June 22, 2021

WV Department of Environmental Protection
Division of Water and Waste Management
401 Certification Program
601 57th Street SE
Charleston, West Virginia 25304

DEP WQS Comments - WQScomments@wv.gov

SUBJ: **Section 401 Water Quality Certification**
Mountain Valley Pipeline

TO WHOM IT MAY CONCERN:

In response to solicitation to provide comments on the Section 401 application for the Mountain Valley Pipeline (MVP), I, Kirk A Bowers, PE, provide expert comments on the documents submitted for review. I am a licensed Professional Engineer in the Commonwealth of Virginia. My review includes an evaluation of documents submitted as part of the application for stream and wetland crossings for the MVP in West Virginia. My long career included regulatory and quality control review of numerous construction plans as a Program Administrator and project manager for public agencies and private engineering companies.

Public Interest and Cumulative Effects: The decision whether to issue a permit should be based on an evaluation of the probable impacts, including cumulative impacts of the proposed activity, on the public interest. The benefit which reasonably may be expected to accrue from the proposal must be balanced against its reasonably foreseeable detriments.

COMMENT: The cumulative impacts of the proposed stream crossings are detrimental to the welfare of the public. Reasonably foreseeable detriments outweigh any possible benefits that may accrue from this project. Issuance of a permit is contrary to the public interest. Primary concerns include economics, wetlands preservation, fish and aquatic life endangerment, and water quality degradation.

SUMMARY OF COMMENTS: My comments include a review of the Attachments submitted with the application including stream and river crossing plans and profiles, stream data forms, and 2015 – 592 Tables 1 – 20. I reviewed the plans and tables for completeness, constructability and sediment loading impacts to downstream channels. Due to lack of time to review all of the crossings, my review was limited to primary stream channels.

Overall, the documents are not ready for review as they are lacking information and there are numerous errors in the Tables used to decide crossing methods for streams. The documents were hastily prepared with little thought about environmental impacts. Reasons used to justify choices of crossing methods are flawed or not relevant.

There are numerous errors in the application documents. The plan sheets do not include any erosion control measures on the construction plan sheets. On some plan sheets, it is stated that the erosion control devices were not shown so that the plan sheets would not be cluttered. At what point do the designers plan to show the erosion control measures on the plan sheets? How can construction proceed when the construction plans are substantially incomplete? Erosion control is a major issue at stream crossings. Yet, the plan sheets do not include any site details for erosion control measures.

Lack of adequate construction documents is a continuing trend for the MVP. Since the beginning of the project, construction plans were not adequately designed to avoid or minimize sediment flowing into adjacent waterbodies. Adequate plan review is not performed due to time constraints imposed on review agencies. There are thousands of documents to review with little time for public or agency reviews. As a result, numerous errors are missed and poor decisions are made which results in more siltation to streams, rivers and aquatic species habitat.

Attachment J, Construction details

1. Sheet 4 shows typical streambank stabilization details using rip rap or rolled erosion control matting. Show the approximate location and type of streambank stabilization on all Resource Crossing plan sheets.

2. Typical stream crossing details, note 3, states that all soil stockpiles must be placed at least 10 feet from top of stream bank. Upon review of stream crossing plan sheets, locations of stream bank tops are not shown in most locations. Without location of top of banks, the soil stockpiles cannot be located.

Revise all stream crossing plans sheets to indicate locations of top of stream banks and soil stockpiles.

2015-592 Tables 1 – 20

1. Table 2, Stream Impacts. This table lists temporary and permanent impacts for stream crossing lengths, area of impacts and fill volumes for the open cut crossing method. It also references the Figures in the Detail Maps for the Individual permit crossings.

However, Table 2 does not reference the Resource Crossing plan sheets for each stream crossing. The Detail Maps only show the locations of the stream and wetland crossings with topography and land features. These maps do not show construction details for each crossing. The Resource Crossing plan and profile sheets show general construction layout with topographic features for stream crossings. Revise the title of the Detail Maps to read "Location Maps for individual permit crossings".

Revise Table 2 to include a column that references the Resource Crossing plan sheets.

2. Table 2 includes columns for calculated areas of impact and fill volumes. There are no calculations provided in the application that verify the areas of impact and fill volumes. In order to provide verification of calculations, submit detailed engineering calculations for review. Reference the calculations in the plan sheets.

3. This General comment applies to all plan sheets in attachments H - 2 for spreads A thru I. The Notes on each sheet state that:

- *APPROVED E&SC BMPS HAVE BEEN REMOVED FOR CLARITY.*
- *SPOIL FROM CROSSING TO BE LOCATED MINIMUM 10' FROM BANK.*

All of the plan sheets are incomplete. They do not show the trench excavation width on the plan sheets. Erosion control perimeter measures are not shown adjacent to stream crossings. There are no top of banks delineated on plan sheets. Information is lacking for construction of trench excavation across stream. It would be advisable to conduct a geotechnical investigation of subsurface conditions as part of analysis for crossing method determination.

4. Stream crossing data was used on plan sheets to check the calculations for impact areas and fill volumes. The results of sample calculations do not agree with the amount of impact areas and fill volumes given in Table 2. Several sample calculations are shown below:

EXAMPLE: Stream crossing S-A1A shows the following in Table 2:

Temporary impact = 80 linear feet
Temporary impact area = 0.0641 acres = 2,792 square feet
Temporary fill volume = 1,034 cubic yards = 27,918 cubic feet

Dividing the impact area of 2792 square feet by impact length of 80 feet equals impact width of 34.9 feet. This would be shown as:

2792/80 = 34.9 feet for the width of impacted area.

