FERC in April 2016. This plan was revised and provided to FERC in February 2017. The Plan outlines the procedures and safety measures that the contractor will

adhere to while implementing blasting activities, including the vicinity of brine pits if blasting is required. Blasting for grade or trench excavation will be considered only after all other reasonable means of excavation have been evaluated and determined to be unlikely to achieve the required results. Areas where blasting may be required will be reviewed for features, such as brine pits, karst terrain, structures, utilities, and wells. The Blasting Plan specifies protection measures for such features in the vicinity of blasting. To reiterate, if blasting is required, it would only be undertaken to the limited extent necessary to fracture the rock in the excavation to promote ripping and excavation in the immediate vicinity of the pipeline trench. Seismic energy propagation from such controlled and limited blasting is not anticipated to affect any nearby structure or other resource.

Mountain Valley prepared an Unanticipated Discovery of Contamination Plan, which would be used in the event that unknown areas of contaminated soils are encountered during construction of the Project. In regards to mitigation, Mountain Valley has submitted its Spill Prevention, Control, and Countermeasure (SPCC) Plan and Unanticipated Discovery of Contamination Plan to the FERC. The Plan details how such discoveries will be handled during construction. In accordance with the plan, if contamination is suspected, those materials will be segregated and isolated from other materials excavated and representative samples will be collected and submitted to an environmental laboratory for analysis and/or waste classification. If the testing reveals that the material is impacted, it will then be properly managed and disposed of at the appropriately permitted facility.

**USFS Comment No. 22:** Jefferson National Forest – During meetings held by the Forest Service, and also during the MVP DEIS public meetings, concerned members of the public have raised questions about groundwater issues. One such example that was not disclosed in this chapter is the trenching process and any potential interactions with groundwater or mixing of stormwater runoff and groundwater with open trenches. Specifically address in sections above and also pertinent info on JNF.

**Mountain Valley Response No. 22:** Trench excavation on the Project will typically be to a depth of approximately 10 feet. Mountain Valley expects that, in most areas, groundwater would not be encountered during shallow excavation. In areas where groundwater is encountered during excavation, Mountain Valley would pump any encountered groundwater to a well-vegetated or stabilized upland area and dewatered in accordance with the requirements of MVP typical detail MVP-ES-2 Pumped Water Filter Bag and Virginia Department of Environmental Quality (VADEQ) STD & SPEC 3.26 Dewatering Structure. These documents will be included in MVP's Project Specific Standards and Specifications that will be submitted to VADEQ in March 2017 for review and approval. In order to minimize potential for surface water runoff from entering the trench, Mountain Valley will implement STD & SPEC 3.09 Temporary Diversion Dike upslope of the trench (as needed). In areas where implementation of STD & SPEC 3.09 is not feasible, Mountain Valley would utilize silt fence along the upslope limit of disturbance (as needed) to slow upland runoff and divert it away from the trench. Following a precipitation event, Mountain Valley would dewater precipitation or any stormwater runoff that entered the trench in accordance with MVP typical detail MVP-ES2 (Pumped Water Filter Bag) and STD & SPEC 3.26 Dewatering Structure.

**USFS Comment No. 23:** Jefferson National Forest – No data was presented for the Valley and Ridge aquifer system or disclosure of recharge areas. No data was presented for surficial aquifers; thus section does not adequately disclose conditions on JNF.

**Mountain Valley Response No. 23:** An extensive discussion related to the character of aquifers in the area of the Project, as well as documentation of agency statements regarding the need for the states to gather additional data on aquifers was provided in Section 2.1.1 of Resource Report Number 2. Aquifers in the area of the Project are typically limited in both vertical and horizontal extent and are not “regional” aquifers that cover large areas. Although aquifers occur in geologic formations, these formations are not generally characterized as “regional” aquifers in the area of the Project. Discussions on the Valley and Ridge and

Karst aquifers were also presented to address USFS Comment No. 9, and USFS Comment No. 11 in this current submittal.

**USFS Comment No. 24:** The pipeline trenches would rarely exceed 10 feet in depth, and could encounter shallow groundwater along its route.” The Forest Service agrees with this statement. Further, there is lack of documentation and disclosure of how frequent these surficial aquifers occur along the pipeline, and therefore the scale of impacts. In addition, due to the steep slopes, the need to have trench breakers with discharge, will likely affect the quality and quantity of these surficial aquifers in the long term. Full disclosure of these effects are necessary. This is likely a major or significant impact, but currently is not disclosed with any data. Further expand disclosure for karst areas.

**Mountain Valley Response No. 24** The primary extent of National Forest land traversed by the proposed alignment are ridgelines and mountain slopes (Peters Mountain, Sinking Creek Mountain, Brush Mountain). The mountain slopes are underlain by a relatively thin overburden mantle or, in some areas, thicker colluvial deposits and ancient debris flows. These veneer deposits on the mountain slopes do not constitute surficial aquifers. Rather, they are ephemerally saturated zones with limited spatial extent that act to convey precipitation downward to the underlying sedimentary bedrock interface where infiltration to the deeper primary bedrock aquifer occurs via secondary porosity (joints, fractures, bedding planes) in the shale, siltstone and sandstone (with minor limestone beds).

One (1) unconsolidated river plain deposits associated with Craig Creek comprises the only surficial aquifer on National Forest land. The alluvial deposits associated with Craig Creek are observed on the valley floor between Brush Mountain and Sinking Creek Mountain near MP 219.4 and MP 219.7. Note that portions of the Craig Creek valley are on private lands. Generally speaking, alluvial deposits may reach sufficient thickness to yield moderate supplies of water; however, this is not generally considered a potable water supply aquifer due to surface influence. In the vicinity of MP 219.4 to 219.7, outcrops of Devonian age shale suggest that the alluvial sediments are limited in depth, constrained mostly in the stream channel hosting Craig Creek. The alluvial surficial aquifer in the vicinity of the proposed alignment discharges to Craig Creek and is primarily fed by either surface water derived from upland drainages or groundwater discharging from bedrock that is recharged by upland slopes of the ridgelines.

Trench breakers will be used to manage and redirect seepage flowing into the backfilled trench from slope overburden deposits, if and where they become saturated from precipitation events. Theoretical impacts to this subsurface water would be pirating the natural flow direction and robbing a critical aquifer recharge path, and / or significantly changing the natural water chemistry, which is assumed to be weakly buffered in contact with siliciclastic deposits. However, based on the shallow nature of the excavation, the configuration of the backfilled trench, and the backfilled materials, any temporary redirection of percolating water in the trench backfill will have no discernable effect on the quantity, quality and ultimate flow rate and direction of the infiltrating subsurface water. The water that infiltrates the trench will discharge from short segments established by the trench breakers, and resume its natural downslope flow rate and direction away from the backfill. Ultimately, the subsurface water will continue through the unconsolidated deposits by gravity flow along naturally established preferential pathways and recharge upland bedrock aquifer through secondary porosity or the Craig Creek alluvial deposits. Resident time in the trench backfill will be relatively short compared to natural percolation rates, as controlled by the distribution of trench breakers (i.e., best construction practices limit the amount of trench to be managed by a breaker). While in the trench backfill, the water will be in contact with either native backfill, or similar, and is not anticipated to undergo notable changes in chemistry. Mountain Valley considers potential risk for affecting these shallow subsurface water-conveying deposits to be negligible and likely even less for the alluvial aquifer in the valley bottom or deeper bedrock-hosted primary aquifers in the area.

