# Mountain Valley Pipeline Project

# Docket No. CP16-10-000

# Attachment DR4 Geology 8

February 2017

**Response:**

Mountain Valley evaluated the Indian Creek Report and notes that it neither documents nor demonstrates experience in the analysis of geologic hazards for natural gas pipeline construction in karst terrain, on steep slopes, or in the analysis of seismic hazards, materials, and engineering controls. It is vital that infrastructure projects such as the Mountain Valley Pipeline Project be evaluated for efficacy by scientific and engineering analyses. Mountain Valley developed numerous detailed analyses and documents on the topics of karst terrain, hydrogeology, foundation and slope analyses, water resources, seismic hazards analysis, and materials design. The resulting documents include the Karst Hazards Assessment, Karst Mitigation Plan, Seismic Hazards Assessment, Materials Engineering and Design, and the Water Supply Identification and Testing Plan.

| Comment | Response |
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| Acreage Requirements for Work Activities: | The Indian Creek Report states there will be over 100 acres of access roads associated with Project construction; however, many of the access roads included in this acreage are currently in use and would be improved for Project use. |
| Geology of Summers and Monroe County: | The Indian Creek Report discusses caves in the Avis Limestone. However, none of these caves in Summers County are within 10 miles of the proposed route. In fact, there are only two known caves in the Avis limestone that are over 1,000 feet in length and both are located in Mercer County, which is not part of the Project area. There is no risk to these caves from Project construction. |
| Geology of Summers and Monroe County: | Referring to the Abbs Valley Anticline in the Ellison Ridge area, the Indian Creek Report states that the underlying Greenbrier Formation is observed in caves accessed through openings in the overlying sandstone and shale. This statement is not accurate because there are no known caves on Ellison Ridge. |
| Table 2 and Table 3 – Karst. | These tables reference “open throats” for sinkholes even if the maps do not indicate open throats. The vast majority of sinkholes visited did not have open throats and exhibited bottoms that were consistent with the surrounding ground cover. |

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| Karst: | An un-named cave area is referenced in the Indian Creek Report. However, investigation of this area by the Karst Specialist Team determined that this is not a karst feature, but was developed entirely in sandstone and is not karstic in nature. This section of the Indian Creek Report also discussed Haala Cave, which is a small cave located in the creek bank approximately 2 miles downstream from the pipeline crossing of Indian Creek. It is not situated in a location relative to local hydrology that presents risk for impact from pipeline construction. |
| Seismic Hazards: | Mountain Valley addressed seismic hazards in Resource Report #6, and concluded that there is minor to negligible risk presented to the pipeline (i.e., design criteria are well within acceptable factor of safety). Mountain Valley is also addressing slopes and potential landslide activation from a seismic triggering event. Mountain Valley has determined that slopes are generally stable in this area and does not consider there to be a significant risk presented to pipeline, slopes, or karst features in the area referenced by the Indian Creek Report. |
| Soils of Summers and Monroe Counties: | The Indian Creek Report asserts concerns over topsoil formation after reclamation, the presence of acid-forming soils, negative impacts from soil erosion, and effects on soil permeability. Mountain Valley will stockpile topsoil during land clearing and use this for reclamation of the pipeline limit of disturbance. Mountain Valley is aware of the potential for encountering acid forming materials (AFM) during construction. An assessment of AFM was presented in Resource Report #6. Natural gas pipelines have been installed in many regions of the United States, included the Appalachian region, and there is no record of notable and extensive degradation of soil or related surface conditions due to pipeline construction and operation. |

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| Soils of Summers and Monroe Counties: | The Indian Creek Report asserts that blasting will probably be required for all areas where bedrock is less than 10 feet below ground surface. However, this assertion is false. Standard mechanical ripping will be sufficient to remove "red shale" along the proposed alignment in this area. Harder bedrock, if encountered, will be excavated to the extent possible, using rippers, breakers, and hoe rams. Blasting would be employed as a last resort, and is not anticipated to be extensive. |
| Water Resources of Summers and Monroe Counties: | This section did not present any new information that Mountain Valley has not already considered or accounted for through 1) proposed alignment adjustments, 2) avoidance-monitoring-mitigation techniques described in the Karst Hazards Assessment, Karst Mitigation Plan, Erosion and Sediment Control Plan, and 3) the Water Resources Identification and Testing Plan. |
| Streams: | The Indian Creek Report asserts that when aquatic habitats are impacted by the physical activity of trenching and utilization of stream crossing work spaces, the stream habitats cannot be restored. Based on the nature of the proposed construction (narrow excavation typically less than 10 feet below ground) Mountain Valley does not concur with the Indian Creek Report on habitat restoration. For pipeline construction projects, habitat restoration at stream crossings occurs rapidly. |
| Mitigation for Wetlands: | The potential for impacts to wetlands is not significant because Mountain Valley completed route adjustments to avoid these features to the maximum extent practicable. Wetlands that are impacted will be restored following the FERC's Procedures. |
| Hydrostatic Testing: | The Indian Creek Report asserts that disposing of thousands of gallons of hydrostatic test water would destroy aquatic habitat. On the contrary, all hydrostatic test water discharges will be conducted in upland areas with no discharge occurring directly to any waterbody, wetland, or other sensitive resources. As such, impacts from hydrostatic test discharges are not anticipated. |

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| Conclusions: | The remaining discussion presented in the Indian Creek Report regarding groundwater, groundwater and surface water interactions, and ecological systems. Mountain Valley has already addressed these issues with alignment adjustments to avoid potential risk for impact or through mitigation measures included in the Project plans referenced previously in this response. In addition, Mountain Valley has provided responses to the same or similar issues raised by the same author in the Roanoke County Hydrogeological Assessment. See the response to General, Question 3g. |