The actual trench width used during excavation is 10 feet. There is no correlation with the actual trench width used during excavation. The measurements used in all of the calculations were not given.

Multiplying trench depth of 7 feet, which includes 3 feet of cover and 4 feet for pipeline diameter with pipe wall thickness, by the impact area of 2792 square feet equals 19,544 cubic feet or 724 cubic yards.

This is shown as:
7 x 2792 = 19544 cf / 27 cubic feet per yard = 724 cubic yards

Table 2 shows 1,034 cubic yards which is a difference of 310 cubic yards. The calculations do not agree.

How were the numbers shown in Table 2 calculated? Provide a detailed explanation of calculations.

5. Stream S-A125 is listed as 20 linear feet of impact length in Table 2. On sheet 5 of 28, Resource crossing in Attachment H-2a, Spread A, stream S-A125 is shown with an ordinary high-water mark width greater than 20 feet. On sheet 6 of 28, Resource crossing, Attachment H-2a, Spread A, the profile for the crossing is not shown. This stream crossing was shown on the plan view, but not on the profile.

6. The length of impact is much longer than 20 feet for Stream S-A125. The total impact area and volume of fill are both incorrect. Review and revise all calculations for this stream crossing. Include Stream S-A125 in the profile view. It is missing.

7. RESOURCE NAME: S-I63. Sheet 15 of 30, Attachment H-2B graphically shows the stream crossing at 26 feet. The profile for S-163 shows an OHWM of 20 feet. Table 2 lists the linear impact at 60 feet. Table 15 lists linear impact at 74 feet. Which number is correct?

   Sheet 15 of 30, Attachment H-2B has additional errors:

   - Sandbag dams are shown as 100 feet on both sides of stream. The dam extends up a 45-degree slope on the east side of crossing. As shown on the pan sheet, the cofferdams are not shown correctly.
   - There is an offset shown for the permanent easement at the stream crossing. The maximum width of the permanent easement is shown as 70 feet. The permanent easement is 50 feet, unless there was a reason to widen the easement. Why was the easement offset and widened for this stream crossing?

This also affects the LOD width as shown the plan sheet, which measures over 145 feet.

Review and revise Sheet 15 to show correct easement widths and locations of cofferdams.

8. RESOURCE NAME: S-VV2. Sheet 29 of 30, Attachment H-2B, graphically shows the stream crossing at 25 feet. Sheet 30 of 30 profile shows an OHWM of 20 feet. Table 2 lists the impact length at 90 feet. Table 15 lists the impact length at 145 feet. Explain and correct the length of impact.

9. RESOURCE NAME: S-L60, Left Fork Knawl Creek. Sheet 1 of 60, Attachment H-2C graphically shows the stream crossing of 30 feet. Table 2 lists the impact length at 60 feet. Table 15 lists the impact length at 42 feet. Explain and correct the length of impact.

   Table 15 for S-L60 states that:

   The pipeline has already been installed under Big Knawl Road and there is a fully restored steep hill adjacent to the pipe tie-in. Trenchless methods are technically and logistically difficult for this crossing because they would require the removal of the completed road bore and are not less environmentally damaging than this temporary stream impact because the steep hill adjacent to the crossing, which has been fully restored, would have to be re-disturbed to complete a bore. A minor temporary impact associated with the bore to maintain access will be required.

   Comment: The plan view shows the pipeline constructed to a point that is 10 feet from the OHWM of Left Fork Knawl Creek. The location of a bore pit would be on the south side of the Creek which has a gentle slope and would not require disturbing the restored area on the north side of the Road. The pipeline profile on Sheet 2 indicates the pipeline with 3 to 4 feet of cover.

   This statement led to the decision to use Open Cut method for stream crossing. It is fallacious and requires further evaluation.

10. RESOURCE NAME: S-LL1. The OHWM for Knawl Creek is shown as 30 feet on Sheet 3 of 60, Attachment H-2C. Table 2 lists the impact length as 88 feet. Table 15 lists the impact length as 66 feet. Review and revise the impact length of stream LL1. They should be in agreement.

Table 15 for stream LL1 states:

This crossing is located adjacent to a steep slope that is extremely long, approximately 420-feet in length with an average slope exceeding 45%. The bore pits are estimated to be nearly 30 feet. These factors create logistically difficult construction conditions, complicated winching systems, and excessive spoils. Furthermore, the time to complete the trenchless crossing is nearly double the duration a.

The north of stream crossing LL1 has a gentle, flat slope with ample room for a bore pit. There is a 30-foot landing on the south side of the stream below a steep slope that could accommodate a receiving bore pit. No winching would be required for a bore pit on south side of stream. This statement was used to decide on the crossing method.

The statement is contrived and fallacious. The time for completion of the crossing is not relevant and is not a reason for selection of crossing method. Re-evaluate the crossing method for this stream crossing.

11. RESOURCE NAME: S-J70. Table 2 lists the impact length as 77 feet. Table 15 lists the impact length as 62 feet. Review and revise the impact length of stream S-J70. They should be in agreement.

    Table 15 for stream J70 states:

    This stream is located in a valley with long and steep slopes on both approaches. The bore pits are projected to be nearly 50-feet deep, which creates logistically difficult construction conditions and insufficient area for a bore pit soil stockpile.