The Mountain Valley Karst Hazards Assessment (KHA) identified karst terrain that is traversed by the

proposed alignment. The KHA included field reconnaissance on National Forest land between mileposts 196.3 and 220.8 of the October 2016 Proposed Route. A narrow zone of undivided Tonoloway limestone and Keefer sandstone is mapped on JNF lands (Rader and Gathright, 1989; Schultz and Stanley, 2001; Schultz, 1993).<sup>11</sup> The Tonoloway is a laminated limestone with thin interbedded calcareous shale and siltstone. However, no karst features were observed and Mountain Valley does not consider this to constitute a relevant issue for resource protection or hazards assessment on JNF lands.

**USFS Comment No. 25:** Aquifers – In areas of shallow groundwater, construction activities may affect aquifers temporarily but also long-term since grading and reduction of vegetation will alter surface to ground water interactions for the life of the project. Additionally, the need to have trench breakers with discharge, will likely affect the quality and quantity of these surficial aquifers for the life of the project. Need full disclosure supported by data. Not just one-time construction impacts but must disclose long-term impacts.

**Mountain Valley Response No. 25:** Please see Response No. 24 and Response No. 26.

**USFS Comment No. 26:** Aquifers – If disturbed by construction, wells in near surface aquifers will not likely re-establish. Construction will require trenching and potentially blasting into bedrock. Once subsurface flow conditions are altered, it is unlikely that pre-disturbance conditions can be reestablished. Trench breakers with discharge, will be put in place, so for the life of the project surficial groundwater will be impacted. This would impact wells in proximity to the project.

**Mountain Valley Response No. 26:** See the response to USFS Comment No. 24 for a discussion on near-surface aquifers, theoretical impacts from construction (including use of trench breakers) and a discussion on why there is actually, or in practice, negligible risk for impacts to the unconsolidated deposits that ephemerally convey seepage on the mountain slopes, or to the sole surficial aquifer on National Forest land, or to the local and regional groundwater system as a whole. There is not reasonable expectation that subsurface flow conditions will be altered to the extent that the naturally established preferential seepage pathways will be affected on the mountain slopes. And, by translation, there is negligible risk for pre-disturbance conditions be altered. It is correct that trench breakers with discharge conveyance will be installed to manage seepage into short segments of the backfilled trench, but there is simply no reasonable expectation (i.e., the risk is so remote as to be negligible) the surficial aquifer will be affected.

The only surficial aquifer on or in the near vicinity to National Forest lands is the unconsolidated river plain deposits associated with Craig Creek, observed on the valley floor between Brush Mountain and Sinking Creek Mountain near MP 219.4 and MP 219.7. Mountain Valley proposes to cross Craig Creek, and the surficial aquifer by dry open-cut method. Shale bedrock is observed in limited outcrops and underlies the alluvial deposits in Craig Creek valley, in the vicinity of the proposed alignment crossing. Shale is considered to be rippable by standard construction methods to depths anticipated for pipeline trenching and bedding construction. Thus MVP is confident that standard trenching methods will be applicable (i.e., blasting will not be required) to promote excavation and pipeline construction across Craig Creek in the vicinity of National Forest land.

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<sup>11</sup> Rader, E. K. and Gathright, T. M (1986) Geologic Map of Giles County, Virginia. Virginia Division of Mineral Resources, Publication 69, Commonwealth of Virginia, Department of Mines, Minerals, and Energy, Division of Mineral Resources, Charlottesville, VA; Schultz, A. P. and Stanley, C. B. (2001). Geologic map of the Virginia portion of the Lindside Quadrangle, Virginia. Publication 160 Virginia Division of Mineral Resources; Cooperative Geological Mapping Program, U.S. Geological Survey; Schultz, A. P. (1993). Geologic Map of Large Rock Block Slides at Sinking Creek Mountain, Appalachian Valley and Ridge Province, Southwestern Virginia, and Comparison with the Colorado Front Range. U.S. Geological Survey, Miscellaneous Investigation Series, Map I-2370. U.S. Department of the Interior.

The Craig Creek surficial aquifer is under water-table conditions. A drilled water well completed in these deposits would typically derive water radially from the surrounding shallow aquifer. However, such a water well would likely not be permitted as a drinking water source by a state agency because it would be considered to produce Ground Water Under Direct Influence of surface water (aka GWUDI in regulatory parlance). This refers to a groundwater source that is located close enough to nearby surface water (stream or river) to receive direct surface water recharge. There is little likelihood that a drinking water well would be installed under these conditions, in such a location on JNF lands. However, under the remote chance that a drinking water well was installed, that well would be drilled below the surficial aquifer, with casing installed and sealed in bedrock at a depth sufficient to prevent the surficial aquifer from recharging the well. Per Virginia Department of Health private water well regulations, properly constructed water wells must, for sanitary purposes, use a minimum of 20 feet of casing (additional casing may be dictated by the site-specific geology) to isolate non-potable shallow groundwater. Therefore, construction and installation of the pipeline crossing Craig Creek and the surficial aquifer is not reasonably expected to affect a properly completed water supply well.

**USFS Comment No. 27:** Aquifers – “restore the ground surface as closely as practicable to original contours, and re-establish vegetation to facilitate restoration of pre-construction overland water flows and recharge patterns.” Construction will require trenching and potentially blasting into bedrock. Depending on the topography and steep slopes, establishing existing contours may not be realistic. Trench breakers with discharge, will be put in place, so for the life of the project surficial groundwater will be impacted. Need full disclosure for life of project impacts as well as construction impacts.

**Mountain Valley Response No. 27:** Following the removal of trees and vegetation and the installation of temporary erosion and sediment controls, topsoil will be removed from the pipeline ROW and stockpiled for reuse during restoration. The pipeline trench will be excavated to a depth of approximately seven to ten feet. Bedrock will be chipped with blasting utilized in extremely difficult conditions. Permanent trench breakers will be installed in accordance with MVP specifications. In areas where groundwater is encountered, drains will be installed in the trench breakers. Groundwater collected by the trench breaker will be conveyed to surface and dewatered through a stabilized discharge outlet to natural drainage areas adjacent to the trench breaker. No long-term impacts to surficial groundwater resources are anticipated.

