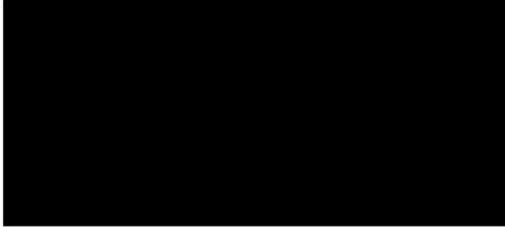




File Code: 6270

Date: OCT 11 2019



This is our final response to your Freedom of Information Act (FOIA) request #2019-FS-R8-03496-F of April 18, 2019. Your request was received in this office on April 18, 2019. In your letter you requested the following records:

- “Copies of records (e-mails and other electronic documents, calendars, hand written memos, phone notes, routing and transmittal slips, other memorandums, data, notes, inter-agency and intra-agency correspondence) between MVP, Jefferson NF, and FERC specifically related to the proposed changes to the Mountain Valley Pipeline route in Monroe County, WV or Giles County, VA around the area on Peters Mountain between the existing MVP pipeline route and New River. That area includes but is not limited to the existing “Columbia Gas-Celanese Pipeline.”

A reasonable search was conducted by the staff on the George Washington and Jefferson National Forests. Your request and subsequent records were referred to the Office of the General Counsel, U.S. Department of Agriculture for consultation on May 8, 2019 for a release determination. On October 3, 2019, the Office of the General Counsel approved this response.

Upon review of these records it has been determined that 223 pages are being released in full, 5 pages have been partially redacted in accordance with the FOIA, 5 U.S.C. § 552(b)(5).

Exemptions

FOIA Exemption 5 permits the Government to withhold “inter-agency or intra-agency memorandums or letters which would not be available by law to a party in litigation with the agency.” We have determined that portions of the records requested must be withheld pursuant to both the deliberative process privilege and the attorney-client privilege of Exemption 5 of the FOIA, 5 U.S.C. 552(b)(5).

Deliberative Process Privilege

This is the most commonly invoked privilege incorporated within Exemption 5 is the deliberative process privilege, the general purpose of which is to “prevent injury to the quality of agency decisions.” Specifically, three policy purposes consistently have been held to constitute the bases for this privilege: (1) to encourage open, frank discussions on matters of policy between subordinates and superiors; (2) to protect against premature disclosure of proposed policies before they are actually adopted; and (3) to protect against public confusion that might



result from disclosure of reasons and rationales that were not in fact ultimately the grounds for an agency's action.

Attorney-Client Privilege

The attorney-client privilege protects confidential communication between an attorney and a client relating to a legal matter for which the client has sought professional advice. The privilege applies to facts divulged by a client to an attorney, and communications between attorneys which reflect client-supplied information.

Fees

For purposes of this FOIA request, we have determined that you fall into the category of an All Other requester. In accordance with 7 C.F.R. Subtitle A, Part 1, Subpart A, Appendix A, we are required to collect fees for search, and duplication of records. We made the discretionary decision to grant you a waiver of fees, therefore, no search, review or duplication costs are being assessed with this release.

Appeal Rights

This concludes the Forest Service response to your FOIA request. The FOIA provides you the right to appeal this response. Any appeal must be made in writing, within 90 days from the date of this letter, to the Chief, USDA, Forest Service:

- 1) by email to wo_foia@fs.fed.us
- 2) by regular mail to Mail Stop 1143, 1400 Independence Avenue, SW, Washington, DC 20250-1143
- 3) by Fed Ex or UPS to 201 14th Street, SW, Washington, DC 20250-1143, and telephone 202-205-1542

The term "FOIA APPEAL" should be placed in capital letters on the subject line of the email or on the front of the envelope. To facilitate the processing of your appeal, please include a copy of this letter and/or the FOIA case number (2019-FS-R8-03496-F) assigned to your request.

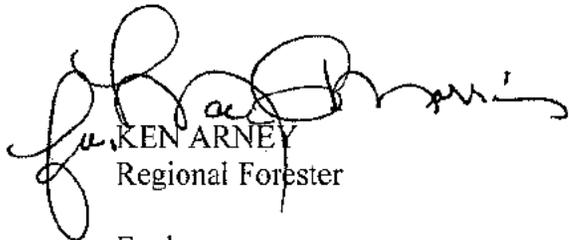
If you need further assistance or would like to discuss any aspect of your request, please contact the FOIA Public Liaison at 202-205-1542. Additionally, you may contact the Office of Government Information Services (OGIS) National Archives and Records Administration to inquire about the FOIA mediation services they offer. The contact information for OGIS is as follows:

Office of Government Information Services
National Archives and Records Administration
8601 Adelphi Road-OGIS
College Park, Maryland 20740-6001
e-mail: ogis@nara.gov
telephone: 202-741-5770
toll free: 877-684-6448
facsimile: 202-741-5769

[REDACTED]

If you have questions regarding this FOIA request, you may contact Douglas Meloche at 404-347-4427 or at douglas.meloche@usda.gov.

Sincerely,



KEN ARNEY
Regional Forester

Enclosures

cc: Sarah Kathmann, Douglas Meloche, Matthew Tilden

FEDERAL ENERGY REGULATORY COMMISSION
WASHINGTON, D.C. 20426

OFFICE OF ENERGY PROJECTS

In Reply Refer To:
OEP/DG2E/G3
Mountain Valley Pipeline LLC
CP16-10-000

August 20, 2018

Matthew Eggerding, Counsel
Mountain Valley Pipeline LLC
625 Liberty Ave., Suite 1700
Pittsburgh, PA 15222

Re: Limited Construction Approval

Dear Mr. Eggerding:

I grant your August 17, 2018 request for Mountain Valley Pipeline LLC (Mountain Valley) to resume limited construction activities at six locations. Allowing these limited construction activities to proceed is justified for the reasons outlined in your request, and the completion and restoration of the right-of way at these specific locations would reduce the risk of potential safety and environmental impacts.

This authorization is in accordance with our August 10, 2018 partial approval of Mountain Valley's Stabilization Plan. Mountain Valley must follow the measures outlined in its Plan, in order to stabilize and restore the right-of-way, as appropriate, during the period covered by the Commission's temporary stop work order. I remind you that Mountain Valley must comply with all applicable terms and conditions of the Commission's October 13, 2017 *Order Issuing Certificates and Granting Abandonment Authority* (Order) in the above-referenced docket, as well as any conservation measures identified by the federal land managing agencies.

If you have any questions regarding this approval, please call me at 202-502-8059 (or email to paul.friedman@ferc.gov).

Sincerely,



Paul Friedman
Environmental Project Manager



625 Liberty Avenue, Suite 1700 | Pittsburgh, PA 15222
 844-MVP-TALK | mail@mountainvalleypipeline.info
 www.mountainvalleypipeline.info

August 17, 2018

Terry L. Turpin
 Director, Office of Energy Projects
 Federal Energy Regulatory Commission
 888 First Street NE
 Washington, DC 20426

Re: Mountain Valley Pipeline, LLC
 Docket No. CP16-10-000
 Supplement to Temporary Stabilization Plan

Dear Mr. Turpin:

On August 8, 2018, Mountain Valley Pipeline, LLC filed its Temporary Stabilization Plan in response to the Federal Energy Regulatory Commission's August 3, 2018 Notification of Stop Work Order. On August 10, 2018, the Commission Staff issued a letter order authorizing portions of the Temporary Stabilization Plan. In this filing, Mountain Valley supplements its Temporary Stabilization Plan. Mountain Valley requests approval to implement the measures described in this filing.

1. The Temporary Stabilization Plan included measures related to the Blue Ridge Parkway. An email from the National Park Service concurring with these measures is attached hereto.

2. In its Temporary Stabilization Plan, Mountain Valley included a section entitled "Specific Areas of Sensitive Environmental Concern." A table that describes additional areas in this category is included below.

Spread	MP Start	MP End	Area	Status	Stabilization Measure
D	98.8	99.0	County Route 9 (Laurel Creek Road)	In Progress Bore	Currently 5' of 150' of the bore are completed under the railroad and road. The bore pit along the road is ~18' deep. Complete the bore, install grouting around the bored pipe under, back fill the open trench and complete final restoration.
F	179.09	179.10	County Route 9 (Wayside Talcott Road)	In Progress Bore	Currently 135' of 260' of the bore are completed under a sensitive environmental resource. Completing the bore along with final restoration will eliminate the risk of potentially impacting the sensitive environmental resource.

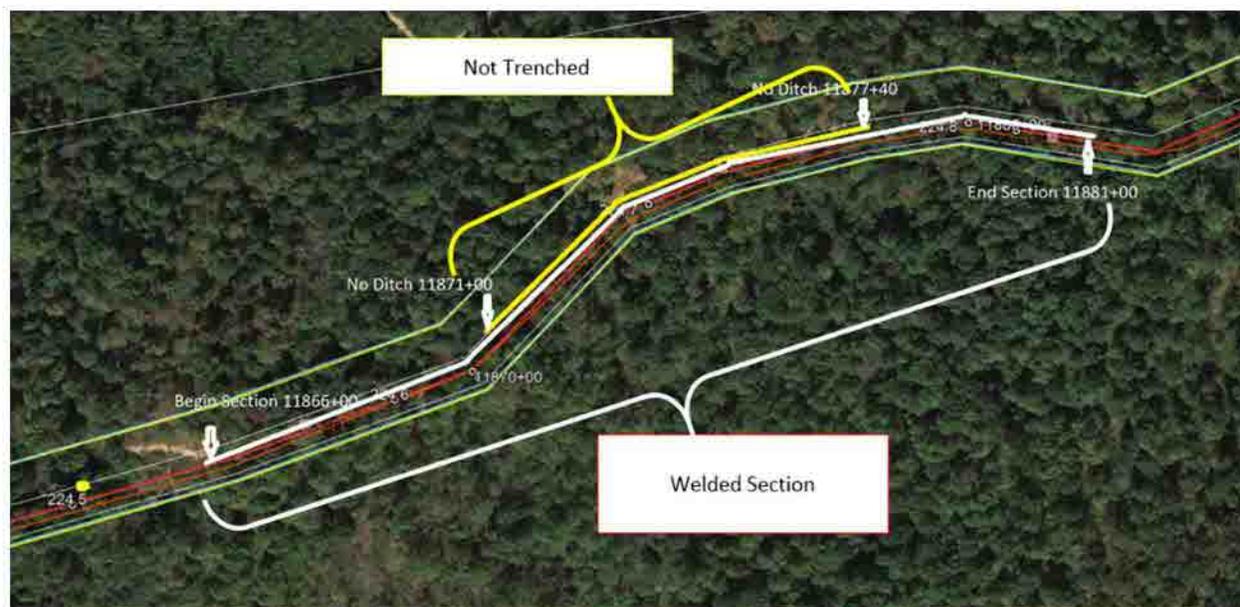
Mr. Terry L. Turpin

August 17, 2018

Page 2 of 5

Spread	MP Start	MP End	Area	Status	Stabilization Measure
H	245.88	245.89	US Route 221 (Bent Mountain Road)	In Progress Bore	The pipe is currently installed under the road. Install grouting around the bored pipe under the road, back fill the open trench and complete final restoration.

3. Between approximate MPs 224.5 and 224.8, there is a 1500' section of welded pipe that is adjacent to both trenched and untrenched areas. Specifically, there is a 600' untrenched length in the middle of this welded section:



To the east of this section, the area between approximate MPs 224.8 and 225.2 is backfilled and ready to restore. However, access to the right-of-way between MPs 224.5 and 225.2 is provided by the access road at MP 225.2:



Mr. Terry L. Turpin

August 17, 2018

Page 3 of 5

Until the section between approximate MPs 224.5 and 224.8 is installed, the entire area between MPs 224.5 and 225.2 cannot be restored. That is because Mountain Valley would need to maintain a travel lane between MPs 224.8 and 225.2 to allow vehicles to access the area between MPs 224.5 and 224.8 for monitoring and maintenance. Allowing Mountain Valley to trench this 600' section and install the welded pipe will allow Mountain Valley to fully restore 0.6 miles of the right-of-way. Mountain Valley requests permission for this limited activity because there are clear advantages to allowing this activity to proceed to prevent potential safety and environmental impacts.

4. Between approximate MPs 247.8 and 248.3, the right-of-way has been trenched except for two limited areas. While the pipe for the 0.5-mile section has not been "strung" next to the trench in the traditional sense, the pipe is staged in the middle of the section at 248.0. The first untrenched section is shown in the picture below:



The pipe for this section is staged at MP 248.0, as shown below:

Mr. Terry L. Turpin

August 17, 2018

Page 4 of 5



The second untrenched area begins at MP 248.1, as shown in the picture below. There is a 100' section that was previously trenched and backfilled to remediate environmental concerns until the pipe could be installed:



Mr. Terry L. Turpin

August 17, 2018

Page 5 of 5

For the area between approximate MPs 247.8 and 248.3, Mountain Valley requests approval to weld the pipe, trench the two limited sections described above, lower in, backfill, and restore. The pipe is onsite and ready to be welded and installed. In addition, there is a clear environmental advantage to complete the installation and final restoration in this area, especially considering the environmental concerns associated with the previously-backfilled area.

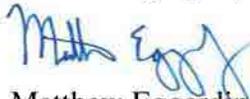
If you have any questions, please do not hesitate to contact me at (412) 553-5786 or meggerding@eqt.com. Thank you.

Respectfully submitted,

MOUNTAIN VALLEY PIPELINE, LLC

by and through its operator,

EQM Gathering Opco, LLC

By: 

Matthew Eggerding

Senior Counsel, Midstream

Attachment

cc: Rich McGuire, OEP
James Martin, OEP
Paul Friedman, OEP
All Parties

Eggerding, Matthew

From: Neylon, Megan
Sent: Wednesday, August 15, 2018 3:39 PM
To: Eggerding, Matthew; Veneziano, Philip
Subject: FW: [EXTERNAL] Blue Ridge Parkway Restoration Plan

From: Viets, Alexa <alexaviets@nps.gov>
Sent: Tuesday, August 7, 2018 3:03 PM
To: Neylon, Megan <MNeylon@eqt.com>; J D Lee <J_D_Lee@nps.gov>
Cc: Bambi Teague <bambiteague@nps.gov>; John Anderson <j_david_anderson@nps.gov>; mary_c_krueger@nps.gov; bryan_faehner@nps.gov; Klinefelter, Jeffrey <JKlinefelter@eqt.com>; Pierce, Jack D. (Contractor) <JPierce@eqt.com>; Avi.Kupfer@usdoj.gov; Andrew Tittler <Andrew.Tittler@sol.doi.gov>
Subject: Re: [EXTERNAL] Blue Ridge Parkway Restoration Plan

Megan,

Thank you for sending us this with quick turn around. We have discussed further and the NPS supports Option 1 (with our requested edits as noted below) which we believe will stabilize the site and adhere most appropriately to the Stop Work Order.

Please let us know if you have any questions.

Best,

Alexa Viets

Option 1 (as amended): Ultimate removal of all construction equipment and stockpiled pipe, etc. Temporarily rough grade both the north (PWR) and south (PWL) side of the Blue Ridge Parkway, seed and mulch all disturbed areas and stockpiled soil, and install grouting around the bore pipe to ensure road stability. During the temporary stop work order, Mountain Valley will monitor and maintain the temporary sediment and erosion control devices on site, including after each rain clean and repair if necessary.

Assure that the cattle has access to the existing spring and the work area is fenced off to exclude the cattle.

Repair and stabilize the private road on the south (PWL) side of the parkway motor road and make sure that it is accessible and in good repair.

See permit specifications for seeding guidelines within the agricultural lease and adjacent to the motor road for seeding.

Due to the uncertainty of the timing on FERCs release to restart work, this could mean construction and permanent stabilization in the winter months. The pipe that is stacked in this area will be moved off of National Park Service property.

On Tue, Aug 7, 2018 at 1:23 PM, Neylon, Megan <MNeylon@eqt.com> wrote:

All,

Thank you for taking the time this morning to discuss stabilization of the National Park Service Property. On Friday August 3, 2018, FERC issued a stop work order for Mountain Valley. In that order, FERC requested that Mountain Valley prepare a stabilization plan for the Project. This plan is due tomorrow 8/8/18. As discussed, MVP is proposing three

options to stabilize the National Park Service Property. Please review these options and let me know how the National Park Service would like for MVP to proceed.

Currently, the northern side of the Blue Ridge Parkway is trenched, pipe is in the trench and the bore under the Parkway is complete. On the southern side of the Parkway, the bore pit remains open, the right-of-way is graded, and pipe is stacked to be strung and welded.

Option 1: Temporarily rough grade both the north and south side of the Blue Ridge Parkway, seed and mulch though area, and install grouting around the bore pipe to ensure road stability. During the temporary stop work order, Mountain Valley will monitor and maintain the temporary sediment and erosion control devices on site. Due to the uncertainty of the timing on FERCs release to restart work, this could mean construction and permanent stabilization in the winter months. The pipe that is stacked in this area will be moved off of National Park Service property.

Option 2: Complete the northern section of the Blue Ridge Parkway. This would include, completing, fixing/replacing drain tiles, install grouting around the bore pipe to ensure road stability, padding and back filling the trench and bore pit, and complete final restoration. This will allow for vegetation to grow on this section prior to the winter freeze/thaw cycle. On the southside MVP proposes to back fill the bore pit, rough grade the right-of-way, and temporarily seed and mulch the area. During the temporary stop work order, Mountain Valley will monitor and maintain the temporary sediment and erosion control devices on site. Due to the uncertainty of the timing on FERCs release to restart work, this could mean construction and permanent stabilization in the winter months. The pipe that is stacked in this area will be moved off of National Park Service property.

Option 3: Fully complete the National Park Service Blue Ridge Parkway section (Both the North and South sections) in order to get the area to final grade and get vegetation established prior to the winter freeze/thaw cycle.

In an effort to more effectively and permanently protect resources within and adjacent to the National Park Service Property, Mountain Valley proposes to include option 3 in the stabilization plan to be filed with FERC.

Thank you,

Megan E. Neylon

Environmental Permitting Supervisor

Mountain Valley Pipeline

2200 Energy Drive

MKA Madsen, Kneppers & Associates, Inc.

Construction Consultants & Engineers

100% Employee Owned Company (USA)

August 23, 2018

Sent via email to: ngillen@transcon.com

MR. NIKOLAUS GILLEN
TRANSCON ENVIRONMENTAL
802 Montgomery St., Suite 200
San Francisco, CA 94133

**RE: MOUNTAIN VALLEY PIPELINE
AUGUST 9 AND 10, 2018 SITE EVALUATION
MKA PROJECT NO. 2018.0895**

Dear Mr. Gillen:

Madsen Kneppers & Associates, Inc. (MKA) has prepared this summary of observations documented during our August 9 and 10, 2018 site evaluation. Our evaluation included conducting a walking reconnaissance of the pipeline alignment on portions of Brush Mountain and Sinking Creek Mountain that are located on United States Department of Agriculture (USDA) Forest Service lands. We also conducted a reconnaissance of Pocahontas Road and Mystery Ridge Road that will be used for temporary access for pipeline construction.

The purposes of our evaluation were to observe and document surface features that may be indicative of potential stability issues on constructed cut and/or embankment slopes within and adjacent to the limits of disturbance (LOD). These include tension cracks that may have developed due to settlement, discontinuities in the fill body, and/or minor slope movement. Additionally, we were to observe and document the locations and performance of existing temporary erosion control measures. Our observations are indicative of the visible conditions that were present on the date of our inspection.

Present during the site evaluation were representatives of Mountain Valley Pipeline, Ms. Melissa Fontanese, P.E., Ms. Robin Reed, P.G., and Transcon Environmental inspectors Mr. Dan Danko and Mr. Nathan Amick. The following presents a summary of our observations for the involved sections of the pipeline and the Pocahontas Road. Note that when references are made to left and right sides of the right of way and of LOD the directions are determined assuming one is looking in the direction of increasing station numbers (i.e. up-station).

USA OFFICES

ATLANTA :: AUSTIN :: CHICAGO :: COLUMBUS :: DALLAS :: DENVER :: DETROIT :: HOUSTON :: LAS VEGAS :: LOS ANGELES :: MIAMI :: NEW ORLEANS :: ORLANDO
PENSACOLA :: PHOENIX :: PORTLAND :: PRINCETON :: SACRAMENTO :: SAN DIEGO :: SAN FRANCISCO :: SEATTLE :: SPOKANE :: TAMPA

MKA CANADA, INC.

CALGARY :: EDMONTON :: TORONTO :: WINNIPEG



[Exhibit 1](#) provides a selection of photographs that depict surface features on constructed cut and/or embankment slopes observed on Brush Mountain, Pocahontas Road, and Sinking Creek Mountain. [Exhibit 2](#) provides a selection of photographs that depict the planned and additional erosion control measures for Brush Mountain, Pocahontas Road, and Sinking Creek Mountain. [Exhibit 3](#) provides a selection of the plans for Brush Mountain and Sinking Creek Mountain that have been marked to delineate the areas where two-tone right of way, tension cracks, sloughing, and rock slide/toppling was observed.

The following summarizes our observations made for Brush Mountain, Sinking Creek Mountain, and Pocahontas Road.

Brush Mountain (Station 11622+00 through 11669+00)

- Tension Cracks at or Near Crest of Descending Embankment
 - Station 11669+00 to 11667+00 left side LOD ([Exhibit 1, Photo 1](#))
 - Slope length 21 feet from crest to toe;
 - Slope angle 31 degrees; and
 - Discontinuous tension cracks documented near crest and up to approximately 6 feet behind crest
 - Station 11622+00 left side of LOD ([Exhibit 1, Photo 3](#))
 - Slope length 19 feet from crest to toe;
 - Slope angle 43 degrees;
 - Discontinuous tension cracks documented near crest and up to approximately 4 feet behind crest; and
 - Cracks extended for approximately 150 feet
- Stockpile Tension Cracks ([Exhibit 1, Photos 4 through 6](#))
 - Observed on numerous stockpiles on the right side of LOD; and
 - Occurred primarily on crests of stockpiles
- Rock Slide/Topple ([Exhibit 1, Photo 2](#))
 - Approximate station 11624+00 at cut slope on the right side of LOD
- Two Tone Construction Occurrence
 - Approximate station 11648+50 through 11641+00
 - Approximate station 11628+50 through 11626+50
- Erosion Control Measures
 - Frequency and location of water bars and sumps were in general conformance with plans issued in November 2017 ([Exhibit 2, Photo 5](#))



- Stream crossing locations were in general conformance with plans issued November 2017 ([Exhibit 2, Photo 6](#))
- Frequency and location of super silt fencing were in general conformance with plans issued in November 2017
- There was evidence of maintenance of erosion control measures; and additional erosion control measures, not specified on the November 2107 plans, were placed along the LOD boundaries including the following:
 - Silt fences ([Exhibit 2, Photo 1](#))
 - Filter socks ([Exhibit 2, Photo 2](#))
 - Super silt fences ([Exhibit 2, Photo 1](#))

Sinking Creek Mountain (Station 11553+00 through 11596+91)

- Tension Cracks at or Near Crest of Descending Embankment
 - Station 11578+30 on the left side of LOD
 - Slope angle 34 degrees.
 - Station 11576+00 on the left side of LOD ([Exhibit 1, Photos 14 and 15](#))
 - Slope length approximately 19 feet from crest to toe. The angle of the slope was approximately 34 degrees.
 - Station 11588+89 on the fill slope on the left side of the right of way. ([Exhibit 1, Photo 12](#))
- Stockpile Tension Cracks ([Exhibit 1, Photos 11 and 13](#))
 - Tension cracks were observed in and adjacent to numerous stockpiles on the left side of the right of way.
 - Tension cracks occurred primarily on the crests of the stockpiles and adjacent to the water bar sumps.
- Sloughing
 - Station 11570+97 Center of the LOD ([Exhibit 1, Photo 10](#))
 - Base of the cut slope for the two tone section
 - Continued for approximately 400 feet down station.
 - Slope angle ranged between 47 and 70 degrees
 - Between 3 to 10 feet in height.
 - Station 11591+00 ([Exhibit 1, Photo 9](#))
 - On cut slope of two tone section.
- Two Tone Construction
 - Approximate station 11590+00 through 11596+00.



- Approximate station 11568+00 a through 11570+00.
- Erosion Control Measures
 - Frequency and location of water bars and sumps were in general conformance with plans issued in November 2017 ([Exhibit 2, Photos 12 and 13](#))
 - Stream crossing locations were in general conformance with plans issued November 2017 ([Exhibit 2, Photo 10](#))
 - Frequency and location of super silt fencing was placed in general conformance with plans issued in November 2017. Additional erosion control measures were placed along the LOD boundaries including the following:
 - Silt fences
 - Filter socks
 - Super silt fences

Pocahontas Road (Station 0+00 through 315+00)

- Erosion Control Measures
 - Filter socks were placed along the alignment more frequently than called for in the November 2017 plans ([Exhibit 2, Photo 7](#))
 - Additional erosion control measures were placed along the alignment including:
 - Water bars ([Exhibit 2, Photo 8](#))
 - Water bar sumps on the right side of the road with filter socks and silt fences placed across outlets of the sumps ([Exhibit 2, Photo 9](#))
 - Silt fences placed along the sides of the road.
- A non-geologic sinkhole had formed over a pre-existing culvert located at station 264+92 ([Exhibit 1, Photos 7 and 8](#))

Summary

During the MKA August 8 and 9, 2018 site evaluation we documented tension cracks on constructed embankment fill slopes and stockpiles on Brush Mountain and Sinking Creek Mountain. There was shallow surface sloughing that occurred on Two Tone cut slopes within the right of way. There was one rock slide/topple observed on the right side of the right of way.



Mr. Nikolaus Gillen

August 23, 2018

MKA Project No. 2018.0895

Page 5 of 5

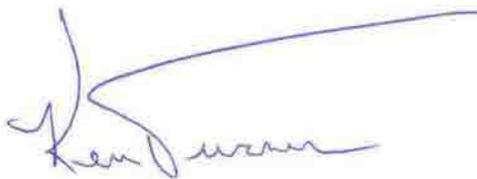
Additional, temporary erosion control measures were observed on Brush Mountain, Pocahontas Road, and Sinking Creek Mountain that were not called out in the plans. There was no indication of problematic erosion observed during the site evaluation that impacted conditions outside of the LOD.

The need for addressing and evaluating remediation/repairs and potential stability issues and or discontinuities in the fill bodies were discussed with Ms. Fontanese and Ms. Reed. These issues should be communicated to MVP's engineering team for their analysis.

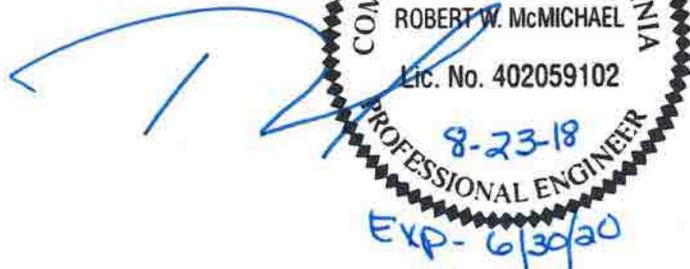
Please contact me with any questions.

Sincerely,

MADSEN, KNEPPERS & ASSOCIATES, INC.



Mr. Kenneth J. Turner, P.E.*, P.G.**



Mr. Robert McMichael, P.E., G.E., D.GE.

*Licensed Professional Engineer (Civil) in: Arizona

**Licensed Professional Geologist in: Arizona

Attachments: Exhibit 1 – Erosion Features Photographs
Exhibit 2 – Erosion Control Photographs
Exhibit 3 – Issues Map



Exhibit 1 –
Erosion Features Photographs



PHOTO #

1

PHOTO BY

KJT

PHOTO DATE

08/09/18

LOCATION: Brush Mountain, Station 11669+00, left side of right-of-way.

COMMENTS: View looking up station of embankment tension crack.



PHOTO #

2

PHOTO BY

KJT

PHOTO DATE

08/09/18

LOCATION: Brush Mountain, Station 11622+50, right side of right-of-way.

COMMENTS: View looking down station of rock slide/topple.



PHOTO #

3

PHOTO BY

KJT

PHOTO DATE

08/09/18

LOCATION: Brush Mountain, Station 11622+00, left side of right-of-way.

COMMENTS: View looking up station of tension crack.



PHOTO #

4

PHOTO BY

RMG

PHOTO DATE

08/09/18

LOCATION: Brush Mountain, Station 11658+27, right side of right-of-way.

COMMENTS: View looking down station of typical stockpile tension cracks.

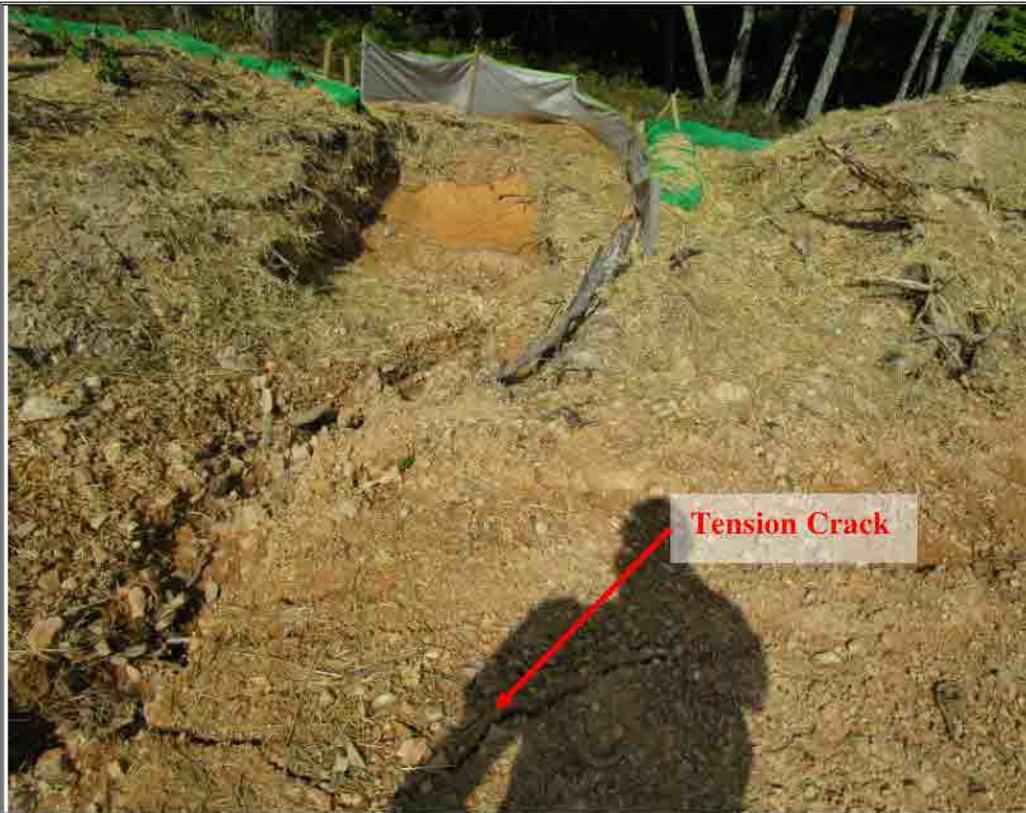


PHOTO #

5

PHOTO BY

RMG

PHOTO DATE

08/09/18

LOCATION: Brush Mountain, right side of right-of-way.

COMMENTS: View looking away from center of typical stockpile tension cracks.



PHOTO #

6

PHOTO BY

RMG

PHOTO DATE

08/09/18

LOCATION: Brush Mountain, Station 11650+00, right side of right-of-way.

COMMENTS: View looking down station of typical stockpile tension cracks.



PHOTO #

7

PHOTO BY

RMG

PHOTO DATE

08/09/18

LOCATION: Pocahontas Road, Station 264+92, right side of the road.

COMMENTS: View looking down station of a non-geologic sinkhole.



PHOTO #

8

PHOTO BY

RMG

PHOTO DATE

08/09/18

LOCATION: Pocahontas Road, Station 264+92, right side of the road.

COMMENTS: Close up view of non-geologic sinkhole.



PHOTO #

9

PHOTO BY

KJT

PHOTO DATE

08/10/18

LOCATION: Sinking Creek Mountain, Station 11591+00, center of right-of-way.

COMMENTS: View looking up station of shallow sloughing in 3 foot two tone construction segment.



PHOTO #

10

PHOTO BY

KJT

PHOTO DATE

08/10/18

LOCATION: Sinking Creek Mountain, Station 11570+97, center of right-of-way.

COMMENTS: View looking towards left side of right-of-way, at sloughing on 8 foot high two-tone construction segment.



PHOTO #

11

PHOTO BY

KJT

PHOTO DATE

08/10/18

LOCATION: Sinking Creek Mountain, Station 11556+88, left side of right-of-way.

COMMENTS: View looking down station of typical stockpile tension cracks.



PHOTO #

12

PHOTO BY

RMG

PHOTO DATE

08/10/18

LOCATION: Sinking Creek Mountain, Station 11588+89, left side of right-of-way.

COMMENTS: View looking down station of typical stockpile tension cracks.



PHOTO #

13

PHOTO BY

RMG

PHOTO DATE

08/10/18

LOCATION: Sinking Creek Mountain, Station 11579+96, left side of right-of-way.

COMMENTS: View looking up station of typical stockpile tension cracks.



PHOTO #

14

PHOTO BY

RMG

PHOTO DATE

08/10/18

LOCATION: Sinking Creek Mountain, Station 11576+00, left side of right-of-way.

COMMENTS: View looking down station of embankment tension cracks.



PHOTO #

15

PHOTO BY

RMG

PHOTO DATE

08/10/18

LOCATION: Sinking Creek Mountain, Station 11576+00, left side of right-of-way.

COMMENTS: Close up view of tension cracks and scarp.

Exhibit 2 –
Erosion Control Photographs



PHOTO #

1

PHOTO BY

KJT

PHOTO DATE

08/09/18

LOCATION: Brush Mountain, Station 11664+00, right side of right-of-way.

COMMENTS: View looking down station of typical additional silt fence and super silt fence.

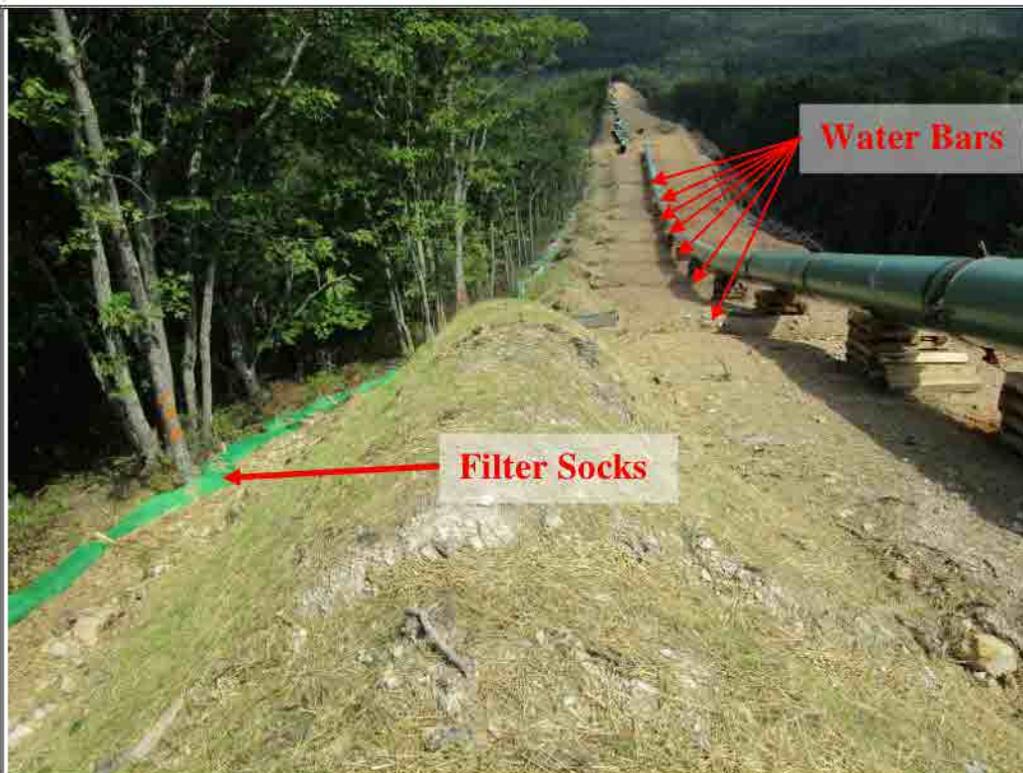


PHOTO #

2

PHOTO BY

RMG

PHOTO DATE

08/09/18

LOCATION: Brush Mountain, Station 11654+73, right side of right-of-way.

COMMENTS: View looking down station of typical steep slope water bar placement frequency as well as additional wattles placed adjacent to right side LOD.



PHOTO #

3

PHOTO BY

KJT

PHOTO DATE

08/09/18

LOCATION: Brush Mountain, Station 11650+00, left side of right-of-way.

COMMENTS: View looking up station at typical additional silt fence.



PHOTO #

4

PHOTO BY

KJT

PHOTO DATE

08/09/18

LOCATION: Brush Mountain, Station 11649+00, center of right-of-way.

COMMENTS: View looking down station of typical slope soil stabilization matting.



PHOTO #

5

PHOTO BY

RMG

PHOTO DATE

08/09/18

LOCATION: Brush Mountain, Station 11647+97, right side of right-of-way.

COMMENTS: View looking down station of typical water bar and sump.



PHOTO #

6

PHOTO BY

RMG

PHOTO DATE

08/09/18

LOCATION: Brush Mountain, Station 11626+00, right side of right-of-way.

COMMENTS: View looking down station at typical stream crossing.



PHOTO #

7

PHOTO BY

RMG

PHOTO DATE

08/09/18

LOCATION: Pocahontas Road, Station 13+62, right side of the road.

COMMENTS: View looking down station at typical filter socks.



PHOTO #

8

PHOTO BY

RMG

PHOTO DATE

08/09/18

LOCATION: Pocahontas Road, Station 75+59.

COMMENTS: View looking up station at typical additional water bars and sumps.



PHOTO #

9

PHOTO BY

RMG

PHOTO DATE

08/09/18

LOCATION: Pocahontas Road, Station 106+50, right side of road.

COMMENTS: View looking towards the right side of the road at a typical additional water bar sump.



PHOTO #

10

PHOTO BY

RMG

PHOTO DATE

08/10/18

LOCATION: Sinking Creek Mountain, Station 1158+89, left side of the right-of-way.

COMMENTS: View looking down station at a typical stream crossing.



PHOTO #

11

PHOTO BY

KJT

PHOTO DATE

08/10/18

LOCATION:	Sinking Creek Mountain Station 11590+00, right side of the right-of-way.
COMMENTS:	View looking towards the right side of the right-of-way at a typical shallow slope water bar and sump, as well as additional silt fence.



PHOTO #

12

PHOTO BY

RMG

PHOTO DATE

08/10/18

LOCATION:	Sinking Creek Mountain, Station 11579+96, left side of right-of-way.
COMMENTS:	View looking up station at a typical steep slope water bar sump as well as, super silt fence.



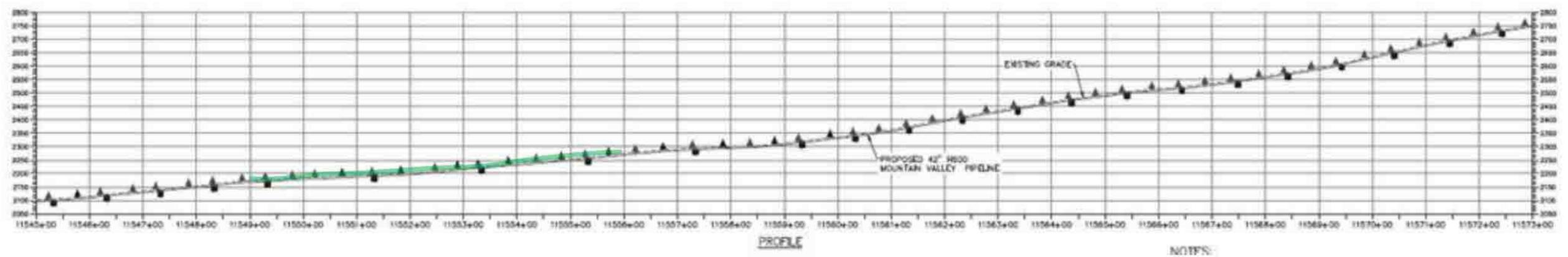
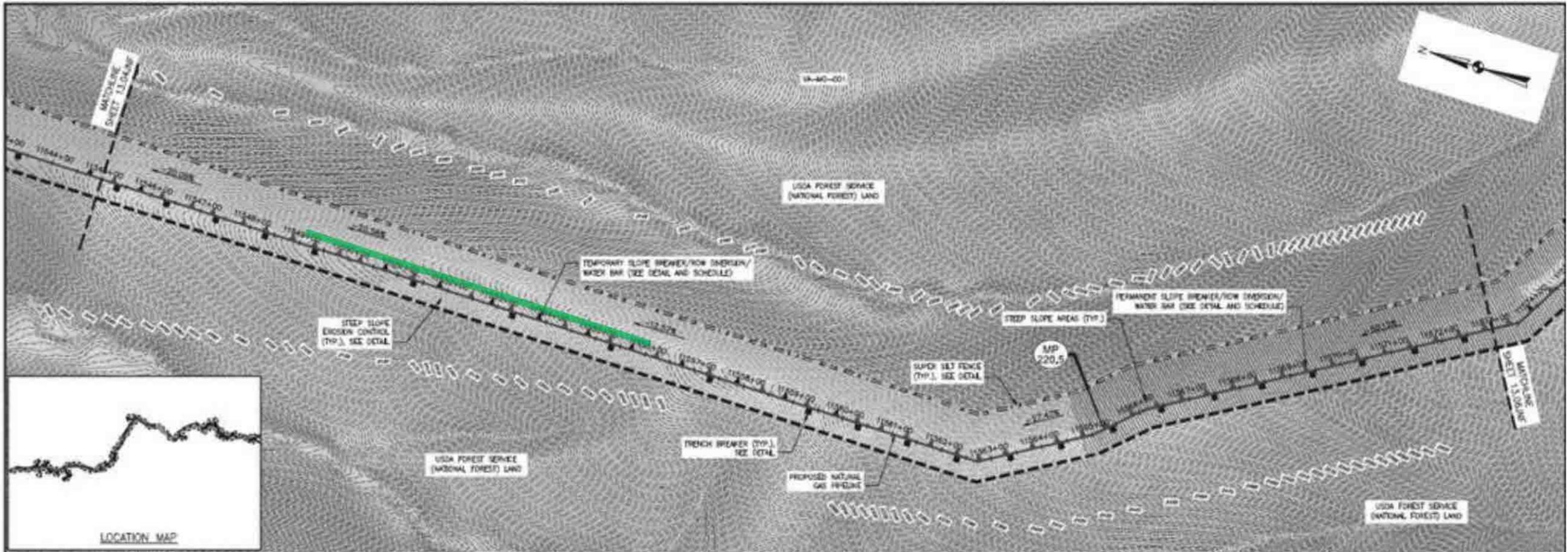
PHOTO #
13

PHOTO BY
RMG

PHOTO DATE
08/10/18

LOCATION:	Sinking Creek Mountain, Station 11567+01, left side of right-of-way.
COMMENTS:	View looking towards the right side of the right-of-way at a typical steep slope water bar.

Exhibit 3 –
Issues Map



Legend	
Tension Cracks	— — — — —
Sloughing	— — — — —
Topples/Slide	• • • • •
Two-Tone	—————

EXHIBIT 3 – ISSUES MAP
 Mountain Valley Pipeline
 Brush Mountain
 MKA Project No. 2018.0895



United States Department of the Interior

Bureau of Land Management

Eastern States
Southeastern States District Office
273 Market Street
Flowood, Mississippi 39232
<http://www.es.blm.gov>



ORIGINAL

August 24, 2018

IN REPLY REFER TO:
2880 (ESJ020) VMC

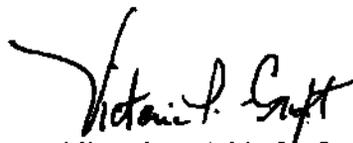
Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street NE
Washington, DC 20426

Re: Mountain Valley Pipeline, LLC
Docket No. CP16-10-000
Mineral Leasing Act Section 28(p) Analysis for the Mountain Valley Pipeline

Dear Ms. Bose:

Enclosed for your docket please find the Bureau of Land Management's analysis of the Mountain Valley Pipeline project under section 28(p) of the Mineral Leasing Act of 1920. Please note that this analysis in itself does not constitute a record of decision or right-of-way grant.

Sincerely,


Victoria (Vicki) Craft
Project Manager

Enclosure (1)
-Practicality Analysis

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COMMISSION
2018 AUG 28 A 11:30
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CC: Public File, Docket No. CP16-10-000

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AUG 23 2018

Mr. Joseph R. Balash
Assistant Secretary - Land and Minerals Management
U.S. Department of the Interior
1849 C Street NW
Washington, DC 20240

Re: Mineral Leasing Act Section 28(p) Analysis for the Mountain Valley Pipeline

Dear Mr. Balash:

Section 28(p) of the Mineral Leasing Act of 1920 provides that “[i]n order to minimize adverse environmental impacts and the proliferation of separate rights-of-way across Federal lands, the utilization of rights-of-way in common shall be required to the extent practical.”¹ On July 27, 2018, the U.S. Court of Appeals for the Fourth Circuit vacated the record of decision and right-of-way (ROW) grant for the Mountain Valley Pipeline (MVP). The court found that the record of decision did not address whether “the utilization of an existing right of way would be *impractical*,” and specified that the BLM on remand must “favor[] routes utilizing existing rights of way unless those alternatives [are] impractical.”²

The Bureau of Land Management (BLM) has prepared this supplemental analysis to address the court’s instructions on remand. As explained below, we conclude that the additional utilization of existing ROWs across federal lands would be impractical.

I. Background

In order to implement the court’s instructions, we have analyzed whether any route alternative exists that would result in greater collocation with other ROWs on federal lands than the route that was previously approved by the BLM, and that would be practical. Each of these two criteria is explained in greater detail below.

A. Collocation on Federal Lands

The first criterion that a route alternative must satisfy is that it must result in greater collocation with other ROWs on federal lands - that is, it must cross fewer miles of federal lands without

¹ 30 U.S.C. § 185(p).

² See *Sierra Club, Inc. v. U.S. Forest Serv.*, - F.3d -, 2018 WL 3595760, at *16 (4th Cir. July 27, 2018) (emphasis in the original).

collocation than the previously approved alternative. We limit our comparison of collocation to federal lands because section 28(p) aims to minimize “the proliferation of separate rights-of-way across Federal lands,” and because the BLM has no authority over the MVP route except to the extent that the route involves the use of federal lands.³

In order to determine the extent of collocation on federal lands, we rely on two independent assessments: one conducted by staff of the Federal Energy Regulatory Commission (FERC), and one conducted by MVP.⁴ Although the results of these two independent assessments are generally consistent, they occasionally provide different estimates of the extent of collocation on federal lands, because of the technical challenges inherent in measuring the lengths of potential pipeline routes. Where the two assessments provide conflicting results on the question of whether a given route alternative would result in greater collocation on federal lands than the previously approved route, we have assumed conservatively that the route alternative would satisfy this criterion, and proceeded to examine whether the route alternative would be practical.

B. Practicality

The second criterion that a route alternative must satisfy is that it must be practical. In interpreting the term “practical” for purposes of this analysis, we have taken into consideration the term’s common usage, as well as relevant administrative and judicial interpretations. Black’s Law Dictionary defines “practical” as meaning “[l]ikely to succeed or be effective,” and “[u]seful or suitable for a particular purpose or situation.”⁵ The BLM’s regulations note that one of the objectives of the BLM’s pipeline ROW program is to “[p]romote[] the use of rights-of-way in common considering engineering and technological compatibility,” and that the use of ROWs in common may be required “where safety and other considerations allow.”⁶ In the only judicial or administrative decision addressing section 28(p), the Interior Board of Land Appeals determined that this standard includes consideration of a route’s cost and land-disturbance footprint, affirming that a route alternative was not “practical” when it would have “require[d]

³ See § 185(c)(2),(p). We define federal lands, consistently with section 28, to exclude “lands in the National Park System.” See 30 U.S.C. § 185(b)(1).