    As shown on the plan view, page 7 of 60, Attachment H-2C, the toe of slope on the south side of the stream crossing is more than 40 feet. The slope on the north side of the crossing is relatively gentle. There are no long and steep slopes visible on the plan view. The statement in Table 15 is not true.

    Furthermore, and the cost to avoid the temporary impacts is unreasonably high relative to the proposed construction method.

    <u>Cost is not a relevant factor</u> for determination of crossing method. In this instance, the engineer has made a decision based on cost analysis in order to keep costs low for the client. The decision was not objective. Re-evaluate crossing method for this stream crossing.

12. RESOURCE NAME: S-A11a & S-A11a-BRAID-2. Attachment H-2A Spread A, page 13. The proposed pipeline is shown running for more than 45 feet in the stream bed under the stream. The pipeline runs parallel to the stream centerline instead of perpendicular to the stream flow.

    It is stated in the Individual Permit Application, Section **5.2.5, Stream Crossing Geometry** that "*Mountain Valley will minimize the impacts of instream construction by installing the pipeline as close to perpendicular to stream courses as practicable. Furthermore, where site conditions require that the ROW cross a stream at a relatively shallow angle, field adjustments to the placement of pipeline within the approved ROW will be made to increase the crossing angles for these streams to the maximum extent practicable in light of the site conditions, thereby reducing or eliminating low-angle crossings.*"

    Review and revise stream crossing location and plan. Review the method for stream crossing. At this location, the construction easement may not provide sufficient space for stream crossing alignment.

    In Stream S-A11a, Table 15 shows a crossing length of 96 feet with the stream braids included. Table 2 shows an impact length of 113 feet with another 11 feet and 77 feet of impact lengths shown for Braids 1 and 2. Are the correct lengths shown?

13. RESOURCE NAME:S-UU5. Attachment H-2A Spread A, page 19, plan and profile sheets.

    Stream S-UU5 is shown as 4 feet wide on plan and profile. Table 2 shows 79 linear feet for impacted length. Table 15 shows 190 feet as crossing length. Which is the correct length?

    It is stated that "*This crossing is located on long and steep slope that would involve logistically difficult construction conditions, an extensive equipment winching system, and an excessively deep bore pit (37') that would require benching for a trenchless crossing. Furthermore, the estimated time to complete a trenchless crossing is nearly twice as long and the cost to avoid the temporary impacts is unreasonably high relative to the proposed construction method.*"

    This statement is not correct. There are flat slopes at bottom of the steep slopes that may provide sufficient space for bore pits. The profile view indicates a trench depth of 8 feet across the stream valley which is far less than 37 feet indicated in the text for bore pit depths. Re-evaluate this location for boring under stream and wetlands. Provide geotechnical investigation of subsurface conditions as part of analysis of crossing methods.

14. RESOURCE NAME: W-K43, S-K73, W-K44 & S-K75. Attachment H-2A Spread A, page 21.

    Stream S-K74 does not appear to be impacted. Correct Table 2 to delete S-K74. Table 15 shows the crossing length as 286 feet. This is more than the total of all lengths shown in Table 2 for this crossing. Revise Table 15 to reflect correct lengths.

15. RESOURCE NAME: S-I63. Attachment H-2b Spread B, page 15.

    Table 2 lists impact length as 60. Table 15 shows crossing length of 76 feet. Which is the correct length?

    In Table 15, It is stated that "*This crossing is located in a valley that has long and steep slopes on both sides which would require an extensive equipment winching system and excessively deep bore pits. The available area to store the excess material is extremely limited due to the narrowed ROW and county road.*" The area below the County Road may offer enough space for a bore pit. Where is the top of stream bank located? Review site plan.

    Re-evaluate this location for a boring operation. Conduct a geotechnical investigation of subsurface conditions as part of analysis for crossing method determination.

16. RESOURCE NAME: S-B2A, S-B3A & W-A40. Attachment H-2A Spread A, page 11.

    In Table 15, It is stated that "*This crossing is located on a long and steep slope on one side that would create logistically difficult construction conditions and would require an excessively deep bore pit for a trenchless crossing*."

    Stream crossing at S-B3A and wetland crossing W-A40 have low slopes in areas on both sides of crossings. The pipeline could be shifted west to provide more space for bore pits. <u>Re-evaluate this location for a boring operatio</u>n. Conduct a geotechnical investigation of subsurface conditions as part of analysis for crossing method determination.

Table 15 lists 243 feet as crossing length. Table 2 lists 212 total feet of linear impact. Which is the correct length?

How were the fill volumes calculated? The profile view shows no sections for streams.

17. RESOURCE NAME: W-CD-16, S-VV12 & W-VV8. Attachment H-2B Spread B, page 25.

    Table 15 lists 132 feet of crossing length. Table 2 lists 77 total feet of linear impact. Which is the correct length?

    In Table 15, It is stated that "*This multiple resource crossing presents several factors that support an open-cut crossing. The resources are located on a steep slope that is extremely long, which would require a winching system of nearly 900-feet. In addition, the bore pits would be 35-feet deep, resulting in an excessive amount of soil, with limited area for storage.*"

    The areas adjacent to S-VV!2 and W-VV8 shown on the plan view are relatively flat and may provide space for bore pits on either side. Shift pipeline west to maximize space for bore pits. Re-evaluate this location for a boring operation. Conduct a geotechnical investigation of subsurface conditions as part of analysis for crossing method determination.