Following installation of the pipeline, the trench will be backfilled with native material. The subgrade will be decompacted prior to returning topsoil to the ROW areas. The Project disturbed areas will be graded to match original contours to the greatest extent practicable to maintain existing drainage patterns. Permanent erosion control measures (i.e. slope breakers) will be installed to control stormwater runoff and minimize erosion potential. Temporary erosion control measures will remain in place with continued inspection and maintenance following construction until the area is permanently stabilized with vegetative cover. Mountain Valley has developed specific seed mixes to be used throughout the Project in both Virginia and West Virginia. Recommended seed mixes were developed in coordination with Wildlife Habitat Council, US Forest Service, US Fish and Wildlife Service, Virginia Department of Conservation and Recreation and Mountain Valley’s threatened and endangered species consultant. Seed mixes are designed to provide habitat for threatened and endangered species as well as to stabilize and revegetate the Project limits with pollinator friendly species.

**USFS Comment No. 28:** Aquifers – “pipeline trenches and operational pipelines do not provide a barrier to groundwater flow where the pipeline intersects water-table aquifers.” Correct, however, the pipeline actually concentrates shallow ground water flow toward and along the trench. Trench breakers with discharge, will be put in place, so for the life of the project surficial groundwater will be impacted as well as surface locations where discharge is taking place. I suspect these are major impacts that need full disclosure for life of project impacts as well as temporary construction impacts. Provide data on shallow

aquifer water quality and quantity.

**Mountain Valley Response No. 28:** Mountain Valley does not concur with the USFS's conclusion that pipeline construction and operation would permanently disrupt water flow in shallow, surficial deposits. Please refer to Response No. 24 regarding the surficial deposits, construction BMPs and likely temporary influence on subsurface seepage. Importantly, if the pipeline trench intersects subsurface seepage, BMPs such as trench breakers will divert this water from the trench, but not necessarily to the surface. As appropriate, based on current flow conditions in the overburden, the seepage may be diverted out of the trench but back into the overburden downgradient. This will have no measureable effect on the underlying aquifer, and no long-term effects on the local water budget.

**USFS Comment No. 29:** Karst Terrain – provide results of fracture trace/lineament analysis for the EIS, not prior to construction. The data results from this study will help disclose potential impacts to groundwater and karst terrain, and is critical for the impact analysis.

**Mountain Valley Response No. 29:** MVP submitted a Fracture Trace Lineament Analysis on October 13, 2016 to FERC. An updated version has been submitted to FERC in February 17, 2017 and was uploaded to the docket as Attachment DR4 Geology 11.

**USFS Comment No. 30:** Pittsylvania County, Virginia (the Robin Court Subdivision) public supply is missing from discussion on affected environment on p4-71. Describe in full detail the potential short-term and long-term impacts from the project.

**Mountain Valley Response No. 30:** Mountain Valley expects no short-term or long-term impacts on any water supply (including that for the Robin Court Subdivision) as a result of pipeline construction and operations. The Robin Court Subdivision water supply is a public community water system owned by the Pittsylvania County Service Authority.<sup>12</sup> This community water system consists of one drilled 6-inch well. The well was drilled to a depth of 425 feet and cased to a depth of 104 feet. In light of the fact that the proposed pipeline construction will entail a 7-foot to 10-foot excavation, there is negligible risk to this water supply well from pipeline construction. No information on well yield for this water supply is available. As noted previously, Mountain Valley will address the concerns of public and private water supplies, on a case-by-case basis in accordance with the Water Supply Identification and Testing Plan (Resource Report #2).

**USFS Comment No. 31:** Cite reference of what regulation states 150ft or 500ft in karst is sufficient. Most SWAPs have their own protection zones identified and depending on topography and local knowledge could be up to ½ mile or more.

**Mountain Valley Response No. 31:** The buffer distance of 150 feet on either side of the alignment was selected by Mountain Valley for water supply identification because this exceeds the 125-foot buffer requested by FERC under conditions where blasting is occurring near an active well. Mountain Valley is not stating that all areas with water supplies within these buffer distances will require blasting but simply that these buffer distances are conservative in terms of maximizing protection of water supplies and are commensurate with the scope and scale of the construction project (shallow narrow excavation for pipeline installation with land reclamation to pre-construction conditions). The 500-foot buffer in karst was requested by FERC, and accepted by Mountain Valley, because it greatly exceeds the 150-foot buffer, and a larger buffer is appropriate in karst terrain. In areas where the Karst Hazards Assessment noted features of concern, the 500-foot buffer for identifying water wells to be tested was expanded as necessary to capture

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<sup>12</sup> See [www.wppdc.org/content/wppdc/uploads/PDF/docs\\_publications/env\\_nat\\_resources/rpt\\_-\\_11\\_1102\\_-\\_wppdc\\_-\\_section\\_2\\_-\\_existing\\_water\\_source\\_information\\_-\\_daa.pdf](http://www.wppdc.org/content/wppdc/uploads/PDF/docs_publications/env_nat_resources/rpt_-_11_1102_-_wppdc_-_section_2_-_existing_water_source_information_-_daa.pdf).

the water supply for identification and potential testing. Public water supplies within three miles downstream of construction or within a HUC-10 watershed traversed by the proposed alignment were identified for testing. If case-specific conditions warrant, or a water supply requests to be sampled, Mountain Valley will accommodate this by expanding the buffer distance if necessary.

**USFS Comment No. 32:** Prior to construction, Mountain Valley would evaluate brine pits within 150 feet of the construction right-of-way. Brine pits would be evaluated for potential leakage or local contamination. Prior to DEIS (not prior to construction) these contaminated sources need to be evaluated and potential impacts disclosed here - in this section – for full disclose of affected environment and impacts. Supplement this section with data/survey results. Describe the short- term and long-term project impacts.

**Mountain Valley Response No. 32:** MVP has not identified and does not anticipate crossing any brine pits within or near USFS or USACE property or the ROW. However, if one is encountered, MVP will implement the same procedures identified in the Mine Pool Mitigation Plan.

**USFS Comment No. 33:** blasting may impact groundwater quantity by altering the recharge and flow of groundwater in blasting areas.” The Forest Service agrees with this statement. Therefore, please quantify impacts based on full disclosure of affected environment. Please consider short- term and long-term impacts since the trench will require breakers along steep slopes with discharge, which will have impacts over the life of the project.

**Mountain Valley Response No. 33:** Please see Response No. 24 and Response No. 26.

**USFS Comment No. 34:** JNF – “impacts would be temporary or short-term. It is unlikely that the trench would be deep enough to significantly affect aquifers.” USFS does not concur with this statement. The impact analysis lacks full disclosure of existing conditions of surficial aquifers, recharge zones, and springs – need data to support statements. Please disclose survey information and any water quality/quantity data. The public concerns over trenching and impacts to groundwater and subsurface flow alterations must be disclosed here. Trenches will require breakers along steep slopes with discharge, which will have impacts over the life of the project. Please update this section to fully disclose short-term and long-term project impacts to groundwater sources.