⁴ See Email from Rich McGuire, FERC, to Victoria Craft, BLM (Aug. 16, 2018) (McGuire August 16, 2018 Email); Email from Megan Neylon, MVP, to Victoria Craft, BLM (Aug. 17, 2018) (Neylon August 17, 2018 Email). Unlike the figures reported in the FEIS for “[l]ength adjacent to existing right-of-way,” these assessments included collocation with both major ROWs such as pipelines or electric transmission lines and smaller ROWs such as roads. See FEIS at 3-20. Cf. 70 Fed. Reg. 20,970, 20,970 (April 22, 2005) (“Some examples of land uses which require a right-of-way grant include: transmission lines, communication sites, roads, highways, trails, telephone lines, canals, flumes, pipelines, and reservoirs.”). For this reason, along with the fact that the FEIS’s figures do not distinguish between miles of collocation on federal and non-federal lands, we do not generally rely on the FEIS’s figures for “[l]ength adjacent to existing right-of-way” for this analysis.

⁵ See “Practical,” Black’s Law Dictionary (10th ed. 2014).

⁶ See 43 C.F.R. §§ 2881.2(c), 2882.10(b). See also 70 Fed. Reg. at 21,033 (noting that “there may be situations where for technical or safety reasons it is not practical” to make use of an existing ROW).

construction of an additional 39 miles of pipeline at an estimated additional cost of \$37.5 million," as well as "installation of an additional compressor station and ... the temporary disturbance of a substantially greater acreage of lands during construction."⁷ Similarly, in interpreting a parallel standard in another statute, the Board affirmed that a route was not "practical" where it would have "require[d] construction of up to an additional 60 miles of 345 kV power line and ha[d] an adverse impact on an additional 60 miles of public and private land," while "preclud[ing] the opportunity to improve" service to one of the project's proposed customers.⁸ Finally, a regulation issued to implement section 404 of the Clean Water Act prohibits the issuance of a dredge or fill discharge permit "if there is a practicable alternative to the proposed discharge" that is environmentally preferable, and defines "practicable" as including "consideration [of] cost, existing technology, and logistics in light of overall project purposes."⁹ In reviewing decisions made under this regulation by the U.S. Army Corps of Engineers (USACE), courts have deferred to the agency's practicability determinations, and upheld its consideration of factors including cost, construction delays, logistical feasibility, and "the objectives of the applicant's project."¹⁰

Accordingly, we interpret the term "practical," for purposes of this analysis, as referring to the suitability of a route alternative for achieving its purpose, and to the likelihood that attempting to utilize that route would succeed in achieving that purpose.¹¹ The purpose of any route alternative is to construct a pipeline to deliver natural gas from the MVP's beginning point to its endpoint, via its mid-route delivery points, in a safe, environmentally responsible, and cost-effective manner.¹² In certain cases, however, as discussed below, a particular route alternative may also have a more specific purpose, such as mitigating the impact of the MVP on certain resources. Therefore, the determination of whether a route alternative is practical includes consideration of the construction challenges and potential safety hazards that would arise from constructing or operating the pipeline along the route;¹³ the environmental consequences of constructing the

⁷ *Wyo. Indep. Producers Ass'n*, 133 IBLA 65, 82 (1995).

⁸ *Paul Herman*, 146 IBLA 80, 105 (1998) (interpreting 43 U.S.C. § 1763).

⁹ See 40 C.F.R. §§ 230.3(f), 230.10(a).

¹⁰ See *Friends of Santa Clara River v. U.S. Army Corps of Eng'rs*, 887 F.3d 906, 912, 921-922 (9th Cir. 2018) (quotation marks omitted); *Friends of the Earth v. Hintz*, 800 F.2d 822, 833-834 (9th Cir. 1986); *Nat'l Parks Cons. Ass'n v. Semonite*, 311 F. Supp. 3d 350, 377-378 (D.D.C. 2018).

¹¹ See "Practical," Black's Law Dictionary.

¹² See MVP Final Environmental Impact Statement at 1-8 (June 23, 2017) (FEIS). While the section 28(p) analysis described here is distinct from the National Environmental Policy Act analysis contained in the FEIS, the information and analysis presented in the FEIS is in many instances relevant to the section 28(p) analysis.

¹³ See 43 C.F.R. §§ 2881.2(c), 2882.10(b); 70 Fed. Reg. at 21,033.

pipeline along the route;¹⁴ any resulting increase in the pipeline's length and footprint;¹⁵ the ability of the route to serve the MVP's mid-route delivery points;¹⁶ the additional costs associated with the alternative;¹⁷ and the likelihood that the route would achieve any specific purpose identified for that route alternative.¹⁸

Although our comparison of the extent of collocation is limited to federal lands, determining the practicality of a route requires consideration of the route as a whole. A route alternative may increase the extent of collocation on federal lands, but prove impractical because of technical or other considerations relating to the route as a whole.

II. The MVP and the Previously Approved Route

The MVP is intended "to transport natural gas produced in the Appalachian Basin to markets in the Northeast, Mid-Atlantic, and Southeastern United States."¹⁹ Specifically, the project is

¹⁴ We note that section 28(p) can be read as requiring "the utilization of rights-of-way-in common" only where such collocation would "minimize adverse environmental impacts" as compared to an alternative with less collocation. See 30 U.S.C. § 185(p). Had we applied a separate requirement that any route alternative must "minimize adverse environmental impacts" compared to the previously approved alternative, we would have concluded on this basis alone that none of the route alternatives would satisfy the criteria of section 28(p). See FEIS at 3-20, 3-22, 3-25, 3-32, 3-47 to 3-48, 3-51, 3-55, 3-62, 3-65, 3-70 (concluding that none of the route alternatives considered in this analysis would "provide a significant environmental advantage" over the previously approved route). In this case, however, we have not excluded any route alternatives based solely on their environmental impacts.

¹⁵ See *Wya. Indep. Producers*, 133 IBLA at 82; see also *Paul Herman*, 146 IBLA at 105.

¹⁶ See, e.g., *Paul Herman*, 146 IBLA at 105. See also *Friends of Santa Clara River*, 887 F.3d at 912, 921 (requiring consideration of "the objectives of the applicant's project," so long as "those project objectives are not so narrowly defined as to preclude alternatives" (quotation marks omitted)). Each of the route alternatives would serve the MVP's beginning and endpoint.

¹⁷ See *Friends of Santa Clara River*, 887 F.3d at 921-923; *Wya. Indep. Producers*, 133 IBLA at 82. In this case, the cost of each route alternative would be driven primarily by differences in length and in the extent of steep slopes, side slopes, and other challenging construction conditions. See INGAA Foundation, Inc., Final Report No. 2015-03, *Mitigation of Land Movement in Steep and Rugged Terrain for Pipeline Projects: Lessons Learned from Constructing Pipelines in West Virginia* at 6 (2016) (INGAA Rugged Terrain Report), available at <http://www.ingaa.org/File.aspx?id=28629> (noting that "the planning process must weigh the costs of longer alignments to avoid hazards versus cost of mitigation of the hazard"). Therefore, the information presented below about length and construction challenges serves, and was considered by the BLM, as a proxy for such cost information.

¹⁸ See *Friends of Santa Clara River*, 887 F.3d at 921. We note that this definition of practicality is broader than mere technical feasibility – a standard that some, but not all, of the route alternatives considered here would satisfy. See, e.g., FEIS at 3-32 (concluding that the Northern Pipeline – ACP Collocation Alternative is "likely ... technically infeasible"); *id.* at 3-119 (concluding that some of the remaining route alternatives "appear to be technically feasible").

¹⁹ FEIS at 1-8.

intended to transport natural gas from an existing interconnect in West Virginia to an existing natural gas pooling point and gas trading hub located along a major existing natural gas pipeline in Virginia.²⁰

The previously approved route connecting these locations would be 303.5 miles long, and would cross 3.5 miles of federal lands managed by the U.S. Forest Service within the Jefferson National Forest (JNF), in three discontinuous portions located at mileposts (MPs) 196.2 to 197.8, MPs 218.5 to 219.4, and MPs 219.8 to 220.8.²¹ The route would also cross 60 feet of federal lands managed by the USACE, at MP 66.8.²² The route would be collocated with an existing ROW for 1.0 miles of its crossing of the JNF, following a forest road known as Mystery Ridge Road at MPs 196.8 to 197.8.²³ The previously approved route would not be collocated with another ROW for any portion of its crossing of USACE lands.

In addition to its beginning and endpoints, the MVP is also intended to serve three mid-route delivery points that are relevant to this analysis: the WB Interconnect, located at MP 77.6 of the previously approved route; the Roanoke Gas Lafayette Tap, located at MP 235.7; and the Roanoke Franklin Tap, located at MP 261.3.²⁴ The location of the WB Interconnect is determined by existing natural gas infrastructure, while the locations of the two Roanoke Gas taps are determined by the service area of the utility purchaser that will operate those taps and by existing agreements with that purchaser.²⁵ The existence of these three mid-route delivery points was an important factor in the selection of the previously approved route, and in the approval of the MVP project by FERC.²⁶ Therefore, to the extent that any of the route alternatives would bypass these mid-route delivery points, that fact is relevant to the BLM's consideration of the practicality of that route alternative.

III. Route Alternatives

The BLM has analyzed nine route alternatives or families of route alternatives that would affect the MVP project's crossing of the JNF.²⁷ These route alternatives are analyzed in the order of the milepost at which each route alternative first diverges from the previously approved route.

²⁰ FEIS at 1-8, 3-3.

²¹ FEIS at 1-1, 1-14.

²² FEIS at 1-16, 4-277.

²³ FEIS App'x P at P-6; MVP Plan of Development at 1-7 (Nov. 30, 2017) (POD).

²⁴ FEIS at 2-14 to 2-15; FERC Order Issuing Certificates and Granting Abandonment Authority at 4 (Oct. 13, 2017) (FERC Certificate). Two additional mid-route facilities are located at points along the previously approved route that would not be affected by any of the route alternatives considered here. See FEIS at 2-14 to 2-15.

²⁵ See FEIS at 1-8, 2-14; MVP Resource Report 10 and Appendices at 10-2 to 10-3 (Oct. 23, 2015) (Resource Report 10).

²⁶ See FEIS at 1-8 to 1-9, 3-15; FERC Certificate at 3-5.

²⁷ Several of the route alternatives addressed in this analysis would also affect the location of, or necessity for, the crossing of USACE lands. Because the USACE crossing is so short compared with the JNF crossing, however, any differences in the length or location of the USACE crossing

A. Northern Pipeline – ACP Collocation Alternative

The Northern Pipeline – ACP Collocation Alternative would involve collocating the 42-inch-diameter MVP with the planned 42-inch-diameter Atlantic Coast Pipeline (ACP), along the ACP's proposed route.²⁴ This route alternative would diverge from the previously approved route at MP 37, and re-converge at the MVP's endpoint at MP 303.5.²⁹

For purposes of this analysis, the BLM assumes that the ACP would be constructed as proposed, and therefore that this route alternative would collocate the MVP with another ROW for the MVP's entire crossing of federal lands. Accordingly, this route alternative would provide greater collocation on federal lands than the previously approved route.

Constructing the two pipelines in parallel would raise serious constructability challenges:

[A] major disadvantage of the Northern Pipeline – ACP Collocation Alternative route is the necessity to construct two parallel pipelines along approximately 205 miles of the ACP route, much of which presents significant constructability issues related to topography and space. ... Based on [FERC's] review of aerial photography and topographic maps, ... in many areas, such as in Lewis and Upshur Counties, West Virginia and Augusta and Nelson Counties, Virginia,^[30] there is insufficient space along the narrow ridgelines to accommodate two parallel 42-inch-diameter ... pipelines. This would result in side slope (i.e., side-hill) or two-tone construction techniques, with additional acres of disturbance required for [temporary workspaces], given the space needed to safely accommodate equipment and personnel, as well as spoil storage. The constructability issues alone are likely to render this alternative technically infeasible.³¹

would not affect the outcome of the BLM's analysis for these route alternatives. As to alternatives apart from those addressed in this analysis, no route alternatives exist that would result in collocation of the USACE crossing and that are practical. A private landowner whose parcel is located approximately 2.5 miles from the USACE crossing proposed collocating the MVP with an existing pipeline near her property, but this proposal (which may not have resulted in collocation at the USACE crossing itself) would be impractical due to constructability and safety concerns. See FEIS at 3-112. No other route alternative has been identified that would involve collocation with that existing pipeline. See McGuire August 16, 2018 Email.

²⁸ FEIS at 3-29.

²⁹ FEIS at 3-29 to 3-30.

³⁰ These counties include much of the ACP's crossing of federal lands. See FEIS at 3-30.

³¹ FEIS at 3-32. See also FERC Order on Rehearing at 73, 163 FERC ¶ 61,197 (June 15, 2018) ("The area's steep slopes and narrow ridgeways make construction of two adjacent pipelines technically infeasible."). FERC's assessment is supported by information submitted by MVP. See MVP Responses to FERC Environmental Information Request at 177 (Mar. 31, 2016) (March 31, 2016 Responses) ("Significant mountaintop removal and material excavation would be required to obtain a proper level construction surface to work on during the pipeline

Moreover, the Northern Pipeline – ACP Collocation Alternative would cross at least 19.1 miles of federal lands – more than five times as much as the previously approved MVP route.³² Because a separate 125-foot-wide ROW may be required for each pipeline,³³ collocating the MVP with the ACP may result in a substantial increase in federal land disturbance compared with constructing each pipeline along its previously approved route.

Furthermore, the Northern Pipeline – ACP Collocation Alternative would include 22 more miles of side slope than the previously approved route, in addition to any side slope construction required by the need to fit two parallel pipelines on narrow ridgelines.³⁴ Construction along side slopes, where the gradient of the slope is perpendicular or oblique to the pipeline route, requires modified construction techniques and presents considerable safety and operational risks both during and after construction.³⁵ Although the terrain of the project area makes some degree of side slope construction unavoidable, and the project incorporates best management practices to mitigate the risks associated with side slopes, reducing side slopes is a key factor in comparing route alternatives for the MVP project.³⁶

Finally, because the Northern Pipeline – ACP Collocation Alternative would diverge from the previously approved route at MP 37, and re-converge only at the MVP's endpoint at MP 303.5, this route alternative would bypass all three of the mid-route delivery points discussed above.³⁷ The two Roanoke Gas taps, in particular, could not be relocated so as to meet the ACP's route, meaning that an alternative that follows the ACP route would require either forfeiting the

installation phase. ... There is insufficient space along the tops of the ridgelines for two adjacent large diameter pipelines in these areas. Constructing two large diameter pipelines in the mountainous terrain would add significant construction personnel risk with the amount of equipment necessary to move and install both pipelines in the steep terrain. Sidebooms do not have enough weight capacity or levered distance to hold or move a second pipe over the first pipe trench. Erosion and sediment control risks significantly increase with the amount of soil and steep slope disturbance required for the two 42-inch pipelines ditch excavation and soil control.”); Resource Report 10 at 10-16 (similar).

³² See FEIS at 3-31. The version of the ACP route included in that project's final environmental impact statement may cross even more federal lands. See ACP Final Environmental Impact Statement at 4-423 (July 2017).

³³ FEIS at 3-29.

³⁴ See FEIS at 3-32.

³⁵ FEIS at 2-37, 3-4, 4-52 to 4-56; INGAA Rugged Terrain Report at 26-28, 40-41; McGuire August 16, 2018 Email.

³⁶ FEIS at 3-3. See also INGAA Rugged Terrain Report at 30 (recommending that side slope areas “should be identified early in the project design and planning processes, and minimized to the greatest extent possible”); *id.* at 61 (“Careful planning and routing is always preferred to avoid or minimize potential threats from landslide and erosion hazards, but mitigation is usually required when such hazards cannot be avoided.”).

³⁷ See FEIS at 3-30.

purpose of serving this customer, or else building nearly 60 miles of additional pipeline in order to reach those taps.³⁸

For these reasons, we conclude that the Northern Pipeline -- ACP Collocation Alternative is not practical.

B. Highway Collocation Alternative

The Highway Collocation Alternative is a route alternative that would follow public roads for as much of its route as possible.³⁹ More specifically, this route alternative would mostly be collocated with interstate highways, intersecting the previously approved route in the vicinity of MP 60 and crossing the JNF alongside Interstate 77.⁴⁰ For purposes of this analysis, we assume that this route alternative would collocate the MVP with an interstate highway ROW for the MVP project's entire crossing of federal lands, and would therefore provide greater collocation on federal lands than the previously approved route.

The FEIS examined two versions of this collocated route alternative, one that would be located within the highway ROWs and one that would be located "adjacent to, but outside of," the highway ROWs.⁴¹ The version that would be located outside the highway ROWs

would likely present numerous and substantive construction challenges, including traversing roadway overpasses and underpasses, large interchanges, elevated sections of roadway including bridges, areas congested with development and homes, and narrow valleys where the most suitable terrain (i.e., flat) is already partially or fully encumbered by the roadway.⁴²

The version of this route alternative that would be located within the highway ROWs, meanwhile, would likely be prohibited by state laws and policies.⁴³ In West Virginia, the state agency's utility placement policy "prohibits longitudinal occupancy inside the controlled access right of way, by any utility, on any type of [controlled] highway, ... except ... underground fiber

³⁸ FEIS at 3-14. See also March 31, 2016 Responses at 177 ("[MVP] will also serve Roanoke Gas which is located along its Proposed Route in southwest Virginia; a market that cannot be served by moving to the Northern Pipeline Alternative route."); Resource Report 10 at 10-8, 10-16 (similar).

³⁹ FEIS at 3-18.

⁴⁰ FEIS at 3-18 to 3-19.

⁴¹ FEIS at 3-18.

⁴² FEIS at 3-18. This version of the Highway Collocation Alternative would not "utiliz[e] a ROW] in common," and therefore does not satisfy section 28(p) for that reason, as well.

⁴³ Federal regulations permit state agencies to establish policies regarding utility installations in interstate highway ROWs. See 23 C.F.R. § 645.209(c)(1). See also 30 U.S.C. § 185(v) ("The Secretary or agency head shall take into consideration and to the extent practical comply with State standards for right-of-way construction, operation, and maintenance.").

optic facilities.⁴⁴ And in Virginia, where the JNF crossing is primarily located, state regulations provide that “[n]ew utilities will not be permitted to be installed parallel to the roadway longitudinally within the controlled or limited access right-of-way lines of any highway” except in “special cases,” and even then only if such installation would not “involve tree removal or severe tree trimming.”⁴⁵ This limitation on tree removal or trimming is likely incompatible with the placement of a natural gas pipeline.⁴⁶

In addition, the Highway Collocation Alternative would be 142.5 miles (almost 47%) longer than the previously approved route, cross six times as many miles of federal lands, and cross more than twice as many perennial waterbodies, resulting in substantial additional costs and environmental impacts.⁴⁷ This route alternative would also cross an additional 51 miles of side slopes and an additional 125 miles of lands with landslide potential, amplifying the constructability concerns described above.⁴⁸ It would also bypass the three mid-route delivery points discussed above.⁴⁹

For these reasons, we conclude that the Highway Collocation Alternative is not practical.⁵⁰

C. Alternative 1/Hybrid Alternative 1A

⁴⁴ See W. Va. Div. of Highways, *Accommodation of Utilities on Highway Right of Way and Adjustment and Relocation of Utility Facilities on Highway Projects*, at 2 (2007), available at https://transportation.wv.gov/highways/engineering/files/ACCOMMODATION_OF_UTILITIES.pdf.

⁴⁵ 24 Va. Admin. Code. § 30-151-301(2)(d). See also Va. Dep’t of Trans., *Utility Manual of Instructions: Utility Relocation Policies & Procedures*, at 8-7 (2011), available at http://www.virginia.gov/business/resources/right_of_way/utility_manual02132012_techrev.pdf. Such installations must also satisfy other requirements, including that “the installation will not adversely affect the safety, design, construction, operation, maintenance or stability of the highway,” that “the accommodation will not interfere with or impair the present use or future expansion of the highway,” and that “any alternative location would be contrary to the public interest,” taking into account “the direct and indirect environmental and economic effects that would result from the disapproval of [such] use.” See § 30-151-301(2)(a)-(c).

⁴⁶ See FEIS at 3-18.

⁴⁷ FEIS at 3-20.

⁴⁸ FEIS at 3-20.

⁴⁹ See FEIS at 3-19. Although such an alternative was not analyzed in the FEIS, it may be possible to construct a route alternative that generally follows the previously approved route, but deviates from that route between MPs 150 and 250 in order to cross the JNF along existing highways. See FEIS at 3-19. Such a hypothetical route alternative might avoid bypassing the three mid-route delivery points discussed above, but would otherwise be subject to most of the same practical concerns.

⁵⁰ See also FEIS at 3-17 (“This alternative concept is not evaluated in detail below due to the associated construction challenges, logistical constraints, and environmental impacts which we determined render it technically infeasible and/or as not providing a significant environmentally [sic] advantage compared to the proposed action.”).

Alternative 1 was designed to maximize collocation with an existing electric transmission line.⁵¹ Hybrid Alternative 1A is a variant that would follow the previously approved route through MP 135 and from there on follow the route of Alternative 1, re-converging with the previously approved route at its endpoint at MP 303.5.⁵² These two route alternatives are considered together here, since they are identical at the JNF crossing.⁵³ Both route alternatives would result in greater collocation on federal lands than the previously approved route, crossing fewer miles of federal lands overall and being collocated with the existing transmission line for the entirety of that crossing.⁵⁴

Collocating underground pipelines with electric transmission lines over long distances poses distinctive constructability and safety challenges that would be exacerbated in the circumstances of the MVP. Locating pipelines near transmission lines poses risks to pipeline workers from operating in close proximity to high voltage power lines, and increased risk of pipeline corrosion from interference with pipeline cathodic protection systems and from other forms of electrical interference.⁵⁵ These risks increase with parallel or near-parallel installation, especially at collocation lengths over a mile.⁵⁶ To mitigate these safety concerns, as well as concerns related to access for construction and operations, parallel installations typically involve adjacent or partially overlapping ROWs, rather than complete collocation.⁵⁷ Finally, because side slopes and

⁵¹ FEIS at 3-22. Alternative 1 was the original proposed alternative, but was supplanted by the previously approved route due to concerns regarding side slopes. See FEIS at 3-17; Resource Report 10 at 10-10 to 10-11.

⁵² FEIS at 3-25.

⁵³ Another route alternative, known as Hybrid Alternative 1B, would follow Alternative 1 through MP 135 and from there on follow the previously approved route. See FEIS at 3-25 to 3-26. Hybrid Alternative 1B is not considered here, since it would be identical to the previously approved route at the JNF crossing.

⁵⁴ See FEIS at 3-24, 3-27; McGuire August 16, 2018 Email; Neylon August 17, 2018 Email.

⁵⁵ See generally INGAA Foundation, Inc., Final Report No. 2015-04, *Criteria for Pipelines Co-Existing with Electric Power Lines* (2015) (INGAA Power Lines Report), available at <http://www.ingaa.org/File.aspx?id=24732>; McGuire August 16, 2018 Email.

⁵⁶ See INGAA Power Lines Report at 4, 45-49. The previously approved route would be collocated with electric transmission lines for numerous short stretches, but rarely for distances of a mile or more. See FEIS App'x P at P-1 to P-8.

⁵⁷ See McGuire August 16, 2018 Email (noting that in a typical configuration, the 50-foot-wide permanent pipeline ROW would be adjacent to the transmission line ROW, and the pipeline's temporary 100- to 125-foot-wide construction ROW would overlap with the transmission line ROW by 25 feet); FEIS at 3-22 ("The pipeline could be installed as close as 25 feet away from powerline infrastructure, with temporary workspace located even closer, but other configurations would also be required based on soil type and working conditions where the pipeline would be located much further away."). See also FEIS App'x P at P-1 to P-8 (listing offset distances between the centerline of the previously approved route and the edges of existing transmission line ROWs); INGAA Power Lines Report at 4, 46 (noting that interference risk is "Medium" for separation distances of 100 to 500 feet, and "High" for distances under 100 feet). MVP has also noted that constructing a major pipeline in the immediate vicinity of an electric transmission line poses "[c]onstructability and safety issues associated with ... the possibility of undermining

steep slopes⁵⁸ of the kind frequently encountered along the MVP's route pose a far greater challenge for pipelines than for electric transmission lines, which have a far smaller physical footprint and are capable of spanning stretches of challenging terrain, routes that are suitable for transmission line construction may be unsuitable for pipeline construction.⁵⁹ Therefore, while collocation with electric transmission lines can often be achieved, including in parts of the previously approved route of the MVP, the challenges of such collocation are highly relevant to the practicality analysis.

Alternative 1 would be over twenty miles longer than the previously approved route,⁶⁰ resulting in significant additional construction costs, and would pose significant technical challenges. In particular, Alternative 1 would cross 171.4 miles of steep slopes in excess of 20% grade – 42.8 miles more than the previously approved route, and over half the entire length of Alternative 1.⁶¹ Alternative 1 would also cross more miles of side slope than the previously approved route, including over 100 miles of “severe side slopes,”⁶² and would include two crossings of the New River, which the previously approved route avoids crossing.⁶³ These factors would pose substantial constructability and safety challenges.⁶⁴

power line towers.” MVP Responses to Data Requests issued January 27, 2017, at 570 (Feb. 17, 2017) (February 17, 2017 Responses).

⁵⁸ Construction along steep slopes where the gradient of the slope is parallel to the pipeline route poses many of the same challenges as construction along side slopes, though such challenges are typically less severe than in side slope conditions. FEIS at 2-49, 3-25, 4-28, 4-45, 4-52 to 4-56; INGAA Rugged Terrain Report at 7, 24. *See also* MVP Responses to Data Requests issued December 24, 2015, at 238 (Jan. 15, 2016) (describing construction and safety challenges associated with steep slopes).

⁵⁹ *See* McGuire August 16, 2018 Email. *See also* Resource Report 10 at 10-10 to 10-11 (“While the overhead transmission lines span significant areas of slide [sic] slope, these areas would be required to be crossed directly by the pipeline.”); February 17, 2017 Responses at 570 (“It is also important to recognize that the design requirements for a ROW for one type of infrastructure are not necessarily the same for other types of infrastructure.”).

⁶⁰ FEIS at 3-24.

⁶¹ *See* FEIS at 3-24.

⁶² FEIS at 3-24; Resource Report 10 at 10-10, 10-14.

⁶³ FEIS at 3-24. As explained by FERC staff, crossing the New River poses both constructability challenges and environmental concerns. *See* McGuire August 16, 2018 Email (“The New River in the immediate vicinity of the proposed route ranges from about 300 to 350 feet wide (a major river crossing). It is not a complete obstacle, as it could be crossed (likely via [horizontal directional drilling], although with a risk of an inadvertent release of drilling mud into the River), however as a significant environmental resource, avoidance (which was accomplished with the proposed route) if possible was preferred.”). Alternative 1 would also cross 38 more perennial waterbodies and 14.5 more miles of karst terrain. FEIS at 3-24.

⁶⁴ *See also* Resource Report 10 at 10-11 (“MVP determined that Route Alternative 1 represented insurmountable construction challenges, as well as a high risk of slope failure and pipeline slips, once the pipeline was to be in operation. ... [M]uch of the existing right-of-way was ultimately found unsuitable for pipeline construction ...”).

Hybrid Alternative 1A would pose many of the same challenges as Alternative 1. While this route alternative would be shorter than Alternative 1 and include fewer miles of steep slope, it would still be 6.3 miles longer than the previously approved route, and feature 140.8 miles of steep slope (almost 10% more than the previously approved route), as well as both crossings of the Now River.⁶⁵ Hybrid Alternative 1A would also cross 177.2 miles of side slope (over 10% more than the previously approved route, exceeding even Alternative 1), and a significant portion of the "severe side slopes" crossed by Alternative 1.⁶⁶ The additional miles of steep slope and side slope, compared with the previously approved route, would "present[] substantially more obstacles to safe construction, increas[e] extra workspace requirements, and potentially affect[] worksite stability during construction and after restoration."⁶⁷

Both Alternative 1 and Hybrid Alternative 1A would also pose constructability challenges associated with the necessary crossing of the Blue Ridge Parkway. While the previously approved route would cross the Parkway in an open grassy area, allowing the pipeline to bore under the Parkway, Alternative 1 and Hybrid Alternative 1A would cross the Parkway in a location flanked on one side by a wetland and floodplain and on the other by a short, steep slope, which together would complicate the boring process.⁶⁸

In addition, Alternative 1 would bypass the three mid-route delivery points discussed above, while Hybrid Alternative 1A would bypass two of the three.⁶⁹

For these reasons, we conclude that Alternative 1 and Hybrid Alternative 1A are not practical.

D. Variations 110, 110R, and 110J

Variations 110, 110R, and 110J were developed in order to avoid a number of sensitive resources located in the general vicinity of the JNF crossing, between MPs 175 and 235.⁷⁰ Each of these variations would cross more miles of federal lands than the previously approved route but would be collocated for fewer of those miles.⁷¹ Therefore, these route alternatives do not satisfy the criteria of section 28(p).⁷²

E. SR 635-ANST Variation

⁶⁵ FEIS at 3-25, 3-27 to 3-28. Hybrid Alternative 1A would also cross 22 more perennial waterbodies. FEIS at 3-27.

⁶⁶ FEIS at 3-24 to 3-25, 3-28; Resource Report 10 at 10-14.

⁶⁷ FEIS at 3-25.

⁶⁸ FEIS at 4-324 to 4-325; Resource Report 10 at 10-61.

⁶⁹ See FEIS at 3-26.

⁷⁰ FEIS at 3-44 to 3-45.

⁷¹ See McGuire August 16, 2018 Email; Neylon August 17, 2018 Email.

⁷² Furthermore, we note that Variation 110 crosses a designated wilderness area within the JNF, which renders this route variation impractical. See FEIS at 3-44, 3-46. See also Letter from U.S. Forest Service to FERC (May 16, 2016) (noting lack of authority to approve a pipeline within a wilderness area).

The SR 635-ANST Variation, located between MPs 191.7 and 207.8, was developed in order to examine the feasibility of reducing impacts on hikers traveling along the Appalachian National Scenic Trail (ANST) by crossing the ANST at the same location as an existing state road.⁷³ This route variation would cross 2.9 miles more federal lands than the previously approved route, and would not be collocated for any part of its crossing.⁷⁴ Therefore, the SR 635-ANST Variation does not satisfy the criteria of section 28(p).⁷⁵

F. CGV Variation

The CGV Variation, located between MPs 195 and 200, was developed in order to examine the feasibility of collocating the MVP with two existing pipelines that cross the JNF.⁷⁶ This route alternative would provide increased collocation on federal lands, replacing a 1.7 mile crossing of federal lands of which 1 mile is collocated with a 1.6 mile crossing that is mostly or entirely

⁷³ FEIS at 3-52.

⁷⁴ FEIS at 3-54; McGuire August 16, 2018 Email; Neylon August 17, 2018 Email. While the SR 635-ANST Variation would cross the ANST at the same location as the state road, the route alternative would not continue alongside that existing road. See McGuire August 16, 2018 Email. To the contrary, due to the topography of the area, the SR 635-ANST Variation would be forced to parallel the ANST for one mile. See MVP Responses to Data Requests issued January 27, 2017 and Supplemental Materials (Mar. 2, 2017) (March 2, 2017 Responses) at 39; MVP Additional Responses to June 28, 2016 Data Request at 63 (July 18, 2016) (July 18, 2016 Responses). In light of the purpose of section 28(p), we do not consider the ANST, which is a congressionally designated national scenic trail, *res* 16 U.S.C. § 1244(a)(1), to be an existing ROW with which Congress intended to encourage collocation of pipelines.

⁷⁵ Moreover, even if the SR 635-ANST Variation provided greater collocation than the previously approved route, this route alternative would be impractical. The environmental, constructability, and safety effects of the SR 635-ANST Variation would be mixed: the variation would be 1.5 miles shorter and would affect 89.2 fewer acres of interior forest, but would cross 2.9 more miles of federal lands and cross more wetlands, perennial waterbodies, and miles of inventoried roadless areas; similarly, the variation would cross fewer miles of steep slope and side slope, but more miles of land with landslide potential. FEIS at 3-52. More importantly, however, the SR 635-ANST Variation would be unlikely to succeed at its purpose, to reduce the impact of the MVP on ANST users. Whereas the previously approved route would cross the ANST perpendicularly, and preserve a 300-foot forested buffer on either side of the ANST by boring under the trail, the SR 635-ANST Variation would be forced to parallel the trail for about a mile, as noted above, likely increasing visual impacts on the trail. See FEIS at 3-52 to 3-53; March 2, 2017 Responses at 39; July 18, 2016 Responses at 63. Moreover, the low topography of the trail crossing site would limit the length of the borehole, eliminating the forested buffer and further increasing the visual impacts. March 2, 2017 Responses at 39; July 18, 2016 Responses at 63. Furthermore, the SR 635-ANST Variation would bring the MVP ROW closer to the ANST's Wind Rock overlook, increasing visual impacts on this overlook. March 2, 2017 Responses at 39. For these reasons, the SR 635-ANST Variation is not likely to succeed at its purpose of reducing impacts on users of the ANST, rendering the route impractical.

⁷⁶ FEIS at 3-48.

collocated.⁷⁷ The elimination of less than three-quarters of a mile of uncollocated crossing of federal lands would come at a cost of 9 more miles of total pipeline, however, including 4.1 more miles of steep slope and 4.6 more miles of side slope.⁷⁸ The CGV Variation would also result in 136.3 more acres of construction disturbance, including 60.8 more acres on forested land; increase the MVP's potential impacts on the watershed relied on by the Red Sulphur Public Service District, a public water supply utility; and bring the MVP ROW closer to the ANST's Angel's Rest overlook, increasing visual impacts on this overlook.⁷⁹ For these reasons, we conclude that the CGV Variation is not practical.

G. AEP-ANST Variation

The AEP-ANST Variation, located between MPs 195.4 and 200, was developed in order to examine the feasibility of reducing impacts on hikers traveling along the ANST by crossing the ANST at the same location as an existing electric transmission line.⁸⁰ The AEP-ANST Variation would cross approximately 0.9 more miles of federal lands than the previously approved route, while providing, at best, no more than 0.8 miles of additional collocation on federal lands.⁸¹ Because the AEP-ANST Variation involves at least 0.1 mile more uncollocated crossing of federal lands, this route alternative provides less net collocation on federal lands, and does not satisfy the criteria of section 28(p).⁸²

⁷⁷ FEIS at 3-50; *id.* App'x P at P-6; POD at 1-7; McGuire August 16, 2018 Email; Neylon August 17, 2018 Email. While the FEIS indicates that the relevant portion of the previously approved route contains zero miles "adjacent to existing right-of-way," this figure considers only major features such as transmission lines and pipelines, and excludes the previously approved route's collocation with a forest road, as noted above. See FEIS at 3-20, 3-50.

⁷⁸ FEIS at 3-50; McGuire August 16, 2018 Email; Neylon August 17, 2018 Email. Underscoring the constructability and safety concerns associated with the additional steep slopes and side slopes, the same pipeline ROW with which this route alternative would be collocated was previously the site of a slope failure related to side slopes. See FEIS at 4-45, 4-67, 4-69. See also INGAA Rugged Terrain Report at 7 (noting that "[l]andslide and erosion hazards are more commonly found, or created, ... where the proposed alignment intersects existing landslide[s]").

⁷⁹ FEIS at 3-50; March 2, 2017 Responses at 44.

⁸⁰ FEIS at 3-52, 3-55.

⁸¹ See FEIS at 3-54; McGuire August 16, 2018 Email; Neylon August 17, 2018 Email.

⁸² The AEP-ANST Variation would also pose constructability and safety concerns. The general concerns related to collocating the MVP with electric transmission lines are discussed above. In the specific context of the AEP-ANST Variation, these challenges include more miles of steep slope, side slope, shallow bedrock, and areas with landslide potential than the previously approved route. FEIS at 3-54. Moreover, this route alternative would be 3.2 miles longer, would cross more perennial waterbodies and forested land (but less inventoried roadless area, inventoried semi-primitive area, interior forest, and karst area), would result in an additional 48.9 acres of construction disturbance and a larger area of forested land disturbance during both construction and operation, and would increase the MVP's potential impacts on the Red Sulphur Public Service District watershed. FEIS at 3-54; March 2, 2017 Responses at 40.

H. Brush Mountain Alternatives 1 and 2

Brush Mountain Alternatives 1 and 2, located between MPs 219.5 and 220.7, were developed in order to reduce impacts to the Craig Creek watershed.⁸³ Brush Mountain Alternative 1 would feature the same amount of federal lands crossing and the same amount of collocation as the previously approved route, and therefore does not satisfy the criterion of providing greater collocation on federal lands.⁸⁴ Brush Mountain Alternative 2, meanwhile, may provide greater collocation, but by no more than 0.22 miles.⁸⁵ Any such increase in collocation, meanwhile, would come at the cost of a larger increase in the total mileage (0.3 additional miles), the mileage of side slope (0.4 additional miles), and the mileage of lands with landslide potential (0.3 additional miles).⁸⁶ Because Brush Mountain Alternative 2 would entail greater

Furthermore, like the SR 635-ANST Variation, the AEP-ANST Variation would be unlikely to accomplish its purpose of reducing impacts on users of the ANST. Under either the AEP-ANST Variation or the previously approved route, hikers would experience a clearing at the location where the trail crosses the existing electric transmission line, and no clearing where the previously approved route crosses the trail (due to the 300-foot forested buffer). See FEIS at 3-52, 4-312; FEIS App'x S figs. 1a to 7b. The majority of new visual impacts on trail users would therefore occur, under either scenario, not due to near-field impacts at the location where the previously approved route crosses the trail, but rather due to more distant views of the MVP ROW from various points along the trail. See FEIS at 4-312; see generally FEIS App'x S. The AEP-ANST Variation would not reduce the overall visual footprint of the MVP ROW, and may in fact increase that overall footprint due to the larger area of forested land disturbance. See also March 2, 2017 Responses at 40 (noting that "the visual impact on ANST users would likely be greater because of the open view that trail users have when within the [transmission line] right-of-way"). Moreover, the AEP-ANST Variation would also bring the MVP ROW closer to the Angel's Rest overlook, increasing visual impacts on this overlook. March 2, 2017 Responses at 40. Therefore, the AEP-ANST Variation is not likely to succeed at its purpose of reducing impacts on users of the ANST.

For these reasons, we conclude that the AEP-ANST Variation is not practical.

⁸³ FEIS at 3-61 to 3-62.

⁸⁴ FEIS at 3-64; Neylon August 17, 2018 Email. Brush Mountain Alternative 1 also poses a significant constructability and safety concern related to an area of especially steep slope, over 43% grade. FEIS at 3-62 to 3-64; March 2, 2017 Responses at 47; MVP Responses to Data Requests issued January 27, 2017, at 139 (Feb. 23, 2017).

⁸⁵ One assessment estimated that Brush Mountain Alternative 2 would cross 1.3 miles of federal lands with no collocation, and therefore would offer no collocation advantage. See Neylon August 17, 2018 Email. The other assessment estimated that the route alternative would cross 1.18 miles of federal lands with 0.4 miles of collocation, for a net of 0.78 miles of federal lands without collocation. McGuire August 16, 2018 Email. By contrast, the corresponding segment of the previously approved route would cross 1.0 miles of federal lands, with between 0 and 0.2 miles of collocation, for a net of between 0.8 and 1.0 miles of federal lands without collocation. Neylon August 17, 2018 Email; FEIS at 3-64.

⁸⁶ FEIS at 3-64; MVP Responses to Data Requests issued January 27, 2017, at 140 (Feb. 23, 2017); March 2, 2017 Responses at 48. The FEIS also concluded that Brush Mountain Alternative 2 would not offer a significant environmental advantage compared to the previously

constructability and safety challenges than the previously approved route while providing at best a marginal increase in collocation on federal lands, we conclude that this route alternative is impractical.

I. Slussers Chapel Variations

The Slussers Chapel Variations consist of two route alternatives located between MPs 220.7 and 223.7 that were developed in order to reduce impacts on the Slussers Chapel Conservation Site.⁴⁷ One route alternative, Modified Variation 250, would replace a portion of the route located entirely on non-federal lands with a route that would cross 2.3 miles of federal lands, and therefore does not satisfy the criterion of increased collocation on federal lands.⁴⁸ The other route alternative, the VADCR Slussers Chapel Conservation Site Avoidance Variation, would replace a portion of the route that crosses 0.04 miles of federal lands with a route that would cross 2.54 miles of federal lands, and therefore does not appear to satisfy this criterion, either.⁴⁹ This route alternative would also traverse a narrow ridgetop with a designated wilderness area on one side, steep slopes on the other side, and an existing forest road along the ridge, posing significant constructability and safety concerns that the previously approved route avoids and that render this route alternative impractical.⁵⁰ For these reasons, we conclude that these route alternatives do not satisfy the criteria of section 28(p).

IV. Conclusion

As the analysis above demonstrates, none of the route alternatives would result in greater collocation on federal lands and be practical. Several of the route alternatives would not result in greater collocation on federal lands. Each of the remaining route alternatives would be impractical due to a combination of constructability and safety challenges, increased

approved route. FEIS at 3-65. Because the purpose of Brush Mountain Alternative 2 is to reduce environmental impacts, *see* FEIS at 3-61 to 3-62, the failure to achieve a significant environmental advantage also renders this route alternative impractical.

⁴⁷ FEIS at 3-69 to 3-70. A third route alternative, Variation 250, would not affect the MVP's crossing of federal lands, and therefore is not relevant to this analysis. FEIS at 3-71. Moreover, Variation 250 was adopted by FERC and incorporated into the MVP route. FERC Certificate at 60; *id.* App'x C at 7.

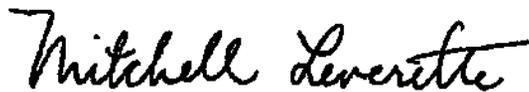
⁴⁸ FEIS at 3-71, 3-74.

⁴⁹ FEIS at 3-72.

⁵⁰ FEIS at 3-69. *See also* February 17, 2017 Responses at 195-196 (“[The Slussers Chapel Variation] significantly increases the construction risks due to its placement along the ridgeline of Brush Mountain. There is an existing Forest Service Road (Forest Road 188/Brush Mountain Road) along the ridge top, with the boundary of Brush Mountain Wilderness north of and parallel to the road. Mountain Valley would need to maintain a 50-foot buffer between the Wilderness Boundary and the edge of construction work area, which would require that the 125-foot-wide construction right-of-way encompass Forest Road 188 as well as significant side slope areas along the south side of the road. In addition, during construction, this section of Forest Road 188 would be closed for an extensive period of time to regular vehicle or foot traffic.”).

environmental impacts, increased length and footprint, increased cost,⁹¹ and inability to serve the purposes of the MVP or the specific purpose of the route alternative in question. Therefore, we conclude that the additional utilization of existing ROWs across federal lands would be impractical.

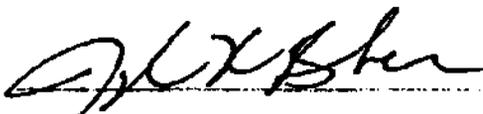
Sincerely,



Mitchell Leverette
Acting State Director, Bureau of Land Management, Eastern States

I concur

I do not concur



Joseph R. Balash
Assistant Secretary - Land and Minerals Management, U.S. Department of the Interior

⁹¹ As noted above, the BLM has considered the information presented above about length and construction challenges as a proxy for cost information.

Document Content(s)

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From: Craft, Victoria
To: [Lauren Johnston](#); [Grace Ellis](#); [Miriam Liberatore](#)
Subject: Fwd: [EXTERNAL] Delegated Letter Order - MVP Partial Authorization to Resume Construction
Date: Wednesday, August 29, 2018 9:23:08 AM
Attachments: [MVP Delegated Letter Order 2018-08-29.pdf](#)

For the file.

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Realty Specialist
Bureau of Land Management
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----- Forwarded message -----

From: Terry Turpin <Terry.Turpin@ferc.gov>
Date: Wed, Aug 29, 2018 at 10:37 AM
Subject: [EXTERNAL] Delegated Letter Order - MVP Partial Authorization to Resume Construction
To: "Perry, Kimberly P CIV USARMY CELRH (US)" <Kimberly.P.Perry@usace.army.mil>, "McWhirter, Jay - OGC" <JAY.MCWHIRTER@ogc.usda.gov>, "Foster, Andrea - OGC" <ANDREA.FOSTER@ogc.usda.gov>, "Abing, Timothy -FS" <tabing@fs.fed.us>, "Kathmann, Sarah - OGC" <sarah.kathmann@ogc.usda.gov>, "Craft, Victoria" <vcraft@blm.gov>, Haninah Levine <haninah.levine@sol.doi.gov>, "Henson, John" <john.henson@sol.doi.gov>, "Spencer, Sally" <sspencer@blm.gov>, Rich McGuire <Rich.McGuire@ferc.gov>, "Loftus, Paul J CIV USARMY CELRH (US)" <Paul.J.Loftus@usace.army.mil>, "Hatten, Michael E CIV USARMY CELRH (US)" <Michael.E.Hatten@usace.army.mil>, "Spagna, Teresa D CIV USARMY CELRH (US)" <Teresa.D.Spagna@usace.army.mil>, "ROBINETTE, Lee A CIV USARMY CELRH (US)" <Lee.A.Robinette@usace.army.mil>, "DeBergh, James V CIV USARMY CEHQ (US)" <James.V.Debergh@usace.army.mil>, James Martin <James.Martin@ferc.gov>, "Beum, Frank R -FS" <fbeum@fs.fed.us>, "Kate MacGregor (kate_macgregor@ios.doi.gov)" <kate_macgregor@ios.doi.gov>, "mmackiew@blm.gov" <mmackiew@blm.gov>, "Skipwith, Aurelia" <aurelia_skipwith@ios.doi.gov>, Mitchell Leverette <mleveret@blm.gov>

All,

The attached letter has been issued to eLibrary and will be showing up in the docket for MVP. Please reach out to discuss as needed.

-Terry

FEDERAL ENERGY REGULATORY COMMISSION
WASHINGTON, D.C. 20426

OFFICE OF ENERGY PROJECTS

In Reply Refer To:
OEP/DG2E/G3
Mountain Valley Pipeline LLC
CP16-10-000

August 29, 2018

Matthew Eggerding, Counsel
Mountain Valley Pipeline LLC
625 Liberty Ave., Suite 1700
Pittsburgh, PA 15222

Re: Partial Authorization to Resume Construction

Dear Mr. Eggerding:

Staff, having further reviewed the status of construction activities along the route of the Mountain Valley Pipeline Project (Project), and additional information provided by the Department of the Interior's Bureau of Land Management (BLM), has determined that the protection of the environment along the Project's right-of-way is best served by modifying the Stop Work Order issued on August 3, 2018.

In the Stop Work Order, staff stated that "[s]hould the agencies authorize alternative routes, [Mountain Valley Pipeline] may need to revise substantial portions of the Project route across non-federal lands, possibly requiring further authorizations and environmental review." On August 24, 2018, the BLM provided the Commission a supplemental analysis of other pipeline route alternatives that offer collocation opportunities across federal lands (see enclosure). Based on the BLM's determination that the route previously approved by all federal agencies provides the greatest level of collocation for an alternative crossing that is also practical, the specific route of the Project no longer seems in question.

Approximately sixty-five percent of the right-of-way between Mileposts 77 and 303 has been cleared of vegetation, with a significant portion of that length having been graded. In those cleared and graded segments, Mountain Valley Pipeline has installed temporary erosion control devices. Maintaining the status quo across non-federal lands while the Department of Agriculture's Forest Service, the Army Corps of Engineers, and the BLM address the Court's instructions regarding federal lands would likely pose threats to plant and wildlife habitat and adjacent waterbodies as long-term employment of temporary erosion control measures would subject significant portions of the route to erosion and soil movement. Requiring immediate restoration of the entire right-of-way to pre-construction conditions would require significant additional construction activity, also causing further environmental impacts.