    The plan view does not confirm that a 900-foot winching system is required to access this location. Provide a plan and profile view of the steep slopes next to the crossing locations that show the total length of the slopes.

18. RESOURCE NAME: S-UV11.

    In Table 15, It is stated that "*Stream S-UV11 is a perennial stream located adjacent to a steep slope that is extremely long, nearly 800 feet in length with an average slope exceed 45%. The bore pits are estimated to be over 20 feet which would require benching and additional area for spoil storage.*"

    As shown on drawing number B-BP-WV-LE-4230-OC-REV2, page 27 and 28, Attachment H-2b, Spread B, this statement is not accurate as the slope adjacent to the north side of stream crossing is 4.7% slope which is much lower than 45%. On south side of crossing, the slope rises 6 feet in a 40-foot section at 16.7% which is much less than 45% referenced in the statement. Re-evaluate this location for a boring operation. Conduct a geotechnical investigation of subsurface conditions as part of analysis for crossing method determination. This is a candidate for boring under stream S-UV11.

The plan view does not confirm that an 800-foot winching system would be required to access this location. Provide a plan and profile view of the steep slopes next to the crossing locations that show the total length of the slopes.

19. RESOURCE NAME: S-A97 & S-A98. Shown on pages 23 & 24, Attachment H – 2c, Spread C.

    Table 2 lists crossing S–A98 as **392** lf of impact length. Table 15 lists crossing length as **121** feet. Clarify the differences in impact lengths.

    Review of plan sheet, page 23, indicates that stream crossings lengths impacted by placement of cofferdams are excessive. Revise the plan sheet to show less stream impacts by reducing the distance between cofferdams. As shown on plan sheet, the length of impact can be reduced.

    On steep slopes, it is probable that rock will be encountered at the stream crossing locations. Typically, in this area with slopes over 30%, rock is often near the surface. There are shallow layers of soil on areas with steeper slopes. It would be advisable to conduct a geotechnical investigation of subsurface conditions as part of analysis for crossing method determination.

20. RESOURCE CROSSING: S-E67. Right Fork Holly Creek. Shown on pages 33 & 34, Attachment H – 2c, Spread C.

    Table 2 lists crossing S– E67 as **92** lf of impact length. Table 15 lists crossing length as **147** feet. Clarify the differences in impact lengths.

    The LOD is 75 feet wide at all stream crossings. How can the impact lengths be greater that the LOD?

    It is stated in Table 15 that "*The open cut method would result in a temporary impact Right Fork Holly River. Avoiding/minimizing these minor impacts through a conventional bore would require a relatively deep bore pit of nearly **30 feet** on the edge of a long steep slope and the excavation of an interim ramp/bench. The additional equipment and excess spoil materials will greatly limit the available space in a work area that has already been minimized.*"

This statement is inaccurate. The profile on sheet 34, Att. H-2C, shows a gentle slope on the east side of crossing and a shelf set back from the top of bank on west side of crossing that can be used as a bore pit location. The depth of bore pits would be less than 15 feet on both sides of crossing.

In Attachment I-3_Forms 2, the Top of Bank Width is listed as 85 feet with a high-water depth of 4 feet. Flow depth is listed as 2 feet. The May 2015 photos for this crossing show a boulder and rock-strewn channel with substantial flow. The profile for the crossing shows that there is space for bore pits and soil stockpiles. However, from the 2015 photos, there is strong evidence of rock substrata that will require blasting or rock breaking equipment to excavate trench for pipeline. The stream width and flow at this location excludes use of the open cut crossing method. Additional geotechnical subsurface evaluation is strongly advised.

Review and revise crossing method for this location.

21. RESOURCE NAME: S-B34, S-B35, S-B36, W-B35, S-B37/38, S-B42, S-B39b, S-B39a/B46, S-B45. Shown on pages 57 & 58, Attachment H – 2c, Spread C.

In Table 15, it is stated that "*These crossings are located along steep slopes and would require the installation of bore pits nearly **40** feet deep requiring the excavation of an interim ramp and bench and dramatically increasing the space occupied by the bore pit and spoil pile. The bore pits would need to be located on a steep slope that would require a logistically difficult winching process.*"

This statement is not accurate. In the profile shown on sheet 58, Att. H- 2c, the depth of bore pits would not exceed 10 feet. The slope is fairly low across the length of all crossings at this location. There is space to construct a bore pit between crossings to reduce the length of borings. The decision to use open cut crossing method was based on construction length of time and expense. The engineer made the decision to use the open cut method because it is less expensive than boring under streams. Boring under streams is more expensive and takes more time.

Review and revise the crossing methods for this location. The statement that "bore pits of nearly 40 feet deep" is exaggerated, conflated and inaccurate. It is clearly shown on the profile that the bore pits would be in the 10 feet depth range.

22. RESOURCE CROSSING: S-04. Shown on pages 59 & 60, Attachment H – 2c, Spread C.

In Table 15, it is stated that "*This crossing is situated on a long steep slope leading into the resource. The topographical constraints would create an extreme winching system, creating a logistically difficult construction condition and deep bore pits.*"

<u>This statement is not accurate</u>. In the profile shown on sheet 60, Att. H- 2c, the depth of bore pits would be 10 to 15 feet deep. There is plenty of space for soil stockpiles on east side of crossing. Low slopes on east side of crossing would not require winching of equipment. Review and revise the crossing methods for this location.