**Mountain Valley Response No. 34:** Please see Response No. 24 and Response No. 26.

**USFS Comment No. 35:** Regarding the statement, “we do not anticipate long-term or significant impacts on groundwater resources as a result of construction or operation of the projects,” USFS does not concur with this statement. The groundwater affected environment and impact analysis lacks full disclosure of surficial aquifers, recharge zones, trenching interactions, and springs – need data to support statements. Please disclose survey information and any water quality/quantity data. The public concerns over trenching and impacts to groundwater and subsurface flow alterations must also be disclosed. Trenches will require breakers along steep slopes with discharge, which will have impacts over the life of the project. Please update this section to fully disclose short-term and long-term project impacts to groundwater sources.

**Mountain Valley Response No. 35:** Please see Response No. 24 and Response No. 26.

**USFS Comment No. 36:** Regarding the statement, “we do not anticipate long-term or significant impacts on groundwater resources as a result of construction or operation of the projects,” USFS does not concur with this statement. The groundwater affected environment and impact analysis lack full disclosure of surficial aquifers, recharge zones, trenching interactions, and springs – need data to support statements. Please disclose survey information and any water quality/quantity data. The public concerns over trenching and impacts to groundwater and subsurface flow alterations must also be disclosed here. Trenches will

require breakers along steep slopes with discharge, which will have impacts over the life of the project. We recommend updating this section with full disclosure of short-term and long-term project impacts to groundwater sources.

**Mountain Valley Response No. 36:** Please see the previous Mountain Valley Response Nos. 10, 11, 12, 14, 16, 20, 24, 26 and 27 for discussions on surficial aquifers, recharge zones, use of trench breakers and putative impacts to unconsolidated deposits or the sole surficial aquifer on National Forest lands, trenching, water body crossings, and springs. In particular, refer to Mountain Valley Response No. 24 and No. 26 for specific discussions on disclosure of potential risks associated with construction and use of trench breakers on unconsolidated slope deposits, and the sole surficial aquifer (Craig Creek alluvial deposits) on National Forest lands.

Mountain Valley conducted a thorough desktop review of the hydrogeologic conditions near the alignment that crosses approximately 3.5 miles of National Forest land approximately between mileposts 196.3 and 220.8 of the October 2016 Proposed Route (note, National Forest lands are not contiguous between these mileposts). The desktop review revealed several publicly available documents that address geology and hydrogeology on and in the vicinity of National Forest lands traversed by the proposed alignment (see list of references after this comment).<sup>13</sup> However, there are no readily available data on water quantity or quality specific to National Forest lands.

Mountain Valley will be contacting all property owners within 150 feet of the alignment (500 feet in karst, but that is not applicable to National Forest land) in the vicinity of National Forest lands in mid-2017. This outreach effort is designed to confirm if a water source (well, spring, intake) is located on the property, request information on the source, and request permission to conduct pre-construction testing. Through this effort, Mountain Valley will be able to provide detailed, actionable and Project-specific data on water supplies, which will be more applicable for review than the regionally distributed publicly available data that may have no bearing on National Forest land.

Locations of springs within 150 feet (500 feet in karst) were updated in Table 4.3.1-2 to be submitted to the FERC for the February 2017 data request. These data will be further refined through the direct property outreach discussed in the previous paragraphs for this response.

**USFS Comment No. 37:** “Permanent fill at 44 wetlands” – The Forest Service requires needs full disclosure in the DEIS, not just prior to construction. Disclose wetland survey data, including wetland size, condition, etc. Include scope and scale of wetland impacts discussed for short-term construction and long-term operations.

**Mountain Valley Response No. 37:** MVP identified 5 wetlands on USFS property, 3 of which may be impacted during the Project. This information will be included in MVP’s Aquatic Resource Report that will be submitted to USFS.

**USFS Comment No. 38:** Confirm that CWA 305(b) requires review of water quality standards. 303(d) is

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<sup>13</sup> Rader, E. K. and Gathright, T. M (1986) Geologic Map of Giles County, Virginia. Virginia Division of Mineral Resources, Publication 69, Commonwealth of Virginia, Department of Mines, Minerals, and Energy, Division of Mineral Resources, Charlottesville, VA; Schultz, A. P. and Stanley, C. B. (2001). Geologic map of the Virginia portion of the Lindsie Quadrangle, Virginia. Publication 160 Virginia Division of Mineral Resources; Cooperative Geological Mapping Program, U.S. Geological Survey; Schultz, A. P. (1993). Geologic Map of Large Rock Block Slides at Sinking Creek Mountain, Appalachian Valley and Ridge Province, Southwestern Virginia, and Comparison with the Colorado Front Range. U.S. Geological Survey, Miscellaneous Investigation Series, Map I-2370. U.S. Department of the Interior.

list of impaired waters.

**Mountain Valley Response No. 38:** CWA Section 303(c) requires that each state review, establish, and revise water quality standards for all surface waters within each state. Section 305(b) requires biennial comprehensive state water quality reports, which are usually combined with reports about impaired waters under Section 303(d).

**USFS Comment No. 39:** Surface Water Use Classifications – Virginia. VDEQ may have a 2016 update. Ensure the most current resource is being utilized.

**Mountain Valley Response No. 39:** The VADEQ approved the Final 2014 305(b)/303(d) Water Quality Assessment Integrated Report on June 13, 2016. No further updates are available.

**USFS Comment No. 40:** Surface Water Use Classifications – Virginia. The document mentions three tiers, but only speaks to Tier III. Please address the other two tiers and disclose stream segments in those categories.

**Mountain Valley Response No. 40:** Water use categories of Tier I and Tier II in Virginia are designated by the VADEQ during review of National Pollutant Discharge Elimination System permit applications. Tier I water quality classification specifies that existing instream water uses and the level of water quality to protect the existing uses shall be maintained and protected. Tier II water quality classification protects water that is better than specified water quality standards.

**USFS Comment No. 41:** It is not enough to just list intakes in table 4.3.2-4. Please include actual water quality data and volumes used to demonstrate affected environment and thus provide potential project impact analysis disclosure. Many of these locations should have Source Water Assessments and Protection Plans with specific protection zones identified. Disclose those specifics here. Public concern over drinking water protection is at the forefront so the Forest Service would like to see potential effects addressed and disclosed here.

**Mountain Valley Response No. 41:** As stated previously, given the nature of the Project, Mountain Valley anticipates there to be no impacts on the quality or quantity of any water supply (public or private). Mountain Valley is committed to taking all necessary precautions for protecting water supplies during construction and operation. As such, Mountain Valley is committed to working directly with the water supply owner to ensure that his or her water supply is not interrupted or otherwise compromised. Mountain Valley has identified where the proposed alignment encounters a Zone of Critical Concern for applicable West Virginia public water supplies (not regulated in Virginia) and is working directly with the applicable suppliers (e.g., Big Bend PSD; Red Sulphur PSD) to address their concerns and ensure no acute or long-term impacts occur to their supply(ies) as a result of pipeline construction or operation. Public water supplies in Virginia and West Virginia within three miles downstream of the proposed alignment or within a HUC-10 watershed (which can encompass hundreds of thousands of acres) were identified and contacted by Mountain Valley to address concerns. These efforts, as well as those for private water supplies that are presented in the Water Supply Identification and Testing Plan, demonstrate Mountain Valley's commitment to protecting water supplies.