In consultation with staff, I have determined that protection of the environment along the Project's right-of-way across non-federal land is best served by completing construction and restoration activities as quickly as possible. Consequently, pursuant to delegated authority under Title 18 of the Code of Federal Regulations, section 375.308(x)(7), and Environmental Condition 2 of the Commission's October 13, 2017 Order¹, I authorize the resumption of construction for the Project, except as indicated below.

Mountain Valley Pipeline has not obtained the rights-of-way and temporary use permits from the federal government needed for the Project to cross federally owned lands. Therefore, construction is still excluded at the following locations:

- the crossing of the Weston and Gauley Bridge Turnpike on lands owned by the U.S. Army Corps of Engineers, in Braxton County, West Virginia; and
- between milepost 196.0 and milepost 221.0, an area encompassing the two watersheds containing the 3.5 miles of pipeline route across the Jefferson National Forest, in Monroe County, West Virginia and Giles County, Virginia.

Finally, construction is being authorized, with the exceptions note above, because construction will best mitigate further environmental impacts. In order to ensure that Mountain Valley Pipeline achieve that objective, it must take all steps necessary to promptly conduct post-construction restoration as soon as construction is complete. I also remind you that Mountain Valley Pipeline must comply with all applicable remaining terms and conditions of the Commission's October 13, 2017 Order.

Sincerely,

Terry L. Turpin
Director,
Office of Energy Projects

¹ *Mountain Valley Pipeline, LLC*, 161 FERC ¶61,043 (2017), *order on reh'g*, 163 FERC ¶61,197 (2018).



United States Department of the Interior



Bureau of Land Management

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August 24, 2018

IN REPLY REFER TO:
2880 (ESJ020) VMC

Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street NE
Washington, DC 20426

Re: Mountain Valley Pipeline, LLC
Docket No. CP16-10-000
Mineral Leasing Act Section 28(p) Analysis for the Mountain Valley Pipeline

Dear Ms. Bose:

Enclosed for your docket please find the Bureau of Land Management's analysis of the Mountain Valley Pipeline project under section 28(p) of the Mineral Leasing Act of 1920. Please note that this analysis in itself does not constitute a record of decision or right-of-way grant.

Sincerely,

Victoria (Vicki) Craft
Project Manager

Enclosure (1)
-Practicality Analysis

CC: Public File, Docket No. CP16-10-000

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AUG 23 2018

Mr. Joseph R. Balash
Assistant Secretary – Land and Minerals Management
U.S. Department of the Interior
1849 C Street NW
Washington, DC 20240

Re: Mineral Leasing Act Section 28(p) Analysis for the Mountain Valley Pipeline

Dear Mr. Balash:

Section 28(p) of the Mineral Leasing Act of 1920 provides that “[i]n order to minimize adverse environmental impacts and the proliferation of separate rights-of-way across Federal lands, the utilization of rights-of-way in common shall be required to the extent practical.”¹ On July 27, 2018, the U.S. Court of Appeals for the Fourth Circuit vacated the record of decision and right-of-way (ROW) grant for the Mountain Valley Pipeline (MVP). The court found that the record of decision did not address whether “the utilization of an existing right of way would be *impractical*,” and specified that the BLM on remand must “favor[] routes utilizing existing rights of way unless those alternatives [are] impractical.”²

The Bureau of Land Management (BLM) has prepared this supplemental analysis to address the court’s instructions on remand. As explained below, we conclude that the additional utilization of existing ROWs across federal lands would be impractical.

I. Background

In order to implement the court’s instructions, we have analyzed whether any route alternative exists that would result in greater collocation with other ROWs on federal lands than the route that was previously approved by the BLM, and that would be practical. Each of these two criteria is explained in greater detail below.

A. Collocation on Federal Lands

The first criterion that a route alternative must satisfy is that it must result in greater collocation with other ROWs on federal lands – that is, it must cross fewer miles of federal lands without

¹ 30 U.S.C. § 185(p).

² See *Sierra Club, Inc. v. U.S. Forest Serv.*, – F.3d –, 2018 WL 3595760, at *16 (4th Cir. July 27, 2018) (emphasis in the original).

collocation than the previously approved alternative. We limit our comparison of collocation to federal lands because section 28(p) aims to minimize “the proliferation of separate rights-of-way across Federal lands,” and because the BLM has no authority over the MVP route except to the extent that the route involves the use of federal lands.³

In order to determine the extent of collocation on federal lands, we rely on two independent assessments: one conducted by staff of the Federal Energy Regulatory Commission (FERC), and one conducted by MVP.⁴ Although the results of these two independent assessments are generally consistent, they occasionally provide different estimates of the extent of collocation on federal lands, because of the technical challenges inherent in measuring the lengths of potential pipeline routes. Where the two assessments provide conflicting results on the question of whether a given route alternative would result in greater collocation on federal lands than the previously approved route, we have assumed conservatively that the route alternative would satisfy this criterion, and proceeded to examine whether the route alternative would be practical.

B. Practicality

The second criterion that a route alternative must satisfy is that it must be practical. In interpreting the term “practical” for purposes of this analysis, we have taken into consideration the term’s common usage, as well as relevant administrative and judicial interpretations. Black’s Law Dictionary defines “practical” as meaning “[l]ikely to succeed or be effective,” and “[u]seful or suitable for a particular purpose or situation.”⁵ The BLM’s regulations note that one of the objectives of the BLM’s pipeline ROW program is to “[p]romote[] the use of rights-of-way in common considering engineering and technological compatibility,” and that the use of ROWs in common may be required “where safety and other considerations allow.”⁶ In the only judicial or administrative decision addressing section 28(p), the Interior Board of Land Appeals determined that this standard includes consideration of a route’s cost and land-disturbance footprint, affirming that a route alternative was not “practical” when it would have “require[d]

³ See § 185(c)(2),(p). We define federal lands, consistently with section 28, to exclude “lands in the National Park System.” See 30 U.S.C. § 185(b)(1).

⁴ See Email from Rich McGuire, FERC, to Victoria Craft, BLM (Aug. 16, 2018) (McGuire August 16, 2018 Email); Email from Megan Neylon, MVP, to Victoria Craft, BLM (Aug. 17, 2018) (Neylon August 17, 2018 Email). Unlike the figures reported in the FEIS for “[l]ength adjacent to existing right-of-way,” these assessments included collocation with both major ROWs such as pipelines or electric transmission lines and smaller ROWs such as roads. See FEIS at 3-20. Cf. 70 Fed. Reg. 20,970, 20,970 (April 22, 2005) (“Some examples of land uses which require a right-of-way grant include: transmission lines, communication sites, roads, highways, trails, telephone lines, canals, flumes, pipelines, and reservoirs.”). For this reason, along with the fact that the FEIS’s figures do not distinguish between miles of collocation on federal and non-federal lands, we do not generally rely on the FEIS’s figures for “[l]ength adjacent to existing right-of-way” for this analysis.

⁵ See “Practical,” Black’s Law Dictionary (10th ed. 2014).

⁶ See 43 C.F.R. §§ 2881.2(c), 2882.10(b). See also 70 Fed. Reg. at 21,033 (noting that “there may be situations where for technical or safety reasons it is not practical” to make use of an existing ROW).

construction of an additional 39 miles of pipeline at an estimated additional cost of \$37.5 million,” as well as “installation of an additional compressor station and ... the temporary disturbance of a substantially greater acreage of lands during construction.”⁷ Similarly, in interpreting a parallel standard in another statute, the Board affirmed that a route was not “practical” where it would have “require[d] construction of up to an additional 60 miles of 345 kV power line and ha[d] an adverse impact on an additional 60 miles of public and private land,” while “preclud[ing] the opportunity to improve” service to one of the project’s proposed customers.⁸ Finally, a regulation issued to implement section 404 of the Clean Water Act prohibits the issuance of a dredge or fill discharge permit “if there is a practicable alternative to the proposed discharge” that is environmentally preferable, and defines “practicable” as including “consideration [of] cost, existing technology, and logistics in light of overall project purposes.”⁹ In reviewing decisions made under this regulation by the U.S. Army Corps of Engineers (USACE), courts have deferred to the agency’s practicability determinations, and upheld its consideration of factors including cost, construction delays, logistical feasibility, and “the objectives of the applicant’s project.”¹⁰

Accordingly, we interpret the term “practical,” for purposes of this analysis, as referring to the suitability of a route alternative for achieving its purpose, and to the likelihood that attempting to utilize that route would succeed in achieving that purpose.¹¹ The purpose of any route alternative is to construct a pipeline to deliver natural gas from the MVP’s beginning point to its endpoint, via its mid-route delivery points, in a safe, environmentally responsible, and cost-effective manner.¹² In certain cases, however, as discussed below, a particular route alternative may also have a more specific purpose, such as mitigating the impact of the MVP on certain resources. Therefore, the determination of whether a route alternative is practical includes consideration of the construction challenges and potential safety hazards that would arise from constructing or operating the pipeline along the route;¹³ the environmental consequences of constructing the

⁷ *Wyo. Indep. Producers Ass’n*, 133 IBLA 65, 82 (1995).

⁸ *Paul Herman*, 146 IBLA 80, 105 (1998) (interpreting 43 U.S.C. § 1763).

⁹ See 40 C.F.R. §§ 230.3(f), 230.10(a).

¹⁰ See *Friends of Santa Clara River v. U.S. Army Corps of Eng’rs*, 887 F.3d 906, 912, 921-922 (9th Cir. 2018) (quotation marks omitted); *Friends of the Earth v. Hintz*, 800 F.2d 822, 833-834 (9th Cir. 1986); *Nat’l Parks Cons. Ass’n v. Semonite*, 311 F. Supp. 3d 350, 377-378 (D.D.C. 2018).

¹¹ See “Practical,” Black’s Law Dictionary.

¹² See MVP Final Environmental Impact Statement at 1-8 (June 23, 2017) (FEIS). While the section 28(p) analysis described here is distinct from the National Environmental Policy Act analysis contained in the FEIS, the information and analysis presented in the FEIS is in many instances relevant to the section 28(p) analysis.

¹³ See 43 C.F.R. §§ 2881.2(c), 2882.10(b); 70 Fed. Reg. at 21,033.

pipeline along the route;¹⁴ any resulting increase in the pipeline's length and footprint;¹⁵ the ability of the route to serve the MVP's mid-route delivery points;¹⁶ the additional costs associated with the alternative;¹⁷ and the likelihood that the route would achieve any specific purpose identified for that route alternative.¹⁸

Although our comparison of the extent of collocation is limited to federal lands, determining the practicality of a route requires consideration of the route as a whole. A route alternative may increase the extent of collocation on federal lands, but prove impractical because of technical or other considerations relating to the route as a whole.

II. The MVP and the Previously Approved Route

The MVP is intended "to transport natural gas produced in the Appalachian Basin to markets in the Northeast, Mid-Atlantic, and Southeastern United States."¹⁹ Specifically, the project is

¹⁴ We note that section 28(p) can be read as requiring "the utilization of rights-of-way-in common" only where such collocation would "minimize adverse environmental impacts" as compared to an alternative with less collocation. See 30 U.S.C. § 185(p). Had we applied a separate requirement that any route alternative must "minimize adverse environmental impacts" compared to the previously approved alternative, we would have concluded on this basis alone that none of the route alternatives would satisfy the criteria of section 28(p). See FEIS at 3-20, 3-22, 3-25, 3-32, 3-47 to 3-48, 3-51, 3-55, 3-62, 3-65, 3-70 (concluding that none of the route alternatives considered in this analysis would "provide a significant environmental advantage" over the previously approved route). In this case, however, we have not excluded any route alternatives based solely on their environmental impacts.

¹⁵ See *Wyo. Indep. Producers*, 133 IBLA at 82; see also *Paul Herman*, 146 IBLA at 105.

¹⁶ See, e.g., *Paul Herman*, 146 IBLA at 105. See also *Friends of Santa Clara River*, 887 F.3d at 912, 921 (requiring consideration of "the objectives of the applicant's project," so long as "those project objectives are not so narrowly defined as to preclude alternatives" (quotation marks omitted)). Each of the route alternatives would serve the MVP's beginning and endpoint.

¹⁷ See *Friends of Santa Clara River*, 887 F.3d at 921-923; *Wyo. Indep. Producers*, 133 IBLA at 82. In this case, the cost of each route alternative would be driven primarily by differences in length and in the extent of steep slopes, side slopes, and other challenging construction conditions. See INGAA Foundation, Inc., Final Report No. 2015-03, *Mitigation of Land Movement in Steep and Rugged Terrain for Pipeline Projects: Lessons Learned from Constructing Pipelines in West Virginia* at 6 (2016) (INGAA Rugged Terrain Report), available at <http://www.ingaa.org/File.aspx?id=28629> (noting that "the planning process must weigh the costs of longer alignments to avoid hazards versus cost of mitigation of the hazard"). Therefore, the information presented below about length and construction challenges serves, and was considered by the BLM, as a proxy for such cost information.

¹⁸ See *Friends of Santa Clara River*, 887 F.3d at 921. We note that this definition of practicality is broader than mere technical feasibility – a standard that some, but not all, of the route alternatives considered here would satisfy. See, e.g., FEIS at 3-32 (concluding that the Northern Pipeline – ACP Collocation Alternative is "likely ... technically infeasible"); *id.* at 3-119 (concluding that some of the remaining route alternatives "appear to be technically feasible").

¹⁹ FEIS at 1-8.

intended to transport natural gas from an existing interconnect in West Virginia to an existing natural gas pooling point and gas trading hub located along a major existing natural gas pipeline in Virginia.²⁰

The previously approved route connecting these locations would be 303.5 miles long, and would cross 3.5 miles of federal lands managed by the U.S. Forest Service within the Jefferson National Forest (JNF), in three discontinuous portions located at mileposts (MPs) 196.2 to 197.8, MPs 218.5 to 219.4, and MPs 219.8 to 220.8.²¹ The route would also cross 60 feet of federal lands managed by the USACE, at MP 66.8.²² The route would be collocated with an existing ROW for 1.0 miles of its crossing of the JNF, following a forest road known as Mystery Ridge Road at MPs 196.8 to 197.8.²³ The previously approved route would not be collocated with another ROW for any portion of its crossing of USACE lands.

In addition to its beginning and endpoints, the MVP is also intended to serve three mid-route delivery points that are relevant to this analysis: the WB Interconnect, located at MP 77.6 of the previously approved route; the Roanoke Gas Lafayette Tap, located at MP 235.7; and the Roanoke Franklin Tap, located at MP 261.3.²⁴ The location of the WB Interconnect is determined by existing natural gas infrastructure, while the locations of the two Roanoke Gas taps are determined by the service area of the utility purchaser that will operate those taps and by existing agreements with that purchaser.²⁵ The existence of these three mid-route delivery points was an important factor in the selection of the previously approved route, and in the approval of the MVP project by FERC.²⁶ Therefore, to the extent that any of the route alternatives would bypass these mid-route delivery points, that fact is relevant to the BLM's consideration of the practicality of that route alternative.

III. Route Alternatives

The BLM has analyzed nine route alternatives or families of route alternatives that would affect the MVP project's crossing of the JNF.²⁷ These route alternatives are analyzed in the order of the milepost at which each route alternative first diverges from the previously approved route.

²⁰ FEIS at 1-8, 3-3.

²¹ FEIS at 1-1, 1-14.

²² FEIS at 1-16, 4-277.

²³ FEIS App'x P at P-6; MVP Plan of Development at 1-7 (Nov. 30, 2017) (POD).

²⁴ FEIS at 2-14 to 2-15; FERC Order Issuing Certificates and Granting Abandonment Authority at 4 (Oct. 13, 2017) (FERC Certificate). Two additional mid-route facilities are located at points along the previously approved route that would not be affected by any of the route alternatives considered here. See FEIS at 2-14 to 2-15.

²⁵ See FEIS at 1-8, 2-14; MVP Resource Report 10 and Appendices at 10-2 to 10-3 (Oct. 23, 2015) (Resource Report 10).

²⁶ See FEIS at 1-8 to 1-9, 3-15; FERC Certificate at 3-5.

²⁷ Several of the route alternatives addressed in this analysis would also affect the location of, or necessity for, the crossing of USACE lands. Because the USACE crossing is so short compared with the JNF crossing, however, any differences in the length or location of the USACE crossing

A. Northern Pipeline – ACP Collocation Alternative

The Northern Pipeline – ACP Collocation Alternative would involve collocating the 42-inch-diameter MVP with the planned 42-inch-diameter Atlantic Coast Pipeline (ACP), along the ACP's proposed route.²⁸ This route alternative would diverge from the previously approved route at MP 37, and re-converge at the MVP's endpoint at MP 303.5.²⁹

For purposes of this analysis, the BLM assumes that the ACP would be constructed as proposed, and therefore that this route alternative would collocate the MVP with another ROW for the MVP's entire crossing of federal lands. Accordingly, this route alternative would provide greater collocation on federal lands than the previously approved route.

Constructing the two pipelines in parallel would raise serious constructability challenges:

[A] major disadvantage of the Northern Pipeline – ACP Collocation Alternative route is the necessity to construct two parallel pipelines along approximately 205 miles of the ACP route, much of which presents significant constructability issues related to topography and space. ... Based on [FERC's] review of aerial photography and topographic maps, ... in many areas, such as in Lewis and Upshur Counties, West Virginia and Augusta and Nelson Counties, Virginia,³⁰ there is insufficient space along the narrow ridgelines to accommodate two parallel 42-inch-diameter ... pipelines. This would result in side slope (i.e., side-hill) or two-tone construction techniques, with additional acres of disturbance required for [temporary workspaces], given the space needed to safely accommodate equipment and personnel, as well as spoil storage. The constructability issues alone are likely to render this alternative technically infeasible.³¹

would not affect the outcome of the BLM's analysis for these route alternatives. As to alternatives apart from those addressed in this analysis, no route alternatives exist that would result in collocation of the USACE crossing and that are practical. A private landowner whose parcel is located approximately 2.5 miles from the USACE crossing proposed collocating the MVP with an existing pipeline near her property, but this proposal (which may not have resulted in collocation at the USACE crossing itself) would be impractical due to constructability and safety concerns. See FEIS at 3-112. No other route alternative has been identified that would involve collocation with that existing pipeline. See McGuire August 16, 2018 Email.

²⁸ FEIS at 3-29.

²⁹ FEIS at 3-29 to 3-30.

³⁰ These counties include much of the ACP's crossing of federal lands. See FEIS at 3-30.

³¹ FEIS at 3-32. See also FERC Order on Rehearing at 73, 163 FERC ¶ 61,197 (June 15, 2018) ("The area's steep slopes and narrow ridgeways make construction of two adjacent pipelines technically infeasible."). FERC's assessment is supported by information submitted by MVP. See MVP Responses to FERC Environmental Information Request at 177 (Mar. 31, 2016) (March 31, 2016 Responses) ("Significant mountaintop removal and material excavation would be required to obtain a proper level construction surface to work on during the pipeline

Moreover, the Northern Pipeline – ACP Collocation Alternative would cross at least 19.1 miles of federal lands – more than five times as much as the previously approved MVP route.³² Because a separate 125-foot-wide ROW may be required for each pipeline,³³ collocating the MVP with the ACP may result in a substantial increase in federal land disturbance compared with constructing each pipeline along its previously approved route.

Furthermore, the Northern Pipeline – ACP Collocation Alternative would include 22 more miles of side slope than the previously approved route, in addition to any side slope construction required by the need to fit two parallel pipelines on narrow ridgelines.³⁴ Construction along side slopes, where the gradient of the slope is perpendicular or oblique to the pipeline route, requires modified construction techniques and presents considerable safety and operational risks both during and after construction.³⁵ Although the terrain of the project area makes some degree of side slope construction unavoidable, and the project incorporates best management practices to mitigate the risks associated with side slopes, reducing side slopes is a key factor in comparing route alternatives for the MVP project.³⁶

Finally, because the Northern Pipeline – ACP Collocation Alternative would diverge from the previously approved route at MP 37, and re-converge only at the MVP's endpoint at MP 303.5, this route alternative would bypass all three of the mid-route delivery points discussed above.³⁷ The two Roanoke Gas taps, in particular, could not be relocated so as to meet the ACP's route, meaning that an alternative that follows the ACP route would require either forfeiting the

installation phase. ... There is insufficient space along the tops of the ridgelines for two adjacent large diameter pipelines in these areas. Constructing two large diameter pipelines in the mountainous terrain would add significant construction personnel risk with the amount of equipment necessary to move and install both pipelines in the steep terrain. Sidebooms do not have enough weight capacity or levered distance to hold or move a second pipe over the first pipe trench. Erosion and sediment control risks significantly increase with the amount of soil and steep slope disturbance required for the two 42-inch pipelines ditch excavation and soil control.”); Resource Report 10 at 10-16 (similar).

³² See FEIS at 3-31. The version of the ACP route included in that project's final environmental impact statement may cross even more federal lands. See ACP Final Environmental Impact Statement at 4-423 (July 2017).

³³ FEIS at 3-29.

³⁴ See FEIS at 3-32.

³⁵ FEIS at 2-37, 3-4, 4-52 to 4-56; INGAA Rugged Terrain Report at 26-28, 40-41; McGuire August 16, 2018 Email.

³⁶ FEIS at 3-3. See also INGAA Rugged Terrain Report at 30 (recommending that side slope areas “should be identified early in the project design and planning processes, and minimized to the greatest extent possible”); *id.* at 61 (“Careful planning and routing is always preferred to avoid or minimize potential threats from landslide and erosion hazards, but mitigation is usually required when such hazards cannot be avoided.”).

³⁷ See FEIS at 3-30.

purpose of serving this customer, or else building nearly 60 miles of additional pipeline in order to reach those taps.³⁸

For these reasons, we conclude that the Northern Pipeline – ACP Collocation Alternative is not practical.

B. Highway Collocation Alternative

The Highway Collocation Alternative is a route alternative that would follow public roads for as much of its route as possible.³⁹ More specifically, this route alternative would mostly be collocated with interstate highways, intersecting the previously approved route in the vicinity of MP 60 and crossing the JNF alongside Interstate 77.⁴⁰ For purposes of this analysis, we assume that this route alternative would collocate the MVP with an interstate highway ROW for the MVP project's entire crossing of federal lands, and would therefore provide greater collocation on federal lands than the previously approved route.

The FEIS examined two versions of this collocated route alternative, one that would be located within the highway ROWs and one that would be located "adjacent to, but outside of," the highway ROWs.⁴¹ The version that would be located outside the highway ROWs

would likely present numerous and substantive construction challenges, including traversing roadway overpasses and underpasses, large interchanges, elevated sections of roadway including bridges, areas congested with development and homes, and narrow valleys where the most suitable terrain (i.e., flat) is already partially or fully encumbered by the roadway.⁴²

The version of this route alternative that would be located within the highway ROWs, meanwhile, would likely be prohibited by state laws and policies.⁴³ In West Virginia, the state agency's utility placement policy "prohibits longitudinal occupancy inside the controlled access right of way, by any utility, on any type of [controlled] highway, ... except ... underground fiber

³⁸ FEIS at 3-14. *See also* March 31, 2016 Responses at 177 ("[MVP] will also serve Roanoke Gas which is located along its Proposed Route in southwest Virginia; a market that cannot be served by moving to the Northern Pipeline Alternative route."); Resource Report 10 at 10-8, 10-16 (similar).

³⁹ FEIS at 3-18.

⁴⁰ FEIS at 3-18 to 3-19.

⁴¹ FEIS at 3-18.

⁴² FEIS at 3-18. This version of the Highway Collocation Alternative would not "utiliz[e a ROW] in common," and therefore does not satisfy section 28(p) for that reason, as well.

⁴³ Federal regulations permit state agencies to establish policies regarding utility installations in interstate highway ROWs. *See* 23 C.F.R. § 645.209(c)(1). *See also* 30 U.S.C. § 185(v) ("The Secretary or agency head shall take into consideration and to the extent practical comply with State standards for right-of-way construction, operation, and maintenance.").

optic facilities.”⁴⁴ And in Virginia, where the JNF crossing is primarily located, state regulations provide that “[n]ew utilities will not be permitted to be installed parallel to the roadway longitudinally within the controlled or limited access right-of-way lines of any highway” except in “special cases,” and even then only if such installation would not “involve tree removal or severe tree trimming.”⁴⁵ This limitation on tree removal or trimming is likely incompatible with the placement of a natural gas pipeline.⁴⁶

In addition, the Highway Collocation Alternative would be 142.5 miles (almost 47%) longer than the previously approved route, cross six times as many miles of federal lands, and cross more than twice as many perennial waterbodies, resulting in substantial additional costs and environmental impacts.⁴⁷ This route alternative would also cross an additional 51 miles of side slopes and an additional 125 miles of lands with landslide potential, amplifying the constructability concerns described above.⁴⁸ It would also bypass the three mid-route delivery points discussed above.⁴⁹

For these reasons, we conclude that the Highway Collocation Alternative is not practical.⁵⁰

C. Alternative 1/Hybrid Alternative 1A

⁴⁴ See W. Va. Div. of Highways, *Accommodation of Utilities on Highway Right of Way and Adjustment and Relocation of Utility Facilities on Highway Projects*, at 2 (2007), available at https://transportation.wv.gov/highways/engineering/files/ACCOMMODATION_OF_UTILITIES.pdf.

⁴⁵ 24 Va. Admin. Code. § 30-151-301(2)(d). See also Va. Dep’t of Trans., *Utility Manual of Instructions: Utility Relocation Policies & Procedures*, at 8-7 (2011), available at http://www.virginiadot.org/business/resources/right_of_way/utility_manual02132012_techrev.pdf. Such installations must also satisfy other requirements, including that “the installation will not adversely affect the safety, design, construction, operation, maintenance or stability of the highway,” that “the accommodation will not interfere with or impair the present use or future expansion of the highway,” and that “any alternative location would be contrary to the public interest,” taking into account “the direct and indirect environmental and economic effects that would result from the disapproval of [such] use.” See § 30-151-301(2)(a)-(c).

⁴⁶ See FEIS at 3-18.

⁴⁷ FEIS at 3-20.

⁴⁸ FEIS at 3-20.

⁴⁹ See FEIS at 3-19. Although such an alternative was not analyzed in the FEIS, it may be possible to construct a route alternative that generally follows the previously approved route, but deviates from that route between MPs 150 and 250 in order to cross the JNF along existing highways. See FEIS at 3-19. Such a hypothetical route alternative might avoid bypassing the three mid-route delivery points discussed above, but would otherwise be subject to most of the same practical concerns.

⁵⁰ See also FEIS at 3-17 (“This alternative concept is not evaluated in detail below due to the associated construction challenges, logistical constraints, and environmental impacts which we determined render it technically infeasible and/or as not providing a significant environmentally [sic] advantage compared to the proposed action.”).

Alternative 1 was designed to maximize collocation with an existing electric transmission line.⁵¹ Hybrid Alternative 1A is a variant that would follow the previously approved route through MP 135 and from there on follow the route of Alternative 1, re-converging with the previously approved route at its endpoint at MP 303.5.⁵² These two route alternatives are considered together here, since they are identical at the JNF crossing.⁵³ Both route alternatives would result in greater collocation on federal lands than the previously approved route, crossing fewer miles of federal lands overall and being collocated with the existing transmission line for the entirety of that crossing.⁵⁴

Collocating underground pipelines with electric transmission lines over long distances poses distinctive constructability and safety challenges that would be exacerbated in the circumstances of the MVP. Locating pipelines near transmission lines poses risks to pipeline workers from operating in close proximity to high voltage power lines, and increased risk of pipeline corrosion from interference with pipeline cathodic protection systems and from other forms of electrical interference.⁵⁵ These risks increase with parallel or near-parallel installation, especially at collocation lengths over a mile.⁵⁶ To mitigate these safety concerns, as well as concerns related to access for construction and operations, parallel installations typically involve adjacent or partially overlapping ROWs, rather than complete collocation.⁵⁷ Finally, because side slopes and

⁵¹ FEIS at 3-22. Alternative 1 was the original proposed alternative, but was supplanted by the previously approved route due to concerns regarding side slopes. See FEIS at 3-17; Resource Report 10 at 10-10 to 10-11.

⁵² FEIS at 3-25.

⁵³ Another route alternative, known as Hybrid Alternative 1B, would follow Alternative 1 through MP 135 and from there on follow the previously approved route. See FEIS at 3-25 to 3-26. Hybrid Alternative 1B is not considered here, since it would be identical to the previously approved route at the JNF crossing.

⁵⁴ See FEIS at 3-24, 3-27; McGuire August 16, 2018 Email; Neylon August 17, 2018 Email.

⁵⁵ See generally INGAA Foundation, Inc., Final Report No. 2015-04, *Criteria for Pipelines Co-Existing with Electric Power Lines (2015)* (INGAA Power Lines Report), available at <http://www.ingaa.org/File.aspx?id=24732>; McGuire August 16, 2018 Email.

⁵⁶ See INGAA Power Lines Report at 4, 45-49. The previously approved route would be collocated with electric transmission lines for numerous short stretches, but rarely for distances of a mile or more. See FEIS App'x P at P-1 to P-8.

⁵⁷ See McGuire August 16, 2018 Email (noting that in a typical configuration, the 50-foot-wide permanent pipeline ROW would be adjacent to the transmission line ROW, and the pipeline's temporary 100- to 125-foot-wide construction ROW would overlap with the transmission line ROW by 25 feet); FEIS at 3-22 ("The pipeline could be installed as close as 25 feet away from powerline infrastructure, with temporary workspace located even closer, but other configurations would also be required based on soil type and working conditions where the pipeline would be located much further away."). See also FEIS App'x P at P-1 to P-8 (listing offset distances between the centerline of the previously approved route and the edges of existing transmission line ROWs); INGAA Power Lines Report at 4, 46 (noting that interference risk is "Medium" for separation distances of 100 to 500 feet, and "High" for distances under 100 feet). MVP has also noted that constructing a major pipeline in the immediate vicinity of an electric transmission line poses "[c]onstructability and safety issues associated with ... the possibility of undermining

steep slopes⁵⁸ of the kind frequently encountered along the MVP's route pose a far greater challenge for pipelines than for electric transmission lines, which have a far smaller physical footprint and are capable of spanning stretches of challenging terrain, routes that are suitable for transmission line construction may be unsuitable for pipeline construction.⁵⁹ Therefore, while collocation with electric transmission lines can often be achieved, including in parts of the previously approved route of the MVP, the challenges of such collocation are highly relevant to the practicality analysis.

Alternative 1 would be over twenty miles longer than the previously approved route,⁶⁰ resulting in significant additional construction costs, and would pose significant technical challenges. In particular, Alternative 1 would cross 171.4 miles of steep slopes in excess of 20% grade – 42.8 miles more than the previously approved route, and over half the entire length of Alternative 1.⁶¹ Alternative 1 would also cross more miles of side slope than the previously approved route, including over 100 miles of "severe side slopes,"⁶² and would include two crossings of the New River, which the previously approved route avoids crossing.⁶³ These factors would pose substantial constructability and safety challenges.⁶⁴

power line towers." MVP Responses to Data Requests issued January 27, 2017, at 570 (Feb. 17, 2017) (February 17, 2017 Responses).

⁵⁸ Construction along steep slopes where the gradient of the slope is parallel to the pipeline route poses many of the same challenges as construction along side slopes, though such challenges are typically less severe than in side slope conditions. FEIS at 2-49, 3-25, 4-28, 4-45, 4-52 to 4-56; INGAA Rugged Terrain Report at 7, 24. *See also* MVP Responses to Data Requests issued December 24, 2015, at 238 (Jan. 15, 2016) (describing construction and safety challenges associated with steep slopes).

⁵⁹ *See* McGuire August 16, 2018 Email. *See also* Resource Report 10 at 10-10 to 10-11 ("While the overhead transmission lines span significant areas of slide [sic] slope, these areas would be required to be crossed directly by the pipeline."); February 17, 2017 Responses at 570 ("It is also important to recognize that the design requirements for a ROW for one type of infrastructure are not necessarily the same for other types of infrastructure.").

⁶⁰ FEIS at 3-24.

⁶¹ *See* FEIS at 3-24.

⁶² FEIS at 3-24; Resource Report 10 at 10-10, 10-14.

⁶³ FEIS at 3-24. As explained by FERC staff, crossing the New River poses both constructability challenges and environmental concerns. *See* McGuire August 16, 2018 Email ("The New River in the immediate vicinity of the proposed route ranges from about 300 to 350 feet wide (a major river crossing). It is not a complete obstacle, as it could be crossed (likely via [horizontal directional drilling], although with a risk of an inadvertent release of drilling mud into the River), however as a significant environmental resource, avoidance (which was accomplished with the proposed route) if possible was preferred."). Alternative 1 would also cross 38 more perennial waterbodies and 14.5 more miles of karst terrain. FEIS at 3-24.

⁶⁴ *See also* Resource Report 10 at 10-11 ("MVP determined that Route Alternative 1 represented insurmountable construction challenges, as well as a high risk of slope failure and pipeline slips, once the pipeline was to be in operation. ... [M]uch of the existing right-of-way was ultimately found unsuitable for pipeline construction ...").

Hybrid Alternative 1A would pose many of the same challenges as Alternative 1. While this route alternative would be shorter than Alternative 1 and include fewer miles of steep slope, it would still be 6.3 miles longer than the previously approved route, and feature 140.8 miles of steep slope (almost 10% more than the previously approved route), as well as both crossings of the New River.⁶⁵ Hybrid Alternative 1A would also cross 177.2 miles of side slope (over 10% more than the previously approved route, exceeding even Alternative 1), and a significant portion of the “severe side slope” crossed by Alternative 1.⁶⁶ The additional miles of steep slope and side slope, compared with the previously approved route, would “present[] substantially more obstacles to safe construction, increas[e] extra workspace requirements, and potentially affect[] worksite stability during construction and after restoration.”⁶⁷

Both Alternative 1 and Hybrid Alternative 1A would also pose constructability challenges associated with the necessary crossing of the Blue Ridge Parkway. While the previously approved route would cross the Parkway in an open grassy area, allowing the pipeline to bore under the Parkway, Alternative 1 and Hybrid Alternative 1A would cross the Parkway in a location flanked on one side by a wetland and floodplain and on the other by a short, steep slope, which together would complicate the boring process.⁶⁸

In addition, Alternative 1 would bypass the three mid-route delivery points discussed above, while Hybrid Alternative 1A would bypass two of the three.⁶⁹

For these reasons, we conclude that Alternative 1 and Hybrid Alternative 1A are not practical.

D. Variations 110, 110R, and 110J

Variations 110, 110R, and 110J were developed in order to avoid a number of sensitive resources located in the general vicinity of the JNF crossing, between MPs 175 and 235.⁷⁰ Each of these variations would cross more miles of federal lands than the previously approved route but would be collocated for fewer of those miles.⁷¹ Therefore, these route alternatives do not satisfy the criteria of section 28(p).⁷²

E. SR 635-ANST Variation

⁶⁵ FEIS at 3-25, 3-27 to 3-28. Hybrid Alternative 1A would also cross 22 more perennial waterbodies. FEIS at 3-27.

⁶⁶ FEIS at 3-24 to 3-25, 3-28; Resource Report 10 at 10-14.

⁶⁷ FEIS at 3-25.

⁶⁸ FEIS at 4-324 to 4-325; Resource Report 10 at 10-61.

⁶⁹ See FEIS at 3-26.

⁷⁰ FEIS at 3-44 to 3-45.

⁷¹ See McGuire August 16, 2018 Email; Neylon August 17, 2018 Email.

⁷² Furthermore, we note that Variation 110 crosses a designated wilderness area within the JNF, which renders this route variation impractical. See FEIS at 3-44, 3-46. See also Letter from U.S. Forest Service to FERC (May 16, 2016) (noting lack of authority to approve a pipeline within a wilderness area).

The SR 635-ANST Variation, located between MPs 191.7 and 207.8, was developed in order to examine the feasibility of reducing impacts on hikers traveling along the Appalachian National Scenic Trail (ANST) by crossing the ANST at the same location as an existing state road.⁷³ This route variation would cross 2.9 miles more federal lands than the previously approved route, and would not be collocated for any part of its crossing.⁷⁴ Therefore, the SR 635-ANST Variation does not satisfy the criteria of section 28(p).⁷⁵

F. CGV Variation

The CGV Variation, located between MPs 195 and 200, was developed in order to examine the feasibility of collocating the MVP with two existing pipelines that cross the JNF.⁷⁶ This route alternative would provide increased collocation on federal lands, replacing a 1.7 mile crossing of federal lands of which 1 mile is collocated with a 1.6 mile crossing that is mostly or entirely

⁷³ FEIS at 3-52.

⁷⁴ FEIS at 3-54; McGuire August 16, 2018 Email; Neylon August 17, 2018 Email. While the SR 635-ANST Variation would cross the ANST at the same location as the state road, the route alternative would not continue alongside that existing road. *See* McGuire August 16, 2018 Email. To the contrary, due to the topography of the area, the SR 635-ANST Variation would be forced to parallel the ANST for one mile. *See* MVP Responses to Data Requests issued January 27, 2017 and Supplemental Materials (Mar. 2, 2017) (March 2, 2017 Responses) at 39; MVP Additional Responses to June 28, 2016 Data Request at 63 (July 18, 2016) (July 18, 2016 Responses). In light of the purpose of section 28(p), we do not consider the ANST, which is a congressionally designated national scenic trail, *see* 16 U.S.C. § 1244(a)(1), to be an existing ROW with which Congress intended to encourage collocation of pipelines.

⁷⁵ Moreover, even if the SR 635-ANST Variation provided greater collocation than the previously approved route, this route alternative would be impractical. The environmental, constructability, and safety effects of the SR 635-ANST Variation would be mixed: the variation would be 1.5 miles shorter and would affect 89.2 fewer acres of interior forest, but would cross 2.9 more miles of federal lands and cross more wetlands, perennial waterbodies, and miles of inventoried roadless areas; similarly, the variation would cross fewer miles of steep slope and side slope, but more miles of land with landslide potential. FEIS at 3-52. More importantly, however, the SR 635-ANST Variation would be unlikely to succeed at its purpose, to reduce the impact of the MVP on ANST users. Whereas the previously approved route would cross the ANST perpendicularly, and preserve a 300-foot forested buffer on either side of the ANST by boring under the trail, the SR 635-ANST Variation would be forced to parallel the trail for about a mile, as noted above, likely increasing visual impacts on the trail. *See* FEIS at 3-52 to 3-53; March 2, 2017 Responses at 39; July 18, 2016 Responses at 63. Moreover, the low topography of the trail crossing site would limit the length of the borehole, eliminating the forested buffer and further increasing the visual impacts. March 2, 2017 Responses at 39; July 18, 2016 Responses at 63. Furthermore, the SR 635-ANST Variation would bring the MVP ROW closer to the ANST's Wind Rock overlook, increasing visual impacts on this overlook. March 2, 2017 Responses at 39. For these reasons, the SR 635-ANST Variation is not likely to succeed at its purpose of reducing impacts on users of the ANST, rendering the route impractical.

⁷⁶ FEIS at 3-48.

collocated.⁷⁷ The elimination of less than three-quarters of a mile of uncollocated crossing of federal lands would come at a cost of 9 more miles of total pipeline, however, including 4.1 more miles of steep slope and 4.6 more miles of side slope.⁷⁸ The CGV Variation would also result in 136.3 more acres of construction disturbance, including 60.8 more acres on forested land; increase the MVP's potential impacts on the watershed relied on by the Red Sulphur Public Service District, a public water supply utility; and bring the MVP ROW closer to the ANST's Angel's Rest overlook, increasing visual impacts on this overlook.⁷⁹ For these reasons, we conclude that the CGV Variation is not practical.

G. AEP-ANST Variation

The AEP-ANST Variation, located between MPs 195.4 and 200, was developed in order to examine the feasibility of reducing impacts on hikers traveling along the ANST by crossing the ANST at the same location as an existing electric transmission line.⁸⁰ The AEP-ANST Variation would cross approximately 0.9 more miles of federal lands than the previously approved route, while providing, at best, no more than 0.8 miles of additional collocation on federal lands.⁸¹ Because the AEP-ANST Variation involves at least 0.1 mile more uncollocated crossing of federal lands, this route alternative provides less net collocation on federal lands, and does not satisfy the criteria of section 28(p).⁸²

⁷⁷ FEIS at 3-50; *id.* App'x P at P-6; POD at 1-7; McGuire August 16, 2018 Email; Neylon August 17, 2018 Email. While the FEIS indicates that the relevant portion of the previously approved route contains zero miles "adjacent to existing right-of-way," this figure considers only major features such as transmission lines and pipelines, and excludes the previously approved route's collocation with a forest road, as noted above. See FEIS at 3-20, 3-50.

⁷⁸ FEIS at 3-50; McGuire August 16, 2018 Email; Neylon August 17, 2018 Email. Underscoring the constructability and safety concerns associated with the additional steep slopes and side slopes, the same pipeline ROW with which this route alternative would be collocated was previously the site of a slope failure related to side slopes. See FEIS at 4-45, 4-67, 4-69. See also INGAA Rugged Terrain Report at 7 (noting that "[l]andslide and erosion hazards are more commonly found, or created, ... where the proposed alignment intersects existing landslide[s]").

⁷⁹ FEIS at 3-50; March 2, 2017 Responses at 44.

⁸⁰ FEIS at 3-52, 3-55.

⁸¹ See FEIS at 3-54; McGuire August 16, 2018 Email; Neylon August 17, 2018 Email.

⁸² The AEP-ANST Variation would also pose constructability and safety concerns. The general concerns related to collocating the MVP with electric transmission lines are discussed above. In the specific context of the AEP-ANST Variation, these challenges include more miles of steep slope, side slope, shallow bedrock, and areas with landslide potential than the previously approved route. FEIS at 3-54. Moreover, this route alternative would be 3.2 miles longer, would cross more perennial waterbodies and forested land (but less inventoried roadless area, inventoried semi-primitive area, interior forest, and karst area), would result in an additional 48.9 acres of construction disturbance and a larger area of forested land disturbance during both construction and operation, and would increase the MVP's potential impacts on the Red Sulphur Public Service District watershed. FEIS at 3-54; March 2, 2017 Responses at 40.

H. Brush Mountain Alternatives 1 and 2

Brush Mountain Alternatives 1 and 2, located between MPs 219.5 and 220.7, were developed in order to reduce impacts to the Craig Creek watershed.⁸³ Brush Mountain Alternative 1 would feature the same amount of federal lands crossing and the same amount of collocation as the previously approved route, and therefore does not satisfy the criterion of providing greater collocation on federal lands.⁸⁴ Brush Mountain Alternative 2, meanwhile, may provide greater collocation, but by no more than 0.22 miles.⁸⁵ Any such increase in collocation, meanwhile, would come at the cost of a larger increase in the total mileage (0.3 additional miles), the mileage of side slope (0.4 additional miles), and the mileage of lands with landslide potential (0.3 additional miles).⁸⁶ Because Brush Mountain Alternative 2 would entail greater

Furthermore, like the SR 635-ANST Variation, the AEP-ANST Variation would be unlikely to accomplish its purpose of reducing impacts on users of the ANST. Under either the AEP-ANST Variation or the previously approved route, hikers would experience a clearing at the location where the trail crosses the existing electric transmission line, and no clearing where the previously approved route crosses the trail (due to the 300-foot forested buffer). *See* FEIS at 3-52, 4-312; FEIS App'x S figs. 1a to 7b. The majority of new visual impacts on trail users would therefore occur, under either scenario, not due to near-field impacts at the location where the previously approved route crosses the trail, but rather due to more distant views of the MVP ROW from various points along the trail. *See* FEIS at 4-312; *see generally* FEIS App'x S. The AEP-ANST Variation would not reduce the overall visual footprint of the MVP ROW, and may in fact increase that overall footprint due to the larger area of forested land disturbance. *See also* March 2, 2017 Responses at 40 (noting that "the visual impact on ANST users would likely be greater because of the open view that trail users have when within the [transmission line] right-of-way"). Moreover, the AEP-ANST Variation would also bring the MVP ROW closer to the Angel's Rest overlook, increasing visual impacts on this overlook. March 2, 2017 Responses at 40. Therefore, the AEP-ANST Variation is not likely to succeed at its purpose of reducing impacts on users of the ANST

For these reasons, we conclude that the AEP-ANST Variation is not practical.

⁸³ FEIS at 3-61 to 3-62.

⁸⁴ FEIS at 3-64; Neylon August 17, 2018 Email. Brush Mountain Alternative 1 also poses a significant constructability and safety concern related to an area of especially steep slope, over 43% grade. FEIS at 3-62 to 3-64; March 2, 2017 Responses at 47; MVP Responses to Data Requests issued January 27, 2017, at 139 (Feb. 23, 2017).

⁸⁵ One assessment estimated that Brush Mountain Alternative 2 would cross 1.3 miles of federal lands with no collocation, and therefore would offer no collocation advantage. *See* Neylon August 17, 2018 Email. The other assessment estimated that the route alternative would cross 1.18 miles of federal lands with 0.4 miles of collocation, for a net of 0.78 miles of federal lands without collocation. McGuire August 16, 2018 Email. By contrast, the corresponding segment of the previously approved route would cross 1.0 miles of federal lands, with between 0 and 0.2 miles of collocation, for a net of between 0.8 and 1.0 miles of federal lands without collocation. Neylon August 17, 2018 Email; FEIS at 3-64.

⁸⁶ FEIS at 3-64; MVP Responses to Data Requests issued January 27, 2017, at 140 (Feb. 23, 2017); March 2, 2017 Responses at 48. The FEIS also concluded that Brush Mountain Alternative 2 would not offer a significant environmental advantage compared to the previously

constructability and safety challenges than the previously approved route while providing at best a marginal increase in collocation on federal lands, we conclude that this route alternative is impractical.

I. Slussers Chapel Variations

The Slussers Chapel Variations consist of two route alternatives located between MPs 220.7 and 223.7 that were developed in order to reduce impacts on the Slussers Chapel Conservation Site.⁸⁷ One route alternative, Modified Variation 250, would replace a portion of the route located entirely on non-federal lands with a route that would cross 2.3 miles of federal lands, and therefore does not satisfy the criterion of increased collocation on federal lands.⁸⁸ The other route alternative, the VADCR Slussers Chapel Conservation Site Avoidance Variation, would replace a portion of the route that crosses 0.04 miles of federal lands with a route that would cross 2.54 miles of federal lands, and therefore does not appear to satisfy this criterion, either.⁸⁹ This route alternative would also traverse a narrow ridgetop with a designated wilderness area on one side, steep slopes on the other side, and an existing forest road along the ridge, posing significant constructability and safety concerns that the previously approved route avoids and that render this route alternative impractical.⁹⁰ For these reasons, we conclude that these route alternatives do not satisfy the criteria of section 28(p).

IV. Conclusion

As the analysis above demonstrates, none of the route alternatives would result in greater collocation on federal lands and be practical. Several of the route alternatives would not result in greater collocation on federal lands. Each of the remaining route alternatives would be impractical due to a combination of constructability and safety challenges, increased

approved route. FEIS at 3-65. Because the purpose of Brush Mountain Alternative 2 is to reduce environmental impacts, *see* FEIS at 3-61 to 3-62, the failure to achieve a significant environmental advantage also renders this route alternative impractical.

⁸⁷ FEIS at 3-69 to 3-70. A third route alternative, Variation 250, would not affect the MVP's crossing of federal lands, and therefore is not relevant to this analysis. FEIS at 3-71. Moreover, Variation 250 was adopted by FERC and incorporated into the MVP route. FERC Certificate at 60; *id.* App'x C at 7.

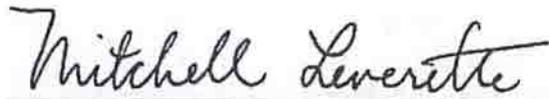
⁸⁸ FEIS at 3-71, 3-74.

⁸⁹ FEIS at 3-72.