23. RESOURCE NAMES: S-F36b. Shown on pages 1 & 2, Attachment H – 2d, Spread D.

    Table 2 lists crossing length impact of 78 feet. Table 15 lists stream crossing length as 38 feet. Clarify the differences in impact lengths.

    It is stated in Table 15 that the decision to use the open cut method was made because "*A trenchless crossing method at this location could not be completed without excavating a bore pit within a landowner's driveway and blocking access to their home. This situation would continue for several weeks. Accordingly, a trenchless crossing of this resource has been deemed logistically impracticable*."

    Please show the driveway to the home on sheet 1. The plan view of this crossing does not show a driveway at this location.

24. RESOURCE NAME: S-A65. Big Beaver Creek. Shown on pages 39 & 40, Attachment H – 2d, Spread D.

    Table 2 lists impact length of 77 feet. Table 15 lists crossing length of 99 feet. Clarify the difference in lengths.

    There is large amounts of stream flow and depth at this location. The stream width is 70 feet wide. Trenching method for this crossing requires a phased approach to build a coffer dam on one side of Beaver Creek and install the pipeline halfway across the stream. Then build a coffer dam on the other side of stream crossing and complete the pipeline installation. This is a common method used for streams with larger flow rates and channel widths. It is necessary to evaluate subsurface conditions before beginning construction in order to determine whether there is rock and boulders below the stream bottom.

Review methods and details for construction at this crossing. Due to high stream flow rates and water depth, the open cut method for this crossing is not an option.

25. RESOURCE NAME: S-J25 & S-J24. Shown on pages 47 & 48, Attachment H – 2d, Spread D. The plan view on sheet 47 shows two stream channels for S-J24. Both have 15-foot stream bank widths. However, shown in Appendix I-3, Forms-4, sheet 54, the top of bank width is listed as 15 feet. There appears to be a duplicate of stream J24 that is not a valid stream. Please review information on stream J24.

    The profile of the crossing on sheet 48 shows a depth of 8' MIN. FOR SCOUR MITIGATION to the top of the pipeline. The previous pipeline profiles show 3- or 4-feet minimum cover over top of pipeline. What is the reason that this stream crossing is deeper than others?

    It is stated in Table 15 that "*This area has been subject to frequent flooding from adjacent streams, which previously caused Mountain Valley to relocate a mainline valve to a different location. These conditions present an unacceptable risk for crews and equipment completing a bore at this location over an extended duration.*"

    Please show the adjacent streams that caused the flooding and show the limits of the floodplain on the plan view. This area is a candidate for boring as it has a low slope gradient on either side of stream J24.

    Review methods and details for construction at this crossing.

26. RESOURCE NAME: S-I36. Shown on pages 73 & 74, Attachment H – 2d, Spread D. Table 2 lists crossing length impact as 77 feet. Table 15 shows crossing length of 116 feet. Explain the difference in lengths.

    It is stated in Table 15 that "*D-058 and D-059 are adjacent crossings are discussed together due to their proximity. These crossings present multiple confounding constructability challenges that limit the available options and necessitated the development of a unique solution. The access to the location of these crossings is severely limited by long steep slopes, and there is insufficient suitable workspace.*"

    What is the "*unique solution*" stated in the narrative? There are no details shown on sheet 73 that indicate the above referenced solution. The profile for this area indicates lower slopes on both sides of crossing. There is space between the adjacent crossing for a bore pit.

The flow rate for Hominy Creek is higher than most crossings for most of the year. The width and depth of the stream require carefully constructed flow diversions in order to use open cut methods. This crossing would require a phased approach to trenching. It is too wide and too much water flows through this stream. A detailed phased plan is required for construction.

It is the engineer's responsibility to design a plan that can be built. The plan on sheet 73 does not show enough details for construction. Revise and re-submit plans for additional review.

Show additional profiles and plans that indicate the "*long steep slopes*" that limit access to this crossing location. The profile shows slopes that are less than 10% on either side of crossing. This area has a high probability of subterranean rock that would require a ramhoe for trench excavation. A geotechnical investigation is necessary for this location to determine the extent and type of rock.

27. RESOURCE NAME: S-H88. Shown on pages 1 & 2, Attachment H – 2e, Spread E.

    In Table 15 it is stated that "*A trenchless crossing method at this location could not be completed without excavating a bore pit within proximity to a landowner private drive. A trenchless crossing of this resource has been deemed logistically impracticable due to the need to maintain the landowner's access over an extended duration and the safety risk of operating heavy equipment for an extended time with a private landowner in close proximity and traversing the site*."

    Please show the driveway on sheet 1, plan view of crossing. The driveway is not shown. Photos of this area in Att. I-3, stream form 4, show more than 50% of the crossing has boulders and exposed rock on both sides of crossing. A geotechnical investigation is necessary for this location to determine the extent and type of rock. What methods will be used for trench rock excavation?

    Table 2 lists crossing length impact as 76 feet. Table 15 shows crossing length of 37 feet. Explain the difference in lengths.