**USFS Comment No. 42:** Source VDEQ 2012 – is out of date and should cite a 2016 version. Update all pertinent data.

**Mountain Valley Response No. 42:** The dataset collected as part of the 303(d) listing ran from January 1, 2007, through December 31, 2012. The VADEQ released the Final 2014 305(b)/303(d) Water Quality Assessment Integrated Report on June 13, 2016.

**USFS Comment No. 43:** From document: According to the NRI, the MVP would cross four NRI listed waterbodies. Under the current alignment, one of these waterbodies, Craig Creek, would be crossed four separate times. MVP is coordinating with the Forest Service to modify the crossing of Craig Creek (see table 3.5.3-1), pending MVP's submission of a final revision of the crossing. This needs to be completed for an accurate effects analysis.

**Mountain Valley Response No. 43:** Please see Response Number 2.

**USFS Comment No. 44:** “Table 4.3.2-8 provides waterbodies crossed in areas of shallow bedrock” – describe what is meant by shallow bedrock in this context. Describe the affected environment, more so than just a table. What does the water quality data indicate about these sources? Just because streams are not 303(d) listed does not mean the streams are not vulnerable to certain impacts. Full disclosure of current conditions with water quality data is critical to DEIS impact analysis.

**Mountain Valley Response No. 44:** Mountain Valley's pipeline construction would entail an approximate 10-foot-deep excavation. Therefore, bedrock within seven feet of the ground surface is considered shallow. Areas with shallow bedrock classifications were identified using the Natural Resources Conservation Service's (NRCS) Soil Survey Geographic Database (SSURGO). The Project route would traverse about 118 miles of shallow bedrock. Areas of shallow depth to bedrock are summarized in Table 4.1.1-14 of the DEIS and listed in detail by milepost in Appendix M of the DEIS. There is no additional information on bedrock, shallow or deep, that is readily and publicly available beyond what was presented by Mountain Valley in Resource Report #6. Mountain Valley has accounted for stream crossings in its construction documentation on crossings and Project-specific erosion and sediment control plan. Moyer and Hyer (2009)<sup>14</sup> reported the results of a USGS water quality monitoring study during construction of the East Tennessee Natural Gas' Jewell Ridge Lateral pipeline. This water quality monitoring study indicated that pipeline construction did not adversely alter long-term water-quality conditions (short-term turbidity increases did occur downstream but the increases were shown to be minimal compared to the turbidity values measured during natural runoff events). Mountain Valley has vast experience in the construction of natural gas pipelines and has prepared multiple layers of plans and contingencies to ensure to the extent practical that no negative impacts to groundwater or surface water quality will result from pipeline construction and operation.

**USFS Comment No. 45:** JNF – It is not enough to just list streams in table 4.3.2-11. Instead, include the actual water quality/quantity data and to demonstrate affected environment and thus provide potential project impact analysis disclosure. Many of these sources had macroinvertebrate data collected too. Disclose those specifics here. Public concern over water protection is at the forefront. Use best available science from current surveys and past monitoring efforts to adequately disclose existing condition. Reference MVP survey data, EPA STORET data, and USFS data - all available to be summarized here.

**Mountain Valley Response No. 45:** To date, Mountain Valley did not conduct any water quantity, quality or Macroinvertebrate studies on USFS property. After reviewing EPA Storet and other publicly available data, none of the streams have been classified as impaired (Category 4 or 5) or assessed for water quality in 303(d) assessments. In 2002, according to EPA Storet, these streams were assessed for Aquatic Life Support (Fish, Shellfish, wildlife Protection and Propagation, Fish Consumption (Aquatic Life Harvesting)). The streams were assessed as Good in both categories. Tier 1 and Tier 2 information was unavailable but MVP was able to determine from available Virginia Department of Environmental Quality data that no Tier 3 designated streams are crossed by the Project within NFS lands.

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<sup>14</sup> Reference: Moyer, D.L., and Hyer, K.E., 2009, Continuous turbidity monitoring in the Indian Creek watershed, Tazewell County, Virginia, 2006–08: U.S. Geological Survey Scientific Investigations Report 2009–5085, 42 p.

**USFS Comment No. 46:** Public concern over stormwater discharge and trench breaker/shallow ground water discharge is not mentioned here. For the Jefferson National Forest, the document should fully disclose surface water resources that have the potential to be impacted by the project. These are not only short-term construction issues, but long-term life of project. Update this section to address these issues.

**Mountain Valley Response No. 46:** Please see Response No. 24 and Response No. 26.

**USFS Comment No. 47:** Document states: Mountain Valley would follow guidance from the WVDEP regarding natural streambank restoration and would consult with the WVDEP to identify design options for specified crossings. Specify what guidance would be followed in Virginia.

**Mountain Valley Response No. 47:** Mountain Valley will consult with Virginia in the same manner it will coordinate with West Virginia in identifying options for specified crossings. Mountain Valley will conduct streambank restoration in accordance with applicable federal and state permit conditions in Virginia.

**USFS Comment No. 48:** “surface water supplies within 3 miles” – This section should reference site-specific SWAP protection zones and procedures and be in compliance with the State SWAP rather than the arbitrary 3 miles. Some SWAPs include protection zones up to 5 miles.

**Mountain Valley Response No. 48:** The reference to three miles is a FERC requirement. In addition, as discussed above, Mountain Valley has accounted for SWAP protection zones (only regulated in West Virginia) and determined that the proposed alignment (as adjusted made) does not impinge on any Virginia public water supply voluntarily established protection zones.

**USFS Comment No. 49:** Document states: Mountain Valley would not site any ATWS within 100 feet of a stream within the Jefferson National Forest. The stream corridor buffer width increases with slope according to Jefferson Forest Plan Riparian Standards, and is 125 ft for slopes >10% and 150 ft for slopes >45 % for perennial streams.

**Mountain Valley Response No. 49:** Mountain Valley does not propose to have any work space within 100-feet of a stream on JNF property.

**USFS Comment No. 50:** JNF – Update this paragraph about Craig Creek with most current alignment modifications and compressed workspace parallel to the creek during construction.

**Mountain Valley Response No. 50:** Please See Response No. 2.

**USFS Comment No. 51:** Document states: Mountain Valley conducted an analysis to determine the amount of sedimentation that could occur in the Jefferson National Forest as a result of instream construction. The sedimentation analysis should have included all ground disturbing activities associated with the project (access roads, staging areas, and pipeline construction upslope of streams), not just in-stream construction activities.