⁹⁰ FEIS at 3-69. *See also* February 17, 2017 Responses at 195-196 (“[The Slussers Chapel Variation] significantly increases the construction risks due to its placement along the ridgeline of Brush Mountain. There is an existing Forest Service Road (Forest Road 188/Brush Mountain Road) along the ridge top, with the boundary of Brush Mountain Wilderness north of and parallel to the road. Mountain Valley would need to maintain a 50-foot buffer between the Wilderness Boundary and the edge of construction work area, which would require that the 125-foot-wide construction right-of-way encompass Forest Road 188 as well as significant side slope areas along the south side of the road. In addition, during construction, this section of Forest Road 188 would be closed for an extensive period of time to regular vehicle or foot traffic.”).

environmental impacts, increased length and footprint, increased cost,⁹¹ and inability to serve the purposes of the MVP or the specific purpose of the route alternative in question. Therefore, we conclude that the additional utilization of existing ROWs across federal lands would be impractical.

Sincerely,



Mitchell Leverette
Acting State Director, Bureau of Land Management, Eastern States

I concur

I do not concur



Joseph R. Balash
Assistant Secretary - Land and Minerals Management, U.S. Department of the Interior

⁹¹ As noted above, the BLM has considered the information presented above about length and construction challenges as a proxy for cost information.

From: Victoria Craft
To: [Grace Ellis](#); [Lauren Johnston](#); [Miriam Liberatore](#)
Subject: Fwd: MVP Developments
Date: Thursday, August 30, 2018 6:53:33 AM
Attachments: [ATT00001.htm](#)
[MVP Deleagated Letter Order 2018-08-29.pdf](#)
[117 - 28j Notice as Filed.pdf](#)
[ATT00002.htm](#)

For your informational purposes and file. Thanks,

Sent from my iPhone

Begin forwarded message:

From: "Leverette, Mitchell" <mleveret@blm.gov>
To: Barbara Eggers <beggers@blm.gov>, Sally Spencer <sspencer@blm.gov>, "Craft, Victoria" <vcraft@blm.gov>, "Fink, Elena" <efink@blm.gov>, Francis Piccoli <fpiccoli@blm.gov>
Subject: Fwd: MVP Developments

fyi.

Mitchell Leverette
Acting State Director
Eastern States
Bureau of Land Management
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Washington, DC 20003

202-912-7702 (w)
202-431-2262 (c)

----- Forwarded message -----

From: Sullins, Tony <tony.sullins@sol.doi.gov>
Date: Wed, Aug 29, 2018 at 5:06 PM
Subject: MVP Developments
To: Katharine MacGregor <katharine_macgregor@ios.doi.gov>, Cally Younger <cally.younger@sol.doi.gov>, Casey Hammond <casey_hammond@ios.doi.gov>, Mitchell Leverette <mleveret@blm.gov>
Cc: "Ballenger, Matthew" <matthew.ballenger@sol.doi.gov>, "Moody, Aaron" <aaron.moody@sol.doi.gov>, "Levine, Haninah" <haninah.levine@sol.doi.gov>, John Henson <john.henson@sol.doi.gov>

Hello All,

As you may have heard, FERC posted a Partial Order to Resume Construction for MVP. This FERC action (Letter Order attached) is limited to non-federal lands and was taken after consideration of our Mineral Leasing Act Section 28(p) memo ("practicality analysis") provided to FERC last week. Just today, the Department of Justice filed Notice with the Court of our 28(p) analysis, a document reviewed and edited by your

SOL Team. (also attached below)

(b)(5); Deliberative Process Privilege; Attorney-Client Privilege



Please let me know if I can provide any additional information. Tony

Tony Sullins
Regional Solicitor
Northeast Region
(612) 713-7100



U.S. Department of Justice

Environment and Natural Resources Division

90-13-9-15293

Appellate Section
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Ben Franklin Station
Washington, DC 20044-7415

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August 29, 2018

VIA ELECTRONIC FILING

Patricia S. Connor
Clerk of the Court
U.S. Court of Appeals for the Fourth Circuit
Lewis F. Powell, Jr. United States Courthouse Annex
1100 East Main Street, Suite 501
Richmond, Virginia 23219-3517

Re: Federal Rule of Appellate Procedure 28(j) and Local Rule 28(e)
Notice in *Sierra Club v. United States Forest Service*,
Nos. 17-2399 (L), 18-1012, 18-1019, 18-1036 (4th Cir.)

Dear Ms. Connor:

On August 24, 2018, the Bureau of Land Management (BLM) submitted the attached *Mineral Leasing Act Section 28(p) Analysis for the Mountain Valley Pipeline* to the Federal Energy Regulatory Commission (FERC) for filing on FERC's public docket for the project. FERC Dkt. No. CP16-10-000, Accession No. 20180828-0035 (Aug. 28, 2018), <https://elibrary.ferc.gov/>. The BLM prepared the analysis in accordance with the Court's opinion dated July 27, 2018. *See slip op.* at 42. The analysis concludes that "the additional utilization of existing [rights of way] across federal lands would be impractical." Attachment at 17.

Although BLM's analysis is not a final agency action or a new Record of Decision to replace the previous decision that the Court has ordered to be vacated, the BLM's completion of the analysis addresses Petitioners' concern that future project activities authorized by FERC will improperly influence the analysis. *See* Petitioners' Reply in Support of Motion for Emergency Injunction (Doc. 116), at 2-5. Therefore, and for the additional reasons stated in Federal Respondents' Opposition (Doc. 114), Petitioners' Motion should be denied.

Sincerely,

/s/ Kevin W. McArdle

Kevin W. McArdle

Emily Polachek

U.S. Department of Justice

Attorneys for Appellant



United States Department of the Interior

Bureau of Land Management
Eastern States
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ORIGINAL

August 24, 2018

IN REPLY REFER TO:
2880 (ESJ020) VMC

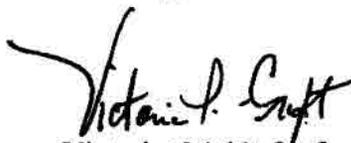
Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street NE
Washington, DC 20426

Re: Mountain Valley Pipeline, LLC
Docket No. CP16-10-000
Mineral Leasing Act Section 28(p) Analysis for the Mountain Valley Pipeline

Dear Ms. Bose:

Enclosed for your docket please find the Bureau of Land Management's analysis of the Mountain Valley Pipeline project under section 28(p) of the Mineral Leasing Act of 1920. Please note that this analysis in itself does not constitute a record of decision or right-of-way grant.

Sincerely,


Victoria (Vicki) Craft
Project Manager

Enclosure (1)
-Practicality Analysis

FILED
SECRETARY OF THE
COMMISSION
2018 AUG 28 A 11:30
FEDERAL ENERGY REGULATORY COMMISSION

CC: Public File, Docket No. CP16-10-000

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United States Department of the Interior



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AUG 23 2018

Mr. Joseph R. Balash
Assistant Secretary - Land and Minerals Management
U.S. Department of the Interior
1849 C Street NW
Washington, DC 20240

Re: Mineral Leasing Act Section 28(p) Analysis for the Mountain Valley Pipeline

Dear Mr. Balash:

Section 28(p) of the Mineral Leasing Act of 1920 provides that “[i]n order to minimize adverse environmental impacts and the proliferation of separate rights-of-way across Federal lands, the utilization of rights-of-way in common shall be required to the extent practical.”¹ On July 27, 2018, the U.S. Court of Appeals for the Fourth Circuit vacated the record of decision and right-of-way (ROW) grant for the Mountain Valley Pipeline (MVP). The court found that the record of decision did not address whether “the utilization of an existing right of way would be *impractical*,” and specified that the BLM on remand must “favor[] routes utilizing existing rights of way unless those alternatives [are] impractical.”²

The Bureau of Land Management (BLM) has prepared this supplemental analysis to address the court’s instructions on remand. As explained below, we conclude that the additional utilization of existing ROWs across federal lands would be impractical.

I. Background

In order to implement the court’s instructions, we have analyzed whether any route alternative exists that would result in greater collocation with other ROWs on federal lands than the route that was previously approved by the BLM, and that would be practical. Each of these two criteria is explained in greater detail below.

A. Collocation on Federal Lands

The first criterion that a route alternative must satisfy is that it must result in greater collocation with other ROWs on federal lands - that is, it must cross fewer miles of federal lands without

¹ 30 U.S.C. § 185(p).

² See *Sierra Club, Inc. v. U.S. Forest Serv.*, - F.3d -, 2018 WL 3595760, at *16 (4th Cir. July 27, 2018) (emphasis in the original).

collocation than the previously approved alternative. We limit our comparison of collocation to federal lands because section 28(p) aims to minimize “the proliferation of separate rights-of-way across Federal lands,” and because the BLM has no authority over the MVP route except to the extent that the route involves the use of federal lands.³

In order to determine the extent of collocation on federal lands, we rely on two independent assessments: one conducted by staff of the Federal Energy Regulatory Commission (FERC), and one conducted by MVP.⁴ Although the results of these two independent assessments are generally consistent, they occasionally provide different estimates of the extent of collocation on federal lands, because of the technical challenges inherent in measuring the lengths of potential pipeline routes. Where the two assessments provide conflicting results on the question of whether a given route alternative would result in greater collocation on federal lands than the previously approved route, we have assumed conservatively that the route alternative would satisfy this criterion, and proceeded to examine whether the route alternative would be practical.

B. Practicality

The second criterion that a route alternative must satisfy is that it must be practical. In interpreting the term “practical” for purposes of this analysis, we have taken into consideration the term’s common usage, as well as relevant administrative and judicial interpretations. Black’s Law Dictionary defines “practical” as meaning “[l]ikely to succeed or be effective,” and “[u]seful or suitable for a particular purpose or situation.”⁵ The BLM’s regulations note that one of the objectives of the BLM’s pipeline ROW program is to “[p]romote[] the use of rights-of-way in common considering engineering and technological compatibility,” and that the use of ROWs in common may be required “where safety and other considerations allow.”⁶ In the only judicial or administrative decision addressing section 28(p), the Interior Board of Land Appeals determined that this standard includes consideration of a route’s cost and land-disturbance footprint, affirming that a route alternative was not “practical” when it would have “require[d]

³ See § 185(c)(2),(p). We define federal lands, consistently with section 28, to exclude “lands in the National Park System.” See 30 U.S.C. § 185(b)(1).

⁴ See Email from Rich McGuire, FERC, to Victoria Craft, BLM (Aug. 16, 2018) (McGuire August 16, 2018 Email); Email from Megan Neylon, MVP, to Victoria Craft, BLM (Aug. 17, 2018) (Neylon August 17, 2018 Email). Unlike the figures reported in the FEIS for “[l]ength adjacent to existing right-of-way,” these assessments included collocation with both major ROWs such as pipelines or electric transmission lines and smaller ROWs such as roads. See FEIS at 3-20. Cf. 70 Fed. Reg. 20,970, 20,970 (April 22, 2005) (“Some examples of land uses which require a right-of-way grant include: transmission lines, communication sites, roads, highways, trails, telephone lines, canals, flumes, pipelines, and reservoirs.”). For this reason, along with the fact that the FEIS’s figures do not distinguish between miles of collocation on federal and non-federal lands, we do not generally rely on the FEIS’s figures for “[l]ength adjacent to existing right-of-way” for this analysis.

⁵ See “Practical,” Black’s Law Dictionary (10th ed. 2014).

⁶ See 43 C.F.R. §§ 2881.2(c), 2882.10(b). See also 70 Fed. Reg. at 21,033 (noting that “there may be situations where for technical or safety reasons it is not practical” to make use of an existing ROW).

construction of an additional 39 miles of pipeline at an estimated additional cost of \$37.5 million,” as well as “installation of an additional compressor station and ... the temporary disturbance of a substantially greater acreage of lands during construction.”⁷ Similarly, in interpreting a parallel standard in another statute, the Board affirmed that a route was not “practical” where it would have “require[d] construction of up to an additional 60 miles of 345 kV power line and ha[d] an adverse impact on an additional 60 miles of public and private land,” while “preclud[ing] the opportunity to improve” service to one of the project’s proposed customers.⁸ Finally, a regulation issued to implement section 404 of the Clean Water Act prohibits the issuance of a dredge or fill discharge permit “if there is a practicable alternative to the proposed discharge” that is environmentally preferable, and defines “practicable” as including “consideration [of] cost, existing technology, and logistics in light of overall project purposes.”⁹ In reviewing decisions made under this regulation by the U.S. Army Corps of Engineers (USACE), courts have deferred to the agency’s practicability determinations, and upheld its consideration of factors including cost, construction delays, logistical feasibility, and “the objectives of the applicant’s project.”¹⁰

Accordingly, we interpret the term “practical,” for purposes of this analysis, as referring to the suitability of a route alternative for achieving its purpose, and to the likelihood that attempting to utilize that route would succeed in achieving that purpose.¹¹ The purpose of any route alternative is to construct a pipeline to deliver natural gas from the MVP’s beginning point to its endpoint, via its mid-route delivery points, in a safe, environmentally responsible, and cost-effective manner.¹² In certain cases, however, as discussed below, a particular route alternative may also have a more specific purpose, such as mitigating the impact of the MVP on certain resources. Therefore, the determination of whether a route alternative is practical includes consideration of the construction challenges and potential safety hazards that would arise from constructing or operating the pipeline along the route;¹³ the environmental consequences of constructing the

⁷ *Wyo. Indep. Producers Ass’n*, 133 IBLA 65, 82 (1995).

⁸ *Paul Herman*, 146 IBLA 80, 105 (1998) (interpreting 43 U.S.C. § 1763).

⁹ See 40 C.F.R. §§ 230.3(f), 230.10(a).

¹⁰ See *Friends of Santa Clara River v. U.S. Army Corps of Eng’rs*, 887 F.3d 906, 912, 921-922 (9th Cir. 2018) (quotation marks omitted); *Friends of the Earth v. Hintz*, 800 F.2d 822, 833-834 (9th Cir. 1986); *Nat’l Parks Cons. Ass’n v. Semonite*, 311 F. Supp. 3d 350, 377-378 (D.D.C. 2018).

¹¹ See “Practical,” Black’s Law Dictionary.

¹² See MVP Final Environmental Impact Statement at 1-8 (June 23, 2017) (FEIS). While the section 28(p) analysis described here is distinct from the National Environmental Policy Act analysis contained in the FEIS, the information and analysis presented in the FEIS is in many instances relevant to the section 28(p) analysis.

¹³ See 43 C.F.R. §§ 2881.2(c), 2882.10(b); 70 Fed. Reg. at 21,033.

pipeline along the route;¹⁴ any resulting increase in the pipeline's length and footprint;¹⁵ the ability of the route to serve the MVP's mid-route delivery points;¹⁶ the additional costs associated with the alternative;¹⁷ and the likelihood that the route would achieve any specific purpose identified for that route alternative.¹⁸

Although our comparison of the extent of collocation is limited to federal lands, determining the practicality of a route requires consideration of the route as a whole. A route alternative may increase the extent of collocation on federal lands, but prove impractical because of technical or other considerations relating to the route as a whole.

II. The MVP and the Previously Approved Route

The MVP is intended "to transport natural gas produced in the Appalachian Basin to markets in the Northeast, Mid-Atlantic, and Southeastern United States."¹⁹ Specifically, the project is

¹⁴ We note that section 28(p) can be read as requiring "the utilization of rights-of-way-in common" only where such collocation would "minimize adverse environmental impacts" as compared to an alternative with less collocation. See 30 U.S.C. § 185(p). Had we applied a separate requirement that any route alternative must "minimize adverse environmental impacts" compared to the previously approved alternative, we would have concluded on this basis alone that none of the route alternatives would satisfy the criteria of section 28(p). See FEIS at 3-20, 3-22, 3-25, 3-32, 3-47 to 3-48, 3-51, 3-55, 3-62, 3-65, 3-70 (concluding that none of the route alternatives considered in this analysis would "provide a significant environmental advantage" over the previously approved route). In this case, however, we have not excluded any route alternatives based solely on their environmental impacts.

¹⁵ See *Wyo. Indep. Producers*, 133 IBLA at 82; see also *Paul Herman*, 146 IBLA at 105.

¹⁶ See, e.g., *Paul Herman*, 146 IBLA at 105. See also *Friends of Santa Clara River*, 887 F.3d at 912, 921 (requiring consideration of "the objectives of the applicant's project," so long as "those project objectives are not so narrowly defined as to preclude alternatives" (quotation marks omitted)). Each of the route alternatives would serve the MVP's beginning and endpoint.

¹⁷ See *Friends of Santa Clara River*, 887 F.3d at 921-923; *Wyo. Indep. Producers*, 133 IBLA at 82. In this case, the cost of each route alternative would be driven primarily by differences in length and in the extent of steep slopes, side slopes, and other challenging construction conditions. See INGAA Foundation, Inc., Final Report No. 2015-03, *Mitigation of Land Movement in Steep and Rugged Terrain for Pipeline Projects: Lessons Learned from Constructing Pipelines in West Virginia* at 6 (2016) (INGAA Rugged Terrain Report), available at <http://www.ingaa.org/File.aspx?id=28629> (noting that "the planning process must weigh the costs of longer alignments to avoid hazards versus cost of mitigation of the hazard"). Therefore, the information presented below about length and construction challenges serves, and was considered by the BLM, as a proxy for such cost information.

¹⁸ See *Friends of Santa Clara River*, 887 F.3d at 921. We note that this definition of practicality is broader than mere technical feasibility – a standard that some, but not all, of the route alternatives considered here would satisfy. See, e.g., FEIS at 3-32 (concluding that the Northern Pipeline – ACP Collocation Alternative is "likely ... technically infeasible"); *id.* at 3-119 (concluding that some of the remaining route alternatives "appear to be technically feasible").

¹⁹ FEIS at 1-8.

intended to transport natural gas from an existing interconnect in West Virginia to an existing natural gas pooling point and gas trading hub located along a major existing natural gas pipeline in Virginia.²⁰

The previously approved route connecting these locations would be 303.5 miles long, and would cross 3.5 miles of federal lands managed by the U.S. Forest Service within the Jefferson National Forest (JNF), in three discontinuous portions located at mileposts (MPs) 196.2 to 197.8, MPs 218.5 to 219.4, and MPs 219.8 to 220.8.²¹ The route would also cross 60 feet of federal lands managed by the USACE, at MP 66.8.²² The route would be collocated with an existing ROW for 1.0 miles of its crossing of the JNF, following a forest road known as Mystery Ridge Road at MPs 196.8 to 197.8.²³ The previously approved route would not be collocated with another ROW for any portion of its crossing of USACE lands.

In addition to its beginning and endpoints, the MVP is also intended to serve three mid-route delivery points that are relevant to this analysis: the WB Interconnect, located at MP 77.6 of the previously approved route; the Roanoke Gas Lafayette Tap, located at MP 235.7; and the Roanoke Franklin Tap, located at MP 261.3.²⁴ The location of the WB Interconnect is determined by existing natural gas infrastructure, while the locations of the two Roanoke Gas taps are determined by the service area of the utility purchaser that will operate those taps and by existing agreements with that purchaser.²⁵ The existence of these three mid-route delivery points was an important factor in the selection of the previously approved route, and in the approval of the MVP project by FERC.²⁶ Therefore, to the extent that any of the route alternatives would bypass these mid-route delivery points, that fact is relevant to the BLM's consideration of the practicality of that route alternative.

III. Route Alternatives

The BLM has analyzed nine route alternatives or families of route alternatives that would affect the MVP project's crossing of the JNF.²⁷ These route alternatives are analyzed in the order of the milepost at which each route alternative first diverges from the previously approved route.

²⁰ FEIS at 1-8, 3-3.

²¹ FEIS at 1-1, 1-14.

²² FEIS at 1-16, 4-277.

²³ FEIS App'x P at P-6; MVP Plan of Development at 1-7 (Nov. 30, 2017) (POD).

²⁴ FEIS at 2-14 to 2-15; FERC Order Issuing Certificates and Granting Abandonment Authority at 4 (Oct. 13, 2017) (FERC Certificate). Two additional mid-route facilities are located at points along the previously approved route that would not be affected by any of the route alternatives considered here. See FEIS at 2-14 to 2-15.

²⁵ See FEIS at 1-8, 2-14; MVP Resource Report 10 and Appendices at 10-2 to 10-3 (Oct. 23, 2015) (Resource Report 10).

²⁶ See FEIS at 1-8 to 1-9, 3-15; FERC Certificate at 3-5.

²⁷ Several of the route alternatives addressed in this analysis would also affect the location of, or necessity for, the crossing of USACE lands. Because the USACE crossing is so short compared with the JNF crossing, however, any differences in the length or location of the USACE crossing

A. Northern Pipeline – ACP Collocation Alternative

The Northern Pipeline – ACP Collocation Alternative would involve collocating the 42-inch-diameter MVP with the planned 42-inch-diameter Atlantic Coast Pipeline (ACP), along the ACP's proposed route.²⁸ This route alternative would diverge from the previously approved route at MP 37, and re-converge at the MVP's endpoint at MP 303.5.²⁹

For purposes of this analysis, the BLM assumes that the ACP would be constructed as proposed, and therefore that this route alternative would collocate the MVP with another ROW for the MVP's entire crossing of federal lands. Accordingly, this route alternative would provide greater collocation on federal lands than the previously approved route.

Constructing the two pipelines in parallel would raise serious constructability challenges:

[A] major disadvantage of the Northern Pipeline – ACP Collocation Alternative route is the necessity to construct two parallel pipelines along approximately 205 miles of the ACP route, much of which presents significant constructability issues related to topography and space. ... Based on [FERC's] review of aerial photography and topographic maps, ... in many areas, such as in Lewis and Upshur Counties, West Virginia and Augusta and Nelson Counties, Virginia,^[30] there is insufficient space along the narrow ridgelines to accommodate two parallel 42-inch-diameter ... pipelines. This would result in side slope (i.e., side-hill) or two-tone construction techniques, with additional acres of disturbance required for [temporary workspaces], given the space needed to safely accommodate equipment and personnel, as well as spoil storage. The constructability issues alone are likely to render this alternative technically infeasible.³¹

would not affect the outcome of the BLM's analysis for these route alternatives. As to alternatives apart from those addressed in this analysis, no route alternatives exist that would result in collocation of the USACE crossing and that are practical. A private landowner whose parcel is located approximately 2.5 miles from the USACE crossing proposed collocating the MVP with an existing pipeline near her property, but this proposal (which may not have resulted in collocation at the USACE crossing itself) would be impractical due to constructability and safety concerns. See FEIS at 3-112. No other route alternative has been identified that would involve collocation with that existing pipeline. See McGuire August 16, 2018 Email.

²⁸ FEIS at 3-29.

²⁹ FEIS at 3-29 to 3-30.

³⁰ These counties include much of the ACP's crossing of federal lands. See FEIS at 3-30.

³¹ FEIS at 3-32. See also FERC Order on Rehearing at 73, 163 FERC ¶ 61,197 (June 15, 2018) ("The area's steep slopes and narrow ridgeways make construction of two adjacent pipelines technically infeasible."). FERC's assessment is supported by information submitted by MVP. See MVP Responses to FERC Environmental Information Request at 177 (Mar. 31, 2016) (March 31, 2016 Responses) ("Significant mountaintop removal and material excavation would be required to obtain a proper level construction surface to work on during the pipeline

Moreover, the Northern Pipeline – ACP Collocation Alternative would cross at least 19.1 miles of federal lands – more than five times as much as the previously approved MVP route.³² Because a separate 125-foot-wide ROW may be required for each pipeline,³³ collocating the MVP with the ACP may result in a substantial increase in federal land disturbance compared with constructing each pipeline along its previously approved route.

Furthermore, the Northern Pipeline – ACP Collocation Alternative would include 22 more miles of side slope than the previously approved route, in addition to any side slope construction required by the need to fit two parallel pipelines on narrow ridgelines.³⁴ Construction along side slopes, where the gradient of the slope is perpendicular or oblique to the pipeline route, requires modified construction techniques and presents considerable safety and operational risks both during and after construction.³⁵ Although the terrain of the project area makes some degree of side slope construction unavoidable, and the project incorporates best management practices to mitigate the risks associated with side slopes, reducing side slopes is a key factor in comparing route alternatives for the MVP project.³⁶

Finally, because the Northern Pipeline – ACP Collocation Alternative would diverge from the previously approved route at MP 37, and re-converge only at the MVP's endpoint at MP 303.5, this route alternative would bypass all three of the mid-route delivery points discussed above.³⁷ The two Roanoke Gas taps, in particular, could not be relocated so as to meet the ACP's route, meaning that an alternative that follows the ACP route would require either forfeiting the

installation phase. ... There is insufficient space along the tops of the ridgelines for two adjacent large diameter pipelines in these areas. Constructing two large diameter pipelines in the mountainous terrain would add significant construction personnel risk with the amount of equipment necessary to move and install both pipelines in the steep terrain. Sidebooms do not have enough weight capacity or levered distance to hold or move a second pipe over the first pipe trench. Erosion and sediment control risks significantly increase with the amount of soil and steep slope disturbance required for the two 42-inch pipelines ditch excavation and soil control.”); Resource Report 10 at 10-16 (similar).

³² See FEIS at 3-31. The version of the ACP route included in that project's final environmental impact statement may cross even more federal lands. See ACP Final Environmental Impact Statement at 4-423 (July 2017).

³³ FEIS at 3-29.

³⁴ See FEIS at 3-32.

³⁵ FEIS at 2-37, 3-4, 4-52 to 4-56; INGAA Rugged Terrain Report at 26-28, 40-41; McGuire August 16, 2018 Email.

³⁶ FEIS at 3-3. See also INGAA Rugged Terrain Report at 30 (recommending that side slope areas “should be identified early in the project design and planning processes, and minimized to the greatest extent possible”); *id.* at 61 (“Careful planning and routing is always preferred to avoid or minimize potential threats from landslide and erosion hazards, but mitigation is usually required when such hazards cannot be avoided.”).

³⁷ See FEIS at 3-30.

purpose of serving this customer, or else building nearly 60 miles of additional pipeline in order to reach those taps.³⁸

For these reasons, we conclude that the Northern Pipeline -- ACP Collocation Alternative is not practical.

B. Highway Collocation Alternative

The Highway Collocation Alternative is a route alternative that would follow public roads for as much of its route as possible.³⁹ More specifically, this route alternative would mostly be collocated with interstate highways, intersecting the previously approved route in the vicinity of MP 60 and crossing the JNF alongside Interstate 77.⁴⁰ For purposes of this analysis, we assume that this route alternative would collocate the MVP with an interstate highway ROW for the MVP project's entire crossing of federal lands, and would therefore provide greater collocation on federal lands than the previously approved route.

The FEIS examined two versions of this collocated route alternative, one that would be located within the highway ROWs and one that would be located "adjacent to, but outside of," the highway ROWs.⁴¹ The version that would be located outside the highway ROWs

would likely present numerous and substantive construction challenges, including traversing roadway overpasses and underpasses, large interchanges, elevated sections of roadway including bridges, areas congested with development and homes, and narrow valleys where the most suitable terrain (i.e., flat) is already partially or fully encumbered by the roadway.⁴²

The version of this route alternative that would be located within the highway ROWs, meanwhile, would likely be prohibited by state laws and policies.⁴³ In West Virginia, the state agency's utility placement policy "prohibits longitudinal occupancy inside the controlled access right of way, by any utility, on any type of [controlled] highway, ... except ... underground fiber

³⁸ FEIS at 3-14. *See also* March 31, 2016 Responses at 177 ("[MVP] will also serve Roanoke Gas which is located along its Proposed Route in southwest Virginia; a market that cannot be served by moving to the Northern Pipeline Alternative route."); Resource Report 10 at 10-8, 10-16 (similar).

³⁹ FEIS at 3-18.

⁴⁰ FEIS at 3-18 to 3-19.

⁴¹ FEIS at 3-18.

⁴² FEIS at 3-18. This version of the Highway Collocation Alternative would not "utiliz[e a ROW] in common," and therefore does not satisfy section 28(p) for that reason, as well.

⁴³ Federal regulations permit state agencies to establish policies regarding utility installations in interstate highway ROWs. *See* 23 C.F.R. § 645.209(c)(1). *See also* 30 U.S.C. § 185(v) ("The Secretary or agency head shall take into consideration and to the extent practical comply with State standards for right-of-way construction, operation, and maintenance.").

optic facilities.”⁴⁴ And in Virginia, where the JNF crossing is primarily located, state regulations provide that “[n]ew utilities will not be permitted to be installed parallel to the roadway longitudinally within the controlled or limited access right-of-way lines of any highway” except in “special cases,” and even then only if such installation would not “involve tree removal or severe tree trimming.”⁴⁵ This limitation on tree removal or trimming is likely incompatible with the placement of a natural gas pipeline.⁴⁶

In addition, the Highway Collocation Alternative would be 142.5 miles (almost 47%) longer than the previously approved route, cross six times as many miles of federal lands, and cross more than twice as many perennial waterbodies, resulting in substantial additional costs and environmental impacts.⁴⁷ This route alternative would also cross an additional 51 miles of side slopes and an additional 125 miles of lands with landslide potential, amplifying the constructability concerns described above.⁴⁸ It would also bypass the three mid-route delivery points discussed above.⁴⁹

For these reasons, we conclude that the Highway Collocation Alternative is not practical.⁵⁰

C. Alternative 1/Hybrid Alternative 1A

⁴⁴ See W. Va. Div. of Highways, *Accommodation of Utilities on Highway Right of Way and Adjustment and Relocation of Utility Facilities on Highway Projects*, at 2 (2007), available at https://transportation.wv.gov/highways/engineering/files/ACCOMMODATION_OF_UTILITIES.pdf.

⁴⁵ 24 Va. Admin. Code. § 30-151-301(2)(d). See also Va. Dep’t of Trans., *Utility Manual of Instructions: Utility Relocation Policies & Procedures*, at 8-7 (2011), available at http://www.virginiadot.org/business/resources/right_of_way/utility_manual02132012_techrev.pdf. Such installations must also satisfy other requirements, including that “the installation will not adversely affect the safety, design, construction, operation, maintenance or stability of the highway,” that “the accommodation will not interfere with or impair the present use or future expansion of the highway,” and that “any alternative location would be contrary to the public interest,” taking into account “the direct and indirect environmental and economic effects that would result from the disapproval of [such] use.” See § 30-151-301(2)(a)-(c).

⁴⁶ See FEIS at 3-18.

⁴⁷ FEIS at 3-20.

⁴⁸ FEIS at 3-20.

⁴⁹ See FEIS at 3-19. Although such an alternative was not analyzed in the FEIS, it may be possible to construct a route alternative that generally follows the previously approved route, but deviates from that route between MPs 150 and 250 in order to cross the JNF along existing highways. See FEIS at 3-19. Such a hypothetical route alternative might avoid bypassing the three mid-route delivery points discussed above, but would otherwise be subject to most of the same practical concerns.

⁵⁰ See also FEIS at 3-17 (“This alternative concept is not evaluated in detail below due to the associated construction challenges, logistical constraints, and environmental impacts which we determined render it technically infeasible and/or as not providing a significant environmentally [sic] advantage compared to the proposed action.”).

Alternative 1 was designed to maximize collocation with an existing electric transmission line.⁵¹ Hybrid Alternative 1A is a variant that would follow the previously approved route through MP 135 and from there on follow the route of Alternative 1, re-converging with the previously approved route at its endpoint at MP 303.5.⁵² These two route alternatives are considered together here, since they are identical at the JNF crossing.⁵³ Both route alternatives would result in greater collocation on federal lands than the previously approved route, crossing fewer miles of federal lands overall and being collocated with the existing transmission line for the entirety of that crossing.⁵⁴

Collocating underground pipelines with electric transmission lines over long distances poses distinctive constructability and safety challenges that would be exacerbated in the circumstances of the MVP. Locating pipelines near transmission lines poses risks to pipeline workers from operating in close proximity to high voltage power lines, and increased risk of pipeline corrosion from interference with pipeline cathodic protection systems and from other forms of electrical interference.⁵⁵ These risks increase with parallel or near-parallel installation, especially at collocation lengths over a mile.⁵⁶ To mitigate these safety concerns, as well as concerns related to access for construction and operations, parallel installations typically involve adjacent or partially overlapping ROWs, rather than complete collocation.⁵⁷ Finally, because side slopes and

⁵¹ FEIS at 3-22. Alternative 1 was the original proposed alternative, but was supplanted by the previously approved route due to concerns regarding side slopes. See FEIS at 3-17; Resource Report 10 at 10-10 to 10-11.

⁵² FEIS at 3-25.

⁵³ Another route alternative, known as Hybrid Alternative 1B, would follow Alternative 1 through MP 135 and from there on follow the previously approved route. See FEIS at 3-25 to 3-26. Hybrid Alternative 1B is not considered here, since it would be identical to the previously approved route at the JNF crossing.

⁵⁴ See FEIS at 3-24, 3-27; McGuire August 16, 2018 Email; Neylon August 17, 2018 Email.

⁵⁵ See generally INGAA Foundation, Inc., Final Report No. 2015-04, *Criteria for Pipelines Co-Existing with Electric Power Lines* (2015) (INGAA Power Lines Report), available at <http://www.ingaa.org/File.aspx?id=24732>; McGuire August 16, 2018 Email.

⁵⁶ See INGAA Power Lines Report at 4, 45-49. The previously approved route would be collocated with electric transmission lines for numerous short stretches, but rarely for distances of a mile or more. See FEIS App'x P at P-1 to P-8.

⁵⁷ See McGuire August 16, 2018 Email (noting that in a typical configuration, the 50-foot-wide permanent pipeline ROW would be adjacent to the transmission line ROW, and the pipeline's temporary 100- to 125-foot-wide construction ROW would overlap with the transmission line ROW by 25 feet); FEIS at 3-22 ("The pipeline could be installed as close as 25 feet away from powerline infrastructure, with temporary workspace located even closer, but other configurations would also be required based on soil type and working conditions where the pipeline would be located much further away."). See also FEIS App'x P at P-1 to P-8 (listing offset distances between the centerline of the previously approved route and the edges of existing transmission line ROWs); INGAA Power Lines Report at 4, 46 (noting that interference risk is "Medium" for separation distances of 100 to 500 feet, and "High" for distances under 100 feet). MVP has also noted that constructing a major pipeline in the immediate vicinity of an electric transmission line poses "[c]onstructability and safety issues associated with ... the possibility of undermining

steep slopes⁵⁸ of the kind frequently encountered along the MVP's route pose a far greater challenge for pipelines than for electric transmission lines, which have a far smaller physical footprint and are capable of spanning stretches of challenging terrain, routes that are suitable for transmission line construction may be unsuitable for pipeline construction.⁵⁹ Therefore, while collocation with electric transmission lines can often be achieved, including in parts of the previously approved route of the MVP, the challenges of such collocation are highly relevant to the practicality analysis.

Alternative 1 would be over twenty miles longer than the previously approved route,⁶⁰ resulting in significant additional construction costs, and would pose significant technical challenges. In particular, Alternative 1 would cross 171.4 miles of steep slopes in excess of 20% grade – 42.8 miles more than the previously approved route, and over half the entire length of Alternative 1.⁶¹ Alternative 1 would also cross more miles of side slope than the previously approved route, including over 100 miles of “severe side slopes,”⁶² and would include two crossings of the New River, which the previously approved route avoids crossing.⁶³ These factors would pose substantial constructability and safety challenges.⁶⁴

power line towers.” MVP Responses to Data Requests issued January 27, 2017, at 570 (Feb. 17, 2017) (February 17, 2017 Responses).

⁵⁸ Construction along steep slopes where the gradient of the slope is parallel to the pipeline route poses many of the same challenges as construction along side slopes, though such challenges are typically less severe than in side slope conditions. FEIS at 2-49, 3-25, 4-28, 4-45, 4-52 to 4-56; INGAA Rugged Terrain Report at 7, 24. *See also* MVP Responses to Data Requests issued December 24, 2015, at 238 (Jan. 15, 2016) (describing construction and safety challenges associated with steep slopes).

⁵⁹ *See* McGuire August 16, 2018 Email. *See also* Resource Report 10 at 10-10 to 10-11 (“While the overhead transmission lines span significant areas of slide [sic] slope, these areas would be required to be crossed directly by the pipeline.”); February 17, 2017 Responses at 570 (“It is also important to recognize that the design requirements for a ROW for one type of infrastructure are not necessarily the same for other types of infrastructure.”).

⁶⁰ FEIS at 3-24.

⁶¹ *See* FEIS at 3-24.

⁶² FEIS at 3-24; Resource Report 10 at 10-10, 10-14.

⁶³ FEIS at 3-24. As explained by FERC staff, crossing the New River poses both constructability challenges and environmental concerns. *See* McGuire August 16, 2018 Email (“The New River in the immediate vicinity of the proposed route ranges from about 300 to 350 feet wide (a major river crossing). It is not a complete obstacle, as it could be crossed (likely via [horizontal directional drilling], although with a risk of an inadvertent release of drilling mud into the River), however as a significant environmental resource, avoidance (which was accomplished with the proposed route) if possible was preferred.”). Alternative 1 would also cross 38 more perennial waterbodies and 14.5 more miles of karst terrain. FEIS at 3-24.

⁶⁴ *See also* Resource Report 10 at 10-11 (“MVP determined that Route Alternative 1 represented insurmountable construction challenges, as well as a high risk of slope failure and pipeline slips, once the pipeline was to be in operation. ... [M]uch of the existing right-of-way was ultimately found unsuitable for pipeline construction ...”).

Hybrid Alternative 1A would pose many of the same challenges as Alternative 1. While this route alternative would be shorter than Alternative 1 and include fewer miles of steep slope, it would still be 6.3 miles longer than the previously approved route, and feature 140.8 miles of steep slope (almost 10% more than the previously approved route), as well as both crossings of the New River.⁶⁵ Hybrid Alternative 1A would also cross 177.2 miles of side slope (over 10% more than the previously approved route, exceeding even Alternative 1), and a significant portion of the “severe side slopes” crossed by Alternative 1.⁶⁶ The additional miles of steep slope and side slope, compared with the previously approved route, would “present[] substantially more obstacles to safe construction, increas[e] extra workspace requirements, and potentially affect[] worksite stability during construction and after restoration.”⁶⁷

Both Alternative 1 and Hybrid Alternative 1A would also pose constructability challenges associated with the necessary crossing of the Blue Ridge Parkway. While the previously approved route would cross the Parkway in an open grassy area, allowing the pipeline to bore under the Parkway, Alternative 1 and Hybrid Alternative 1A would cross the Parkway in a location flanked on one side by a wetland and floodplain and on the other by a short, steep slope, which together would complicate the boring process.⁶⁸

In addition, Alternative 1 would bypass the three mid-route delivery points discussed above, while Hybrid Alternative 1A would bypass two of the three.⁶⁹

For these reasons, we conclude that Alternative 1 and Hybrid Alternative 1A are not practical.

D. Variations 110, 110R, and 110J

Variations 110, 110R, and 110J were developed in order to avoid a number of sensitive resources located in the general vicinity of the JNF crossing, between MPs 175 and 235.⁷⁰ Each of these variations would cross more miles of federal lands than the previously approved route but would be collocated for fewer of those miles.⁷¹ Therefore, these route alternatives do not satisfy the criteria of section 28(p).⁷²

E. SR 635-ANST Variation

⁶⁵ FEIS at 3-25, 3-27 to 3-28. Hybrid Alternative 1A would also cross 22 more perennial waterbodies. FEIS at 3-27.

⁶⁶ FEIS at 3-24 to 3-25, 3-28; Resource Report 10 at 10-14.

⁶⁷ FEIS at 3-25.

⁶⁸ FEIS at 4-324 to 4-325; Resource Report 10 at 10-61.

⁶⁹ See FEIS at 3-26.

⁷⁰ FEIS at 3-44 to 3-45.

⁷¹ See McGuire August 16, 2018 Email; Neylon August 17, 2018 Email.

⁷² Furthermore, we note that Variation 110 crosses a designated wilderness area within the JNF, which renders this route variation impractical. See FEIS at 3-44, 3-46. See also Letter from U.S. Forest Service to FERC (May 16, 2016) (noting lack of authority to approve a pipeline within a wilderness area).

The SR 635-ANST Variation, located between MPs 191.7 and 207.8, was developed in order to examine the feasibility of reducing impacts on hikers traveling along the Appalachian National Scenic Trail (ANST) by crossing the ANST at the same location as an existing state road.⁷³ This route variation would cross 2.9 miles more federal lands than the previously approved route, and would not be collocated for any part of its crossing.⁷⁴ Therefore, the SR 635-ANST Variation does not satisfy the criteria of section 28(p).⁷⁵

F. CGV Variation

The CGV Variation, located between MPs 195 and 200, was developed in order to examine the feasibility of collocating the MVP with two existing pipelines that cross the JNF.⁷⁶ This route alternative would provide increased collocation on federal lands, replacing a 1.7 mile crossing of federal lands of which 1 mile is collocated with a 1.6 mile crossing that is mostly or entirely

⁷³ FEIS at 3-52.

⁷⁴ FEIS at 3-54; McGuire August 16, 2018 Email; Neylon August 17, 2018 Email. While the SR 635-ANST Variation would cross the ANST at the same location as the state road, the route alternative would not continue alongside that existing road. See McGuire August 16, 2018 Email. To the contrary, due to the topography of the area, the SR 635-ANST Variation would be forced to parallel the ANST for one mile. See MVP Responses to Data Requests issued January 27, 2017 and Supplemental Materials (Mar. 2, 2017) (March 2, 2017 Responses) at 39; MVP Additional Responses to June 28, 2016 Data Request at 63 (July 18, 2016) (July 18, 2016 Responses). In light of the purpose of section 28(p), we do not consider the ANST, which is a congressionally designated national scenic trail, see 16 U.S.C. § 1244(a)(1), to be an existing ROW with which Congress intended to encourage collocation of pipelines.

⁷⁵ Moreover, even if the SR 635-ANST Variation provided greater collocation than the previously approved route, this route alternative would be impractical. The environmental, constructability, and safety effects of the SR 635-ANST Variation would be mixed: the variation would be 1.5 miles shorter and would affect 89.2 fewer acres of interior forest, but would cross 2.9 more miles of federal lands and cross more wetlands, perennial waterbodies, and miles of inventoried roadless areas; similarly, the variation would cross fewer miles of steep slope and side slope, but more miles of land with landslide potential. FEIS at 3-52. More importantly, however, the SR 635-ANST Variation would be unlikely to succeed at its purpose, to reduce the impact of the MVP on ANST users. Whereas the previously approved route would cross the ANST perpendicularly, and preserve a 300-foot forested buffer on either side of the ANST by boring under the trail, the SR 635-ANST Variation would be forced to parallel the trail for about a mile, as noted above, likely increasing visual impacts on the trail. See FEIS at 3-52 to 3-53; March 2, 2017 Responses at 39; July 18, 2016 Responses at 63. Moreover, the low topography of the trail crossing site would limit the length of the borehole, eliminating the forested buffer and further increasing the visual impacts. March 2, 2017 Responses at 39; July 18, 2016 Responses at 63. Furthermore, the SR 635-ANST Variation would bring the MVP ROW closer to the ANST's Wind Rock overlook, increasing visual impacts on this overlook. March 2, 2017 Responses at 39. For these reasons, the SR 635-ANST Variation is not likely to succeed at its purpose of reducing impacts on users of the ANST, rendering the route impractical.

⁷⁶ FEIS at 3-48.

collocated.⁷⁷ The elimination of less than three-quarters of a mile of uncollocated crossing of federal lands would come at a cost of 9 more miles of total pipeline, however, including 4.1 more miles of steep slope and 4.6 more miles of side slope.⁷⁸ The CGV Variation would also result in 136.3 more acres of construction disturbance, including 60.8 more acres on forested land; increase the MVP's potential impacts on the watershed relied on by the Red Sulphur Public Service District, a public water supply utility; and bring the MVP ROW closer to the ANST's Angel's Rest overlook, increasing visual impacts on this overlook.⁷⁹ For these reasons, we conclude that the CGV Variation is not practical.

G. AEP-ANST Variation

The AEP-ANST Variation, located between MPs 195.4 and 200, was developed in order to examine the feasibility of reducing impacts on hikers traveling along the ANST by crossing the ANST at the same location as an existing electric transmission line.⁸⁰ The AEP-ANST Variation would cross approximately 0.9 more miles of federal lands than the previously approved route, while providing, at best, no more than 0.8 miles of additional collocation on federal lands.⁸¹ Because the AEP-ANST Variation involves at least 0.1 mile more uncollocated crossing of federal lands, this route alternative provides less net collocation on federal lands, and does not satisfy the criteria of section 28(p).⁸²

⁷⁷ FEIS at 3-50; *id.* App'x P at P-6; POD at 1-7; McGuire August 16, 2018 Email; Neylon August 17, 2018 Email. While the FEIS indicates that the relevant portion of the previously approved route contains zero miles "adjacent to existing right-of-way," this figure considers only major features such as transmission lines and pipelines, and excludes the previously approved route's collocation with a forest road, as noted above. See FEIS at 3-20, 3-50.

⁷⁸ FEIS at 3-50; McGuire August 16, 2018 Email; Neylon August 17, 2018 Email. Underscoring the constructability and safety concerns associated with the additional steep slopes and side slopes, the same pipeline ROW with which this route alternative would be collocated was previously the site of a slope failure related to side slopes. See FEIS at 4-45, 4-67, 4-69. See also INGAA Rugged Terrain Report at 7 (noting that "[l]andslide and erosion hazards are more commonly found, or created, ... where the proposed alignment intersects existing landslide[s]").

⁷⁹ FEIS at 3-50; March 2, 2017 Responses at 44.

⁸⁰ FEIS at 3-52, 3-55.

⁸¹ See FEIS at 3-54; McGuire August 16, 2018 Email; Neylon August 17, 2018 Email.

⁸² The AEP-ANST Variation would also pose constructability and safety concerns. The general concerns related to collocating the MVP with electric transmission lines are discussed above. In the specific context of the AEP-ANST Variation, these challenges include more miles of steep slope, side slope, shallow bedrock, and areas with landslide potential than the previously approved route. FEIS at 3-54. Moreover, this route alternative would be 3.2 miles longer, would cross more perennial waterbodies and forested land (but less inventoried roadless area, inventoried semi-primitive area, interior forest, and karst area), would result in an additional 48.9 acres of construction disturbance and a larger area of forested land disturbance during both construction and operation, and would increase the MVP's potential impacts on the Red Sulphur Public Service District watershed. FEIS at 3-54; March 2, 2017 Responses at 40.

H. Brush Mountain Alternatives 1 and 2

Brush Mountain Alternatives 1 and 2, located between MPs 219.5 and 220.7, were developed in order to reduce impacts to the Craig Creek watershed.⁸³ Brush Mountain Alternative 1 would feature the same amount of federal lands crossing and the same amount of collocation as the previously approved route, and therefore does not satisfy the criterion of providing greater collocation on federal lands.⁸⁴ Brush Mountain Alternative 2, meanwhile, may provide greater collocation, but by no more than 0.22 miles.⁸⁵ Any such increase in collocation, meanwhile, would come at the cost of a larger increase in the total mileage (0.3 additional miles), the mileage of side slope (0.4 additional miles), and the mileage of lands with landslide potential (0.3 additional miles).⁸⁶ Because Brush Mountain Alternative 2 would entail greater

Furthermore, like the SR 635-ANST Variation, the AEP-ANST Variation would be unlikely to accomplish its purpose of reducing impacts on users of the ANST. Under either the AEP-ANST Variation or the previously approved route, hikers would experience a clearing at the location where the trail crosses the existing electric transmission line, and no clearing where the previously approved route crosses the trail (due to the 300-foot forested buffer). See FEIS at 3-52, 4-312; FEIS App'x S figs. 1a to 7b. The majority of new visual impacts on trail users would therefore occur, under either scenario, not due to near-field impacts at the location where the previously approved route crosses the trail, but rather due to more distant views of the MVP ROW from various points along the trail. See FEIS at 4-312; see generally FEIS App'x S. The AEP-ANST Variation would not reduce the overall visual footprint of the MVP ROW, and may in fact increase that overall footprint due to the larger area of forested land disturbance. See also March 2, 2017 Responses at 40 (noting that "the visual impact on ANST users would likely be greater because of the open view that trail users have when within the [transmission line] right-of-way"). Moreover, the AEP-ANST Variation would also bring the MVP ROW closer to the Angel's Rest overlook, increasing visual impacts on this overlook. March 2, 2017 Responses at 40. Therefore, the AEP-ANST Variation is not likely to succeed at its purpose of reducing impacts on users of the ANST

For these reasons, we conclude that the AEP-ANST Variation is not practical.