28. RESOURCE NAME: S-L22. Shown on pages 25 & 26, Attachment H – 2e, Spread E.

    In Table 15 it is stated that "*Due to the location on steep slopes, the bore pits for this crossing are greater than sixty feet in depth which would create extremely excessive spoil piles in a topographical setting that would require a technically* *and logistically difficult winching system, all while being located within an already reduced LOD."* Review of the profile on sheet 26 shows a flat slope on both sides of stream L22. The depth of bore pits for the crossing would be 10 to 12 feet deep. Review and revise the crossing method for S-L22.

29. RESOURCE NAME: S-K17, Buffalo Creek. Shown on pages 1 & 2, Attachment H – 2f, Spread F.

    In Table 15 it is stated that *"A trenchless crossing in this location would require bore pits that are nearly twenty feet deep. Numerous cultural resources have been avoided by the current alignment. Avoiding/minimizing this minor impact through a conventional bore would create excessive spoil piles in an already reduced LOD."*

    What information indicates 20 feet for bore pit depths? Review of profile on sheet 2 shows bore pit depths in the range of 12 feet deep on both sides of crossing K-17. Shift the pipeline alignment to right of centerline to provide more space for bore pits, and to avoid crossing wetlands W-IJ30.

30. RESOURCE NAME(S): S-M3 / S-KL29, Hungard Creek. Shown on pages 31 & 32, Attachment H – 2f, Spread F.

    Table 2 lists an impact length of 155 feet. Table 15 lists crossing length as 208 feet. Clarify the difference in length.

    The flow velocity is fast and the rate of flow is high. This crossing requires a phased approach due to the amount of water flowing at this location. Show the phasing of stream excavation in detail on the plan sheets. A geotechnical investigation is needed to verify subsurface conditions. A substantial amount of rock and boulders can be seen in stream photo in Att. I-3, Form 5.

    In Table 15 it is stated that "*The pipeline has already been installed under an adjacent road (East Clayton Rd). There is no feasible way to tie the two sections of pipe together if a trenchless method is used to install this crossing. Lastly, substantial increase in cost and lost time (four weeks to complete bore) to avoid a temporary impact to this small, one-foot-wide stream is not appropriate and practicable*."

    Please include East Clayton Road on the plan sheet. It is not shown near the crossing location. Hungard Creek is not one-foot-wide. It is 40 to 50 feet wide.

<u>The statement above is not correct and shows lack of professional standards of care during preparation and review of the tables prior to submission</u>. There are numerous unexplained errors similar to this error throughout the tables. The data in these Tables was used to determine whether to use boring or open cut method for construction crossing methods.

The errors in the Tables lead me to believe that the decision-making process for determination of crossing methods was flawed. Persistent errors are an indication of poorly prepared plans. Decisions were made without regard for actual conditions in the field. This is a consistent theme for these documents.

31. RESOURCE NAME: S-J5, Kelly Creek. Shown on pages 41 & 42, Attachment H – 2f, Spread F.

    Table 2 lists impact length of 103 feet. Table 15 lists crossing length of 42 feet. Which is the correct length?

    It is stated in Table 15 that "*This crossing presents multiple challenges that limit the available options and necessitated the development of a unique solution. A bore pit depth greater than 20 feet requires the excavation of an interim ramp and bench and increases the space occupied by the bore pit and spoil pile.* ***Steep slopes (greater than 30%) adjacent to these waterbodies increase the complexity of a bored crossing****, increase safety risk to personnel, and add risk of impact to the waterbody from upland work during a bore. In addition, this crossing is on a property with a well or spring. The open cut method reduces the construction duration near the well/spring.*"

    <u>This statement is not an accurate depiction of site conditions</u>. The profile and plan sheets show low gradient slopes on both sides of stream crossing. Bore pits would be in the range of 10 to 15 feet deep as shown on profile, sheet 42. The well or spring noted in the narrative is not shown on the plan sheet. Include the well location in the plan view with distance to stream crossing. How far from stream crossing is the well?

32. RESOURCE NAME(S): S-A60, S-A63 / S-A61 / W-A13. Shown on sheets 45 – 48 in Attachment H – 2f, Spread F.

    Table 2 lists total impact length of 277 feet. Table 15 lists crossing length of 742 feet. There is a large discrepancy between the lengths. The decision to use open cut methods was partially based on the long length of crossing lengths shown in Table 15. Lumping all of the crossings into one length is not an accurate analysis or depiction of site conditions. The crossing for stream A60 should be included as a separate analysis.

Revise the pipeline alignment to reduce the impact on wetland W-A13. Shift pipeline to left of centerline.

It is stated in Table 15 that "*A trenchless crossing in this area would require bore pits that are nearly 20 feet deep.*" This is not an accurate statement as profiles of crossing shown on sheets 46 and 48 indicate shallow bore pits. The crossing locations are in areas with low gradient slopes.

33. RESOURCE NAME: S-CV19. Shown on sheets 55 – 56 in Attachment H – 2f, Spread F.

    This location is a candidate for boring. Areas adjacent to stream banks have level spaces set back from stream that allow space for bore pits. Photos of this area show an abundance of rock at the crossing. A geotechnical investigation is necessary to determine extent and type of subsurface rock.

34. RESOURCE NAME: S-E41 & S-E40, Dry Creek. Shown on sheets 71 – 72 in Attachment H – 2f, Spread F.

    Table 2 lists impact length of 82 feet. Table 15 lists crossing length of 48 feet. Which is the correct length?

    It is stated in Table 15 that "*Site conditions reduce the available space to stockpile spoils from bore pits. Karst terrain presents greater logistical and technical challenges.*"

    This not accurate. There is space for soil stockpiles. Bore pits would be shallow. A geotechnical investigation would confirm the presence of karst issues at this location. There are no constraints on boring at this location. Revise crossing method.