**Mountain Valley Response No. 51:** The sedimentation analysis prepared for the USFS will be submitted in February 2017. In order to estimate potential sediment introduced into nearby streams from the Project in the area of the Jefferson National Forest, construction, restoration, and operation impacts are divided into three primary activities: (1) access road improvements and construction, (2) tree clearing, and (3) pipeline construction and restoration. The analysis includes factors for all ground disturbing activities during each stage of construction.

**USFS Comment No. 52:** Expand on sediment analysis here. Provide data results and discussion, and reference the appendix where model rationale are presented. The model should have addressed all aspects of construction, but also impacts over the life of the project. Long-term loss of vegetative cover, loss of top soil, chronic erosion on steep slopes, etc. should all be fully disclosed here. It is unacceptable to say everything will be mitigated through the E&SC Plan. Literature has shown proven that BMPs have limited success, even when properly installed and maintained. This is a challenging project over rugged terrain. Truthful disclosure through the DEIS is necessary for the Forest Service.

**Mountain Valley Response No. 52:** Mountain Valley has updated its sedimentation analysis and will provide USFS the final revised sedimentation analysis with the Biological Evaluation.

**USFS Comment No. 53:** Conclusion – “No long-term or significant impacts” The Forest Service does not concur with this statement. The surface waters affected environment section and impact analysis lack full disclosure of current water quality/quantity data or acknowledging discharge of trench water and stormwater over the long-term. Public concerns over surface water impacts and subsurface flow alterations via trench breakers and discharge must be disclosed. Trenches will require breakers along steep slopes with discharge, which will have impacts over the life of the project. Update this section with full disclosure of short-term and long-term project impacts to surface water resources. There would be long-term impacts, so we recommend identifying minor or major impacts. Short-term impacts may be major depending on stream crossings and sediment analysis results, etc.

**Mountain Valley Response No. 53:** Please see Response No. 24 and Response No. 26.

**USFS Comment No. 54:** Conclusion – “would not permanently affect the designated water uses.” The Forest Service does not concur with this rationale. Pipeline impacts are not caused by changes to the designated water uses, but rather site-specific violations of water quality standards per stream segment. Or perhaps long-term chronic high levels of a specific water quality parameter, which diminishes aquatic life. The impact analysis for surface water is insufficient. Please update to include water quality/quantity data and sediment analysis for short-term construction impacts as well as long-term life of project impacts. Conclusions must be based on data results and accurate disclosure.

**Mountain Valley Response No. 54:** Please see Response No. 24 and Response No. 26.

**USFS Comment No. 55:** Wetlands – Table 4.3.3-1 Update this section with the most current wetland survey data for the JNF. The affected environment discussion lacks the best available data. Please utilize wetland survey data to describe specific conditions, not just generalized vegetation. Survey data should help describe surface and groundwater interactions, current condition of sites, and rare species of vegetation and aquatic biota. The content should include more information than what is presented in this section, or reference the appendix where wetland survey data is provided.

**Mountain Valley Response No. 55:** This information will be included in Mountain Valley’s Aquatic Resource Report that will be submitted to USFS.

**USFS Comment No. 56:** Wetlands – JNF: Update this section with the most current wetland survey data. Wetlands on the JNF would be affected. Disclosure of affected environment and impact analysis is required here.

**Mountain Valley Response No. 56:** Mountain Valley identified five wetlands on USFS property. This information will be included in MVP’s Aquatic Resource Report that will be submitted to USFS.

**USFS Comment No. 57:** Wetlands – “If permanent wetland impacts cannot be avoided...” With respect to the JNF, impacts should be disclosed prior to end of DEIS. The Forest Service does not have information sufficient to support an analysis at this time.

**Mountain Valley Response No. 57:** Information regarding wetland impacts will be included in the Plan of Development. MVP will permanently impact three wetlands W-UU11, W-UU12, and W-HH15 that have developed along Pocahontas Road. Permanent impacts to these wetlands is expected to be 0.0053 acres, 0.0004 acres, and 0.0001 acres respectively. Mountain Valley will also permanently impact one wetland along the pipeline right-of-way. Permanent impacts to wetland W-KL14 near milepost 197 will result in a loss of 0.0037 acres.

**USFS Comment No. 58:** Wetlands – “we conclude that impacts on wetlands would not be significant”.... With respect to the JNF, impacts should be disclosed prior to end of DEIS. The Forest Service does not have information sufficient to support an analysis at this time.

**Mountain Valley Response No. 58:** Please see Response No. 57.

**USFS Comment No. 59:** Table 4.1.1-3 only lists waterbodies on the JNF that are crossed by the pipeline itself, but should also include discussions of streams crossed by access roads.

**Mountain Valley Response No. 59:** This information will be included in Mountain Valley’s Aquatic Resource Report that will be submitted to USFS. There will also be a stream and wetland impact table within the POD that includes additional information.

**USFS Comment No. 60:** The discussion on candy darter contains no habitat or species information related to potential impacts from the pipeline project. Stony Creek supports the largest and most robust population of candy darters in the state of Virginia, and one of the few viable populations that is not threatened by the variegate darter (as in WV). The conclusion that there will be no adverse impacts on this species because MVP is following TOY restrictions is weak. The FWS is currently going through analysis to determine if the candy darter warrants federal listing. A stronger argument that the project will not cause a trend toward federal listing is required.

**Mountain Valley Response No. 60:** The distributional range of the candy darter (*Etheostoma osburni*) includes the New River drainage in both West Virginia and Virginia (Chipps et al. 1993, Jenkins and Burkhead 1994)<sup>15</sup>. In West Virginia, the species is distributed widely throughout the Greenbrier, Bluestone, and Gauley river systems and known from Fayette, Greenbrier, Nicholas, Pocahontas, Mercer, Summers, Monroe, and Webster counties (Stauffer et al. 1995, Welsh et al. 2006).<sup>16</sup> In Virginia, the species is historically known from Bland, Giles, Pulaski, and Wythe counties in Virginia and from Reed, Big Walker, Little Stony, and Sinking creeks, along with Spruce and Pine runs, though no recent records exist (Burkhead and Jenkins 1991).

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<sup>15</sup> Burkhead, N. M. and R. E. Jenkins. 1991. Fishes. Pages 321-409 in Virginia’s Endangered Species (K. Terwilliger, coordinator). McDonald and Woodward Publishing Company, Blacksburg, Virginia; Chipps, S. R., W. B. Perry, and S. A. Perry. 1993. Status and distribution of *Phenacobius teretulus*, *Etheostoma osburni*, and “*Rhinichthys bowersi*” in the Monongahela National Forest, West Virginia. *Virginia Journal of Science* 44:47-58.

<sup>16</sup> Stauffer, J. R., Jr., J. M. Boltz, and L. R. White. 1995. The Fishes of West Virginia. Reprinted from the Proceedings of the Academy of Natural Sciences, Philadelphia, Pennsylvania; Welsh, S. A., D. A. Cincotta, and J. F. Switzer. 2006. Fishes of Bluestone National Scenic River. Natural Resources Technical Report 2006/049. U.S. Department of Interior, National Park Service, Northeast Region, Philadelphia, Pennsylvania. 136 pp.