⁸³ FEIS at 3-61 to 3-62.

⁸⁴ FEIS at 3-64; Neylon August 17, 2018 Email. Brush Mountain Alternative 1 also poses a significant constructability and safety concern related to an area of especially steep slope, over 43% grade. FEIS at 3-62 to 3-64; March 2, 2017 Responses at 47; MVP Responses to Data Requests issued January 27, 2017, at 139 (Feb. 23, 2017).

⁸⁵ One assessment estimated that Brush Mountain Alternative 2 would cross 1.3 miles of federal lands with no collocation, and therefore would offer no collocation advantage. See Neylon August 17, 2018 Email. The other assessment estimated that the route alternative would cross 1.18 miles of federal lands with 0.4 miles of collocation, for a net of 0.78 miles of federal lands without collocation. McGuire August 16, 2018 Email. By contrast, the corresponding segment of the previously approved route would cross 1.0 miles of federal lands, with between 0 and 0.2 miles of collocation, for a net of between 0.8 and 1.0 miles of federal lands without collocation. Neylon August 17, 2018 Email; FEIS at 3-64.

⁸⁶ FEIS at 3-64; MVP Responses to Data Requests issued January 27, 2017, at 140 (Feb. 23, 2017); March 2, 2017 Responses at 48. The FEIS also concluded that Brush Mountain Alternative 2 would not offer a significant environmental advantage compared to the previously

constructability and safety challenges than the previously approved route while providing at best a marginal increase in collocation on federal lands, we conclude that this route alternative is impractical.

I. Slussers Chapel Variations

The Slussers Chapel Variations consist of two route alternatives located between MPs 220.7 and 223.7 that were developed in order to reduce impacts on the Slussers Chapel Conservation Site.⁸⁷ One route alternative, Modified Variation 250, would replace a portion of the route located entirely on non-federal lands with a route that would cross 2.3 miles of federal lands, and therefore does not satisfy the criterion of increased collocation on federal lands.⁸⁸ The other route alternative, the VADCR Slussers Chapel Conservation Site Avoidance Variation, would replace a portion of the route that crosses 0.04 miles of federal lands with a route that would cross 2.54 miles of federal lands, and therefore does not appear to satisfy this criterion, either.⁸⁹ This route alternative would also traverse a narrow ridgetop with a designated wilderness area on one side, steep slopes on the other side, and an existing forest road along the ridge, posing significant constructability and safety concerns that the previously approved route avoids and that render this route alternative impractical.⁹⁰ For these reasons, we conclude that these route alternatives do not satisfy the criteria of section 28(p).

IV. Conclusion

As the analysis above demonstrates, none of the route alternatives would result in greater collocation on federal lands and be practical. Several of the route alternatives would not result in greater collocation on federal lands. Each of the remaining route alternatives would be impractical due to a combination of constructability and safety challenges, increased

approved route. FEIS at 3-65. Because the purpose of Brush Mountain Alternative 2 is to reduce environmental impacts, *see* FEIS at 3-61 to 3-62, the failure to achieve a significant environmental advantage also renders this route alternative impractical.

⁸⁷ FEIS at 3-69 to 3-70. A third route alternative, Variation 250, would not affect the MVP's crossing of federal lands, and therefore is not relevant to this analysis. FEIS at 3-71. Moreover, Variation 250 was adopted by FERC and incorporated into the MVP route. FERC Certificate at 60; *id.* App'x C at 7.

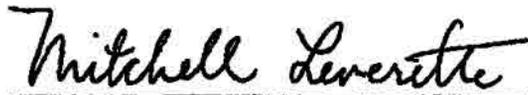
⁸⁸ FEIS at 3-71, 3-74.

⁸⁹ FEIS at 3-72.

⁹⁰ FEIS at 3-69. *See also* February 17, 2017 Responses at 195-196 (“[The Slussers Chapel Variation] significantly increases the construction risks due to its placement along the ridgeline of Brush Mountain. There is an existing Forest Service Road (Forest Road 188/Brush Mountain Road) along the ridge top, with the boundary of Brush Mountain Wilderness north of and parallel to the road. Mountain Valley would need to maintain a 50-foot buffer between the Wilderness Boundary and the edge of construction work area, which would require that the 125-foot-wide construction right-of-way encompass Forest Road 188 as well as significant side slope areas along the south side of the road. In addition, during construction, this section of Forest Road 188 would be closed for an extensive period of time to regular vehicle or foot traffic.”).

environmental impacts, increased length and footprint, increased cost,⁹¹ and inability to serve the purposes of the MVP or the specific purpose of the route alternative in question. Therefore, we conclude that the additional utilization of existing ROWs across federal lands would be impractical.

Sincerely,



Mitchell Leverette
Acting State Director, Bureau of Land Management, Eastern States

I concur

I do not concur



Joseph R. Balash
Assistant Secretary - Land and Minerals Management, U.S. Department of the Interior

⁹¹ As noted above, the BLM has considered the information presented above about length and construction challenges as a proxy for cost information.

Document Content(s)

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FEDERAL ENERGY REGULATORY COMMISSION
WASHINGTON, D.C. 20426

OFFICE OF ENERGY PROJECTS

In Reply Refer To:
OEP/DG2E/G3
Mountain Valley Pipeline LLC
CP16-10-000

August 29, 2018

Matthew Eggerding, Counsel
Mountain Valley Pipeline LLC
625 Liberty Ave., Suite 1700
Pittsburgh, PA 15222

Re: Partial Authorization to Resume Construction

Dear Mr. Eggerding:

Staff, having further reviewed the status of construction activities along the route of the Mountain Valley Pipeline Project (Project), and additional information provided by the Department of the Interior's Bureau of Land Management (BLM), has determined that the protection of the environment along the Project's right-of-way is best served by modifying the Stop Work Order issued on August 3, 2018.

In the Stop Work Order, staff stated that "[s]hould the agencies authorize alternative routes, [Mountain Valley Pipeline] may need to revise substantial portions of the Project route across non-federal lands, possibly requiring further authorizations and environmental review." On August 24, 2018, the BLM provided the Commission a supplemental analysis of other pipeline route alternatives that offer collocation opportunities across federal lands (see enclosure). Based on the BLM's determination that the route previously approved by all federal agencies provides the greatest level of collocation for an alternative crossing that is also practical, the specific route of the Project no longer seems in question.

Approximately sixty-five percent of the right-of-way between Mileposts 77 and 303 has been cleared of vegetation, with a significant portion of that length having been graded. In those cleared and graded segments, Mountain Valley Pipeline has installed temporary erosion control devices. Maintaining the status quo across non-federal lands while the Department of Agriculture's Forest Service, the Army Corps of Engineers, and the BLM address the Court's instructions regarding federal lands would likely pose threats to plant and wildlife habitat and adjacent waterbodies as long-term employment of temporary erosion control measures would subject significant portions of the route to erosion and soil movement. Requiring immediate restoration of the entire right-of-way to pre-construction conditions would require significant additional construction activity, also causing further environmental impacts.

In consultation with staff, I have determined that protection of the environment along the Project's right-of-way across non-federal land is best served by completing construction and restoration activities as quickly as possible. Consequently, pursuant to delegated authority under Title 18 of the Code of Federal Regulations, section 375.308(x)(7), and Environmental Condition 2 of the Commission's October 13, 2017 Order¹, I authorize the resumption of construction for the Project, except as indicated below.

Mountain Valley Pipeline has not obtained the rights-of-way and temporary use permits from the federal government needed for the Project to cross federally owned lands. Therefore, construction is still excluded at the following locations:

- the crossing of the Weston and Gauley Bridge Turnpike on lands owned by the U.S. Army Corps of Engineers, in Braxton County, West Virginia; and
- between milepost 196.0 and milepost 221.0, an area encompassing the two watersheds containing the 3.5 miles of pipeline route across the Jefferson National Forest, in Monroe County, West Virginia and Giles County, Virginia.

Finally, construction is being authorized, with the exceptions note above, because construction will best mitigate further environmental impacts. In order to ensure that Mountain Valley Pipeline achieve that objective, it must take all steps necessary to promptly conduct post-construction restoration as soon as construction is complete. I also remind you that Mountain Valley Pipeline must comply with all applicable remaining terms and conditions of the Commission's October 13, 2017 Order.

Sincerely,

Terry L. Turpin
Director,
Office of Energy Projects

¹ *Mountain Valley Pipeline, LLC*, 161 FERC ¶61,043 (2017), *order on reh'g*, 163 FERC ¶61,197 (2018).



United States Department of the Interior



Bureau of Land Management

Eastern States
Southeastern States District Office
273 Market Street
Flowood, Mississippi 39232
<http://www.es.blm.gov>

August 24, 2018

IN REPLY REFER TO:
2880 (ESJ020) VMC

Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street NE
Washington, DC 20426

Re: Mountain Valley Pipeline, LLC
Docket No. CP16-10-000
Mineral Leasing Act Section 28(p) Analysis for the Mountain Valley Pipeline

Dear Ms. Bose:

Enclosed for your docket please find the Bureau of Land Management's analysis of the Mountain Valley Pipeline project under section 28(p) of the Mineral Leasing Act of 1920. Please note that this analysis in itself does not constitute a record of decision or right-of-way grant.

Sincerely,

Victoria (Vicki) Craft
Project Manager

Enclosure (1)
-Practicality Analysis

CC: Public File, Docket No. CP16-10-000

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United States Department of the Interior



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AUG 23 2018

Mr. Joseph R. Balash
Assistant Secretary – Land and Minerals Management
U.S. Department of the Interior
1849 C Street NW
Washington, DC 20240

Re: Mineral Leasing Act Section 28(p) Analysis for the Mountain Valley Pipeline

Dear Mr. Balash:

Section 28(p) of the Mineral Leasing Act of 1920 provides that “[i]n order to minimize adverse environmental impacts and the proliferation of separate rights-of-way across Federal lands, the utilization of rights-of-way in common shall be required to the extent practical.”¹ On July 27, 2018, the U.S. Court of Appeals for the Fourth Circuit vacated the record of decision and right-of-way (ROW) grant for the Mountain Valley Pipeline (MVP). The court found that the record of decision did not address whether “the utilization of an existing right of way would be *impractical*,” and specified that the BLM on remand must “favor[] routes utilizing existing rights of way unless those alternatives [are] impractical.”²

The Bureau of Land Management (BLM) has prepared this supplemental analysis to address the court’s instructions on remand. As explained below, we conclude that the additional utilization of existing ROWs across federal lands would be impractical.

I. Background

In order to implement the court’s instructions, we have analyzed whether any route alternative exists that would result in greater collocation with other ROWs on federal lands than the route that was previously approved by the BLM, and that would be practical. Each of these two criteria is explained in greater detail below.

A. Collocation on Federal Lands

The first criterion that a route alternative must satisfy is that it must result in greater collocation with other ROWs on federal lands – that is, it must cross fewer miles of federal lands without

¹ 30 U.S.C. § 185(p).

² See *Sierra Club, Inc. v. U.S. Forest Serv.*, – F.3d –, 2018 WL 3595760, at *16 (4th Cir. July 27, 2018) (emphasis in the original).

collocation than the previously approved alternative. We limit our comparison of collocation to federal lands because section 28(p) aims to minimize “the proliferation of separate rights-of-way across Federal lands,” and because the BLM has no authority over the MVP route except to the extent that the route involves the use of federal lands.³

In order to determine the extent of collocation on federal lands, we rely on two independent assessments: one conducted by staff of the Federal Energy Regulatory Commission (FERC), and one conducted by MVP.⁴ Although the results of these two independent assessments are generally consistent, they occasionally provide different estimates of the extent of collocation on federal lands, because of the technical challenges inherent in measuring the lengths of potential pipeline routes. Where the two assessments provide conflicting results on the question of whether a given route alternative would result in greater collocation on federal lands than the previously approved route, we have assumed conservatively that the route alternative would satisfy this criterion, and proceeded to examine whether the route alternative would be practical.

B. Practicality

The second criterion that a route alternative must satisfy is that it must be practical. In interpreting the term “practical” for purposes of this analysis, we have taken into consideration the term’s common usage, as well as relevant administrative and judicial interpretations. Black’s Law Dictionary defines “practical” as meaning “[l]ikely to succeed or be effective,” and “[u]seful or suitable for a particular purpose or situation.”⁵ The BLM’s regulations note that one of the objectives of the BLM’s pipeline ROW program is to “[p]romote[] the use of rights-of-way in common considering engineering and technological compatibility,” and that the use of ROWs in common may be required “where safety and other considerations allow.”⁶ In the only judicial or administrative decision addressing section 28(p), the Interior Board of Land Appeals determined that this standard includes consideration of a route’s cost and land-disturbance footprint, affirming that a route alternative was not “practical” when it would have “require[d]

³ See § 185(c)(2),(p). We define federal lands, consistently with section 28, to exclude “lands in the National Park System.” See 30 U.S.C. § 185(b)(1).

⁴ See Email from Rich McGuire, FERC, to Victoria Craft, BLM (Aug. 16, 2018) (McGuire August 16, 2018 Email); Email from Megan Neylon, MVP, to Victoria Craft, BLM (Aug. 17, 2018) (Neylon August 17, 2018 Email). Unlike the figures reported in the FEIS for “[l]ength adjacent to existing right-of-way,” these assessments included collocation with both major ROWs such as pipelines or electric transmission lines and smaller ROWs such as roads. See FEIS at 3-20. Cf. 70 Fed. Reg. 20,970, 20,970 (April 22, 2005) (“Some examples of land uses which require a right-of-way grant include: transmission lines, communication sites, roads, highways, trails, telephone lines, canals, flumes, pipelines, and reservoirs.”). For this reason, along with the fact that the FEIS’s figures do not distinguish between miles of collocation on federal and non-federal lands, we do not generally rely on the FEIS’s figures for “[l]ength adjacent to existing right-of-way” for this analysis.

⁵ See “Practical,” Black’s Law Dictionary (10th ed. 2014).

⁶ See 43 C.F.R. §§ 2881.2(c), 2882.10(b). See also 70 Fed. Reg. at 21,033 (noting that “there may be situations where for technical or safety reasons it is not practical” to make use of an existing ROW).

construction of an additional 39 miles of pipeline at an estimated additional cost of \$37.5 million,” as well as “installation of an additional compressor station and ... the temporary disturbance of a substantially greater acreage of lands during construction.”⁷ Similarly, in interpreting a parallel standard in another statute, the Board affirmed that a route was not “practical” where it would have “require[d] construction of up to an additional 60 miles of 345 kV power line and ha[d] an adverse impact on an additional 60 miles of public and private land,” while “preclud[ing] the opportunity to improve” service to one of the project’s proposed customers.⁸ Finally, a regulation issued to implement section 404 of the Clean Water Act prohibits the issuance of a dredge or fill discharge permit “if there is a practicable alternative to the proposed discharge” that is environmentally preferable, and defines “practicable” as including “consideration [of] cost, existing technology, and logistics in light of overall project purposes.”⁹ In reviewing decisions made under this regulation by the U.S. Army Corps of Engineers (USACE), courts have deferred to the agency’s practicability determinations, and upheld its consideration of factors including cost, construction delays, logistical feasibility, and “the objectives of the applicant’s project.”¹⁰

Accordingly, we interpret the term “practical,” for purposes of this analysis, as referring to the suitability of a route alternative for achieving its purpose, and to the likelihood that attempting to utilize that route would succeed in achieving that purpose.¹¹ The purpose of any route alternative is to construct a pipeline to deliver natural gas from the MVP’s beginning point to its endpoint, via its mid-route delivery points, in a safe, environmentally responsible, and cost-effective manner.¹² In certain cases, however, as discussed below, a particular route alternative may also have a more specific purpose, such as mitigating the impact of the MVP on certain resources. Therefore, the determination of whether a route alternative is practical includes consideration of the construction challenges and potential safety hazards that would arise from constructing or operating the pipeline along the route;¹³ the environmental consequences of constructing the

⁷ *Wyo. Indep. Producers Ass’n*, 133 IBLA 65, 82 (1995).

⁸ *Paul Herman*, 146 IBLA 80, 105 (1998) (interpreting 43 U.S.C. § 1763).

⁹ See 40 C.F.R. §§ 230.3(f), 230.10(a).

¹⁰ See *Friends of Santa Clara River v. U.S. Army Corps of Eng’rs*, 887 F.3d 906, 912, 921-922 (9th Cir. 2018) (quotation marks omitted); *Friends of the Earth v. Hintz*, 800 F.2d 822, 833-834 (9th Cir. 1986); *Nat’l Parks Cons. Ass’n v. Semonite*, 311 F. Supp. 3d 350, 377-378 (D.D.C. 2018).

¹¹ See “Practical,” Black’s Law Dictionary.

¹² See MVP Final Environmental Impact Statement at 1-8 (June 23, 2017) (FEIS). While the section 28(p) analysis described here is distinct from the National Environmental Policy Act analysis contained in the FEIS, the information and analysis presented in the FEIS is in many instances relevant to the section 28(p) analysis.

¹³ See 43 C.F.R. §§ 2881.2(c), 2882.10(b); 70 Fed. Reg. at 21,033.

pipeline along the route;¹⁴ any resulting increase in the pipeline's length and footprint;¹⁵ the ability of the route to serve the MVP's mid-route delivery points;¹⁶ the additional costs associated with the alternative;¹⁷ and the likelihood that the route would achieve any specific purpose identified for that route alternative.¹⁸

Although our comparison of the extent of collocation is limited to federal lands, determining the practicality of a route requires consideration of the route as a whole. A route alternative may increase the extent of collocation on federal lands, but prove impractical because of technical or other considerations relating to the route as a whole.

II. The MVP and the Previously Approved Route

The MVP is intended "to transport natural gas produced in the Appalachian Basin to markets in the Northeast, Mid-Atlantic, and Southeastern United States."¹⁹ Specifically, the project is

¹⁴ We note that section 28(p) can be read as requiring "the utilization of rights-of-way-in common" only where such collocation would "minimize adverse environmental impacts" as compared to an alternative with less collocation. See 30 U.S.C. § 185(p). Had we applied a separate requirement that any route alternative must "minimize adverse environmental impacts" compared to the previously approved alternative, we would have concluded on this basis alone that none of the route alternatives would satisfy the criteria of section 28(p). See FEIS at 3-20, 3-22, 3-25, 3-32, 3-47 to 3-48, 3-51, 3-55, 3-62, 3-65, 3-70 (concluding that none of the route alternatives considered in this analysis would "provide a significant environmental advantage" over the previously approved route). In this case, however, we have not excluded any route alternatives based solely on their environmental impacts.

¹⁵ See *Wyo. Indep. Producers*, 133 IBLA at 82; see also *Paul Herman*, 146 IBLA at 105.

¹⁶ See, e.g., *Paul Herman*, 146 IBLA at 105. See also *Friends of Santa Clara River*, 887 F.3d at 912, 921 (requiring consideration of "the objectives of the applicant's project," so long as "those project objectives are not so narrowly defined as to preclude alternatives" (quotation marks omitted)). Each of the route alternatives would serve the MVP's beginning and endpoint.

¹⁷ See *Friends of Santa Clara River*, 887 F.3d at 921-923; *Wyo. Indep. Producers*, 133 IBLA at 82. In this case, the cost of each route alternative would be driven primarily by differences in length and in the extent of steep slopes, side slopes, and other challenging construction conditions. See INGAA Foundation, Inc., Final Report No. 2015-03, *Mitigation of Land Movement in Steep and Rugged Terrain for Pipeline Projects: Lessons Learned from Constructing Pipelines in West Virginia* at 6 (2016) (INGAA Rugged Terrain Report), available at <http://www.ingaa.org/File.aspx?id=28629> (noting that "the planning process must weigh the costs of longer alignments to avoid hazards versus cost of mitigation of the hazard"). Therefore, the information presented below about length and construction challenges serves, and was considered by the BLM, as a proxy for such cost information.

¹⁸ See *Friends of Santa Clara River*, 887 F.3d at 921. We note that this definition of practicality is broader than mere technical feasibility – a standard that some, but not all, of the route alternatives considered here would satisfy. See, e.g., FEIS at 3-32 (concluding that the Northern Pipeline – ACP Collocation Alternative is "likely ... technically infeasible"); *id.* at 3-119 (concluding that some of the remaining route alternatives "appear to be technically feasible").

¹⁹ FEIS at 1-8.

intended to transport natural gas from an existing interconnect in West Virginia to an existing natural gas pooling point and gas trading hub located along a major existing natural gas pipeline in Virginia.²⁰

The previously approved route connecting these locations would be 303.5 miles long, and would cross 3.5 miles of federal lands managed by the U.S. Forest Service within the Jefferson National Forest (JNF), in three discontinuous portions located at mileposts (MPs) 196.2 to 197.8, MPs 218.5 to 219.4, and MPs 219.8 to 220.8.²¹ The route would also cross 60 feet of federal lands managed by the USACE, at MP 66.8.²² The route would be collocated with an existing ROW for 1.0 miles of its crossing of the JNF, following a forest road known as Mystery Ridge Road at MPs 196.8 to 197.8.²³ The previously approved route would not be collocated with another ROW for any portion of its crossing of USACE lands.

In addition to its beginning and endpoints, the MVP is also intended to serve three mid-route delivery points that are relevant to this analysis: the WB Interconnect, located at MP 77.6 of the previously approved route; the Roanoke Gas Lafayette Tap, located at MP 235.7; and the Roanoke Franklin Tap, located at MP 261.3.²⁴ The location of the WB Interconnect is determined by existing natural gas infrastructure, while the locations of the two Roanoke Gas taps are determined by the service area of the utility purchaser that will operate those taps and by existing agreements with that purchaser.²⁵ The existence of these three mid-route delivery points was an important factor in the selection of the previously approved route, and in the approval of the MVP project by FERC.²⁶ Therefore, to the extent that any of the route alternatives would bypass these mid-route delivery points, that fact is relevant to the BLM's consideration of the practicality of that route alternative.

III. Route Alternatives

The BLM has analyzed nine route alternatives or families of route alternatives that would affect the MVP project's crossing of the JNF.²⁷ These route alternatives are analyzed in the order of the milepost at which each route alternative first diverges from the previously approved route.

²⁰ FEIS at 1-8, 3-3.

²¹ FEIS at 1-1, 1-14.

²² FEIS at 1-16, 4-277.

²³ FEIS App'x P at P-6; MVP Plan of Development at 1-7 (Nov. 30, 2017) (POD).

²⁴ FEIS at 2-14 to 2-15; FERC Order Issuing Certificates and Granting Abandonment Authority at 4 (Oct. 13, 2017) (FERC Certificate). Two additional mid-route facilities are located at points along the previously approved route that would not be affected by any of the route alternatives considered here. See FEIS at 2-14 to 2-15.

²⁵ See FEIS at 1-8, 2-14; MVP Resource Report 10 and Appendices at 10-2 to 10-3 (Oct. 23, 2015) (Resource Report 10).

²⁶ See FEIS at 1-8 to 1-9, 3-15; FERC Certificate at 3-5.

²⁷ Several of the route alternatives addressed in this analysis would also affect the location of, or necessity for, the crossing of USACE lands. Because the USACE crossing is so short compared with the JNF crossing, however, any differences in the length or location of the USACE crossing

A. Northern Pipeline – ACP Collocation Alternative

The Northern Pipeline – ACP Collocation Alternative would involve collocating the 42-inch-diameter MVP with the planned 42-inch-diameter Atlantic Coast Pipeline (ACP), along the ACP's proposed route.²⁸ This route alternative would diverge from the previously approved route at MP 37, and re-converge at the MVP's endpoint at MP 303.5.²⁹

For purposes of this analysis, the BLM assumes that the ACP would be constructed as proposed, and therefore that this route alternative would collocate the MVP with another ROW for the MVP's entire crossing of federal lands. Accordingly, this route alternative would provide greater collocation on federal lands than the previously approved route.

Constructing the two pipelines in parallel would raise serious constructability challenges:

[A] major disadvantage of the Northern Pipeline – ACP Collocation Alternative route is the necessity to construct two parallel pipelines along approximately 205 miles of the ACP route, much of which presents significant constructability issues related to topography and space. ... Based on [FERC's] review of aerial photography and topographic maps, ... in many areas, such as in Lewis and Upshur Counties, West Virginia and Augusta and Nelson Counties, Virginia,³⁰ there is insufficient space along the narrow ridgelines to accommodate two parallel 42-inch-diameter ... pipelines. This would result in side slope (i.e., side-hill) or two-tone construction techniques, with additional acres of disturbance required for [temporary workspaces], given the space needed to safely accommodate equipment and personnel, as well as spoil storage. The constructability issues alone are likely to render this alternative technically infeasible.³¹

would not affect the outcome of the BLM's analysis for these route alternatives. As to alternatives apart from those addressed in this analysis, no route alternatives exist that would result in collocation of the USACE crossing and that are practical. A private landowner whose parcel is located approximately 2.5 miles from the USACE crossing proposed collocating the MVP with an existing pipeline near her property, but this proposal (which may not have resulted in collocation at the USACE crossing itself) would be impractical due to constructability and safety concerns. See FEIS at 3-112. No other route alternative has been identified that would involve collocation with that existing pipeline. See McGuire August 16, 2018 Email.

²⁸ FEIS at 3-29.

²⁹ FEIS at 3-29 to 3-30.

³⁰ These counties include much of the ACP's crossing of federal lands. See FEIS at 3-30.

³¹ FEIS at 3-32. See also FERC Order on Rehearing at 73, 163 FERC ¶ 61,197 (June 15, 2018) ("The area's steep slopes and narrow ridgeways make construction of two adjacent pipelines technically infeasible."). FERC's assessment is supported by information submitted by MVP. See MVP Responses to FERC Environmental Information Request at 177 (Mar. 31, 2016) (March 31, 2016 Responses) ("Significant mountaintop removal and material excavation would be required to obtain a proper level construction surface to work on during the pipeline

Moreover, the Northern Pipeline – ACP Collocation Alternative would cross at least 19.1 miles of federal lands – more than five times as much as the previously approved MVP route.³² Because a separate 125-foot-wide ROW may be required for each pipeline,³³ collocating the MVP with the ACP may result in a substantial increase in federal land disturbance compared with constructing each pipeline along its previously approved route.

Furthermore, the Northern Pipeline – ACP Collocation Alternative would include 22 more miles of side slope than the previously approved route, in addition to any side slope construction required by the need to fit two parallel pipelines on narrow ridgelines.³⁴ Construction along side slopes, where the gradient of the slope is perpendicular or oblique to the pipeline route, requires modified construction techniques and presents considerable safety and operational risks both during and after construction.³⁵ Although the terrain of the project area makes some degree of side slope construction unavoidable, and the project incorporates best management practices to mitigate the risks associated with side slopes, reducing side slopes is a key factor in comparing route alternatives for the MVP project.³⁶

Finally, because the Northern Pipeline – ACP Collocation Alternative would diverge from the previously approved route at MP 37, and re-converge only at the MVP's endpoint at MP 303.5, this route alternative would bypass all three of the mid-route delivery points discussed above.³⁷ The two Roanoke Gas taps, in particular, could not be relocated so as to meet the ACP's route, meaning that an alternative that follows the ACP route would require either forfeiting the

installation phase. ... There is insufficient space along the tops of the ridgelines for two adjacent large diameter pipelines in these areas. Constructing two large diameter pipelines in the mountainous terrain would add significant construction personnel risk with the amount of equipment necessary to move and install both pipelines in the steep terrain. Sidebooms do not have enough weight capacity or levered distance to hold or move a second pipe over the first pipe trench. Erosion and sediment control risks significantly increase with the amount of soil and steep slope disturbance required for the two 42-inch pipelines ditch excavation and soil control.”); Resource Report 10 at 10-16 (similar).

³² See FEIS at 3-31. The version of the ACP route included in that project's final environmental impact statement may cross even more federal lands. See ACP Final Environmental Impact Statement at 4-423 (July 2017).

³³ FEIS at 3-29.

³⁴ See FEIS at 3-32.

³⁵ FEIS at 2-37, 3-4, 4-52 to 4-56; INGAA Rugged Terrain Report at 26-28, 40-41; McGuire August 16, 2018 Email.

³⁶ FEIS at 3-3. See also INGAA Rugged Terrain Report at 30 (recommending that side slope areas “should be identified early in the project design and planning processes, and minimized to the greatest extent possible”); *id.* at 61 (“Careful planning and routing is always preferred to avoid or minimize potential threats from landslide and erosion hazards, but mitigation is usually required when such hazards cannot be avoided.”).

³⁷ See FEIS at 3-30.

purpose of serving this customer, or else building nearly 60 miles of additional pipeline in order to reach those taps.³⁸

For these reasons, we conclude that the Northern Pipeline – ACP Collocation Alternative is not practical.

B. Highway Collocation Alternative

The Highway Collocation Alternative is a route alternative that would follow public roads for as much of its route as possible.³⁹ More specifically, this route alternative would mostly be collocated with interstate highways, intersecting the previously approved route in the vicinity of MP 60 and crossing the JNF alongside Interstate 77.⁴⁰ For purposes of this analysis, we assume that this route alternative would collocate the MVP with an interstate highway ROW for the MVP project's entire crossing of federal lands, and would therefore provide greater collocation on federal lands than the previously approved route.

The FEIS examined two versions of this collocated route alternative, one that would be located within the highway ROWs and one that would be located "adjacent to, but outside of," the highway ROWs.⁴¹ The version that would be located outside the highway ROWs

would likely present numerous and substantive construction challenges, including traversing roadway overpasses and underpasses, large interchanges, elevated sections of roadway including bridges, areas congested with development and homes, and narrow valleys where the most suitable terrain (i.e., flat) is already partially or fully encumbered by the roadway.⁴²

The version of this route alternative that would be located within the highway ROWs, meanwhile, would likely be prohibited by state laws and policies.⁴³ In West Virginia, the state agency's utility placement policy "prohibits longitudinal occupancy inside the controlled access right of way, by any utility, on any type of [controlled] highway, ... except ... underground fiber

³⁸ FEIS at 3-14. *See also* March 31, 2016 Responses at 177 ("[MVP] will also serve Roanoke Gas which is located along its Proposed Route in southwest Virginia; a market that cannot be served by moving to the Northern Pipeline Alternative route."); Resource Report 10 at 10-8, 10-16 (similar).

³⁹ FEIS at 3-18.

⁴⁰ FEIS at 3-18 to 3-19.

⁴¹ FEIS at 3-18.

⁴² FEIS at 3-18. This version of the Highway Collocation Alternative would not "utiliz[e a ROW] in common," and therefore does not satisfy section 28(p) for that reason, as well.

⁴³ Federal regulations permit state agencies to establish policies regarding utility installations in interstate highway ROWs. *See* 23 C.F.R. § 645.209(c)(1). *See also* 30 U.S.C. § 185(v) ("The Secretary or agency head shall take into consideration and to the extent practical comply with State standards for right-of-way construction, operation, and maintenance.").

optic facilities.”⁴⁴ And in Virginia, where the JNF crossing is primarily located, state regulations provide that “[n]ew utilities will not be permitted to be installed parallel to the roadway longitudinally within the controlled or limited access right-of-way lines of any highway” except in “special cases,” and even then only if such installation would not “involve tree removal or severe tree trimming.”⁴⁵ This limitation on tree removal or trimming is likely incompatible with the placement of a natural gas pipeline.⁴⁶

In addition, the Highway Collocation Alternative would be 142.5 miles (almost 47%) longer than the previously approved route, cross six times as many miles of federal lands, and cross more than twice as many perennial waterbodies, resulting in substantial additional costs and environmental impacts.⁴⁷ This route alternative would also cross an additional 51 miles of side slopes and an additional 125 miles of lands with landslide potential, amplifying the constructability concerns described above.⁴⁸ It would also bypass the three mid-route delivery points discussed above.⁴⁹

For these reasons, we conclude that the Highway Collocation Alternative is not practical.⁵⁰

C. Alternative 1/Hybrid Alternative 1A

⁴⁴ See W. Va. Div. of Highways, *Accommodation of Utilities on Highway Right of Way and Adjustment and Relocation of Utility Facilities on Highway Projects*, at 2 (2007), available at https://transportation.wv.gov/highways/engineering/files/ACCOMMODATION_OF_UTILITIES.pdf.

⁴⁵ 24 Va. Admin. Code. § 30-151-301(2)(d). See also Va. Dep’t of Trans., *Utility Manual of Instructions: Utility Relocation Policies & Procedures*, at 8-7 (2011), available at http://www.virginiadot.org/business/resources/right_of_way/utility_manual02132012_techrev.pdf. Such installations must also satisfy other requirements, including that “the installation will not adversely affect the safety, design, construction, operation, maintenance or stability of the highway,” that “the accommodation will not interfere with or impair the present use or future expansion of the highway,” and that “any alternative location would be contrary to the public interest,” taking into account “the direct and indirect environmental and economic effects that would result from the disapproval of [such] use.” See § 30-151-301(2)(a)-(c).

⁴⁶ See FEIS at 3-18.

⁴⁷ FEIS at 3-20.

⁴⁸ FEIS at 3-20.

⁴⁹ See FEIS at 3-19. Although such an alternative was not analyzed in the FEIS, it may be possible to construct a route alternative that generally follows the previously approved route, but deviates from that route between MPs 150 and 250 in order to cross the JNF along existing highways. See FEIS at 3-19. Such a hypothetical route alternative might avoid bypassing the three mid-route delivery points discussed above, but would otherwise be subject to most of the same practical concerns.

⁵⁰ See also FEIS at 3-17 (“This alternative concept is not evaluated in detail below due to the associated construction challenges, logistical constraints, and environmental impacts which we determined render it technically infeasible and/or as not providing a significant environmentally [sic] advantage compared to the proposed action.”).

Alternative 1 was designed to maximize collocation with an existing electric transmission line.⁵¹ Hybrid Alternative 1A is a variant that would follow the previously approved route through MP 135 and from there on follow the route of Alternative 1, re-converging with the previously approved route at its endpoint at MP 303.5.⁵² These two route alternatives are considered together here, since they are identical at the JNF crossing.⁵³ Both route alternatives would result in greater collocation on federal lands than the previously approved route, crossing fewer miles of federal lands overall and being collocated with the existing transmission line for the entirety of that crossing.⁵⁴

Collocating underground pipelines with electric transmission lines over long distances poses distinctive constructability and safety challenges that would be exacerbated in the circumstances of the MVP. Locating pipelines near transmission lines poses risks to pipeline workers from operating in close proximity to high voltage power lines, and increased risk of pipeline corrosion from interference with pipeline cathodic protection systems and from other forms of electrical interference.⁵⁵ These risks increase with parallel or near-parallel installation, especially at collocation lengths over a mile.⁵⁶ To mitigate these safety concerns, as well as concerns related to access for construction and operations, parallel installations typically involve adjacent or partially overlapping ROWs, rather than complete collocation.⁵⁷ Finally, because side slopes and

⁵¹ FEIS at 3-22. Alternative 1 was the original proposed alternative, but was supplanted by the previously approved route due to concerns regarding side slopes. See FEIS at 3-17; Resource Report 10 at 10-10 to 10-11.

⁵² FEIS at 3-25.

⁵³ Another route alternative, known as Hybrid Alternative 1B, would follow Alternative 1 through MP 135 and from there on follow the previously approved route. See FEIS at 3-25 to 3-26. Hybrid Alternative 1B is not considered here, since it would be identical to the previously approved route at the JNF crossing.

⁵⁴ See FEIS at 3-24, 3-27; McGuire August 16, 2018 Email; Neylon August 17, 2018 Email.

⁵⁵ See generally INGAA Foundation, Inc., Final Report No. 2015-04, *Criteria for Pipelines Co-Existing with Electric Power Lines (2015)* (INGAA Power Lines Report), available at <http://www.ingaa.org/File.aspx?id=24732>; McGuire August 16, 2018 Email.

⁵⁶ See INGAA Power Lines Report at 4, 45-49. The previously approved route would be collocated with electric transmission lines for numerous short stretches, but rarely for distances of a mile or more. See FEIS App'x P at P-1 to P-8.

⁵⁷ See McGuire August 16, 2018 Email (noting that in a typical configuration, the 50-foot-wide permanent pipeline ROW would be adjacent to the transmission line ROW, and the pipeline's temporary 100- to 125-foot-wide construction ROW would overlap with the transmission line ROW by 25 feet); FEIS at 3-22 ("The pipeline could be installed as close as 25 feet away from powerline infrastructure, with temporary workspace located even closer, but other configurations would also be required based on soil type and working conditions where the pipeline would be located much further away."). See also FEIS App'x P at P-1 to P-8 (listing offset distances between the centerline of the previously approved route and the edges of existing transmission line ROWs); INGAA Power Lines Report at 4, 46 (noting that interference risk is "Medium" for separation distances of 100 to 500 feet, and "High" for distances under 100 feet). MVP has also noted that constructing a major pipeline in the immediate vicinity of an electric transmission line poses "[c]onstructability and safety issues associated with ... the possibility of undermining

steep slopes⁵⁸ of the kind frequently encountered along the MVP's route pose a far greater challenge for pipelines than for electric transmission lines, which have a far smaller physical footprint and are capable of spanning stretches of challenging terrain, routes that are suitable for transmission line construction may be unsuitable for pipeline construction.⁵⁹ Therefore, while collocation with electric transmission lines can often be achieved, including in parts of the previously approved route of the MVP, the challenges of such collocation are highly relevant to the practicality analysis.

Alternative 1 would be over twenty miles longer than the previously approved route,⁶⁰ resulting in significant additional construction costs, and would pose significant technical challenges. In particular, Alternative 1 would cross 171.4 miles of steep slopes in excess of 20% grade – 42.8 miles more than the previously approved route, and over half the entire length of Alternative 1.⁶¹ Alternative 1 would also cross more miles of side slope than the previously approved route, including over 100 miles of "severe side slopes,"⁶² and would include two crossings of the New River, which the previously approved route avoids crossing.⁶³ These factors would pose substantial constructability and safety challenges.⁶⁴

power line towers." MVP Responses to Data Requests issued January 27, 2017, at 570 (Feb. 17, 2017) (February 17, 2017 Responses).

⁵⁸ Construction along steep slopes where the gradient of the slope is parallel to the pipeline route poses many of the same challenges as construction along side slopes, though such challenges are typically less severe than in side slope conditions. FEIS at 2-49, 3-25, 4-28, 4-45, 4-52 to 4-56; INGAA Rugged Terrain Report at 7, 24. *See also* MVP Responses to Data Requests issued December 24, 2015, at 238 (Jan. 15, 2016) (describing construction and safety challenges associated with steep slopes).

⁵⁹ *See* McGuire August 16, 2018 Email. *See also* Resource Report 10 at 10-10 to 10-11 ("While the overhead transmission lines span significant areas of slide [sic] slope, these areas would be required to be crossed directly by the pipeline."); February 17, 2017 Responses at 570 ("It is also important to recognize that the design requirements for a ROW for one type of infrastructure are not necessarily the same for other types of infrastructure.").

⁶⁰ FEIS at 3-24.

⁶¹ *See* FEIS at 3-24.

⁶² FEIS at 3-24; Resource Report 10 at 10-10, 10-14.

⁶³ FEIS at 3-24. As explained by FERC staff, crossing the New River poses both constructability challenges and environmental concerns. *See* McGuire August 16, 2018 Email ("The New River in the immediate vicinity of the proposed route ranges from about 300 to 350 feet wide (a major river crossing). It is not a complete obstacle, as it could be crossed (likely via [horizontal directional drilling], although with a risk of an inadvertent release of drilling mud into the River), however as a significant environmental resource, avoidance (which was accomplished with the proposed route) if possible was preferred."). Alternative 1 would also cross 38 more perennial waterbodies and 14.5 more miles of karst terrain. FEIS at 3-24.

⁶⁴ *See also* Resource Report 10 at 10-11 ("MVP determined that Route Alternative 1 represented insurmountable construction challenges, as well as a high risk of slope failure and pipeline slips, once the pipeline was to be in operation. ... [M]uch of the existing right-of-way was ultimately found unsuitable for pipeline construction ...").

Hybrid Alternative 1A would pose many of the same challenges as Alternative 1. While this route alternative would be shorter than Alternative 1 and include fewer miles of steep slope, it would still be 6.3 miles longer than the previously approved route, and feature 140.8 miles of steep slope (almost 10% more than the previously approved route), as well as both crossings of the New River.⁶⁵ Hybrid Alternative 1A would also cross 177.2 miles of side slope (over 10% more than the previously approved route, exceeding even Alternative 1), and a significant portion of the “severe side slope” crossed by Alternative 1.⁶⁶ The additional miles of steep slope and side slope, compared with the previously approved route, would “present[] substantially more obstacles to safe construction, increas[e] extra workspace requirements, and potentially affect[] worksite stability during construction and after restoration.”⁶⁷

Both Alternative 1 and Hybrid Alternative 1A would also pose constructability challenges associated with the necessary crossing of the Blue Ridge Parkway. While the previously approved route would cross the Parkway in an open grassy area, allowing the pipeline to bore under the Parkway, Alternative 1 and Hybrid Alternative 1A would cross the Parkway in a location flanked on one side by a wetland and floodplain and on the other by a short, steep slope, which together would complicate the boring process.⁶⁸

In addition, Alternative 1 would bypass the three mid-route delivery points discussed above, while Hybrid Alternative 1A would bypass two of the three.⁶⁹

For these reasons, we conclude that Alternative 1 and Hybrid Alternative 1A are not practical.

D. Variations 110, 110R, and 110J

Variations 110, 110R, and 110J were developed in order to avoid a number of sensitive resources located in the general vicinity of the JNF crossing, between MPs 175 and 235.⁷⁰ Each of these variations would cross more miles of federal lands than the previously approved route but would be collocated for fewer of those miles.⁷¹ Therefore, these route alternatives do not satisfy the criteria of section 28(p).⁷²

E. SR 635-ANST Variation

⁶⁵ FEIS at 3-25, 3-27 to 3-28. Hybrid Alternative 1A would also cross 22 more perennial waterbodies. FEIS at 3-27.

⁶⁶ FEIS at 3-24 to 3-25, 3-28; Resource Report 10 at 10-14.

⁶⁷ FEIS at 3-25.

⁶⁸ FEIS at 4-324 to 4-325; Resource Report 10 at 10-61.

⁶⁹ See FEIS at 3-26.

⁷⁰ FEIS at 3-44 to 3-45.

⁷¹ See McGuire August 16, 2018 Email; Neylon August 17, 2018 Email.

⁷² Furthermore, we note that Variation 110 crosses a designated wilderness area within the JNF, which renders this route variation impractical. See FEIS at 3-44, 3-46. See also Letter from U.S. Forest Service to FERC (May 16, 2016) (noting lack of authority to approve a pipeline within a wilderness area).

The SR 635-ANST Variation, located between MPs 191.7 and 207.8, was developed in order to examine the feasibility of reducing impacts on hikers traveling along the Appalachian National Scenic Trail (ANST) by crossing the ANST at the same location as an existing state road.⁷³ This route variation would cross 2.9 miles more federal lands than the previously approved route, and would not be collocated for any part of its crossing.⁷⁴ Therefore, the SR 635-ANST Variation does not satisfy the criteria of section 28(p).⁷⁵

F. CGV Variation

The CGV Variation, located between MPs 195 and 200, was developed in order to examine the feasibility of collocating the MVP with two existing pipelines that cross the JNF.⁷⁶ This route alternative would provide increased collocation on federal lands, replacing a 1.7 mile crossing of federal lands of which 1 mile is collocated with a 1.6 mile crossing that is mostly or entirely

⁷³ FEIS at 3-52.

⁷⁴ FEIS at 3-54; McGuire August 16, 2018 Email; Neylon August 17, 2018 Email. While the SR 635-ANST Variation would cross the ANST at the same location as the state road, the route alternative would not continue alongside that existing road. *See* McGuire August 16, 2018 Email. To the contrary, due to the topography of the area, the SR 635-ANST Variation would be forced to parallel the ANST for one mile. *See* MVP Responses to Data Requests issued January 27, 2017 and Supplemental Materials (Mar. 2, 2017) (March 2, 2017 Responses) at 39; MVP Additional Responses to June 28, 2016 Data Request at 63 (July 18, 2016) (July 18, 2016 Responses). In light of the purpose of section 28(p), we do not consider the ANST, which is a congressionally designated national scenic trail, *see* 16 U.S.C. § 1244(a)(1), to be an existing ROW with which Congress intended to encourage collocation of pipelines.

⁷⁵ Moreover, even if the SR 635-ANST Variation provided greater collocation than the previously approved route, this route alternative would be impractical. The environmental, constructability, and safety effects of the SR 635-ANST Variation would be mixed: the variation would be 1.5 miles shorter and would affect 89.2 fewer acres of interior forest, but would cross 2.9 more miles of federal lands and cross more wetlands, perennial waterbodies, and miles of inventoried roadless areas; similarly, the variation would cross fewer miles of steep slope and side slope, but more miles of land with landslide potential. FEIS at 3-52. More importantly, however, the SR 635-ANST Variation would be unlikely to succeed at its purpose, to reduce the impact of the MVP on ANST users. Whereas the previously approved route would cross the ANST perpendicularly, and preserve a 300-foot forested buffer on either side of the ANST by boring under the trail, the SR 635-ANST Variation would be forced to parallel the trail for about a mile, as noted above, likely increasing visual impacts on the trail. *See* FEIS at 3-52 to 3-53; March 2, 2017 Responses at 39; July 18, 2016 Responses at 63. Moreover, the low topography of the trail crossing site would limit the length of the borehole, eliminating the forested buffer and further increasing the visual impacts. March 2, 2017 Responses at 39; July 18, 2016 Responses at 63. Furthermore, the SR 635-ANST Variation would bring the MVP ROW closer to the ANST's Wind Rock overlook, increasing visual impacts on this overlook. March 2, 2017 Responses at 39. For these reasons, the SR 635-ANST Variation is not likely to succeed at its purpose of reducing impacts on users of the ANST, rendering the route impractical.

⁷⁶ FEIS at 3-48.

collocated.⁷⁷ The elimination of less than three-quarters of a mile of uncollocated crossing of federal lands would come at a cost of 9 more miles of total pipeline, however, including 4.1 more miles of steep slope and 4.6 more miles of side slope.⁷⁸ The CGV Variation would also result in 136.3 more acres of construction disturbance, including 60.8 more acres on forested land; increase the MVP's potential impacts on the watershed relied on by the Red Sulphur Public Service District, a public water supply utility; and bring the MVP ROW closer to the ANST's Angel's Rest overlook, increasing visual impacts on this overlook.⁷⁹ For these reasons, we conclude that the CGV Variation is not practical.

G. AEP-ANST Variation

The AEP-ANST Variation, located between MPs 195.4 and 200, was developed in order to examine the feasibility of reducing impacts on hikers traveling along the ANST by crossing the ANST at the same location as an existing electric transmission line.⁸⁰ The AEP-ANST Variation would cross approximately 0.9 more miles of federal lands than the previously approved route, while providing, at best, no more than 0.8 miles of additional collocation on federal lands.⁸¹ Because the AEP-ANST Variation involves at least 0.1 mile more uncollocated crossing of federal lands, this route alternative provides less net collocation on federal lands, and does not satisfy the criteria of section 28(p).⁸²

⁷⁷ FEIS at 3-50; *id.* App'x P at P-6; POD at 1-7; McGuire August 16, 2018 Email; Neylon August 17, 2018 Email. While the FEIS indicates that the relevant portion of the previously approved route contains zero miles "adjacent to existing right-of-way," this figure considers only major features such as transmission lines and pipelines, and excludes the previously approved route's collocation with a forest road, as noted above. See FEIS at 3-20, 3-50.

⁷⁸ FEIS at 3-50; McGuire August 16, 2018 Email; Neylon August 17, 2018 Email. Underscoring the constructability and safety concerns associated with the additional steep slopes and side slopes, the same pipeline ROW with which this route alternative would be collocated was previously the site of a slope failure related to side slopes. See FEIS at 4-45, 4-67, 4-69. See also INGAA Rugged Terrain Report at 7 (noting that "[l]andslide and erosion hazards are more commonly found, or created, ... where the proposed alignment intersects existing landslide[s]").