Dredging and Channelization

Dredging and channelization have led to "incalculable loss of aquatic habitat in the Southeast" (Warren Jr. et al. 1997). Dredging and channelization projects are extensive throughout the region for flood control, navigation, sand and gravel mining, and conversion of wetlands into croplands (Neves et al. 1997, Herrig and Shute 2002). Dredging and channelization modify and destroy habitat for aquatic species by destabilizing the substrate, increasing erosion and siltation, removing woody debris, decreasing habitat heterogeneity, and stirring up contaminants which settle onto the substrate (Hart and Fuller 1974, Williams et al. 1993, Buckner et al. 2002, Bennett et al. 2008). Channel modification is one of the primary contributors to the decline of freshwater mollusks because of substrate instability, headcutting, sedimentation, and actual removal of mussels from their beds during dredging operations (Hart and Fuller 1974, Williams et al. 1993). Neves et al. (1997) describe dredging as “a perpetual problem for sedentary mollusks that are displaced and killed in dredge spoils,” stating, “Endangered mussels of big rivers . . . have been under siege for decades by navigational dredging mostly by the U.S. Army Corps of Engineers. Even the presence of federally endangered species does not prevent the modification of habitats where these animals reside” (p. 71).

Dredging and channelization also threaten imperiled fishes, reptiles, crustaceans, and other species. Dredging removes woody debris which provides cover and nest locations for fish such as the Frecklebelly Madtom (Bennet et al. 2008)[1].

Project Track Record

If you look at the Mountain Valley Pipeline’s track record in West Virginia for failure to provide adequate water quality protection, it doesn’t foster much confidence. In fact, the pipeline has received 46 **notices of violation** for violating water quality standards.

Last year, a consent order from the West Virginia Department of Environmental Protection required the company to pay a $303,706 fine for repeated violations of erosion and sediment control regulations. WV DEP also fined Mountain Valley Pipeline $266,000 in 2019 for similar erosion and water contamination issues, and the Virginia Department of Environmental Quality fined Mountain Valley $2.15 million that same year for water quality violations in Southwest Virginia.

According to the consent order, sediment-laden water was allowed to escape the construction right-of-way due to failures of silt fences, water bars and other erosion control devices. Water bars were improperly installed, allowing runoff to accumulate downhill in quantities that overwhelmed retention sumps.

Mountain Valley also failed to adequately plant grass on denuded strips of land, which contributed to problems with runoff, the order stated. Inspectors often observed sediment in nearby streams, which can endanger fish and other aquatic life and cause problems with water quality downstream.

[1] Petition to list 404 aquatic, riparian and wetland species from the southeastern united states as threatened or endangered under the endangered species act. Center for Biological Diversity, April 20, 2010.

In May, 2019, twice in one month, the West Virginia Department of Environmental Protection issued violation notices on the Mountain Valley Pipeline. State regulators wrote the Mountain Valley Pipeline up for violating water quality standards in Monroe County.

The notice of violation, dated May 9, says MVP failed to put in controls that would have kept sediment-filled water from leaving the construction site. An inspection report from the same day shows perimeter controls and devices installed in a timely manner were “unsatisfactory.”

Threat to Endangered species

North American freshwater ecosystems and the many species they support are one of the most threatened ecosystems on the planet. During the Twentieth Century, at least 123 species of freshwater fishes, mollusks, crayfishes, and amphibians went extinct in North America, and hundreds more aquatic species are now imperiled (Ricciardi and Rasmussen 1999, Williams et al. **1992**). The projected extinction rate for U.S. freshwater animals is five times that of terrestrial animals, and is comparable to the extinction rate for tropical rainforests (Herrig and Shute 2002).

Aquatic and riparian habitats have been severely degraded by direct alteration of waterways such as impoundment, diversion, dredging and channelization. The degradation of aquatic habitats is a primary cause for the loss of biodiversity in streams and rivers (Allan and Flecker 1993). Dredging and channelization have led to “incalculable loss of aquatic habitat in the Southeast” (Warren Jr. et al. 1997). Dredging and channelization projects are extensive throughout the region for flood control, navigation, sand and gravel mining, and conversion of wetlands into croplands (Neves et al. 1997, Herrig and Shute 2002). Dredging and channelization modify and destroy habitat for aquatic species by destabilizing the substrate, increasing erosion and siltation, removing woody debris, decreasing habitat heterogeneity, and stirring up contaminants which settle onto the substrate (Hart and Fuller 1974, Williams et al. 1993, Buckner et al. 2002, Bennett et al. 2008).

Much of the rich aquatic fauna in West Virginia is threatened or already destroyed by pipelines and natural gas wellheads. In the Southeast section of this country, greater than 70 percent of mussels, 48 percent of crayfishes and 28 percent of fishes are considered endangered, threatened or of special concern by the American Fisheries Society (Williams et al. 1992, Taylor et al. 2007, Jelks et al. 2008).

For the Corps of Engineers Huntington District, Table 4, in the 2015-592 Tables, shows a Temporary fill volume of **55,957 cubic yards**, the equivalent of 5,597 dump truck loads of dirt. It is not clearly explained in the application where the volume of dirt will be placed. How much of this fill volume will flow into creeks or streams?