Mountain Valley crosses streams in both states potentially supporting candy darter including (but not limited to) the Gauley and Greenbrier rivers in West Virginia and Stony Creek in Giles County, Virginia. In Virginia, Mountain Valley's proposed crossing of Stony Creek is downstream of the gypsum plant in Kimbalton and downstream of the known candy darter population. A 1994 study indicated that the species was uncommon in Stony Creek but found above the gypsum plant in Kimbalton and therefore upstream of the MVP crossing. Jenkins and Burkhead (1994).<sup>17</sup> Extensive surveys in 1995 in Stony Creek demonstrated that the species was distributed throughout the upper portion of Stony Creek upstream of the gypsum plant at Kimbalton. (Leftwich et al. 1996).<sup>18</sup> Additionally, as stated by the U.S. Forest Service George Washington & Jefferson National Forests (2002),<sup>19</sup> candy darters "are commonly found in Big Stony Creek, perhaps solely above the gypsum plant at Kimbalton." (Big Stony Creek and Stony Creek are synonymous.) Lastly, Mountain Valley's consultations with VDGIF confirmed that literature reports that candy darters in Stony Creek are (generally) more common upstream than downstream.

The biggest threat to the candy darter from Project development and operations include sedimentation and temporary destabilization/removal of localized substrates during instream construction. Mountain Valley plans to cross these streams using dry-ditch (in contrast to wet-ditch) construction methods to minimize potential downstream sedimentation impacts. Additionally, the implementation of erosion and sediment control measures and adherence to time of year restrictions are expected to minimize any temporary effects to the candy darter from sedimentation. In addition, Mountain Valley has agreed to accommodate the Virginia Department of Game and Inland Fisheries' request to conduct fish removals at all perennial stream crossings in Virginia, immediately prior to instream dewatering. Therefore, all fishes will be removed from the instream construction footprint, limiting potential impacts to candy darters, if present. Copies of communications with applicable resource agencies were uploaded to the docket and referenced as Attachment DR4 RTE 5.

**USFS Comment No. 61:** The discussion on orangefin madtom contains no habitat or species information related to potential impacts from the pipeline project, or distance to known populations. The conclusion that there will be no adverse impacts on this species because MVP is following TOY restrictions is weak.

**Mountain Valley Response No. 61:** The orangefin madtom species, habitat and known population information is included in the updated Biological Evaluation.

**USFS Comment No. 62:** The discussion on mussels contains no habitat or species information related to potential impacts from the pipeline project, or distance to known populations.

**Mountain Valley Response No. 62:** Mussel species, habitat and known population information is included in the updated Biological Assessment and Biological Evaluation.

**USFS Comment No. 63:** This section references the BE and determinations from the BE. The FWS is currently going through analysis to determine if the candy darter warrants federal listing. MVP needs to make sure effects analysis supports the determination that the project will not cause a trend toward federal listing.

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<sup>17</sup> Jenkins, R. E. and N. M. Burkhead. 1994. The freshwater fishes of Virginia. American Fisheries Society, Bethesda, Maryland.

<sup>18</sup> Leftwich, K. N., C. A. Dolloff, and M. K. Underwood. 1996. The Candy Darter (*Etheostoma osburni*) in Stony Creek, George Washington - Jefferson National Forest, Virginia: trout predation, distribution, and habitat associations. U.S. Department of Agriculture, Forest Service, Center for Aquatic Technology Transfer, Department of Fisheries and Wildlife Sciences, Virginia Polytechnic Institute and State University, Blacksburg, Virginia.

<sup>19</sup> U.S. Forest Service George Washington & Jefferson National Forests. 2002. AEP 765kv Transmission Line, American Electric Power Transmission Line Construction, Jacksons Ferry, Virginia to Oceana, West Virginia. Supplemental Draft Environmental Impact Statement, Volume 3. Pg. 3.9-1.1

**Mountain Valley Response No. 63:** Please see Response No. 60.

**USFS Comment No. 64:** The EIS should contain an effects analysis of locally rare and MIS species, in addition to noting that mitigation measures would protect them. At a minimum, the document should indicate whether the populations would be expected to increase, decrease, or be unaffected by the project, based on changes of habitat in the vicinity.

**Mountain Valley Response No. 64:** No locally rare species were identified during Project surveys conducted on JNF. An Allegheny woodrat (*Neotoma magister*) midden was identified on an abandoned crossing of the JNF in Giles County, Virginia; however, no signs of the species were identified along the proposed alignment. Additionally, no locally rare plant or avian species were observed during surveys. For the locally rare species not addressed during surveys, no suitable habitat was available along the proposed alignment or the Project is outside of their known range. Refer to the Locally Rare Species list for determinations regarding population increases and decreases.

There are eight Management Indicator Species (MIS) for JNF. All biologist observations were documented during survey efforts for the Project on JNF. Numerous sightings and calls were documented from the northern flicker (*Colaptes auratus*), pileated woodpecker (*Hylatomus pileatus*), eastern wild turkey (*Meleagris gallopavo*), and barred owl (*Strix varia*). Additionally, numerous sightings (and signs – scat/tracks) of white-tailed deer (*Odocoileus virginianus*) and black bear (*Ursus americanus*) were recorded.

Activities associated with the construction of the Project may result in the creation of foraging or nesting areas that could benefit MIS such as the northern flicker, white-tailed deer, and eastern wild turkey. Populations of these species could increase as a result of the Project. Species that may be negatively affected by the destruction or fragmentation of habitat include the pileated woodpecker, barred owl, and possibly black bear; however, these negative impacts/population decreases are expected to be temporary.

**USFS Comment No. 65:** The Landslide Mitigation Plan has not been submitted to the Forest Service for review. The Forest Service has requested that a plan specific to NFS lands be developed and submitted for review

**Mountain Valley Response No. 65:** Mountain Valley submitted the Landslide Mitigation Plan to the USFS in the December 22, 2016 filing and an update will be included as an appendix to the revised POD.

**USFS Comment No. 66:** Permanent impact to soils would also include areas where topsoil is removed and not replaced or mixed with subsoil. The impact in such a case would be loss of soil productivity. Topsoil stockpiling is an important mitigation over the trench and permanent ROW where bladed.

**Mountain Valley Response No. 66:** Mountain Valley will segregate topsoil on USFS property as discussed in a November 11, 2016 filing with the USFS.

**USFS Comment No. 67:** Another construction activity not mentioned is access road(s) construction or improvement. Include discussion of access road(s).

**Mountain Valley Response No. 67:** Details on road improvements and the crossing are provided below and will be included in the forthcoming POD:

#### **Road Improvements**

Prior to the start of construction, MVP will replace and insert the following culverts and prepare the road for truck traffic. Grading will include back dragging ruts, filling in pot holes, and leveling the road surface.