⁷⁹ FEIS at 3-50; March 2, 2017 Responses at 44.

⁸⁰ FEIS at 3-52, 3-55.

⁸¹ See FEIS at 3-54; McGuire August 16, 2018 Email; Neylon August 17, 2018 Email.

⁸² The AEP-ANST Variation would also pose constructability and safety concerns. The general concerns related to collocating the MVP with electric transmission lines are discussed above. In the specific context of the AEP-ANST Variation, these challenges include more miles of steep slope, side slope, shallow bedrock, and areas with landslide potential than the previously approved route. FEIS at 3-54. Moreover, this route alternative would be 3.2 miles longer, would cross more perennial waterbodies and forested land (but less inventoried roadless area, inventoried semi-primitive area, interior forest, and karst area), would result in an additional 48.9 acres of construction disturbance and a larger area of forested land disturbance during both construction and operation, and would increase the MVP's potential impacts on the Red Sulphur Public Service District watershed. FEIS at 3-54; March 2, 2017 Responses at 40.

H. Brush Mountain Alternatives 1 and 2

Brush Mountain Alternatives 1 and 2, located between MPs 219.5 and 220.7, were developed in order to reduce impacts to the Craig Creek watershed.⁸³ Brush Mountain Alternative 1 would feature the same amount of federal lands crossing and the same amount of collocation as the previously approved route, and therefore does not satisfy the criterion of providing greater collocation on federal lands.⁸⁴ Brush Mountain Alternative 2, meanwhile, may provide greater collocation, but by no more than 0.22 miles.⁸⁵ Any such increase in collocation, meanwhile, would come at the cost of a larger increase in the total mileage (0.3 additional miles), the mileage of side slope (0.4 additional miles), and the mileage of lands with landslide potential (0.3 additional miles).⁸⁶ Because Brush Mountain Alternative 2 would entail greater

Furthermore, like the SR 635-ANST Variation, the AEP-ANST Variation would be unlikely to accomplish its purpose of reducing impacts on users of the ANST. Under either the AEP-ANST Variation or the previously approved route, hikers would experience a clearing at the location where the trail crosses the existing electric transmission line, and no clearing where the previously approved route crosses the trail (due to the 300-foot forested buffer). *See* FEIS at 3-52, 4-312; FEIS App'x S figs. 1a to 7b. The majority of new visual impacts on trail users would therefore occur, under either scenario, not due to near-field impacts at the location where the previously approved route crosses the trail, but rather due to more distant views of the MVP ROW from various points along the trail. *See* FEIS at 4-312; *see generally* FEIS App'x S. The AEP-ANST Variation would not reduce the overall visual footprint of the MVP ROW, and may in fact increase that overall footprint due to the larger area of forested land disturbance. *See also* March 2, 2017 Responses at 40 (noting that "the visual impact on ANST users would likely be greater because of the open view that trail users have when within the [transmission line] right-of-way"). Moreover, the AEP-ANST Variation would also bring the MVP ROW closer to the Angel's Rest overlook, increasing visual impacts on this overlook. March 2, 2017 Responses at 40. Therefore, the AEP-ANST Variation is not likely to succeed at its purpose of reducing impacts on users of the ANST

For these reasons, we conclude that the AEP-ANST Variation is not practical.

⁸³ FEIS at 3-61 to 3-62.

⁸⁴ FEIS at 3-64; Neylon August 17, 2018 Email. Brush Mountain Alternative 1 also poses a significant constructability and safety concern related to an area of especially steep slope, over 43% grade. FEIS at 3-62 to 3-64; March 2, 2017 Responses at 47; MVP Responses to Data Requests issued January 27, 2017, at 139 (Feb. 23, 2017).

⁸⁵ One assessment estimated that Brush Mountain Alternative 2 would cross 1.3 miles of federal lands with no collocation, and therefore would offer no collocation advantage. *See* Neylon August 17, 2018 Email. The other assessment estimated that the route alternative would cross 1.18 miles of federal lands with 0.4 miles of collocation, for a net of 0.78 miles of federal lands without collocation. McGuire August 16, 2018 Email. By contrast, the corresponding segment of the previously approved route would cross 1.0 miles of federal lands, with between 0 and 0.2 miles of collocation, for a net of between 0.8 and 1.0 miles of federal lands without collocation. Neylon August 17, 2018 Email; FEIS at 3-64.

⁸⁶ FEIS at 3-64; MVP Responses to Data Requests issued January 27, 2017, at 140 (Feb. 23, 2017); March 2, 2017 Responses at 48. The FEIS also concluded that Brush Mountain Alternative 2 would not offer a significant environmental advantage compared to the previously

constructability and safety challenges than the previously approved route while providing at best a marginal increase in collocation on federal lands, we conclude that this route alternative is impractical.

I. Slussers Chapel Variations

The Slussers Chapel Variations consist of two route alternatives located between MPs 220.7 and 223.7 that were developed in order to reduce impacts on the Slussers Chapel Conservation Site.⁸⁷ One route alternative, Modified Variation 250, would replace a portion of the route located entirely on non-federal lands with a route that would cross 2.3 miles of federal lands, and therefore does not satisfy the criterion of increased collocation on federal lands.⁸⁸ The other route alternative, the VADCR Slussers Chapel Conservation Site Avoidance Variation, would replace a portion of the route that crosses 0.04 miles of federal lands with a route that would cross 2.54 miles of federal lands, and therefore does not appear to satisfy this criterion, either.⁸⁹ This route alternative would also traverse a narrow ridgetop with a designated wilderness area on one side, steep slopes on the other side, and an existing forest road along the ridge, posing significant constructability and safety concerns that the previously approved route avoids and that render this route alternative impractical.⁹⁰ For these reasons, we conclude that these route alternatives do not satisfy the criteria of section 28(p).

IV. Conclusion

As the analysis above demonstrates, none of the route alternatives would result in greater collocation on federal lands and be practical. Several of the route alternatives would not result in greater collocation on federal lands. Each of the remaining route alternatives would be impractical due to a combination of constructability and safety challenges, increased

approved route. FEIS at 3-65. Because the purpose of Brush Mountain Alternative 2 is to reduce environmental impacts, *see* FEIS at 3-61 to 3-62, the failure to achieve a significant environmental advantage also renders this route alternative impractical.

⁸⁷ FEIS at 3-69 to 3-70. A third route alternative, Variation 250, would not affect the MVP's crossing of federal lands, and therefore is not relevant to this analysis. FEIS at 3-71. Moreover, Variation 250 was adopted by FERC and incorporated into the MVP route. FERC Certificate at 60; *id.* App'x C at 7.

⁸⁸ FEIS at 3-71, 3-74.

⁸⁹ FEIS at 3-72.

⁹⁰ FEIS at 3-69. *See also* February 17, 2017 Responses at 195-196 (“[The Slussers Chapel Variation] significantly increases the construction risks due to its placement along the ridgeline of Brush Mountain. There is an existing Forest Service Road (Forest Road 188/Brush Mountain Road) along the ridge top, with the boundary of Brush Mountain Wilderness north of and parallel to the road. Mountain Valley would need to maintain a 50-foot buffer between the Wilderness Boundary and the edge of construction work area, which would require that the 125-foot-wide construction right-of-way encompass Forest Road 188 as well as significant side slope areas along the south side of the road. In addition, during construction, this section of Forest Road 188 would be closed for an extensive period of time to regular vehicle or foot traffic.”).

environmental impacts, increased length and footprint, increased cost,⁹¹ and inability to serve the purposes of the MVP or the specific purpose of the route alternative in question. Therefore, we conclude that the additional utilization of existing ROWs across federal lands would be impractical.

Sincerely,



Mitchell Leverette
Acting State Director, Bureau of Land Management, Eastern States

I concur

I do not concur



Joseph R. Balash
Assistant Secretary - Land and Minerals Management, U.S. Department of the Interior

⁹¹ As noted above, the BLM has considered the information presented above about length and construction challenges as a proxy for cost information.

Weekly Regional Office (RO) Coordination Call Notes**Date:** October 12, 2018 @ 9-10 am EST**Location:** Conference Call**Attendees:**

R8/GWNF	Beth LeMaster, Frank Beum, Jennifer Adams, Mike Donaldson, Peter Gaulke, Stephanie Johnson, Tim Abing
R9/MNF	Mary Beth Borst, Tony Erba
OGC	Sarah Kathmann
FS Enterprise	Jessica Rubado
Galileo	Grace Ellis, Lauren Johnston, Maria Martin

Action Items:

- **Grace** will send Ruby Pipeline POD example to FS.
- **Beth** will work with Jim Twaroski (FS), Frank, and Tim, and draft up a Special Use Permit (SUP) for stabilization-plan related activities.
- **FS** solidifies talking point update team and approval process.
- **Jessica** sends talking points re: the court opinion to FS personnel in both regions via email.
- **FS** updates talking points once the court mandate hits.
- **Frank & Tim** write up a strategy of updating the Record of Decision (ROD) without a need for additional analysis.

Discussion/Decisions:

- FS is still awaiting the court's opinion on the ACP case. Oral arguments were heard on Friday, September 28. There has been no further indication from the court on when the opinion will be published. The stay for NFS lands is still in effect.
- (b)(5); Deliberative Process Privilege; Attorney-Client Privilege
- (b)(5); Deliberative Process Privilege
- Talking points were approved this week. These will need to be updated as circumstances change. FS still needs to sort out who will write the first draft of the updated points as part of the "pipeline team" in public affairs. The approval process also needs to be finalized. Both Region 8 and Region 9 need to draft the talking points, then the Office of General Counsel (OGC) needs to review them, then Stephanie Johnson reviews them, and then Region 9 reviews them, and then the Washington Office reviews them. Having so many people part of the review process means that it takes a while.
- The talking points developed for use in the case of an adverse court decision are posted on the FS Pinyon site. Beth requested that rangers and other folks have access to them for use if needed.
- Beth thanked the communications team for preparing the talking points. FS personnel on the ground find them helpful.
- No construction activity for ACP is happening on the ground. FS staff is processing four variances for each forest up to the point of signature by the forest supervisors. FS

anticipates 10-12 variances total, as ACP plans to submit two or three more variances for George Washington National Forest roads. FS is about halfway through these last 10-12 variances. All meetings to discuss the variances are scheduled. The Final Environmental Impact Statement (EIS) appears to be sufficient for the variance analysis. Both NEPA coordinators on the project are aware of the variances. Transcon is helping the FS to keep them updated.

- Transcon is still monitoring the Right of Way (ROW) frequently. After big rain events, Transcon is looking for skidding in areas with felled trees and/or road issues. FS gets weekly monitoring reports from Transcon. Transcon is also helping identify when road damage is not caused by ACP, which has proved helpful. Transcon has noted some illegal hunter traffic in the area. FERC and ACP agreed to have monitors out every four weeks.
- Jennifer touched base with the landowner adjacent to the forest who requested to review a specific road design to let him know that the design has not been submitted to the FS. This landowner is also part of a local group of stakeholders with interests in Virginia and West Virginia. The group is officially based in West Virginia. The interested landowner was understanding about the road design and shared the feedback he got from the Virginia Department of Environmental Quality. He had information on pipe and pipe coating aging that Jennifer suggested he file in the FERC docket. He asked for contact information for management and Jennifer suggested that he talk to Clyde Thompson (FS Supervisor for the Monongahela National Forest).
- MVP intended to have the stabilization plan measures in place this week but weather has caused delays. MVP is doing soil amendments and seeding by helicopter. They completed Brush Mountain and got started on the ROW on Sinking Creek but have not yet finished. The seeding by helicopter is time consuming. Jennifer feels that MVP has made a good effort to get everything done that they can, given the conditions. Jennifer feels they have done all they can, but it will not be done for another few days. FS has expressed concern in the past that the seed will not stay in place. MVP did use Flexterra during seeding to help the seed stay in place.
- The talking points for MVP have been approved. The talking points cover the court's opinion, stabilization work, active litigation, and closure orders. They will need to be updated once the mandate hits. The language will be slightly different.
- (b)(5); Deliberative Process Privilege; Attorney-Client Privilege
- MVP and the US Fish and Wildlife Service (FWS) are discussing the potential, but unlikely, need to update the incidental take statement in the Biological Opinion (BO) for MVP. Because MVP's trees are all felled on FS lands, this may be a moot point. The FWS did mention the hydrologic analysis of sedimentation in the BO for MVP, but there is no indication that they relied on it for their determinations.
- On October 10, the court granted MVP's rehearing request. MVP wanted clarification from the court on the BLM ROW grant remand. MVP's goal was to complete the operation on US Army Corps of Engineers (USACE) lands. The court's decision to grant MVP's request stated the mandate from the July 27, 2018 decision will issue on October 17, 2018.
- (b)(5); Deliberative Process Privilege

(b)(5); Attorney-Client Privilege

- FS and BLM worked together to decide that neither party needs to do any additional NEPA analysis in order to issue the stabilization plan.
- The Plan of Development (POD) will be an attachment to the BLM's ROW grant. On Ruby Pipeline, BLM included a FINAL ROD including major variances. There have been some issues on this project that have changed. Tim wants to capture these changes in the narrative of the ROD. Changes due to variances will be included as part of that

(b)(5); Deliberative Process Privilege; Attorney-Client Privilege

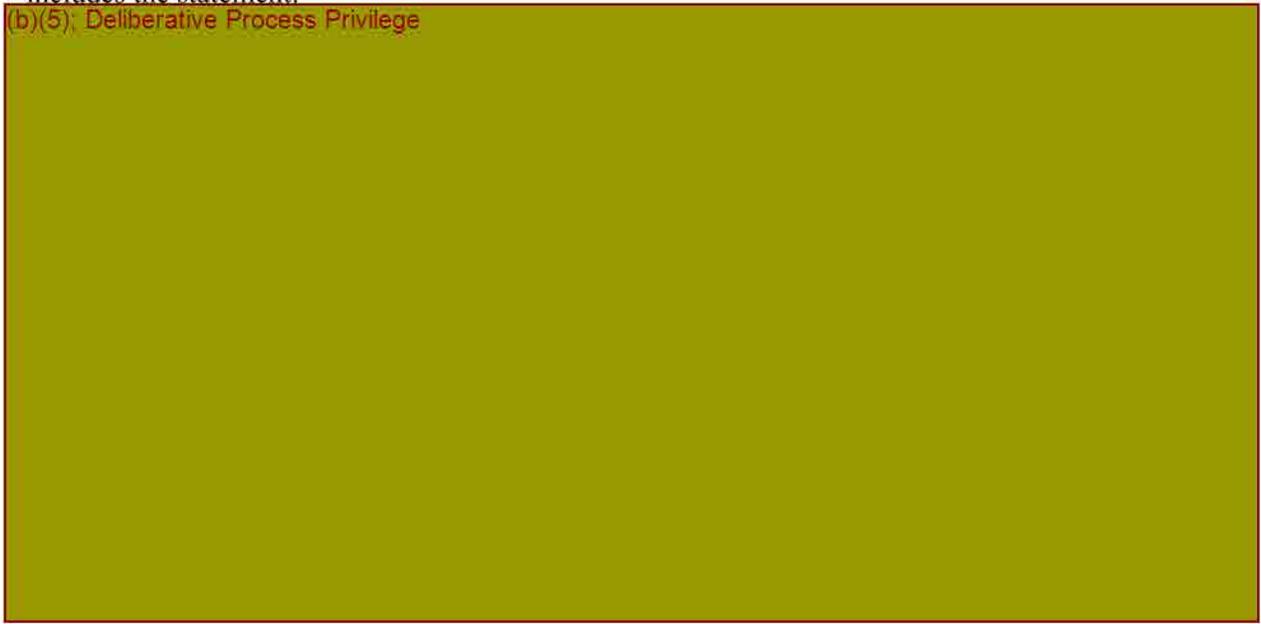
Publishing an updated POD would be administrative in nature.

- There have been no major issues regarding the closure orders on Brush Mountain road. There was only one inquiry from the Roanoke Times regarding the order.

From: [Collins, Thomas K -FS](#)
To: [Adams, Jennifer - FS](#)
Cc: [Madden, Michael J -FS](#); [Grace Ellis](#); [Lauren Johnston](#); [Jeff Davis](#); [Mike Warner](#); [Daniel Danko](#); [Dennis Tripp](#); [Nathan Amick](#); [Nicholas Carrara](#); [MVP](#); [Jayanna Miller](#); [Alli Rhodehamel-Leung](#); [Nik Gillen](#); [Thompson, James H - FS](#); [Woods, Steven -FS](#)
Subject: RE: MVP - MKA Geotech Report
Date: Friday, August 24, 2018 1:51:56 PM
Attachments: [image001.png](#)
[image002.png](#)
[image003.png](#)
[image004.png](#)
[2018 0895 August 9 Site Visit Findings Memo 082318 \(1\).pdf](#)

Jennifer – In regard to the MKA Geotechnical Report (August 23, 2018), Nik asks: “Please advise on how you would like to go about MKA recommendations in the report.” The Report’s Summary includes the statement:

(b)(5), Deliberative Process Privilege



Tom Collins
Geologist
Forest Service
George Washington and Jefferson National Forest
p: 540-265-5152
tkcollins@fs.fed.us
5162 Valleypointe Parkway
Roanoke, VA 24019
www.fs.fed.us



Caring for the land and serving people

From: Nik Gillen [<mailto:ngillen@transcon.com>]
Sent: Friday, August 24, 2018 2:33 PM
To: Adams, Jennifer - FS ; Collins, Thomas K -FS
Cc: Madden, Michael J -FS ; J. Grace Ellis ; Lauren Johnston ; Jeff Davis ; Mike Warner ; Daniel Danko ; Dennis Tripp ; Nathan Amick ; Nicholas Carrara ; MVP ; Jayanna Miller ; Alli Rhodehamel-Leung
Subject: MVP - MKA Geotech Report
Jennifer and Tom,
Please see attached for MKA's report of their recent geotech site visit (8/9-8/10). Please advise

on how you would like to go about MKA recommendations in the report.
Please let Transcon or MKA know if you have any additional questions

Thank you,

Nikolaus Gillen

Biologist/Project Coordinator

Transcon Environmental

Portland, OR

Cell: 925-550-7147

Two color horizontal



Think Green – Not every email needs to be printed.

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MKA Madsen, Kneppers & Associates, Inc.

Construction Consultants & Engineers

100% Employee Owned Company (USA)

August 23, 2018

Sent via email to: ngillen@transcon.com

MR. NIKOLAUS GILLEN
TRANSCON ENVIRONMENTAL
802 Montgomery St., Suite 200
San Francisco, CA 94133

**RE: MOUNTAIN VALLEY PIPELINE
AUGUST 9 AND 10, 2018 SITE EVALUATION
MKA PROJECT NO. 2018.0895**

Dear Mr. Gillen:

Madsen Kneppers & Associates, Inc. (MKA) has prepared this summary of observations documented during our August 9 and 10, 2018 site evaluation. Our evaluation included conducting a walking reconnaissance of the pipeline alignment on portions of Brush Mountain and Sinking Creek Mountain that are located on United States Department of Agriculture (USDA) Forest Service lands. We also conducted a reconnaissance of Pocahontas Road and Mystery Ridge Road that will be used for temporary access for pipeline construction.

The purposes of our evaluation were to observe and document surface features that may be indicative of potential stability issues on constructed cut and/or embankment slopes within and adjacent to the limits of disturbance (LOD). These include tension cracks that may have developed due to settlement, discontinuities in the fill body, and/or minor slope movement. Additionally, we were to observe and document the locations and performance of existing temporary erosion control measures. Our observations are indicative of the visible conditions that were present on the date of our inspection.

Present during the site evaluation were representatives of Mountain Valley Pipeline, Ms. Melissa Fontanese, P.E., Ms. Robin Reed, P.G., and Transcon Environmental inspectors Mr. Dan Danko and Mr. Nathan Amick. The following presents a summary of our observations for the involved sections of the pipeline and the Pocahontas Road. Note that when references are made to left and right sides of the right of way and of LOD the directions are determined assuming one is looking in the direction of increasing station numbers (i.e. up-station).

USA OFFICES

ATLANTA :: AUSTIN :: CHICAGO :: COLUMBUS :: DALLAS :: DENVER :: DETROIT :: HOUSTON :: LAS VEGAS :: LOS ANGELES :: MIAMI :: NEW ORLEANS :: ORLANDO
PENSACOLA :: PHOENIX :: PORTLAND :: PRINCETON :: SACRAMENTO :: SAN DIEGO :: SAN FRANCISCO :: SEATTLE :: SPOKANE :: TAMPA

MKA CANADA, INC.

CALGARY :: EDMONTON :: TORONTO :: WINNIPEG



[Exhibit 1](#) provides a selection of photographs that depict surface features on constructed cut and/or embankment slopes observed on Brush Mountain, Pocahontas Road, and Sinking Creek Mountain. [Exhibit 2](#) provides a selection of photographs that depict the planned and additional erosion control measures for Brush Mountain, Pocahontas Road, and Sinking Creek Mountain. [Exhibit 3](#) provides a selection of the plans for Brush Mountain and Sinking Creek Mountain that have been marked to delineate the areas where two-tone right of way, tension cracks, sloughing, and rock slide/toppling was observed.

The following summarizes our observations made for Brush Mountain, Sinking Creek Mountain, and Pocahontas Road.

Brush Mountain (Station 11622+00 through 11669+00)

- Tension Cracks at or Near Crest of Descending Embankment
 - Station 11669+00 to 11667+00 left side LOD ([Exhibit 1, Photo 1](#))
 - Slope length 21 feet from crest to toe;
 - Slope angle 31 degrees; and
 - Discontinuous tension cracks documented near crest and up to approximately 6 feet behind crest
 - Station 11622+00 left side of LOD ([Exhibit 1, Photo 3](#))
 - Slope length 19 feet from crest to toe;
 - Slope angle 43 degrees;
 - Discontinuous tension cracks documented near crest and up to approximately 4 feet behind crest; and
 - Cracks extended for approximately 150 feet
- Stockpile Tension Cracks ([Exhibit 1, Photos 4 through 6](#))
 - Observed on numerous stockpiles on the right side of LOD; and
 - Occurred primarily on crests of stockpiles
- Rock Slide/Topple ([Exhibit 1, Photo 2](#))
 - Approximate station 11624+00 at cut slope on the right side of LOD
- Two Tone Construction Occurrence
 - Approximate station 11648+50 through 11641+00
 - Approximate station 11628+50 through 11626+50
- Erosion Control Measures
 - Frequency and location of water bars and sumps were in general conformance with plans issued in November 2017 ([Exhibit 2, Photo 5](#))



- Stream crossing locations were in general conformance with plans issued November 2017 ([Exhibit 2, Photo 6](#))
- Frequency and location of super silt fencing were in general conformance with plans issued in November 2017
- There was evidence of maintenance of erosion control measures; and additional erosion control measures, not specified on the November 2107 plans, were placed along the LOD boundaries including the following:
 - Silt fences ([Exhibit 2, Photo 1](#))
 - Filter socks ([Exhibit 2, Photo 2](#))
 - Super silt fences ([Exhibit 2, Photo 1](#))

Sinking Creek Mountain (Station 11553+00 through 11596+91)

- Tension Cracks at or Near Crest of Descending Embankment
 - Station 11578+30 on the left side of LOD
 - Slope angle 34 degrees.
 - Station 11576+00 on the left side of LOD ([Exhibit 1, Photos 14 and 15](#))
 - Slope length approximately 19 feet from crest to toe. The angle of the slope was approximately 34 degrees.
 - Station 11588+89 on the fill slope on the left side of the right of way. ([Exhibit 1, Photo 12](#))
- Stockpile Tension Cracks ([Exhibit 1, Photos 11 and 13](#))
 - Tension cracks were observed in and adjacent to numerous stockpiles on the left side of the right of way.
 - Tension cracks occurred primarily on the crests of the stockpiles and adjacent to the water bar sumps.
- Sloughing
 - Station 11570+97 Center of the LOD ([Exhibit 1, Photo 10](#))
 - Base of the cut slope for the two tone section
 - Continued for approximately 400 feet down station.
 - Slope angle ranged between 47 and 70 degrees
 - Between 3 to 10 feet in height.
 - Station 11591+00 ([Exhibit 1, Photo 9](#))
 - On cut slope of two tone section.
- Two Tone Construction
 - Approximate station 11590+00 through 11596+00.



- Approximate station 11568+00 a through 11570+00.
- Erosion Control Measures
 - Frequency and location of water bars and sumps were in general conformance with plans issued in November 2017 ([Exhibit 2, Photos 12 and 13](#))
 - Stream crossing locations were in general conformance with plans issued November 2017 ([Exhibit 2, Photo 10](#))
 - Frequency and location of super silt fencing was placed in general conformance with plans issued in November 2017. Additional erosion control measures were placed along the LOD boundaries including the following:
 - Silt fences
 - Filter socks
 - Super silt fences

Pocahontas Road (Station 0+00 through 315+00)

- Erosion Control Measures
 - Filter socks were placed along the alignment more frequently than called for in the November 2017 plans ([Exhibit 2, Photo 7](#))
 - Additional erosion control measures were placed along the alignment including:
 - Water bars ([Exhibit 2, Photo 8](#))
 - Water bar sumps on the right side of the road with filter socks and silt fences placed across outlets of the sumps ([Exhibit 2, Photo 9](#))
 - Silt fences placed along the sides of the road.
- A non-geologic sinkhole had formed over a pre-existing culvert located at station 264+92 ([Exhibit 1, Photos 7 and 8](#))

Summary

During the MKA August 8 and 9, 2018 site evaluation we documented tension cracks on constructed embankment fill slopes and stockpiles on Brush Mountain and Sinking Creek Mountain. There was shallow surface sloughing that occurred on Two Tone cut slopes within the right of way. There was one rock slide/topple observed on the right side of the right of way.



Mr. Nikolaus Gillen
August 23, 2018
MKA Project No. 2018.0895
Page 5 of 5

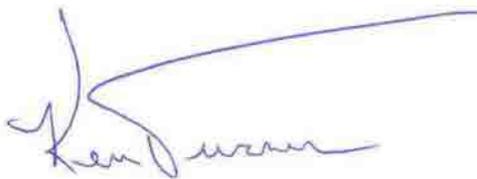
Additional, temporary erosion control measures were observed on Brush Mountain, Pocahontas Road, and Sinking Creek Mountain that were not called out in the plans. There was no indication of problematic erosion observed during the site evaluation that impacted conditions outside of the LOD.

The need for addressing and evaluating remediation/repairs and potential stability issues and or discontinuities in the fill bodies were discussed with Ms. Fontanese and Ms. Reed. These issues should be communicated to MVP's engineering team for their analysis.

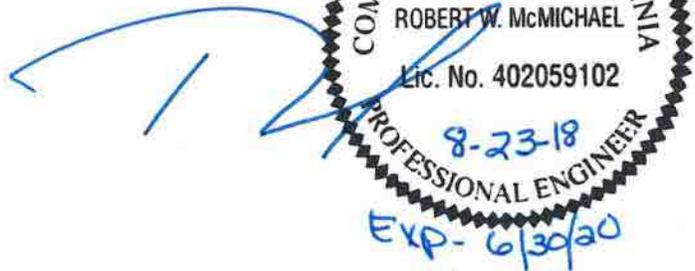
Please contact me with any questions.

Sincerely,

MADSEN, KNEPPERS & ASSOCIATES, INC.



Mr. Kenneth J. Turner, P.E.*, P.G.**



Mr. Robert McMichael, P.E., G.E., D.GE.

*Licensed Professional Engineer (Civil) in: Arizona

**Licensed Professional Geologist in: Arizona

Attachments: Exhibit 1 – Erosion Features Photographs
Exhibit 2 – Erosion Control Photographs
Exhibit 3 – Issues Map



Exhibit 1 –
Erosion Features Photographs



PHOTO #

1

PHOTO BY

KJT

PHOTO DATE

08/09/18

LOCATION: Brush Mountain, Station 11669+00, left side of right-of-way.

COMMENTS: View looking up station of embankment tension crack.



PHOTO #

2

PHOTO BY

KJT

PHOTO DATE

08/09/18

LOCATION: Brush Mountain, Station 11622+50, right side of right-of-way.

COMMENTS: View looking down station of rock slide/topple.



PHOTO #

3

PHOTO BY

KJT

PHOTO DATE

08/09/18

LOCATION: Brush Mountain, Station 11622+00, left side of right-of-way.

COMMENTS: View looking up station of tension crack.



PHOTO #

4

PHOTO BY

RMG

PHOTO DATE

08/09/18

LOCATION: Brush Mountain, Station 11658+27, right side of right-of-way.

COMMENTS: View looking down station of typical stockpile tension cracks.



PHOTO #

5

PHOTO BY

RMG

PHOTO DATE

08/09/18

LOCATION: Brush Mountain, right side of right-of-way.

COMMENTS: View looking away from center of typical stockpile tension cracks.



PHOTO #

6

PHOTO BY

RMG

PHOTO DATE

08/09/18

LOCATION: Brush Mountain, Station 11650+00, right side of right-of-way.

COMMENTS: View looking down station of typical stockpile tension cracks.



PHOTO #

7

PHOTO BY

RMG

PHOTO DATE

08/09/18

LOCATION: Pocahontas Road, Station 264+92, right side of the road.

COMMENTS: View looking down station of a non-geologic sinkhole.



PHOTO #

8

PHOTO BY

RMG

PHOTO DATE

08/09/18

LOCATION: Pocahontas Road, Station 264+92, right side of the road.

COMMENTS: Close up view of non-geologic sinkhole.



PHOTO #

9

PHOTO BY

KJT

PHOTO DATE

08/10/18

LOCATION: Sinking Creek Mountain, Station 11591+00, center of right-of-way.

COMMENTS: View looking up station of shallow sloughing in 3 foot two tone construction segment.



PHOTO #

10

PHOTO BY

KJT

PHOTO DATE

08/10/18

LOCATION: Sinking Creek Mountain, Station 11570+97, center of right-of-way.

COMMENTS: View looking towards left side of right-of-way, at sloughing on 8 foot high two-tone construction segment.



PHOTO #

11

PHOTO BY

KJT

PHOTO DATE

08/10/18

LOCATION: Sinking Creek Mountain, Station 11556+88, left side of right-of-way.

COMMENTS: View looking down station of typical stockpile tension cracks.



PHOTO #

12

PHOTO BY

RMG

PHOTO DATE

08/10/18

LOCATION: Sinking Creek Mountain, Station 11588+89, left side of right-of-way.

COMMENTS: View looking down station of typical stockpile tension cracks.



PHOTO #

13

PHOTO BY

RMG

PHOTO DATE

08/10/18

LOCATION: Sinking Creek Mountain, Station 11579+96, left side of right-of-way.

COMMENTS: View looking up station of typical stockpile tension cracks.



PHOTO #

14

PHOTO BY

RMG

PHOTO DATE

08/10/18

LOCATION: Sinking Creek Mountain, Station 11576+00, left side of right-of-way.

COMMENTS: View looking down station of embankment tension cracks.



PHOTO #

15

PHOTO BY

RMG

PHOTO DATE

08/10/18

LOCATION: Sinking Creek Mountain, Station 11576+00, left side of right-of-way.

COMMENTS: Close up view of tension cracks and scarp.

Exhibit 2 –
Erosion Control Photographs



PHOTO #
1

PHOTO BY
KJT

PHOTO DATE
08/09/18

LOCATION:	Brush Mountain, Station 11664+00, right side of right-of-way.
COMMENTS:	View looking down station of typical additional silt fence and super silt fence.

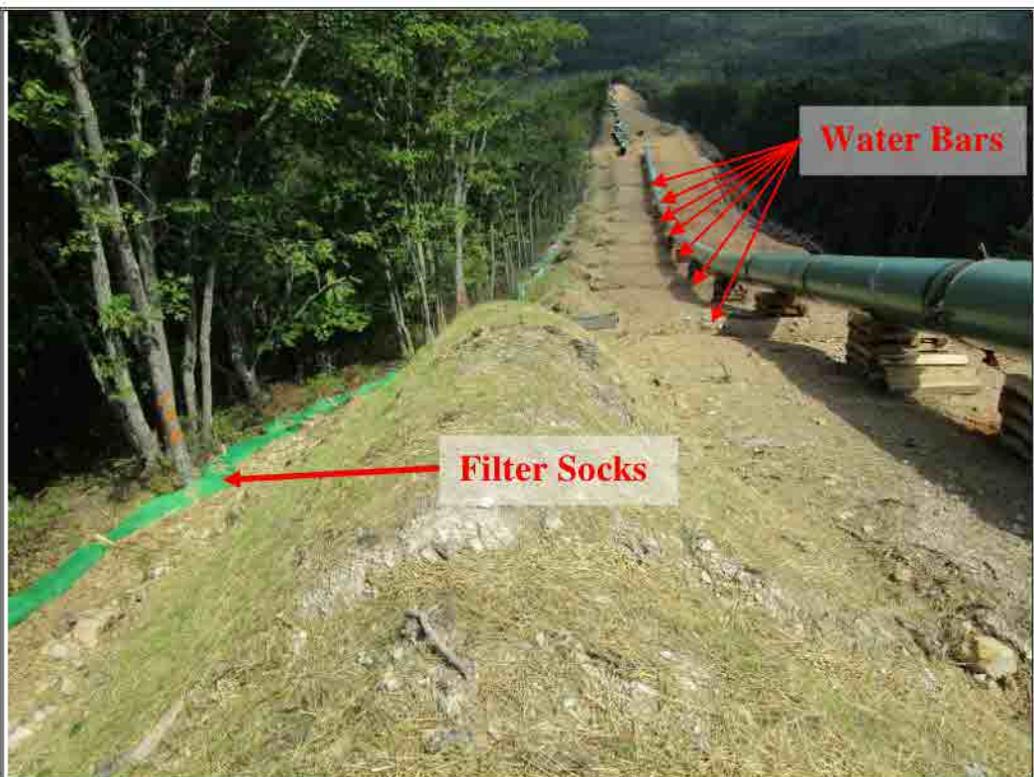


PHOTO #
2

PHOTO BY
RMG

PHOTO DATE
08/09/18

LOCATION:	Brush Mountain, Station 11654+73, right side of right-of-way.
COMMENTS:	View looking down station of typical steep slope water bar placement frequency as well as additional wattles placed adjacent to right side LOD.



PHOTO #

3

PHOTO BY

KJT

PHOTO DATE

08/09/18

LOCATION: Brush Mountain, Station 11650+00, left side of right-of-way.

COMMENTS: View looking up station at typical additional silt fence.



PHOTO #

4

PHOTO BY

KJT

PHOTO DATE

08/09/18

LOCATION: Brush Mountain, Station 11649+00, center of right-of-way.

COMMENTS: View looking down station of typical slope soil stabilization matting.



PHOTO #

5

PHOTO BY

RMG

PHOTO DATE

08/09/18

LOCATION: Brush Mountain, Station 11647+97, right side of right-of-way.

COMMENTS: View looking down station of typical water bar and sump.



PHOTO #

6

PHOTO BY

RMG

PHOTO DATE

08/09/18

LOCATION: Brush Mountain, Station 11626+00, right side of right-of-way.

COMMENTS: View looking down station at typical stream crossing.



PHOTO #

7

PHOTO BY

RMG

PHOTO DATE

08/09/18

LOCATION: Pocahontas Road, Station 13+62, right side of the road.

COMMENTS: View looking down station at typical filter socks.



PHOTO #

8

PHOTO BY

RMG

PHOTO DATE

08/09/18

LOCATION: Pocahontas Road, Station 75+59.

COMMENTS: View looking up station at typical additional water bars and sumps.



PHOTO #

9

PHOTO BY

RMG

PHOTO DATE

08/09/18

LOCATION: Pocahontas Road, Station 106+50, right side of road.

COMMENTS: View looking towards the right side of the road at a typical additional water bar sump.



PHOTO #

10

PHOTO BY

RMG

PHOTO DATE

08/10/18

LOCATION: Sinking Creek Mountain, Station 1158+89, left side of the right-of-way.

COMMENTS: View looking down station at a typical stream crossing.



PHOTO #

11

PHOTO BY

KJT

PHOTO DATE

08/10/18

LOCATION: Sinking Creek Mountain Station 11590+00, right side of the right-of-way.
COMMENTS: View looking towards the right side of the right-of-way at a typical shallow slope water bar and sump, as well as additional silt fence.



PHOTO #

12

PHOTO BY

RMG

PHOTO DATE

08/10/18

LOCATION: Sinking Creek Mountain, Station 11579+96, left side of right-of-way.
COMMENTS: View looking up station at a typical steep slope water bar sump as well as, super silt fence.

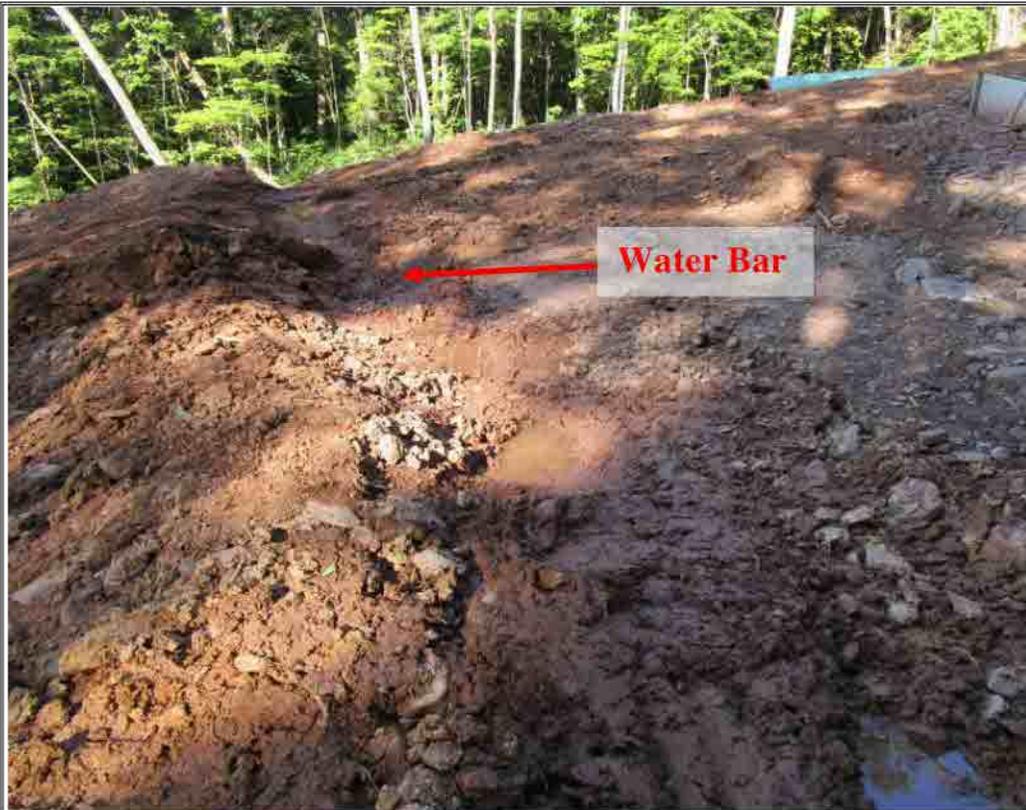


PHOTO #

13

PHOTO BY

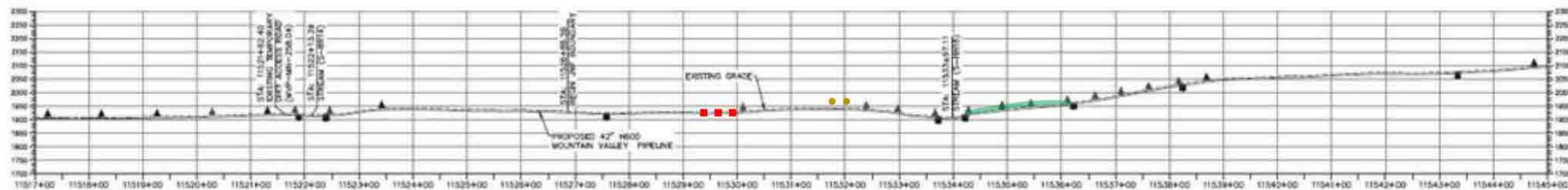
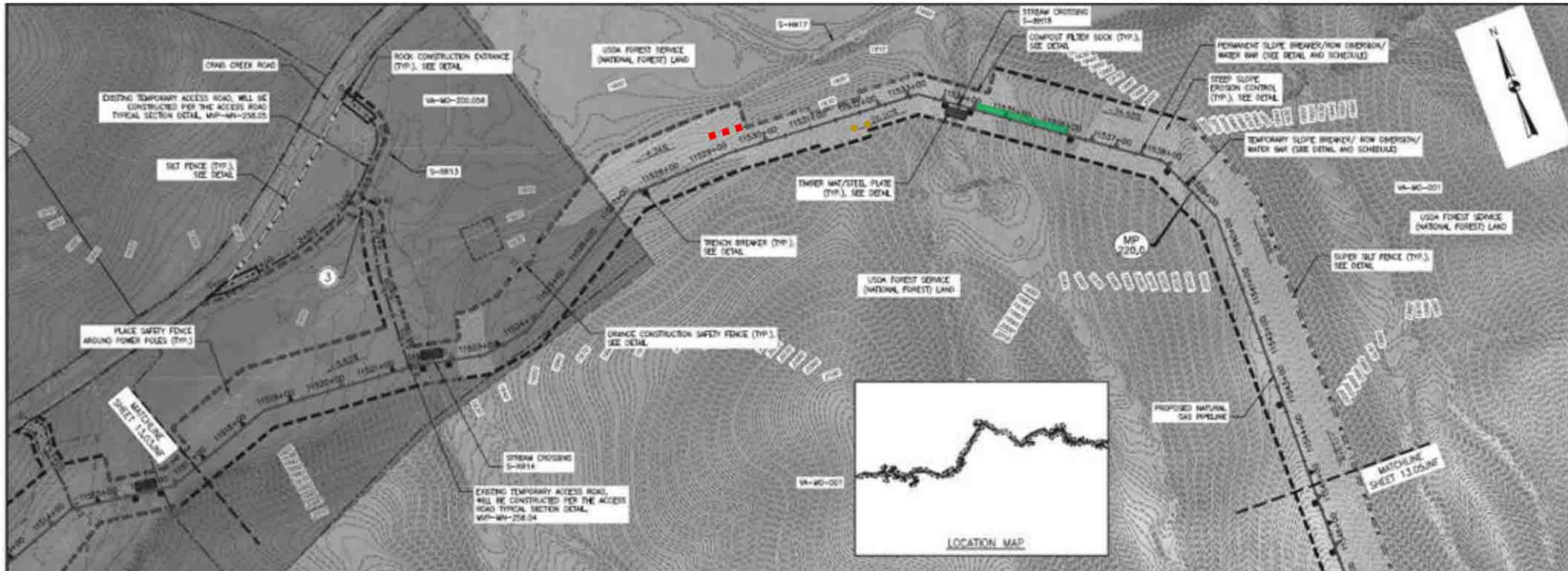
RMG

PHOTO DATE

08/10/18

LOCATION:	Sinking Creek Mountain, Station 11567+01, left side of right-of-way.
COMMENTS:	View looking towards the right side of the right-of-way at a typical steep slope water bar.