This is a significant volume of fill material which would be added to existing fill from other mining, fracking and pipeline construction projects. The cumulative impacts of existing and current land use combined with construction projects should be considered on a regional basis. The MVP is a major source of sediment pollution that when added to existing sources of pollution would exacerbate degradation of streams and waterways.

Sedimentation is one of the primary causes of habitat degradation in southeastern waterways (Neves et al. 1997). Sedimentation and siltation result from a variety of activities with silt reaching waterways during both ground-disturbing activities and storm events (FWS 2000). Suspended sediment threatens the entire aquatic community, from fish to invertebrates to birds. Richter et al. (1997) identify sedimentation as the major stressor affecting the ability of aquatic animals to recover from declines.

Sedimentation is responsible for nearly 40 percent of fish imperilment problems (Etnier 1997). Sedimentation has both direct and indirect negative effects on fish. Suspended sediments cut and clog gills and interfere with respiration. Sedimentation blocks light penetration, which interferes with feeding for species like minnows and darters which feed by sight (Etnier and Starnes 1993). For species which feed by flipping over rocks and consuming the disturbed insects, sedimentation increases the embeddedness of rocks, making them more difficult to move and decreasing habitat suitability for aquatic invertebrate prey (Etnier and Starnes 1993). Sedimentation also interferes with feeding behavior for nocturnal feeders like catfish and imperiled madtoms which catch aquatic insects by relying on the sensitivity of their barbels and on chemoreception, both of which are negatively affected by sedimentation (Todd 1973, Buckner et al. 2002). Benthic species require specific substrate conditions for spawning, feeding, and cover, all of which are degraded by sedimentation (Etnier and Starnes 1993, Warren et al. 1997). When sedimentation fills in the crevices between and beneath rocks, it decreases the availability of cover for resting and predator evasion (Herrig and Shute 2002). Madtoms, darters, suckers, and some minnows deposit their eggs on or near the substrate, and sedimentation interferes with their reproduction both by decreasing habitat suitability and by directly smothering eggs. Ultimately, excessive sedimentation can eliminate fish species from an area by rendering their habitat unsuitable (FWS 2000).

Inadequacy of Existing Regulatory Mechanisms

Pollution and habitat loss are two of the largest threats facing the petitioned species, all of which are dependent on healthy riparian and aquatic habitat for survival. The federal Clean Water Act provides a basic level of water quality protection for imperiled southeastern species, but is inadequate to ensure their continued survival without the addition of Endangered Species Act protection and Critical Habitat designation. The provisions of the Clean Water Act are inadequate to protect the petitioned species because pollution from point and non-point sources is causing ongoing degradation of water quality, current water quality standards are not effectively protecting sensitive species or sensitive developmental stages of species, and loss of stream and wetland habitat continues.

National Pollution Discharge Elimination System (NPDES), under which point sources are licensed and maximum pollutant discharge concentrations are set. The NPDES system is not adequate to protect the petitioned species from the negative effects of pollution because permits may be issued with few restrictions, cumulative effects of all the point sources within a watershed are not taken into consideration when permits are issued, and state governments often lack the resources or political will to monitor and enforce permits (Buckner et al. 2002)[2].

In West Virginia, adequate regulatory mechanisms to protect aquatic habitats from pollution are lacking due to jurisdictional issues and conflicting priorities. The state also has a history of lax enforcement of environmental laws:

> *"In many ways, West Virginia has been treated as a Third World country by the rest of the nation, or, perhaps more accurately, by industrial interests throughout the world. Industrial siting in the region is often based on the same criteria used to site plants in Latin American countries, i.e., lower salaries can be paid, tax rates on industries are lower, and perhaps most importantly, pollution laws and other measures to preserve environmental integrity are poorly enforced and easily circumvented by using political pressure" (Folkerts 1997, p. 11).*

The socioeconomic setting is such that when conflicts arise between economic development and species protection, economic development generally prevails (FWS 1997).

[2] Petition to list 404 aquatic, riparian and wetland species from the Southeastern United States as threatened or endangered under the Endangered species act, Center for Biological Diversity, April 20, 2010, p. 25.

Even if existing laws are strictly enforced, current water quality standards are not sufficient to protect sensitive species or sensitive life-stages of species. Water-quality standards are not based on toxicity testing of rare species, and some aquatic organisms are more sensitive to pollutants than the organisms which are used to establish the standards (Herrig and Shute 2002). Permitted activities may thus negatively affect rare aquatic species. Further, current standards are for surface water quality, and because sediments store and accumulate toxins, benthic species are not adequately protected by existing criteria[3].

Conclusion

Due to thousands of application documents, review agencies need additional time to perform thorough plan reviews in order to ensure that construction documents are correct and adequate for construction. The documents as submitted contain numerous errors and require extensive corrections in order to be constructable and compliant with regulatory standards.

Aside from the errors, all measures should be taken to avoid siltation of waterbodies. The Section 401 Water Quality application does not meet requirements for adequate protection of water quality. Major revisions are required to the application documents.

The application for this permit should be denied. There is a high risk of increased water quality degradation from open cut trenching construction methods for stream crossings. Additional review is needed to determine cumulative impacts to the watersheds that are crossed by the MVP.

Respectfully,

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[3] Petition to list 404 aquatic, riparian and wetland species from the Southeastern United States as threatened or endangered under the Endangered species act, Center for Biological Diversity, April 20, 2010, p. 26.