## **Pocahontas Road (FR #972) Construction Plan**

### Overview

- MVP will undertake grading to level the roadway bed and remove rutting in approximately nine areas. Additional areas may be identified as needing grading during construction;
- MVP will widen the roadway bed in approximately eight areas. Widening will include expand the road surface widening could include tree clearing, brush/limb removal, and grading;
- MVP will replace five existing culverts and install three new culverts along the route. Culverts were evaluated in the field. Any culvert that looked to be unstable or overtopped was marked for replacement. MVP then conducted an analysis and designed the replacement culverts to carry flows associated with a ten year, 24-hour storm event using SCS/TR-55 methodology in accordance with Virginia Department of Environmental Quality Standards; MVP will place stone in several areas and clean out drainage ditches where necessary during pre-construction preparation, construction, and reclamation;
- MVP will install a wash rack within the additional temporary work space at the beginning of Clendenin Road to keep equipment clean when leaving and entering the JNF.

### Locations of Specific Improvements

- 7+00 – 18+50 – grading
- 30+00 – 37+00 – grading
- 31+00 – 38+00 – grading
- 41+00 – 43+00 – widen and grading
- 45+00 – 46+00 – widen
- 48+00 – replace an existing 18-inch culvert with a 30-inch culvert
- 59+00 – 70+00 – grading
- 75+00 – 79+00 – widen
- 76+10 – install a new 48-inch culvert
- 84+00 – 89+00 – grading
- 93+50 – replace existing 18-inch culvert with a 36-inch culvert
- 99+00 – 114+00 – grading
- 101+50 – install a new culvert 42-inch culvert and widen the road
- 130+00 – extend replace existing 18-inch culvert with a 30-inch culvert
- 129+00 – 133+50 – grading and widen
- 150+00 – 155+00 – grading and widen
- 152+50 – extend and replace the existing 24-inch culvert with a 42-inch culvert
- 204+00 – 209+00 – widen
- 219+00 – 223+00 – widen
- 220+00 – install a new 18-inch culvert
- 252+10 – temporarily removing the existing gate
- 263+00 – 266+00 – widen
- 264+50 – replace or repair existing 60-inch culvert
- 275+00 – 279+00 – widen
- 304+00 – 309+00 – widen

- 309+00 – extension of the existing road

### **Mystery Ridge (FR #11080) Road Construction Plan**

- MVP will undertake moderate to heavy blading and roadway bed widening from the intersection of Pocahontas Road heading north until the area indicated on the alignment sheets that says “end Mystery Ridge Road construction.”
- There are no existing culverts and MVP currently has no plans to add new ones.
- MVP will place stone as needed during pre-construction preparation, construction, and reclamation.

### **Crossing Brush Mountain (FR #188)**

Brush Mountain Road will be crossed by the Project. MVP intends to open-cut the road. Temporary closure of the road is not expected to exceed five days. The road surface will be returned to original conditions post installation of the pipeline.

**USFS Comment No. 68:** Verify that visual simulations were submitted by Mountain Valley and received by FERC prior to the end of the DEIS period. Please see the Forest Service’s information request for additional visual analysis filed on December 12, 2016.

**Mountain Valley Response No. 68:** The Jefferson National Forest Visual Impact Assessment will be submitted to the USFS and FERC in February 2017.

**USFS Comment No. 69:** The FEIS needs to discuss route alternative(s) that avoid NFS lands and reasons why they are not analyzed in further detail. The Forest Service has requested that MVP provide such an alternative. The Forest Service requires this information to support a decision.

**Mountain Valley Response No. 69:** Mountain Valley’s alternative analysis will be included in the SF-299 that will be submitted to the BLM and FS for the right-of-way grant.

**USFS Comment No. 70:** FERC recommends that: “Prior to the end of the draft EIS comment period, Mountain Valley should file with the Secretary a plan that describes how long-term and permanent impacts on migratory bird habitat would be minimized. This plan should include an emphasis on high quality and/or larger intact core interior forest areas. This plan should also document consultations with the FWS, FS, WVDNR, and VDGIF.” As of this time, no consultations have occurred in reference to the significant impacts to high quality forest interior core areas on the Eastern Divide Ranger District or the Supervisor’s Office of the Jefferson National Forest.

**Mountain Valley Response No. 70:** Mountain Valley submitted an initial draft Migratory Bird Conservation Plan in January 2016 and a revised draft in October 2016. Based on comments received from USFWS and the State of Virginia, revisions to this document are currently underway. Current updates will be provided upon completion.

**USFS Comment No. 71:** The use of herbicides will be inevitable for the control of non-native invasive species, if not for maintenance of the ROW. We encourage MVP to analyze the effects of herbicide use in the EIS rather than defer to a later time and separate decision. Indeed, these could be considered connected actions and thus a Decision must be made in the EIS. Please see the Forest Service’s information request filed on November 15, 2016, MVP’s response filed on December 16, 2016, and information request filed December 21, 2016.

**Mountain Valley Response No. 71:** Mountain Valley filed a Herbicide Use Plan for use on USFS property on December 16, 2016. Mountain Valley will continue to coordinate with the USFS on finalization of this plan.

**USFS Comment No. 72:** In the Final Resource Report we noted: “disclosure of impacts in terms of acres by Major Forest Community types, as well as impacts to stands greater than 40 and 100 years old.” Please ensure this information is disclosed in the EIS as it was not included in the DEIS.

**Mountain Valley Response No. 72:** Please see the following table in regards to potential acreage impacts on USFS property. Tetra Tech created this data by clipping the pipeline route’s centerline to the prescription areas named old growth from the USFS Land and Resource Management Plan:

**MVP Hybrid Route LOD Intersecting Old Growth Within the JNF**

<b>Project Feature</b>	<b>Nearest MP</b>	<b>Designation</b>	<b>Management</b>	<b>Acres of Impact</b>
Access Road, ATWS	197.9	Old-Growth Forest Communities Associated with Disturbance	Unsuitable for new utilities	1.62
Access Road	197.9	Old-Growth Forest Communities Associated with Disturbance	Unsuitable for new utilities	0.67
Pipeline, ATWS	218.7	Old-Growth Forest Communities Associated with Disturbance	Unsuitable for new utilities	5.08
Pipeline	219.3	Old-Growth Forest Communities Associated with Disturbance	Unsuitable for new utilities	0.07
			total	7.44

**USFS Recommendations for Seed Mixes and Seeding Techniques (Accession Number 20161107-5124):** On December 15, 2016, USFS submitted recommendations for seed mixes and seeding techniques for the proposed Mountain Valley Pipeline Project.

**Mountain Valley Response:** Mountain Valley sent correspondence to USFS on February 15, 2017 stating that MVP will incorporate USFS’s December 15, 2016 recommendations for seed mixes and seeding techniques for the Mountain Valley Pipeline Project in the Jefferson National Forest.

Please feel free to contact me if you have questions or need any additional information. Thank you for your time and consideration.

Sincerely,

John Centofanti  
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