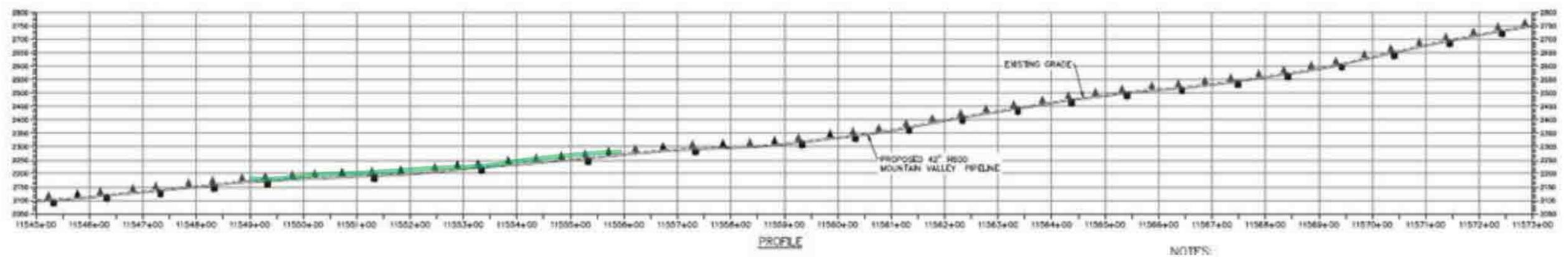
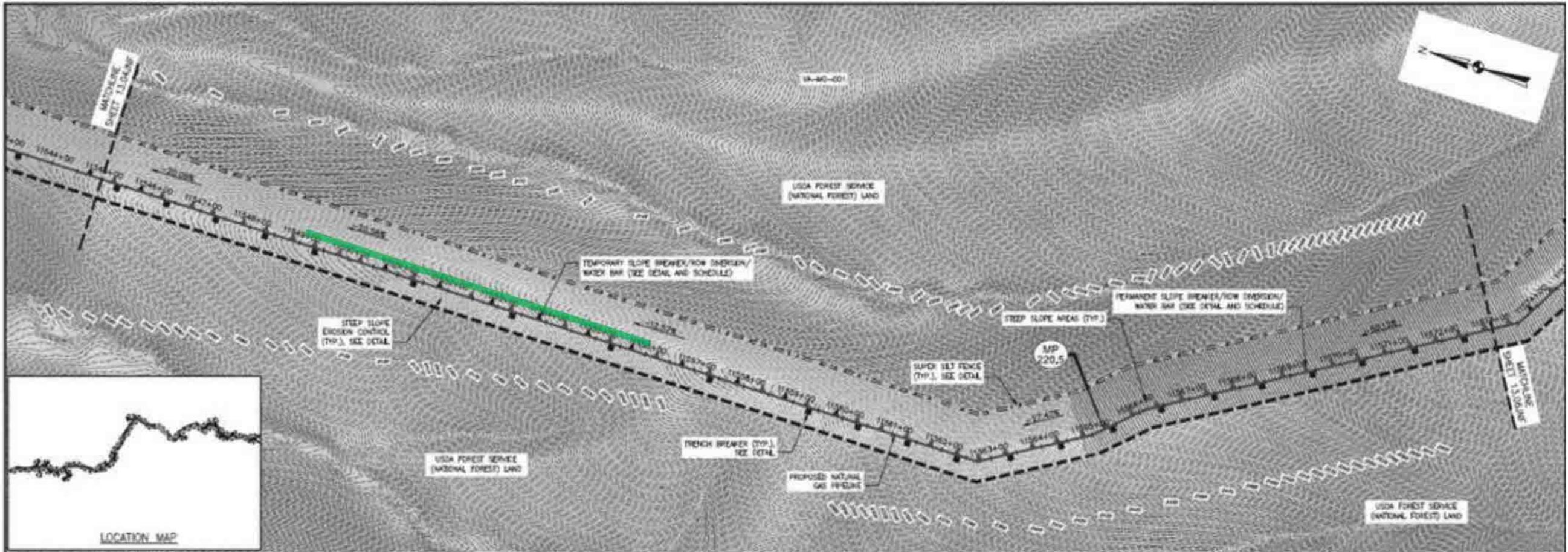
Exhibit 3 –
Issues Map



Legend	
Tension Cracks	— — — — —
Sloughing	— — — — —
Topple/Slide	• • • • •
Two-Tone	— — — — —

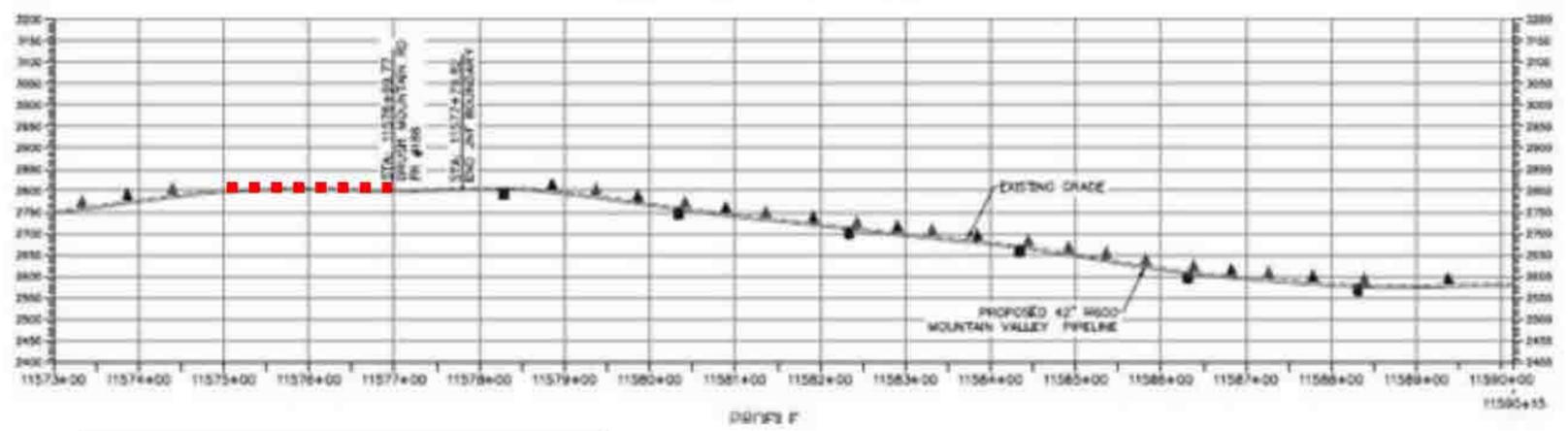
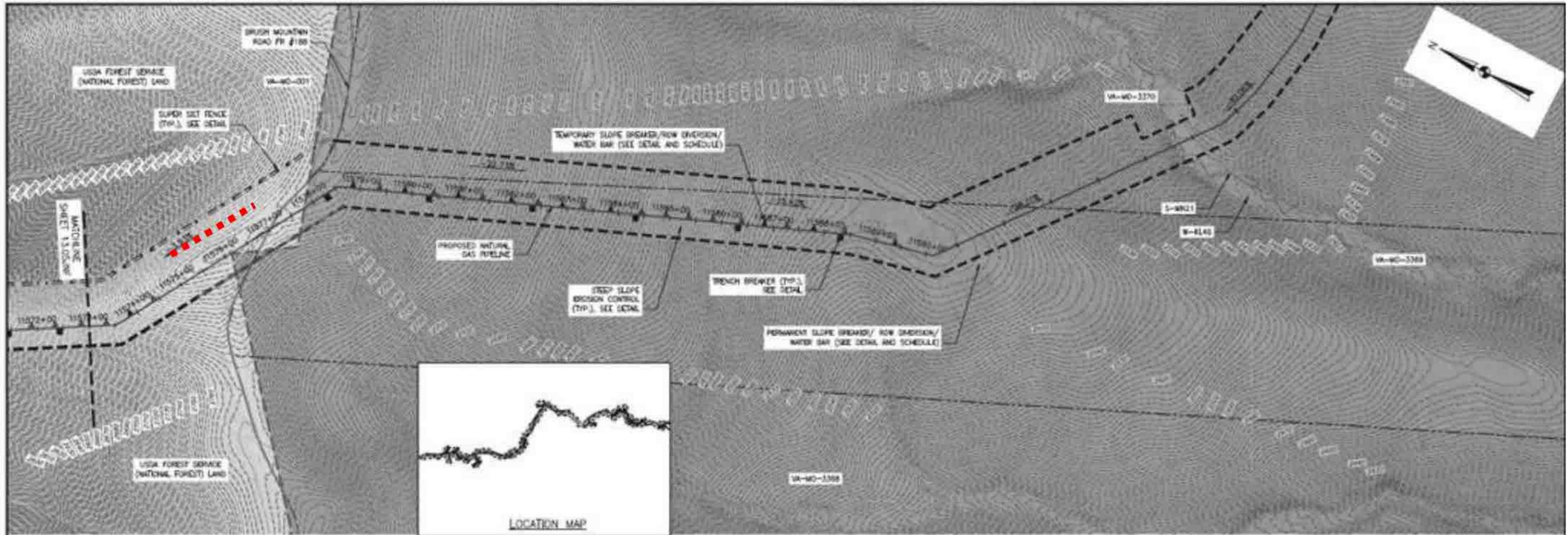
MKA Madsen, Kneppers & Associates, Inc.
Construction Consultants & Engineers
100% Employee Owned Company

EXHIBIT 3 – ISSUES MAP
Mountain Valley Pipeline
Brush Mountain
MKA Project No. 2018.0895



Legend	
Tension Cracks	— — — — —
Sloughing	— — — — —
Topple/Slide	• • • • •
Two-Tone	—————

EXHIBIT 3 – ISSUES MAP
 Mountain Valley Pipeline
 Brush Mountain
 MKA Project No. 2018.0895



Legend	
Tension Cracks	Red dashed line
Sloughing	Purple dashed line
Topple/Slide	Yellow dotted line
Two-Tone	Green solid line

EXHIBIT 3 – ISSUES MAP
 Mountain Valley Pipeline
 Brush Mountain
 MKA Project No. 2018.0895

ACP, MVP, WB Xpress FS-FERC Biweekly Coordination Call**Date** August 28, 2018 @ 2:00-3:30 PM (Eastern)**Location:** Conference Call**Attendees:**

Forest Service (FS)	Jennifer Adams, Laura Hise, Lisa Miller-Allard, Todd Hess, Will Wilson, Catherine Johnson
Bureau of Land Management (BLM)	Victoria Craft
Federal Energy Regulatory Commission (FERC)	Kevin Bowman, Nancy Fox-Fernandez, Paul Friedman
Merjent	Unknown
Cardno	Doug Mooneyhan
Transcon	Alli Rhodehamel-Leung, Jayanna Miller, Jeff Davis, Nadine Benally
Galileo Project, LLC	Grace Ellis, Lauren Johnston, Maria Martin, Peter Rocco, Rosana Nesheim

I. Mountain Valley Project (MVP) Updates

- Paul informed Vicki that he will put her PDF memo into the FERC docket once FERC leadership decides whether or not to rescind the MVP stop work order.
- FERC's stop work order allows MVP to complete construction between milepost (MP) 0 and MP 77, with a gap at Weston & Gauley Bridge Gauley Turnpike Trail. The stop work order also allows MVP to execute the stabilization plan. FERC has also issued some variances to MVP.
- MVP's crews are working on the right-of-way (ROW) to maintain erosion control devices (ECD), and FERC monitors are still on site.
- Nik Gillen (Transcon) is reviewing the ROW today. In the last couple of weeks, Transcon has observed sedimentation outside the limits of disturbance (LOD) and has worked with FS to issue two non-compliances. Transcon also instructed MVP on how to correct a couple of issues outside the LOD for emergency activity.
- Transcon observed MVP mulching, seeding, and removing sediment from outside the LOD by hand. A couple of areas where MVP did this work were not approved. Transcon is working on a non-compliance for the unapproved work. Although Transcon has not documented any severe resource impacts, sediment outside the LOD will be an ongoing issue until MVP starts construction or until work stops for the winter.
- The only variance Transcon and FS are working on is for a sediment retrieval for MVP to retrieve debris from outside the ROW.
- The FERC monitor for FS lands has retired. Cardno expects to have a replacement monitor on site by next week.
- FS leadership is still discussing the how to proceed with the court's orders.
- Lauren has added the meeting notes for the June 6-8 National Parks Service (NPS) field visit at the Appalachian National Scenic Trail (ANST) to the FTP site.

Action Items:

- **Doug** informs Transcon of FERC replacement monitor for FS lands.
- **Doug** provides **Paul** with meeting notes for June 6-8 NPS field visit to ANST.

II. Atlantic Coast Pipeline (ACP) Updates:

- FERC has approved ACP's stabilization plan and has allowed ACP to install pipe only in open trenches in the upper areas of West Virginia.
- At the request of the US Fish and Wildlife Service (FWS), FERC sent FWS a letter asking for re-initiation of Section 7 consultation. This will allow FWS to address outstanding issues from Fourth Circuit ruling. The letter has been posted to the FERC docket.
- Over the last couple of weeks, Transcon has worked with ACP to provide FS with complete variance packages. FS and Transcon are working on six variance requests, three of which are on the Monongahela National Forest (MNF). FS and Transcon are prioritizing variances on the MNF. Transcon expects ACP to provide outstanding information and data for the three MNF variances within the next two weeks, at which time Transcon will schedule meetings with FS specialists to review each of those variances.
- FS is providing feedback on ACP's road designs on the George Washington National Forest (GWNF). FS is determining the next steps and meeting with Virginia Department of Environmental Quality (DEQ). Once ACP's road designs meet FS and DEQ needs, FS will start working on applying the same criteria to the development of road designs for the remainder of the access roads ACP needs on the GWNF.

III. WB Xpress Updates

- Columbia presented their schedule for wrapping up construction and moving into restoration to FS today at the weekly WBX external meeting. Columbia estimated an in-service date of October 26th.
- During this week's inspections, Transcon observed erosion and sediment outside the ROW in the Smoke Hole area and near Middle Mountain Road at Laurel Fork. At Upper Gulf Run, Transcon observed that the sump was full and not cleaned out. Rocks and sediment overtopped that filter sock and went outside the ROW.
- Transcon observed that Columbia had installed water bars and j-hooks at Smoke Hole and that Columbia had restored the area with Flexterra. Transcon had observed sediment outside the ROW during the inspection on August 14th and issued a notice of non-compliance. Transcon observed that the same area washed out again and issued another notice of non-compliance last week. Transcon also observed that some of the permanent water bars had deep erosion channels, which is a concern. Transcon forwarded this information to Brian Bowman (NV5).
- Transcon observed that Columbia completed the last stream crossing at Laurel Fork. Transcon expects Columbia to restore that area today. Columbia has trenched most of the ROW.
- Columbia has welded all the way through the MNF on the cheat mountain salamander (CMS) area, and Columbia has started testing the pipe. In the timber rattlesnake area, Transcon observed that Columbia has backfilled and pulled the topsoil back for everything within the 100-foot buffer. Transcon expects Columbia to reseed the area tomorrow.
- Columbia is still working on the variance request C-224 for the topsoil replacement proposal in the CMS area. Columbia needs to include maintenance activities in the variance before FS can process it.

- Columbia is currently working on the timber rattlesnake gestation areas. Columbia was unable to uncover some of the rattlesnake holes in the hibernacula area.
- FS is putting together a briefing paper to send to the regional forester, who will decide on whether to remove or abandon-in-place the old WBX pipe at Laurel Fork.
- Nancy and Todd will meet at 8:00 am on site for tomorrow's FERC inspection.

Action Items:

- **Galileo** sends Columbia's restoration schedule PowerPoint presentation to Nancy & Gertrude. *Complete.*

Next Scheduled Meeting: Tuesday, September 11, 2018 2:00-3:30pm (Eastern)

From: [Abing, Timothy -FS](#)
To: [Grace Ellis](#); [Lauren Johnston](#)
Subject: FW: MVP Stabilization Plan
Date: Monday, September 24, 2018 1:31:30 PM
Attachments: [image001.png](#)
[image002.png](#)
[image003.png](#)
[image004.png](#)
[Letter to Tim Abing Re Mountain Valley JNF Stabilization Plan \(Final September 11, 2018\).pdf](#)
[Attachment 1 – Mountain Valley Response to USFS Stabilization Plan \(Final 9-11-18\).pdf](#)
[Attachment 2 – MVP Proposed Stabilization Plan for Jefferson National Forest \(September 11, 2018\).pdf](#)
[Appendix A Geosyntec Review Of MVP Orderly Shutdown Recommendation \(August 9, 2018\).pdf](#)
[Appendix B Stormwater Discharge Modeling for Waterbar Drainage Area \(September 11, 2018\).pdf](#)

For MVP Project Record



Timothy Abing
Director - Lands, Minerals, and Uses
On detail – Pipeline Infrastructure Regional Coordinator

Forest Service
Southern Region

p: 404-347-3989

c: 404-387-7898

f: 404-347-2437

tabing@fs.fed.us

1720 Peachtree Road NW, Suite 792S

Atlanta, GA 30309-2405

www.fs.fed.us



Caring for the land and serving people

From: Dawley, Joseph [mailto:JDawley@eqt.com]
Sent: Tuesday, September 11, 2018 11:10 PM
To: Abing, Timothy -FS ; Beum, Frank R -FS
Cc: Neylon, Megan ; Klinefelter, Jeffrey ; Cooper, Bob
Subject: MVP Stabilization Plan

Tim and Frank,

Attached is a letter presenting Mountain Valley Pipeline's response to the United States Forest Service's stabilization plan for the Jefferson National Forest. This letter contains multiple documents and I apologize for the fragmented nature of this submittal. Along with the letter, this submittal includes two attachments and associated appendices. Specifically, this submittal includes the following:

1. Letter to Tim Abing regarding Mountain Valley JNF Stabilization Plan
 - a. Attachment 1 – Mountain Valley Response to USFS Stabilization Plan, September 11, 2018
 - i. Appendix A – Geosyntec Review of MVP Orderly Shutdown Recommendation, August 9, 2018
 - ii. Appendix B – Stormwater Discharge Modeling for Waterbar Drainage Area, September 11, 2018
 - b. Attachment 2 – MVP Proposed Stabilization Plan for Jefferson National Forest,

September 11, 2018

Upon your review please let me know if you have any questions or would like to schedule a call to discuss.

Thanks,

Joe

Joseph M. Dawley, P.E.

Deputy General Counsel, Public Policy & Environmental Affairs

EQT Corporation

625 Liberty Avenue

Pittsburgh, PA 15222

(412) 553-7708

jdawley@eqt.com

To learn about EQT's sustainability efforts visit: <https://csr.eqt.com>

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625 Liberty Avenue, Suite 1700 | Pittsburgh, PA 15222
844-MVP-TALK | mail@mountainvalleypipeline.info
www.mountainvalleypipeline.info

September 11, 2018

Timothy Abing
Director - Lands, Minerals, and Uses
United States Forest Service, Southern Region
1720 Peachtree Road NW, Suite 792S
Atlanta, GA 30309-2405

Re: Stabilization Plan for Jefferson National Forest

Dear Director Abing:

On August 3, 2018, in response to the July 27, 2018 remand order of the United States Court of Appeals for the Fourth Circuit ("Court Order") regarding the Mountain Valley Pipeline Project ("Project"), FERC issued a stop-work order to Mountain Valley Pipeline, LLC (MVP). With respect to the crossing of the Jefferson National Forest (JNF), the stop-work order provided an exception for any measures deemed necessary by the U.S. Forest Service (USFS) to stabilize the right-of-way (ROW) and work areas. The need to stabilize the ROW and work area is significant because MVP had made considerable progress on construction of the Project at the time of the Court Order. MVP had cleared, graded, and strung pipe along 1.86 miles of the ROW in the JNF. It had also welded a total of 1,290 feet of pipe in five different sections and staged over 200 loose joints of pipe along the ROW. On August 25, 2018, USFS proposed a stabilization plan to MVP ("USFS Plan").

MVP submits the attached responses to the USFS Plan (Attachment 1). MVP also submits an alternative stabilization plan that will provide better protection to the JNF and private lands and watersheds adjacent to the JNF ("MVP Plan"), which is provided as Attachment 2 to this letter. MVP's primary goal of stabilization is to minimize erosion and sediment runoff from the ROW during the pendency of the remand required by the Court Order.

The MVP crossing of the JNF consists of two segments of ROW totaling approximately 3.6 miles. The first segment, known as the Peters Mountain Segment, includes approximately 9,211 feet in Giles County, Virginia and 558 feet in Monroe County, West Virginia. The second segment, known as the Sinking Creek Mountain and Brush Mountain Segment, includes approximately 9,810 feet in Montgomery County, Virginia. While MVP has conducted no earth disturbance on the Peters Mountain Segment (only hand-felling of trees), as noted above, MVP has fully cleared and graded the Sinking Creek Mountain and Brush Mountain Segment. At the time the Court Order was issued, MVP was welding pipe on Brush Mountain. Upon issuance of the order, MVP ceased construction activities in all areas of the JNF and reassigned the welding crews to areas outside the JNF. Since that time, MVP has limited its activities in the JNF to maintaining erosion control devices (ECDs) to limit any erosion and sediment impacts to the environment.

The USFS Plan adopts a status quo approach, which is to stabilize the ROW in its current state by taking whatever steps are available to prevent erosion and sediment runoff despite the considerable challenges associated with stabilizing the ROW in a temporary state, working around pipe that is staged along the ROW, and maintaining temporary ECDs that are designed for short-term construction phase activities.

A significant amount of construction activity will be necessary to implement the USFS Plan, the result of which will only be maintenance of the ROW and ECDs in a precarious temporary condition for an extended period of time.

By contrast, MVP's preferred stabilization plan will achieve permanent restoration of the ROW. This involves installation of the existing pipe that is staged on the Sinking Creek Mountain and Brush Mountain segment of the JNF. An alternative to installation of all staged pipe is installation of just the welded sections, with relocation of the loose joints to a staging area off the JNF. This alternative is less desirable from an environmental perspective than installation of all staged pipe but is still preferable to the USFS Plan of securing welded segments in place.

In comparison to the USFS plan, MVP's preferred plan will result in slightly more construction activity during the implementation phase, but MVP's permanent approach ensures superior stabilization that will greatly reduce erosion and sediment runoff and offer greater protection to the lands in and adjacent to the JNF.

Upon your review of MVP's responses to the USFS Plan and the MVP Plan, please let me know if you would like to schedule a time to discuss in more detail.

Sincerely,



Joseph M. Dawley

Deputy General Counsel, Public Policy and
Environmental

Attachment 1

Mountain Valley Pipeline Response to USFS Stabilization Plan

September 11, 2018

Mountain Valley Pipeline, LLC (MVP) provides the following response to the United States Forest Service's (USFS) August 25, 2018 proposed stabilization plan for the Mountain Valley Pipeline Project ("USFS Plan").

Current Status in the Jefferson National Forest

The Mountain Valley Pipeline Project ("Project") crossing of Jefferson National Forest (JNF) consists of two segments of right-of-way (ROW) totaling approximately 3.6 miles. The first segment, known as the Peters Mountain Segment, includes approximately 9,211 feet in Giles County, Virginia and 558 feet in Monroe County, West Virginia. The second segment, known as the Sinking Creek Mountain and Brush Mountain Segment, includes approximately 9,810 feet in Montgomery County, Virginia.

Peters Mountain. For the Peters Mountain Segment, MVP has only completed tree felling on the ROW to date. Trees have been hand-felled and left in place across the ROW. There has been no significant ground disturbance at this point. The ground in this segment is stable and poses no threat to erosion and sediment impacts the environment. This area also includes Pocahontas and Mystery Ridge roads, which have been exposed to light vehicular traffic. Erosion and sediment control devices (ECDs) have been installed along the roads, and regular maintenance activity is ongoing as required.

Sinking Creek Mountain and Brush Mountain. On the Sinking Creek Mountain and Brush Mountain Segment, the ROW has been fully cleared, graded, and prepared for construction. MVP has strung and bent pipe in preparation for welding along the entire length of this segment. Topsoil generally has been segregated and stockpiled on the non-working side of the right-of-way. Due to the pipe strung along the trench line, topsoil is not currently accessible in most locations. Equipment access to the non-working side for environmental maintenance is also limited. No trench has been dug or pipe installed in the ground.

On Brush Mountain, MVP has welded a total of 1,290 feet of pipe in five different sections. In addition to those welded sections, there are 20 loose joints of equaling approximately 800 feet of pipe on the top of Brush Mountain. Another 79 joints totaling approximately 3,160 feet have been strung along the ROW, bent, and placed on skids waiting to be welded. On Sinking Creek Mountain, 114 joints totaling approximately 4,560 feet have been strung along the ROW, bent, and placed on skids waiting to be welded, but no welding has occurred.

MVP Response to USFS Plan

MVP offers specific comments on how it would implement the USFS Plan, followed by concerns related to that proposed implementation. MVP's comments are supported by the report entitled *Independent Review of MVP Orderly Shutdown Recommendation*, Geosyntec Consultants, August 9, 2018, which is provided as Appendix A to this Plan and the Technical Memorandum entitled *Stormwater Hydrology Modeling for Waterbar Drainage Area*,

Geosyntec Consultants, September 11, 2018, which is provided as Appendix B to this Plan. Due to the different state of the two segments, MVP's comments are tailored to each segment.

Peters Mountain Segment

USFS Plan. The USFS Plan for the Peters Mountain Segment is as follows:

- Leave felled trees in place within ROW
- Maintain and monitor installed ECDs every seven calendar days and within 24 hours after any storm event greater or equal to 0.5 inches in a 24-hour period. ECDs will be enhanced, repaired, and replaced as necessary.
- Monitor and control invasive species consistent with the Exotic and Invasive Species Control Plan included in the Plan of Development.
- Ensure that maintenance and monitoring activities do not preclude the use of Pocahontas or Mystery Ridge Roads for other purposes.

MVP Response. MVP agrees that this is the best course of action to ensure stabilization of the Peters Mountain Segment of the Project.

Sinking Creek Mountain and Brush Mountain Segment

The USFS Plan for the Sinking Creek Mountain and Brush Mountain Segment includes six items, which MVP has numbered for ease of reference in this comment response.

USFS Plan Item 1. Pipe may remain on site without burying if it can be safely secured to the hillside and not unduly interfere with stabilization goals. Describe means to secure pipe, protect bare steel, and address UV degradation.

MVP Implementation Proposal for Item 1. There are two general categories of pipe in this segment: welded sections and individual pipe segments. The welded sections total approximately 1,290 feet in length, consisting of five sections ranging from 160 to 508 feet in length, and are located on Brush Mountain. The welded sections are staged on box cribs, which are temporary wooden structures used to support heavy objects, slightly off center of the ROW. Most of the welded sections are located on steep slopes and are currently secured with anchors that comprise clamps attached to driven posts. The clamps are placed around the pipe and a strap connects the clamp to a post driven into the ground. There is one welded pipe section on a relatively flat area at the top of Brush Mountain that has been anchored to the ground. No additional work is required to secure these welded sections.

Securing the individual pipe segments is not feasible because leaving those segments on site would unduly interfere with stabilization goals. The ECDs would be inaccessible for maintenance due to the disbursement of joints along the ROW restricting access to the non-working side of the ROW. Instead, to implement this item of the USFS Plan, MVP would relocate the joints from steep slopes to existing flat areas on the ROW, including the areas near Craig Creek and at the top of Brush Mountain, which are both outside the JNF, as shown in Figure 1 below. Relocation of the joints would require mobilizing excavators to move the joints,

washing the excavators at a wash station before they leave the JNF, and depositing the joint in the staging area. Two sets of equipment could be used at each of the boundaries of the JNF to eliminate the need to wash the equipment. Excavators can only move one joint at a time so relocation of the joints would require over 250 round trips, or 500 one-way trips, taking approximately two to three weeks.

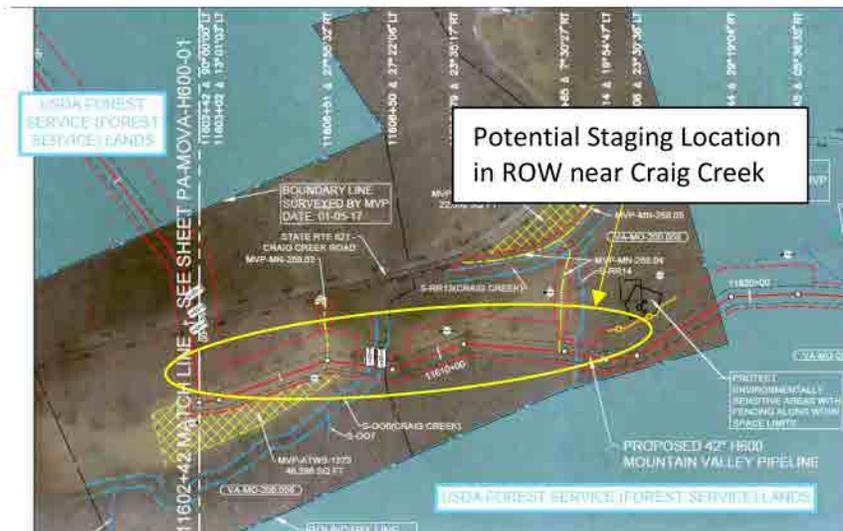


Figure 1. Potential Pipe Staging Location Adjacent to Craig Creek.

With respect to UV degradation, all pipe was coated in June or July 2017 and does not show any signs of UV damage. All pipe in this area is 0.740” wall pipe. MVP will inspect pipe coating for UV damage and will cover or paint the pipe if it becomes necessary.

MVP Concerns for Item 1. The construction ROW is 125 feet in width for the Project. Figures 2 and 3 depict typical ROW layouts in a level and side-hill cross section and show both the “working” and “non-working” areas of the ROW. Non-working areas are also referred to as “spoil side” or “temporary ROW.”

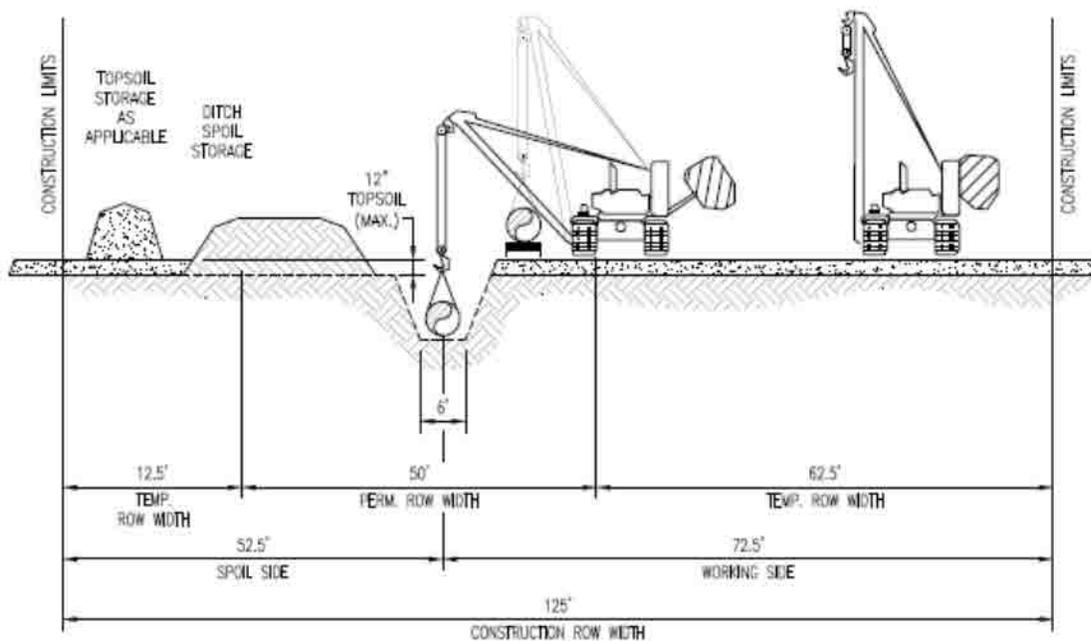


Figure 2. ROW Layout on Level Cross Section

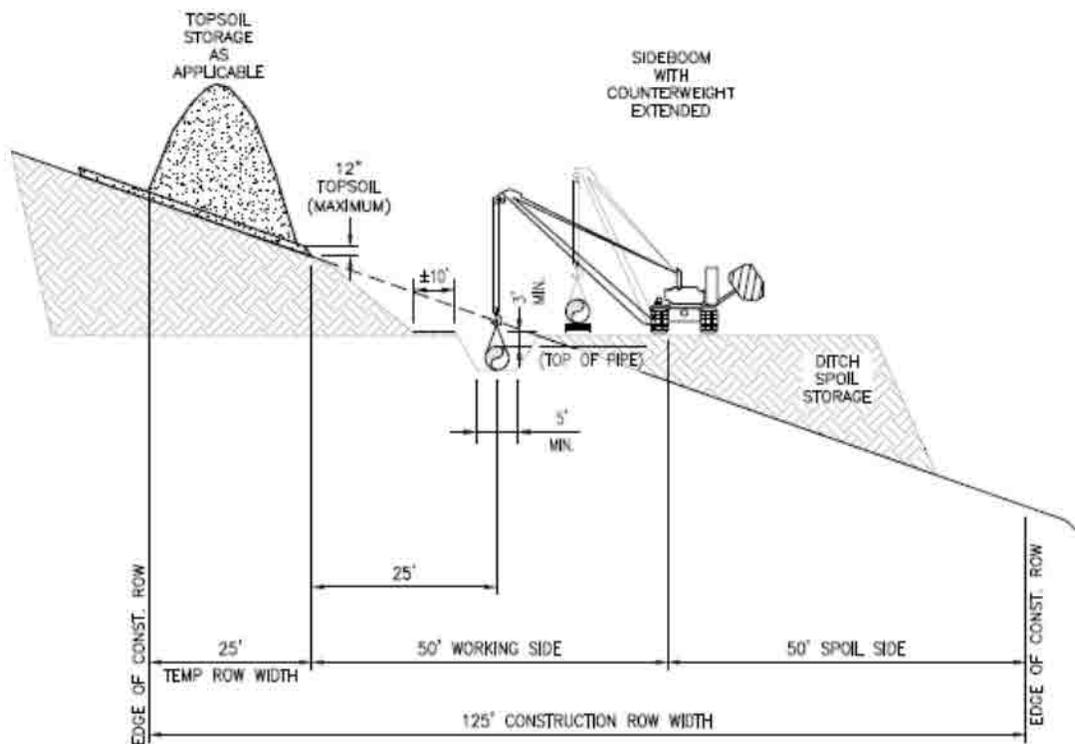


Figure 3. ROW Layout on Side-Hill Cross Section.

The below photo presented as Figure 4 provides an example of a welded pipeline section and individual pipe joints located on ROW within the JNF and is useful to understand the actual

“working” and “non-working” portions of the ROW from a field application perspective. In general, the wider section of the ROW is referred to as the “working side” and the narrower section is referred to as the “non-working side.”



Figure 4. View of Pipe (welded sections and individual joints) in JNF.

While the welded pipe segments can be secured in place under a temporary restoration scenario, the presence of the pipe above grade will adversely affect the stabilization goals during this time period. More specifically, the location of the welded sections restricts access to the non-working side of the ROW, as shown in the above photo (Figure 4). As shown in Photo 2 of Exhibit 2 in *August 9 and 10, 2018 Site Evaluation* prepared by Madsen, Kneppers, & Associates, Inc. (Evaluation), the non-working side includes waterbars, end treatments, silt fences, and spoil piles that will require continued maintenance during a temporary restoration scenario. Even with the individual joints removed, securing the welded sections in place still leaves inaccessible sections of non-working ROW in those areas. Overall, securing the welded pipe segments to the hillside limits MVP’s ability to temporarily stabilize the ROW and accomplish the stabilization goals that the USFS calls for in the remainder of the USFS Plan.

The relocation of individual joints will require equipment activity on the ROW that will resemble or exceed the activity of normal pipeline construction. For example, the section of ROW adjacent to Craig Creek (Figure 1) will experience approximately 300 one-way equipment trips on the ROW just upslope of the creek. During normal pipeline installation construction, the number of one-way equipment trips is expected to be no more than 200 trips, including permanent restoration. While this joint-relocation process would allow some access to the non-working side of the ROW to maintain ECDs once complete, it will require significantly more activity along the ROW, leading to increased effort to establish temporary stabilization.

USFS Plan Item 2. Perform actions needed within the limits of disturbance to stabilize or prevent landslides, slips, or mass wasting.

MVP Implementation Proposal for Item 2. A slip in a rock cut along the ROW has been documented on the Brush Mountain segment around Sta. 11624+00 along with numerous tension

cracks noted by the USFS inspectors. MVP began preparing and implementing a plan for stabilizing the slip on August 10, 2018. As of August 29, 2018, the slope remains stable with no change in conditions since completing stabilization procedures. MVP is continuing to monitor the slip area for any further signs of instability. Areas that are characterized by tension cracks were regraded as needed and continue to be monitored.

MVP Concerns for Item 2. The Sinking Creek section has approximately 1,900 feet of two-tone ROW. Two-tone sections are constructed with two levels of the ROW separated by a slope (Figure 5). The slope between the two levels is subject to slips and erosion over time, as shown in Exhibit 1, Photo 9 of the Evaluation. In addition, stormwater controls that convey water from the upper level to sumps at the lower level may become compromised by the erosion of the slope between the two levels. Because there are welded sections of pipe on the lower level of the two tone, maintenance of the slope and stormwater controls is limited.



Figure 5. Two-Tone ROW Construction

USFS Plan Item 3. Stabilize topsoil and spoil piles and leave in current locations by: (1) seeding and mulching piles, (2) following seeding guidance in Appendix H-7 to H-15 of the Plan of Development, and (3) installing and maintaining silt fencing around the base of all topsoil stockpiles. Spoil piles (other than topsoil) may be re-spread or handled differently as needed to achieve stability or otherwise further stabilization plan goals.

MVP Implementation Proposal for Item 3. MVP seeded and mulched all spoil stockpiles during construction. MVP will confirm seeding was successful and supplement as needed. The stockpiles are stacked along the edge of the ROW. Certain spoil stockpiles on the working side of the ROW may be spread; however, spreading topsoil is best left for final restoration.

MVP will install additional erosion and sediment control measures, as needed, for temporary stabilization. MVP will scarify travel lanes and compacted areas to promote growth while limiting excessive loosening of soils that will overwhelm temporary ECDs during rain events.

MVP will temporarily seed and mulch the ROW consistent with the Restoration Plan included in the Plan of Development; however, the Restoration Plan requires spreading topsoil back across the ROW prior to seeding. Without the topsoil, additional amendments will likely be required to condition the soils that are currently at the surface of the ROW. Amendments will be selected based on soil testing, and seed mixes will be selected from Appendix H-7 to H-15 of the Plan of Development.

MVP Concerns for Item 3. The tension cracks noted by USFS in the stockpiles are evidence that the piles were not designed to remain in place for extended periods of time; the soil in the piles was expected to be spread back out across the ROW after pipe construction. Ensuring stability of the stockpiles will require close scrutiny and maintenance; however, the piles are located on the non-working side of the ROW, which currently has access restricted by welded sections of pipe.

USFS Plan Item 4. Stabilize all areas of bare soils (the exception to this would be exposed soil areas underneath strung pipe) in accordance with the following: (1) install additional erosion control devices/structures requiring machinery, as needed, before implementing other stabilization measures; (2) disk compacted areas to a depth of 4 to 6 inches; (3) seed, lime, fertilize, and mulch according to specifications in Appendix H of POD (Restoration Plan, pp 3.5 – 3.8 for seedbed prep and seeding); (4) select species that would provide the most erosion control (Appendix H: Table 3.7.1-3, POD); (5) use a biotic soil amendment to provide nutrients necessary to grow vegetation on exposed subsoils; (6) seed, hydroseed, and hydromulch on slopes based on MVP's approved Restoration Plan; and (7) monitor revegetation success four weeks after seeding and again in the spring. Success is 80% soil cover. Re-seed if there is less than 80% soil cover according to specifications in Appendix H of POD.

MVP Implementation Proposal for Item 4. Additional ECDs will be installed as appropriate, unless areas cannot be accessed due to the location of the pipes on the ROW. In areas that cannot be accessed with machinery, ECDs will be installed manually, if feasible. Once installation of additional ECDs has been completed and pipe has been secured to the ROW, exposed soils within the ROW will be scarified using heavy equipment as needed. MVP is proposing to scarify rather than to disc compacted areas due to (1) the difficulty of accessing the steep slopes and the presence of weathered, partially weathered, and solid rock near the ground surface; (2) the need to maintain waterbars on a tight spacing within the ROW, which would make the discing process extremely difficult; and (3) the fact that discing would excessively loosen already erodible soils and increase the mobility of sediments from the operation.

Due to the lack of topsoil, amendments will be required to modify the soil quality to promote successful vegetation growth. Amendments will be hauled to the ROW using tracked dump. Due to the restricted working conditions along the ROW created by the secured pipe and two-tone ROW sections, amendments will likely be spread manually over a significant portion of the ROW. Temporary stabilization using a combination of mechanical and manual methods to condition the soil and spread seed will require several weeks to successfully execute. MVP will follow the requirements in the Restoration Plan for achieving approval of the materials

(amendments, binders, mulches, seed mix, etc.) and executing the temporary stabilization process. The requirements of the Restoration Plan anticipated a ROW restored to approximate precondition grades; therefore, temporary stabilization processes may be adjusted to account for the temporary conditions currently in place.

MVP Concerns for Item 4. Adding the soil amendments requiring a significant number of round trips with tracked dump trucks. The success of seeding the steep slopes on the edges of the ROW that tie into the existing grades outside of the ROW will be limited; therefore, functioning silt fence will continue to be the main method for controlling sediment from these slopes and preventing release outside the ROW. Over long-term, the erosion of the steep slopes will increase the maintenance burden.

USFS Plan Item 5. Monitor and maintain erosion control structures and devices. Maintenance is to be done with hand tools. Use of machinery for maintenance must be approved in advance by the Forest Service. Entry can be via UTVs or ATVs. To minimize erosion of soil underneath strung pipe, install silt fencing around and underneath pipe staged in the ROW. Monitor every 7 calendar days and within 24 hours after any storm event equal to or greater than 0.5 inches of rain per 24-hour period.

MVP Implementation Proposal for Item 5. MVP will conduct monitoring and maintenance of the ECDs. Maintenance will be conducted manually as is feasible with mechanical methods only used with USFS approval.

MVP Concerns for Item 5. During the winter season, even manual maintenance will be difficult to conduct due to the terrain and likely wet, cold conditions. Maintenance activities can lead to further disturbance and degrading of the temporarily stabilized ROW. Using equipment to maintain ECDs will be kept as a last resort since the use of equipment will require removing and reinstalling waterbars, creating additional land disturbance. Subsequent revegetation of these areas would not be feasible, increasing the maintenance burden.

USFS Plan Item 6. Restrict vehicle access by blocking entrances to the ROW with boulders or earthen berms.

MVP Implementation Proposal for Item 6. Once temporary stabilization activities are complete, vehicle access to the ROW will be restricted by placing boulders, earthen berms, or other measures at the entrance to the ROW to restrict access. MVP will inform USFS of the proposed access restricting measures for comment.

MVP's Additional Concerns Regarding Impacts Due to Reopening the ROW

If MVP is authorized to resume work in the JNF along the same alignment after the agencies complete their tasks on remand, then the implementation of temporary stabilization measures in the Sinking Creek Mountain and Brush Mountain Segment will increase the risk of impacts to the environmental resources for the following reasons.

- Increased equipment traffic. Placing temporary stabilization measures and subsequently reopening the ROW for construction and permanent stabilization will lead to approximately 1,600 equipment trips throughout the Brush Mountain and Sinking Creek Mountain Segment. Relative to the area located near Craig Creek referenced under *MVP Concerns for Item 1*, the number of equipment trips would be approximately 950 trips compared to 200 trips for normal pipeline construction.
- Runoff concentration. Under temporary stabilization, runoff from the ROW will continue to be concentrated along the waterbars. While the waterbars discharge to sumps that discharge through silt fence, the more stable sheet flow conditions that characterize the pre-existing and restored conditions are not achieved. In the technical memorandum entitled *Stormwater Hydrology Modeling for Waterbar Drainage Area*, the effect of the waterbars in concentrating runoff during temporary stabilization, relative to the pre-existing condition and initial stages of the permanently restored condition, is an increase in runoff discharge. The goal of the permanently stabilized condition is to not exceed the discharge of the pre-existing condition.
- Preservation of topsoil. The quality of the topsoil stripped from the ROW will be significantly degraded if the stockpiles are spread for temporary stabilization and stripped again for construction. MVP recommends the topsoil stockpiles remain in place; however, as stated above the stockpiles are not intended to remain for long periods of time.
- Long-term exposure of steep slopes. Slopes along the edges of the ROW are steeper than the pre-existing and the proposed restored conditions. These steep slopes will be difficult to stabilize and will likely ravel over time. These slopes can generally be flattened with the exception of areas with stockpiles or welded pipe.
- Extended exposure of risk to wildlife. Leaving ECDs in place for long-term will increase risk to wildlife.

via Email (rcooper@eqt.com)

9 August 2018

Mr. Robert Cooper
Senior Vice President, Engineering & Construction
Mountain Valley Pipeline
625 Liberty Avenue
Suite 1700
Pittsburgh, PA 15222

RE: Independent Review of MVP Orderly Shutdown Recommendation

Dear Mr. Cooper:

Geosyntec Consultants, Inc. (Geosyntec) is pleased to provide this letter report to Mountain Valley Pipeline, LLC (Mountain Valley) in reference to the Mountain Valley Pipeline (MVP) project (the "Project"). Mountain Valley retained Geosyntec to provide an independent third-party review and analysis (the "Independent Review") of its "*Mountain Valley Pipeline, Jefferson National Forest, Construction Status, Orderly Shutdown Scenarios, Risks, and Recommendation*" document dated August 1, 2018 (the "Orderly Shutdown Recommendation"). This letter report presents the results of the Independent Review and includes a brief summary of the Project, a summary of the scope of work completed by Geosyntec, a description of findings, and recommendations for Mountain Valley's consideration.

INTRODUCTION

Geosyntec understands that a Federal judge recently ruled that the United States Forest Service (USFS) and Bureau of Land Management (BLM) must reconsider permits granting construction of the Project through a portion of the Jefferson National Forest (JNF) located in Giles and Montgomery Counties, Virginia and Monroe County, West Virginia. As a result of this decision, Mountain Valley has prepared its Orderly Shutdown Recommendation to describe alternative scenarios and present a recommended approach for ceasing construction efforts on this portion of the Project while the USFS and BLM conduct their review.

This Independent Review was undertaken for the purpose of providing Mountain Valley with an independent third-party review of and opinion regarding their Orderly Shutdown Recommendation to determine if the recommended scenario proposed by Mountain Valley to bring construction operations within the JNF to an orderly shut-down are protective of the environment and in compliance with regulatory requirements.

PROJECT DESCRIPTION

The Project consists of installation of approximately 303 miles of 42-inch diameter natural gas pipeline that begins at an interconnect site in Wetzel County, West Virginia and ends at Transco Station 165 in Pittsylvania County, Virginia. Near the border between Virginia and West Virginia, the Project crosses through the JNF in two general locations. The pipeline route extends approximately 9,769 feet through the Peters Mountain segment of JNF (referred herein as PM) and approximately 9,810 feet through the Sinking Creek Mountain and Brush Mountain segments of JNF (referred herein as SCM and BM, respectively).

On October 13, 2017, the Federal Energy Regulatory Commission (FERC) issued an order to Mountain Valley granting a Certificate of Public Convenience and Necessity pursuant to Section 7(c) of the Natural Gas Act for construction of the Project. Prior to receiving notice to proceed from FERC to commence construction of each segment, the required federal, state, and local environmental permits and approvals were received.

SCOPE OF REVIEW

Our Independent Review generally consisted of the following tasks: (1) desktop review of readily available project-specific documents, (2) a site reconnaissance to document site conditions, evaluate erosion & sediment (E&S) controls and geohazard concerns related to the shutdown; and (3) review and evaluation of the Orderly Shutdown Recommendation to consider relevant regulatory requirements and prudent environmental protection measures. Note that the Independent review focused on the SCM and BM segments of the Project; the PM segment was not reviewed in detail. A more detailed discussion of work performed, findings and recommendations from the Independent Review is provided in the following sections.

DESKTOP REVIEW

Geosyntec completed a desktop review of information to develop an understanding of the Project activities and evaluate existing permit requirements specific to the work in the JNF. The documents reviewed by Geosyntec include the following:

- Opinion by United States Court of Appeals for the Fourth Circuit, No. 17-2399, No. 18-1012, No. 18-1019, No. 18-1036, decided July 27, 2018.
- Plan of Development, Winter Restoration Plan, November 30, 2017.
- Pipeline Alignment, Mountain Valley Project – H600 Line, A-1 Precinct, Montgomery County, VA, Drawings PA-MOVA-H600-01 to PA-MOVA-H600-03, Rev. 7, April 13, 2018.
- Erosion and Sediment Control Plans, Mountain Valley Pipeline Project – H600 Line, Drawings 13.27ES to 13.31ES, Rev. 5, dated March 2, 2018.
- Jefferson National Forest Plan of Development, Mountain Valley Pipeline Project – H600 Line, Drawings 13.01JF to 13.06JF, dated September 25, 2017.

- Project Specific Standards and Specifications for Virginia, April 2017, Revised June 2017.
- Plan of Development, Appendix F – Landslide Mitigation Plan, Rev. 7, November 30, 2017.
- Site-Specific Design of Stabilization Measures in Selected High-Hazard Portions of the Route of the Proposed Mountain Valley Pipeline Project in the Jefferson National Forest, updated April 23, 2018.
- Annual Standards and Specifications, Appendix G – Acid Forming Materials Mitigation Plan, May 2017.
- Mountain Valley Pipeline, Jefferson National Forest, Construction Status, Orderly Shutdown Scenarios, Risks, and Recommendation, dated August 1, 2018.

SITE RECONNAISSANCE

Geosyntec personnel, Christopher Lynch, P.E. (VA) and Scott Sheridan, P.E. (VA), were escorted on a site visit on August 6, 2018 along the Brush Mountain (approximate Stations 11527+00 to 11578+00) and Sinking Creek Mountain (approximate Stations 11461+00 to 11504+50 per the Jefferson National Forest Plan of Development, “JF POD”) sections within the JNF. Geosyntec was escorted by an environmental inspector and welding inspector, both working for Mountain Valley. During the site reconnaissance, Geosyntec personnel observed areas of instability or potential instability along the Limits of Disturbance (LOD), observed areas with E&S risk, and took photographs of areas of interest. A photographic record of the pictures taken is provided as Attachment A. Stationing referred to in the photographic record, as well as in this Independent Review, corresponds to stationing shown in Project Erosion and Sediment Control Plans, which may not match stationing shown in other Project plans or documents.

While on the site reconnaissance, Geosyntec held conversations with several construction personnel involved with this section of pipeline to discuss the proposed alternatives and recommended scenarios outlined in the Orderly Shutdown Recommendation. These discussions were considered during the Independent Review.

A summary of general observations and findings derived from the site reconnaissance follows. Refer to the site visit Photograph Record for examples of the findings listed below.

Topography & Right-of-Way:

- Geosyntec observed steep slope conditions during the site reconnaissance. Based on a review of the JF POD, portions of the right-of-way (ROW) exceed 40% slope. In addition to steep slopes, Geosyntec personnel observed narrow portions of the ROW along the steep slope sections and ridges. Mountain Valley indicates that the LOD width in certain areas of the Project was reduced to be protective of sensitive environmental resources. These narrow areas restrict traffic and, in some instances, required two-tiered ROW construction.

E&S Controls:

- Geosyntec observed that Mountain Valley is actively maintaining E&S and safety controls to provide a temporarily stabilized site and to prevent workers from entering high-risk areas adjacent to the cribbed pipes or steep slopes. Maintaining these temporary controls for an extended duration (potentially through Fall, Winter and Spring seasons) is not feasible and increases risk of environmental impacts.
- The E&S controls observed by Geosyntec were compliant with the Project's Erosion & Sediment Control Plan. Geosyntec observed areas of the E&S controls that may be at increased risk of compromise during major precipitation events and therefore present risk of environmental impacts. These areas of the E&S controls require intense maintenance while the ROW remains in a disturbed condition, and major storms will continue to present risk to the environment until the ROW can be permanently restored.
- Minor issuances of sediment were observed that had occurred as a result of storm events with intensities greater than design. Prolonged usage of temporary E&S controls require constant maintenance and are susceptible to further releases with storms. In areas with steep slopes, the addition of more E&S controls will not necessarily lower the risk to further sediment releases. The best solution for lowering or eliminating the risk is to permanently restore the slopes as quickly as possible.

Slope Stability:

- Geosyntec observed areas of instability including in both weathered rock and soil slopes. One slide occurred within a few days prior to the site visit in a weathered rock temporary cut slope with the rockfall impacting pipes, knocking the pipe off cribbing potentially compromising the welds and coating. An additional slope failure in a temporary weathered rock slope at approximate station 11532+00 was observed during the site visit. A photograph of the failed slope is provided in the Photographic Record (ID 10). In addition, small sloughs in cut slopes within the LOD were observed. Mitigation plans are being developed to address areas of instability, but the areas observed indicated that delay in restoration will lead to further degradation of cut slopes with further precipitation and duration of exposure. The degradation of these slopes will increase the risk to environmental impacts within and beyond the LOD, increase risk to the health and safety of the general public and workers alike, and jeopardize pipe integrity.
- In addition, the tops of temporary cut slopes are at risk of migrating outside the LOD and causing trees to fall both into and outside the LOD. Areas of soil sloughing were observed with soil raveling down steep cut slopes due to continued exposure to weather events. Areas of infiltration into the underlying fractures will potentially degrade weathered rock strength over time possibly leading to increased instability. Exposure of rock fractures by erosion of the overlying soil material can lead to increased infiltration that compromises potential planes of weakness within the rock mass, which is also tied to duration of exposure.

- The topsoil piles left along the edge of the LOD were intended to be stored for a short duration. As the stockpiles are left in place in a temporary condition, the moisture content of the soil will increase within the piles following precipitation events. With the high organic content of these stockpiles, the risk of a sideslope slough of the topsoil piles will increase as moisture content increases. E&S controls designed and installed at the site are not anticipated to retain slope failures and associated debris flows originating from these topsoil stockpiles; therefore, an event of this nature would likely result in a release outside of the LOD. In addition, in narrow areas along the ROW, the topsoil was stockpiled before and after the narrow sections, leading to large stockpiles located above steep slopes. Therefore, the longer the stockpiles remain on site without being spread out as part of permanent restoration, the greater the risk increases for impact to the environment.

Construction Considerations:

- Geosyntec discussed the proposed schedule to bring construction operations within the JNF to an orderly shutdown status for the various alternative scenarios identified in the Orderly Shutdown Recommendation with construction personnel on site. The experience at the site is that intense summer storms have slowed construction. There are narrow LOD areas at the highest elevations of the SCM and BM segments reviewed. Along these slopes, construction cannot be accelerated by adding equipment and personnel due to the congestion that would be created, the construction methods that will be required to install the pipe, and risk of unsafe work conditions. Additional crews can be added to other sections of the pipeline in JNF; however, those additional crews will not increase progress for the narrow sections in question.
- As time progresses, the risk to human health and safety increases due to the degradation of the ROW. Challenges such as traversing the steep slopes, movement of the pipes on the cribbing, slips and sloughs of cut slopes, and degradation of soil and weathered rock surfaces contribute to increased risk to those on site.

REVIEW OF MOUNTAIN VALLEY'S ORDERLY SHUTDOWN PLAN

Geosyntec reviewed the Orderly Shutdown Plan (see Attachment B). Our review focused on construction status information, proposed potential shutdown scenarios and recommendations related to the SCM and BM segments of the Project.

The document presents the current construction status in the SCM and BM segments where the ROW has been fully cleared, graded, and prepared for construction, all of the pipe necessary to complete the SCM and BM portions of the ROW has been staged and bent along the ROW, with certain sections currently strung, welded, and bent in preparation for welding. As of August 1, 2018, no trench had been dug or pipe installed in the ground.

The document presents three potential scenarios for orderly shutdown in the SCM and BM segment, which consist of achieving final restoration of the ROW, temporarily stabilizing the ROW in its current condition, and removal of all pipe and equipment prior to restoration. Durations to implement these potential scenarios are seven (7) days for the temporary stabilization, 35 days for the final restoration and 110 days for the removal of pipe and equipment scenario.

The recommended alternative is to achieve final restoration of the ROW. Mountain Valley believes that this solution provides the greatest level of environmental protection moving forward while the USFS and BLM complete their review.

CONCLUSIONS AND OPINION

The following conclusions are drawn from the work completed as part of this Review.

- The project documents reviewed and field observations from the site reconnaissance indicate that risks of environmental impact resulting from slope stability issues and potential acidic conditions are prevalent in the SCM and BM segment and are increasing with time.
- Observations from the site reconnaissance suggest that it will be challenging to continue to maintain existing E&S control measures for an extended duration, thereby presenting an increased risk of environmental impacts.
- The orderly shutdown activities should be completed in an expedient and safe manner to minimize risk of environmental impacts during the shutdown period.
- The Orderly Shutdown Recommendation prepared by Mountain Valley evaluates reasonable scenarios and recommends an alternative that will achieve full stabilization within the SCM and BM segment in an expeditious manner in order to provide the maximum level of environmental protection.

Based on the work performed during our Independent Review, Geosyntec recommends completion of pipeline installation within the SCM and BM segments followed by permanent stabilization to minimize risks to environmental resources and to protect human health and safety. Should pipelines placed within these segments to accomplish the permanent stabilization not be utilized as part of the final alignment of the Project, we recommend measures be evaluated and employed to allow for the safe in-place abandonment of these segments of pipe.

ADDITIONAL RECOMMENDATIONS

The following general additional recommendations should be considered by Mountain Valley during implementation of the restoration activities.

- Field testing for acidic soils should be performed in all disturbed areas mapped as moderate- to high-risk for sulfide hazard, with appropriate mitigation strategies followed.
- All temporary soil and rock slopes within the LOD should be brought to a permanent design condition as quickly as possible. Two of the six Priority Sites identified in the *Landslide Mitigation Plan* and associated Site-Specific Designs are located within the SCM and BM segments, illustrating the increased geohazard risks within these segments. Permanent stabilization is recommended to include all stabilization measures that have been developed for each priority site and site-specific design at a minimum.

- Slopes of temporary topsoil stockpiles within the LOD should be spread out across the ROW as part of permanent stabilization measures.
- Individual pipe cribbing, ground anchors, and temporary support systems should be reviewed for stability, with particular attention given to potential for ground softening or movement during the remaining duration of use.
- Permanent stabilization is recommended to be performed only once across the segments reviewed. Future redisturbance of areas permanently stabilized will create significantly increased risks of slope instability and loss of sediment from within the LOD due to increased disturbance of undisturbed ground and increased intermixing of highly-organic topsoil with other overburden material.
- Minimization of total duration of any work activity within the segments reviewed is recommended to minimize risks related to slope stability, environmental impacts resulting from transport of sediment from the LOD, and worker safety. Doubling of ground disturbance by temporary or permanent stabilization of the existing conditions, followed by future redisturbance to install pipeline, is expected to significantly increase risks to human health and safety and the environment.

LIMITATIONS

This report represents the results of our Independent Review. The findings and conclusions presented in this report are the result of professional interpretation of the information collected at the time of this study. Findings and conclusions are highly dependent upon documentation provided to Geosyntec by third parties for our review. This evaluation does not include an exhaustive search of all available records nor does it include a detailed assessment of all findings. Environmental and engineering information provided by Mountain Valley or obtained from third party sources (such as agency websites) was reviewed for reasonableness, but was not independently verified. It is important to understand that the conclusions derived herein were based solely on the information provided by Mountain Valley and Geosyntec's observations and that these conclusions could be affected by supplemental documents or further clarifying information. This Independent Review should in no way be implied as an endorsement or approval of any Project documents.

Sincerely,



Christopher Lynch, P.E. (VA)
Project Engineer



Scott Sheridan, P.E. (VA, MD, WV)
Senior Principal



Eric Kovich, P.E. (PA, VA)
Senior Principal

Attachments:

Attachment A – Photographic Record (6 p.)

Attachment B – Mountain Valley Pipeline, Jefferson National Forest – Construction Status, Orderly Shutdown Scenarios, Risks, and Recommendation, dated August 1, 2018 (11 p. with attachment)

Attachment A
Photographic Record

GEOSYNTEC CONSULTANTS
Photographic Record

Client: Mountain Valley

Project Number: NCP2018-2250

Site Name: MVP

Site Location: Jefferson NF, Montgomery County, Virginia

Photograph ID: 1

Date: 8/6/2018

Direction: W

Comments:

Plunge pool outlet, approx. Sta. 11480+70

Note – Stationing referred to in this photographic record corresponds to stationing shown in Project Erosion and Sediment Control Plans, which may not match stationing shown in other Project plans or documents.



Photograph ID: 2

Date: 8/6/2018

Direction: NE

Comments:

Topsoil stockpile, approx. Sta. 11467+00



GEOSYNTEC CONSULTANTS
Photographic Record

Client: Mountain Valley

Project Number: NCP2018-2250

Site Name: MVP

Site Location: Jefferson NF, Montgomery County, Virginia

Photograph ID: 3

Date: 8/6/2018

Direction: N

Comments:

Temporary cut slope, approx. Sta. 11468+00



Photograph ID: 4

Date: 8/6/2018

Direction: SE

Comments:

View from near top of Sinking Creek Mountain toward Brush Mountain.



GEOSYNTEC CONSULTANTS
Photographic Record

Client: Mountain Valley

Project Number: NCP2018-2250

Site Name: MVP

Site Location: Jefferson NF, Montgomery County, Virginia

Photograph ID: 5

Date: 8/6/2018

Direction: E

Comments:
Pipe staged adjacent to temporary cut slopes, approx. Sta. 11529+00.



Photograph ID: 6

Date: 8/6/2018

Direction: S

Comments:
Looking up Brush Mountain segment, approx. Sta. 11540+00



GEOSYNTEC CONSULTANTS
Photographic Record

Client: Mountain Valley

Project Number: NCP2018-2250

Site Name: MVP

Site Location: Jefferson NF, Montgomery County, Virginia

Photograph ID: 7

Date: 8/6/2018

Direction: NW

Comments:

Looking from near top of Brush Mountain toward Sinking Creek Mountain.



Photograph ID: 8

Date: 8/6/2018

Direction: S

Comments:

Silt fence showing evidence of undermining due to stormwater runoff exceeding design storm, approx. Sta. 11577+50



GEOSYNTEC CONSULTANTS
Photographic Record

Client: Mountain Valley

Project Number: NCP2018-2250

Site Name: MVP

Site Location: Jefferson NF, Montgomery County, Virginia

Photograph ID: 9

Date: 8/6/2018

Direction: NW

Comments:
Looking up Sinking Mountain
Segment, approx. Sta. 11495+00



Photograph ID: 10

Date: 8/6/2018

Direction: N

Comments:
Temporary rock slope failure
impacting staged pipe sections,
approx. Sta. 11532+00



GEOSYNTEC CONSULTANTS
Photographic Record

Client: Mountain Valley

Project Number: NCP2018-2250

Site Name: MVP

Site Location: Jefferson NF, Montgomery County, Virginia

Photograph ID: 11

Date: 8/6/2018

Direction: NE

Comments:
Oversized sump collecting discharge from water bars, approx. Sta. 11536+00



Photograph ID: 12

Date: 8/6/2018

Direction: S

Comments:
Two-tiered right-of-way.



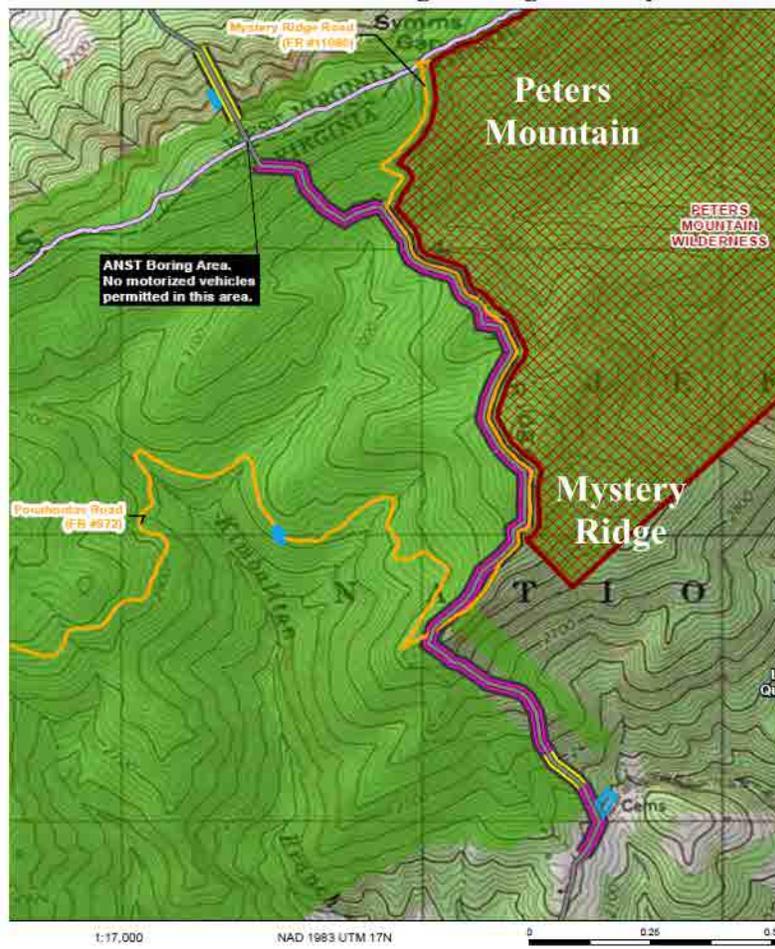
Attachment B
Mountain Valley Pipeline, Jefferson National Forest –
Construction Status, Orderly Shutdown Scenarios,
Risks, and Recommendation, dated August 1, 2018

August 1, 2018

Mountain Valley Pipeline
Jefferson National Forest
Construction Status, Orderly Shutdown Scenarios, Risks, and Recommendation

The MVP crossing of Jefferson National Forest (“JNF”) consists of two segments of right-of-way totaling approximately 3.6 miles along the Mountain Valley Pipeline (“MVP”). The first segment known as Peters Mountain Segment includes approximately 9,211 feet in Giles County, VA and 558 feet in Monroe County, WV (the “JNF Peters Mountain”). The second segment includes approximately 9,810 feet in Montgomery County (“JNF Sinking Creek and Brush Mountain Segment”). JNF Peters Mountain Segment is depicted below:

JNF Peters Mountain Segment Right-of-Way



JNF Peters Mountain has only had tree felling activity on its right-of-way to date. Trees have been hand felled and left laying across the right-of-way. There has been no significant ground disturbance at this point. This area also includes Pocahontas and Mystery Ridge Roads, which have been exposed to light vehicular traffic. E&S controls are installed along the roads and regular maintenance activity is ongoing.

JNF Sinking Creek and Brush Mountain Section are separated by private property where the right-of-way crosses Craig Creek. The JNF Sinking Creek and Brush Mountain Section of right-of-way is depicted below:

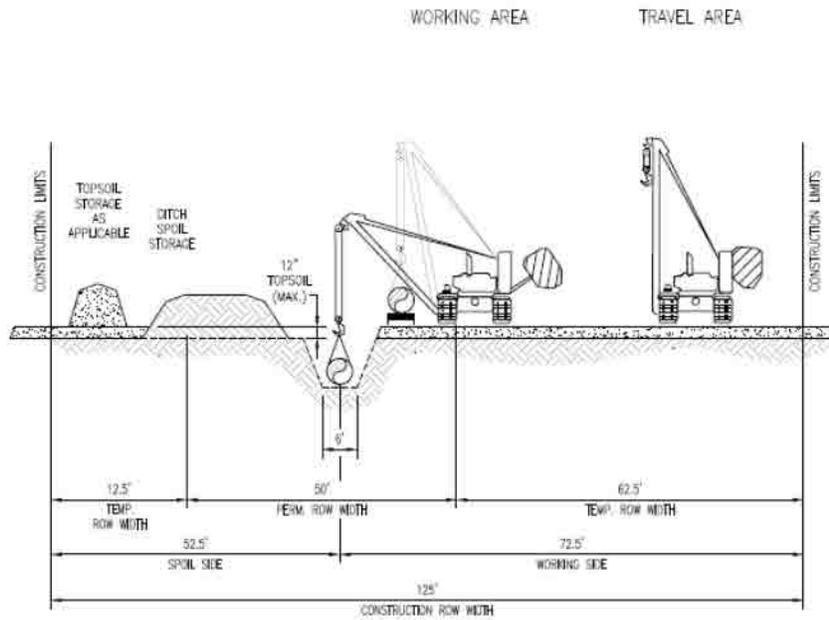
JNF Sinking Creek and Brush Mountain Section Right-of-Way:



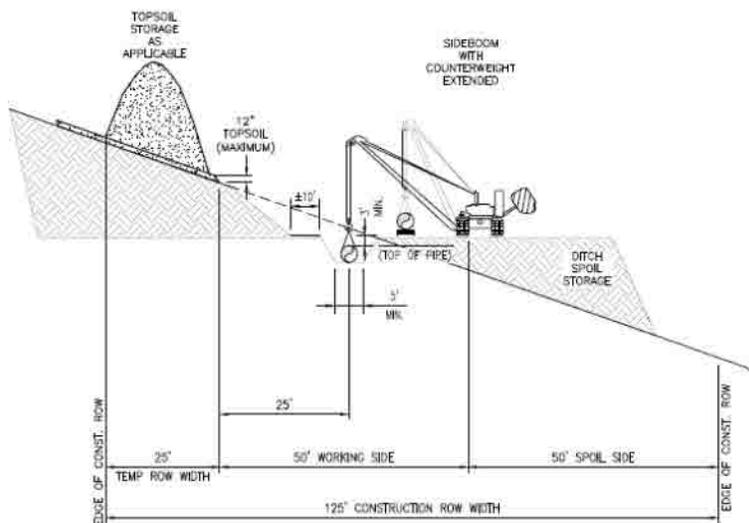
The right-of-way has been fully cleared, graded, and prepared for construction in this entire area. Pipe has been strung and bent in preparation for welding for the entire length of both Sinking Creek and Brush Mountains. All of the pipe necessary to complete the Sinking Creek and Brush Mountain portions of the right-of-way has already been staged and bent along the right-of-way. As of August 1, 2018, no trench has

been dug or pipe installed in the ground. The location of strung and welded pipe segments is depicted on the Alignment Sheets included in Appendix A. The following figures depict the typical right-of-way layouts in a level and side-hill cross section.

TYPICAL RIGHT OF WAY CONSTRUCTION



TYPICAL RIGHT OF WAY CONSTRUCTION – SIDE-HILL LAY



On Brush Mountain, the total welded footage is 1,290 feet and is in (5) different sections. Each of these sections has been temporarily secured to the hillside with an anchoring clamp to limit movement while the trench is excavated. On the top of Brush Mountain there are 20 loose joints of equaling approximately 800 feet of pipe and one (1) four (4) joint section that has been welded together in preparation for crossing the steep narrow ridge. In addition to the welded sections, a total of 79 joints for a total of approximately 3,160 feet have been strung, bent and are sitting on skids waiting to be welded. An anchoring clamp has been placed or pipe has been tied to skids in areas of steep slopes. All pipe that was coated in June or July of 2017 and does not show any signs of UV damage. All pipe in this area is 0.740" wall pipe.

On Sinking Creek Mountain, no welding has occurred to date. An total of 114 joints have been strung, bent, and are sitting on skids for a total of approximately 4,560 feet. Due to the steepness of the slopes on the mountain, the pipe has been strung in four (4) groups going up the mountain eliminating the need for anchors. This technique allows for safer welding and trenching operations in these steep areas. All of this pipe was coated in June or July of 2017 and does not show any signs of UV damage. Again, all the pipe in this area is 0.740" wall pipe.

Below are representative photos of the pipe and welded pipe segments in the right-of-way:

Top of Brush Mountain



Looking North Down Brush Mountain



Looking South Down Sinking Creek Mountain



Looking North Up Sinking Creek Mountain



I. Orderly Shutdown Potential Scenarios

The following includes a discussion of three scenarios to bring construction operations within the JNF to an orderly shut-down status. On the Peters Mountain Section of right-of-way, trees have been hand felled but not yet removed. Stumps and roots remain in place, providing stability of the right-of-way. Minimal additional E&S controls are required to maintain environmental compliance and ensure slope stability in this area. Depending on the length of time until construction is reauthorized, the timber currently laying on the ground that was to be removed and repurposed may no longer be merchantable. Pocahontas and Mystery Ridge Roads will require continued periodic maintenance to replace, upgrade and clean out environmental control devices (“ECD’s”) until the permanent road upgrades can be installed. It is recommended that the Peters Mountain Section of right-of-way remain in its current state until construction is authorized to resume.

The following scenarios is for an orderly shutdown and stabilization of the right-of-way on Sinking Creek and Brush Mountains:

A. Achieve Final Restoration in the Sinking Creek and Brush Mountain Right-of-Way:

Achieving final restoration by the fall of 2018 will allow for vegetation regrowth on the right-of-way before winter. The entire Sinking Creek and Brush Mountain Section is currently graded for construction with pipe strung and welded along the entire length of the right-of-way. The pipe must be lowered into a trench and backfilled prior to implementing final restoration. Subsoil displaced for construction purposes will be restored back to as close to original contours as possible. The top layer of subgrade will be loosened by discing, and topsoil will be disced in to establish a final grade conducive to seed mixes taking root. Seeding and mulching prior to the fall growing season will promote healthy growth on the right-of-way prior to winter.

The following is the anticipated schedule to achieve final restoration in this area.

Schedule to Achieve Final Restoration by 9/17/18:

- Complete Welding: 6 days - start 8/13 (latest possible date)
- Coating: 7 days - start 8/17
- Trenching: 4 days - start 8/20
- Lower In: 5 days - start 8/23
- Tie In / Composite Crew: 20 days - start 8/20
- Restoration: 15 days - start 8/31
- Total Duration: 35 days

This schedule assumes a six-day work week with Sunday utilized as a makeup day for weather and other delays.

With the right-of-way restored to its final state and growth established, minimal maintenance of E&S controls will be required throughout the winter months. Without strung pipe impeding access, MVP will have full access to the right-of-way to maintain ECD’s and address any environmental concerns. Additionally, with the pipe in the ground and backfilled, there is no risk to pipe integrity due to coating degradation or vandalism.

B. Temporarily Stabilize Right-of-Way in its Current State

Temporarily stabilizing the right-of-way includes applying seed and mulch to all areas as graded for construction. Seed and mulch will generally be placed on compacted subsoil instead of loosened/disc'd subsoil and topsoil.

Topsoil is generally segregated and stockpiled on the non-working side of the right-of-way. Due to pipe strung along the trench line, topsoil is not currently accessible in most locations. Equipment access to the non-working side for environmental maintenance is also limited.

The following are risks to implementing temporary stabilization measures for an extended period of time:

1. Growth will be limited going into the winter season. Seed and mulch will generally be placed on compacted subsoil, which will hinder growth. While it is possible to attain short term growth in subsoil, long term growth that is resilient in winter conditions is not likely. Temporarily stabilized soils are more susceptible to erosion and sediment loss than final restored conditions. Not installing the permanent ECDs and establishing vegetation puts erosion events at a greater likelihood.
2. Pipe segments strung along the right-of-way impede access for ECD maintenance. The travel lane is located on the working side of the right-of-way. With pipe strung on the right-of-way, access to the right-of-way on the non-working side is limited. Area under the pipe is also inaccessible by equipment. ECD maintenance is generally performed by hand in these areas, to the extent possible. For the relatively short timeframe that pipe is typically strung along the right-of-way, hand maintenance of ECD's is a manageable approach to maintaining environmental controls. Over an extended period of time, it is difficult to properly maintain these ECD's without the use of equipment.
3. Required E&S maintenance will compound erosion and sediment problems. A temporarily stabilized right-of-way will require significantly more maintenance than a fully restored right-of-way. Each time MVP must revisit the right-of-way to address an environmental concern, additional environmental concerns may be created. For example, accessing the right-of-way with equipment will require water bars to be removed, and will likely damage previously seeded and mulched areas. Under wet conditions, water bars will be difficult to replace and compact to withstand future rain events.
4. Landslide mitigation measures designed for this location cannot installed. MVP prepared a plan titled "Site Specific Design of Stabilization Measures in Selected High-Hazard Portions of the Route of the Mountain Valley Pipeline in the Jefferson National Forest." This plan identified high-risk geotechnical areas within the JNF, including six locations on Brush Mountain. The mitigation measures identified in this plan include installing surface water control measures, subsurface drainage measures, and implementing field-identified solutions by geotechnical

engineers during construction. These measures cannot be installed until the pipeline is installed and backfilled.

The plan also recommends “constructing in a timely fashion to reduce the amount of time when the limit of disturbance is exposed to the elements and not under final grade.” Temporary stabilization without returning the right-of-way to final grade puts these high-hazard, steep slope areas at an elevated risk of geotechnical failures.

5. Pipe segments strung along the right-of-way poses a safety risk in the long run. Pipe segments staged on cribbing are intended to be temporary in nature for the purpose of welding and staging pipe prior to lowering into the trench. Over time, the ground the cribbing rests on may be compromised. Without continuous monitoring and maintenance via the use of heavy equipment, cribbing could fail causing pipe segments to roll down a slope and/or off right-of-way.
6. Pipe segments strung along the right-of-way for an extended period of time is subject to UV damage to the coating. Pipe staged in a storage yard is typically stacked and can be systematically rotated to minimize the UV exposure to any given joint of pipe. Pipe strung along the right-of-way cannot be moved “to the bottom of the pile” to remove it from UV damage. Therefore, the coating will continuously degrade while staged on the right-of-way. None of the pipe currently staged on the right-of-way is expected to fall below the minimum specification for at least 12 months. In addition to the UV exposure, pipe left above the ground is subject to other point source damage due to vehicle traffic and tools during maintenance of ECD’s and cribbing.
7. Uncoated welds are subject to corrosion. There are 28 welds completed on Brush Mountain that have not been epoxy coated in the field. Each weld has approximately one foot of bare metal exposed for the circumference of the pipe. These uncoated welds should not be left exposed to the elements because if left for an extended period of time they are subject to corrosion.
8. Pipe segments strung along the right-of-way for an extended period of time is subject to a higher risk of vandalism. Both sections of the JNF right-of-way have been targeted areas by anti-pipeline activists. Pipe staged on the right-of-way for an extended timeframe increases the likelihood of vandalism.

Schedule to Temporarily Stabilize Right-of-Way in its Current State
Seed and Mulch: 7 days start as soon as possible
Total Duration: 7 days

C. Remove Pipe and Equipment and Restore Right-of-Way

This scenario examines the removal of pipe from the right-of-way so that it can be accessed. It is not practical to remove all pipe at this stage. There are five segments of welded pipe ranging from 160' to over 500' in length that cannot be removed assembled from the mountain. Removing the additional 236 unwelded joints strung along Sinking Creek and Brush Mountains would require approximately 158 truckloads. This is nearly double the loads required to haul the pipe into the right-of-way. The pipe has now been bent and multiple joints cannot be efficiently and safely stacked on a trailer causing additional traffic on Craig Creek Road and State Route 460.

The following are risks to removing the pipe prior to stabilizing the right-of-way:

1. Equipment and truck traffic to remove pipe more than doubles the planned exposure to environmental resources compared to the original construction plan. Multiple waterbodies, including Craig Creek, are crossed when entering Brush Mountain and Sinking Creek Mountain from Craig Creek Road. The equipment crossings at these locations will be used up to an additional 316 times by pipe hauling trucks alone, plus added crossings for equipment required to handle and load the pipe. In addition, water bars and other ECD's along the right-of-way will be compromised by the continuous hauling traffic, which will more than double the traffic expected from when originally stringing the pipe.
2. Double handling of soils to temporarily restore final grade will increase topsoil and subsoil mixing and compromise the integrity of the soils for establishing long term growth. Topsoil was segregated from subsoil when the right-of-way way was graded for construction. When the right-of-way is restored, topsoil will be disced in with subsoil, resulting in mixing. When the right-of-way is stripped again to complete construction, soils will undergo more mixing, further degrading the topsoil and hindering regrowth during final restoration after construction is completed.
3. Landslide mitigation measures for the right-of-way are designed work with pipe installed in the ground. These site-specific designs contemplate a trench being dug and backfilled, and the management of subsurface waters in and around the trench. Slide mitigation designs such as trench breaker drains collect water behind a sand bag breaker built in the trench and divert water off right-of-way via drain pipe. Landslide mitigation measures without a trench to which water will naturally flow and collect will require re-evaluation and additional design considerations not currently included in MVP's landslide mitigation plan. The mitigation measures identified in this plan include installing surface water control measures, subsurface drainage measures, and implementing field-identified solutions by geotechnical engineers during construction. In addition, field identified solutions may be identified by geotechnical engineers during construction and will implemented. These measures cannot be installed until the pipeline is installed and backfilled.

4. Temporarily restoring the right-of-way to final grade without installing the pipe will increase the overall environmental exposure. Restoring the right-of-way to final grade involves removing previously placed ECD's and compacted soils to achieve the original contours. When construction is completed at a later date, the soils will be excavated and stored again along with ECD's. Each time the soil is moved and ECD's are removed and replaced, there is a risk of an environmental impact. Building and restoring the right-of-way twice results in at least twice the environmental exposure.
5. Hauling pipe off right-of-way requires additional handling and exposes the pipe to undue damage. Handling the pipe on the right-of-way, potentially results in damage to the coating and pipe. Best construction practices include minimizing the handling of pipe.
6. The time and level of activity on the right-of-way to remove the pipe and restore to final grade is anticipated to be the same or longer than to install the pipe and restore to final grade. Due to the additional loads and complexity of the logistics of transporting and storing the previously bent pipe, the pipe could be installed with a lesser environmental impact in the same amount of time than it would take to remove the pipe.

Schedule to Remove Pipe and Equipment and Restore Right-of-Way

Coating for 1,290' section – start 8/13 - 1 day

Trenching for 1,290' section – start 8/14 - 1 day

Lower in and backfill 1,290' welded section: start 8/15 - 3 days

Remove Strung Pipe: start 8/13 - 24 days

Restoration: start 8/31 - 15 days

Subtotal to remove pipe and restore right of way – 35 days

Rebuild Right of Way, re-string pipe, install pipe, and restoration – 75 days

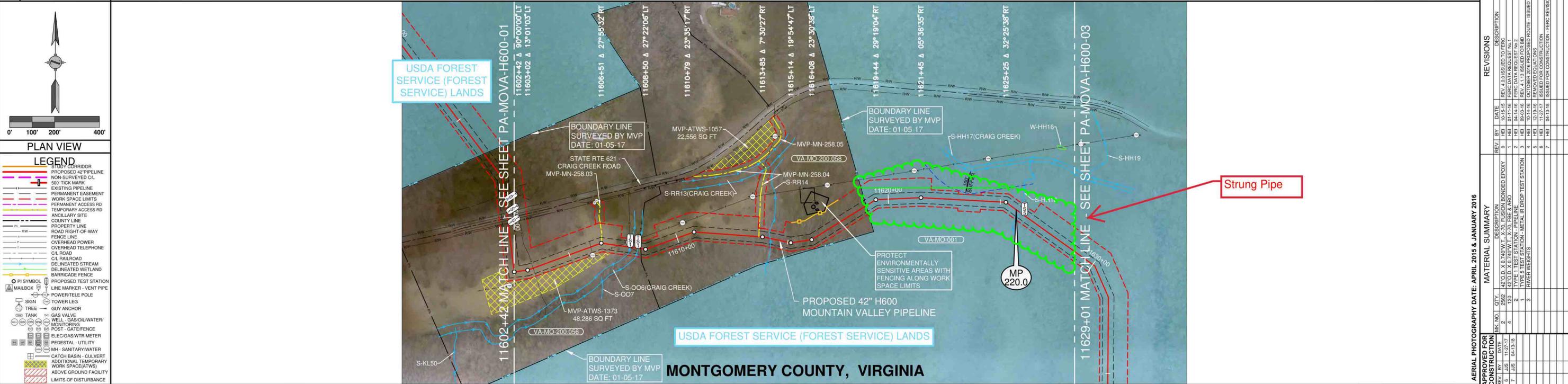
Total Option 3 Duration – 110 days

II. MVP Recommendation

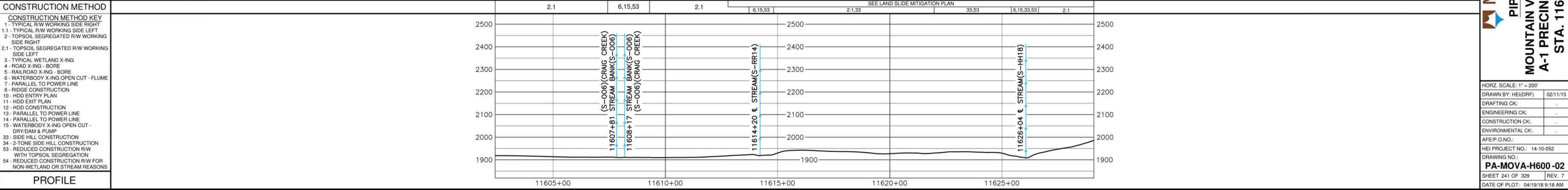
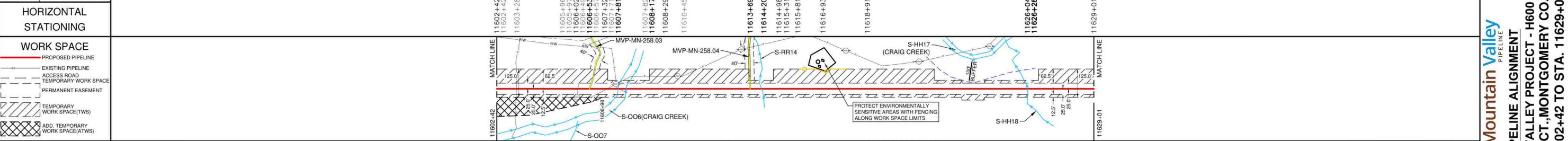
Welding, installation, and backfilling will take less time than removing pipe from the right-of-way. Installing the pipe strung on the right-of-way results in the overall least environmental impacts considering the current state of the right-of-way and will yield the highest likelihood of revegetation success resulting in minimal E&S maintenance and erosion events.

APPENDIX A

RIGHT-OF-WAY & OWNERSHIP DATA		VA-MO-200.056		VA-MO-200.058		VA-MO-001	
DESIGN	PIPE / COATING	2	4	2	4	2	4
	SLOPE DISTANCE	539'	40'	583'	40'	1153'	287'
	CLASS LOCATION / HCA	1					
ENVIRONMENTAL	CONSTRUCTION EXCLUSION	T.O.Y.R.: NO CLEARING JUNE 1 - JULY 31 SEE TREE CLEARING PLAN FOR FURTHER DETAILS		T.O.Y.R.: NO CONSTRUCTION WITHIN STREAMS S-006 & S-RR14 MARCH 1ST - JULY 31ST & FISH RELOCATION REQUIRED CONSULT RESPONSIBLE E.I.		TIME OF YEAR RESTRICTION: NO CLEARING JUNE 1 - JULY 31 SEE TREE CLEARING PLAN FOR FURTHER DETAILS	
	WETLAND / STREAM	S-O06 36 LF		S-RR14 7 LF		S-HH18 6 LF	



APPROVED FOR CONSTRUCTION	APPROVED FOR BIDDING	APPROVED FOR PERC
REV. 01-15-18	REV. 01-15-18	REV. 01-15-18
DESCRIPTION: REVISED PERC DATA	DESCRIPTION: REVISED PERC DATA	DESCRIPTION: REVISED PERC DATA
DATE: 01-15-18	DATE: 01-15-18	DATE: 01-15-18
BY: H.EI	BY: H.EI	BY: H.EI
FOR: H.EI	FOR: H.EI	FOR: H.EI



CONSTRUCTION METHOD	CONSTRUCTION METHOD KEY
1 - TYPICAL R/W WORKING SIDE RIGHT	1 - TYPICAL R/W WORKING SIDE RIGHT
1.1 - TYPICAL R/W WORKING SIDE LEFT	1.1 - TYPICAL R/W WORKING SIDE LEFT
2 - TOPSOIL SEGREGATED R/W WORKING SIDE RIGHT	2 - TOPSOIL SEGREGATED R/W WORKING SIDE RIGHT
2.1 - TOPSOIL SEGREGATED R/W WORKING SIDE LEFT	2.1 - TOPSOIL SEGREGATED R/W WORKING SIDE LEFT
3 - TYPICAL WETLAND X-ING	3 - TYPICAL WETLAND X-ING
4 - ROAD X-ING - BORE	4 - ROAD X-ING - BORE
5 - RAILROAD X-ING - BORE	5 - RAILROAD X-ING - BORE
6 - WATERBODY X-ING OPEN CUT - FLUME	6 - WATERBODY X-ING OPEN CUT - FLUME
7 - PARALLEL TO POWER LINE	7 - PARALLEL TO POWER LINE
8 - RIDGE CONSTRUCTION	8 - RIDGE CONSTRUCTION
10 - HDD ENTRY PLAN	10 - HDD ENTRY PLAN
11 - HDD EXIT PLAN	11 - HDD EXIT PLAN
12 - HDD CONSTRUCTION	12 - HDD CONSTRUCTION
13 - PARALLEL TO POWER LINE	13 - PARALLEL TO POWER LINE
14 - PARALLEL TO POWER LINE	14 - PARALLEL TO POWER LINE
15 - WATERBODY X-ING OPEN CUT - DRY/DAM & PUMP	15 - WATERBODY X-ING OPEN CUT - DRY/DAM & PUMP
33 - SIDE HILL CONSTRUCTION	33 - SIDE HILL CONSTRUCTION
34 - 2 TONE SIDE HILL CONSTRUCTION	34 - 2 TONE SIDE HILL CONSTRUCTION
53 - REDUCED CONSTRUCTION R/W WITH TOPSOIL SEGREGATION	53 - REDUCED CONSTRUCTION R/W WITH TOPSOIL SEGREGATION
54 - REDUCED CONSTRUCTION R/W FOR NON-WETLAND OR STREAM REASONS	54 - REDUCED CONSTRUCTION R/W FOR NON-WETLAND OR STREAM REASONS



REV	BY	DATE	DESCRIPTION
0	HEI	05-15-18	REV. 4.0.0 ISSUED TO PERC
1	HEI	01-11-18	PERC DATA REQUEST NO. 1
2	HEI	09-04-18	REV. 4.1.13 ISSUED FOR BID
3	HEI	10-14-18	OCTOBER 2018 PROPOSED ROUTE - ISSUED TO PERC
4	HEI	12-19-18	REVISED EASEMENTS
5	HEI	04-13-19	ISSUED FOR CONSTRUCTION - PERC REVISION REQUEST

REV	BY	DATE	DESCRIPTION
0	HEI	05-15-18	REV. 4.0.0 ISSUED TO PERC
1	HEI	01-11-18	PERC DATA REQUEST NO. 1
2	HEI	09-04-18	REV. 4.1.13 ISSUED FOR BID
3	HEI	10-14-18	OCTOBER 2018 PROPOSED ROUTE - ISSUED TO PERC
4	HEI	12-19-18	REVISED EASEMENTS
5	HEI	04-13-19	ISSUED FOR CONSTRUCTION - PERC REVISION REQUEST

MOUNTAIN VALLEY PIPELINE
PIPELINE ALIGNMENT
MOUNTAIN VALLEY PROJECT - H600 LINE
A-1 PRECINCT., MONTGOMERY CO., VA.
STA. 11602+42 TO STA. 11629+01

Technical Memorandum

Date: 11 September 2018
To: Mr. Joseph Dawley, EQT Corporation
From: Mr. Scott Sheridan, P.E. (VA), Geosyntec Consultants
Mr. Eric Kovich, P.E. (VA), Geosyntec Consultants
Subject: Stormwater Hydrology Modeling for Waterbar Drainage Area
Mountain Valley Pipeline, Jefferson National Forest, Virginia

The purpose of this stormwater hydrology model analysis is to evaluate the stormwater runoff from a drainage area located on the right-of-way (ROW) in the Jefferson National Forest for the Mountain Valley Pipeline Project (Project) in a steep slope condition under three different scenarios. These scenarios include (1) pre-existing conditions, (2) a temporarily stabilized condition with temporary vegetation, and (3) the initial stage of the permanently stabilized condition with the Restoration Plan in place. The model was conducted on a conceptual section of the ROW using a small drainage area between waterbars for comparison purposes and is not intended to reflect the full stormwater management design approved for the Project.

HYDROLOGIC ANALYSIS

Attached to this technical memorandum are three exhibits identifying the three scenarios that are modelled. The first scenario is a predeveloped condition, assuming forested ground cover prior to construction of the ROW. The second scenario is a temporarily stabilized condition for the 125-foot wide ROW with the appropriate erosion and sediment control devices (ECDs) in place. The third scenario is the initial stage of the permanently stabilized condition in which the ROW consists of a 50-foot wide grassed strip centered on the pipeline with the remaining portion of the ROW planted to achieve a reforested condition per the approved Restoration Plan. Drawings illustrating these scenarios are attached as Exhibit 1.

These three scenarios were modelled using HydroCAD software for the 2-, 10-, and 25-year, 24-hour precipitation events. The ground cover for each condition was modelled with the following parameters.

I. EXISTING SITE CHARACTERISTICS

The existing site area is forested, mountainous terrain with steep slopes on either side of Craig Creek Road leading up to ridge tops. The ROW generally consists of a side slope condition with ground sloping up on one side and down on the other, or the ROW runs along a ridge with both sides sloping down to existing ground.

Figure 1 is a representative photograph of a hillside section along the ROW that is consistent with the modeling conducted for this analysis.



Figure 1
Example of Waterbar Alignment on Hillside Section

Existing Soil Characteristics

The soil along the Brush Mountain ROW is generally Jefferson extremely stony soils, 7 to 25 percent slopes, hydrologic soil group (HSG) A. The soil along the Sinking Creek ROW is generally Berks and Weikert soils, 25 to 65 percent slopes, hydrologic soil groups B and D. A typical soil profile for the Jefferson extremely stony soils is

II. HYDROLOGIC CALCULATION METHODOLOGY

Under the three proposed scenario, flows were determined using the National Resources Conservation Service (NRCS) method, which is dependent on the soil's ability to absorb a certain amount of precipitation before runoff begins. This ability is categorized based on a Hydrologic Soil Group (HSG). The hydrologic calculations were performed using HydroCAD® micro-computer program, the results of which are attached as Exhibit 2. The following list details the assumptions used in determining the flows for each identified outfall.

1. The estimated surface runoff used the NRCS curve number (CN) method. The assumed CN values are presented below:

Table 1
Curve Numbers, CN

Description	HSG	Curve Number, CN
Grass Cover 50-75%	C	79
Woods, good	C	70
Woods, fair	C	73
Fallow, bare soil	C	91

2. The annual 2-, 10-, and 25-year, 24-hour precipitation data using a Type II 24-hour rainfall distribution in accordance with geographic boundaries are 2.80, 4.10, and 4.90 inches per NOAA Atlas 14, Volume 2, Version 3, Location name: Blacksburg, Virginia, US, Latitude: 37.3147, Longitude: -80.4036.
3. The drainage area is contained within the ROW between waterbars and equals 0.26 acres for each of the three conditions.
4. The time of concentration, T_c , was set to 5.0 due to the small drainage area.

Based on the assumptions and inputs stated above, the peak stormwater discharges were modeled for each of the three scenarios. The results of the modeling are summarized in **Table 2** below.

Table 2
Model Results Summary

<i>Scenario</i>	<i>2-Year Storm Discharge Flow (cfs)</i>	<i>10-Year Storm Discharge Flow (cfs)</i>	<i>25-Year Storm Discharge Flow (cfs)</i>
1 – Pre-Existing	0.21	0.53	0.76
2 – Temporary Stabilization	0.71	1.14	1.41
3 – Permanent Stabilization	0.31	0.67	0.92

CONCLUSIONS

The hydrologic modeling was performed on the three ROW scenarios to evaluate the difference between temporary and permanent stabilization. Stormwater discharge from the initial stages of the permanent stabilization condition most closely matches the discharge under the pre-existing scenario. Stormwater discharge for the initial stages of permanent stabilization is closer to pre-existing conditions for the following reasons:

- Vegetation is best established under a permanent stabilization condition;
- Permanent stabilization includes a sheet flow condition as opposed to concentrating runoff with a waterbar; and
- Permanent stabilization includes grading the ROW to slopes that more closely match pre-existing conditions (i.e., slopes are shallower on the edges of the ROW).

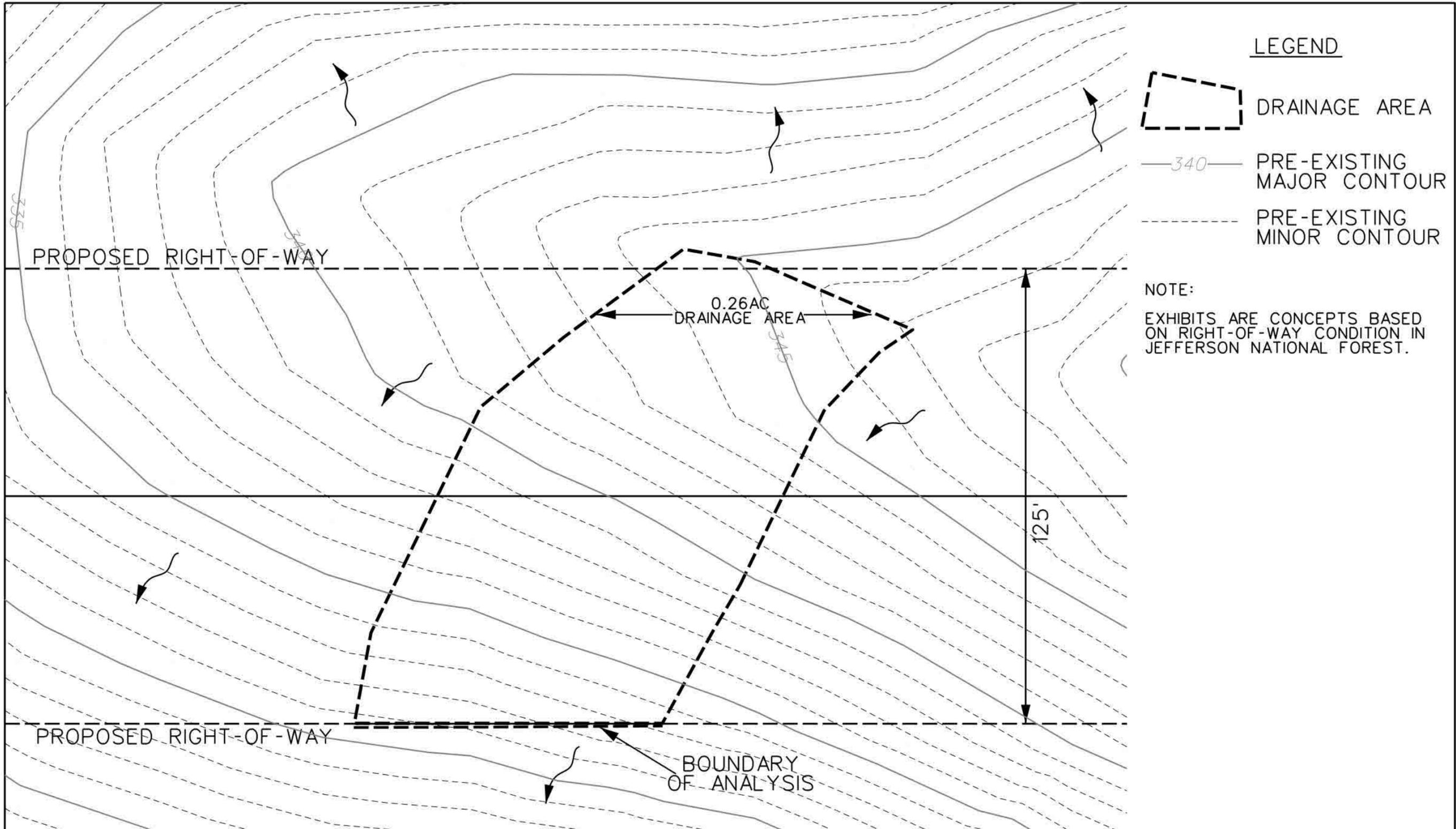
Exhibits:

Exhibit 1 - Drawings

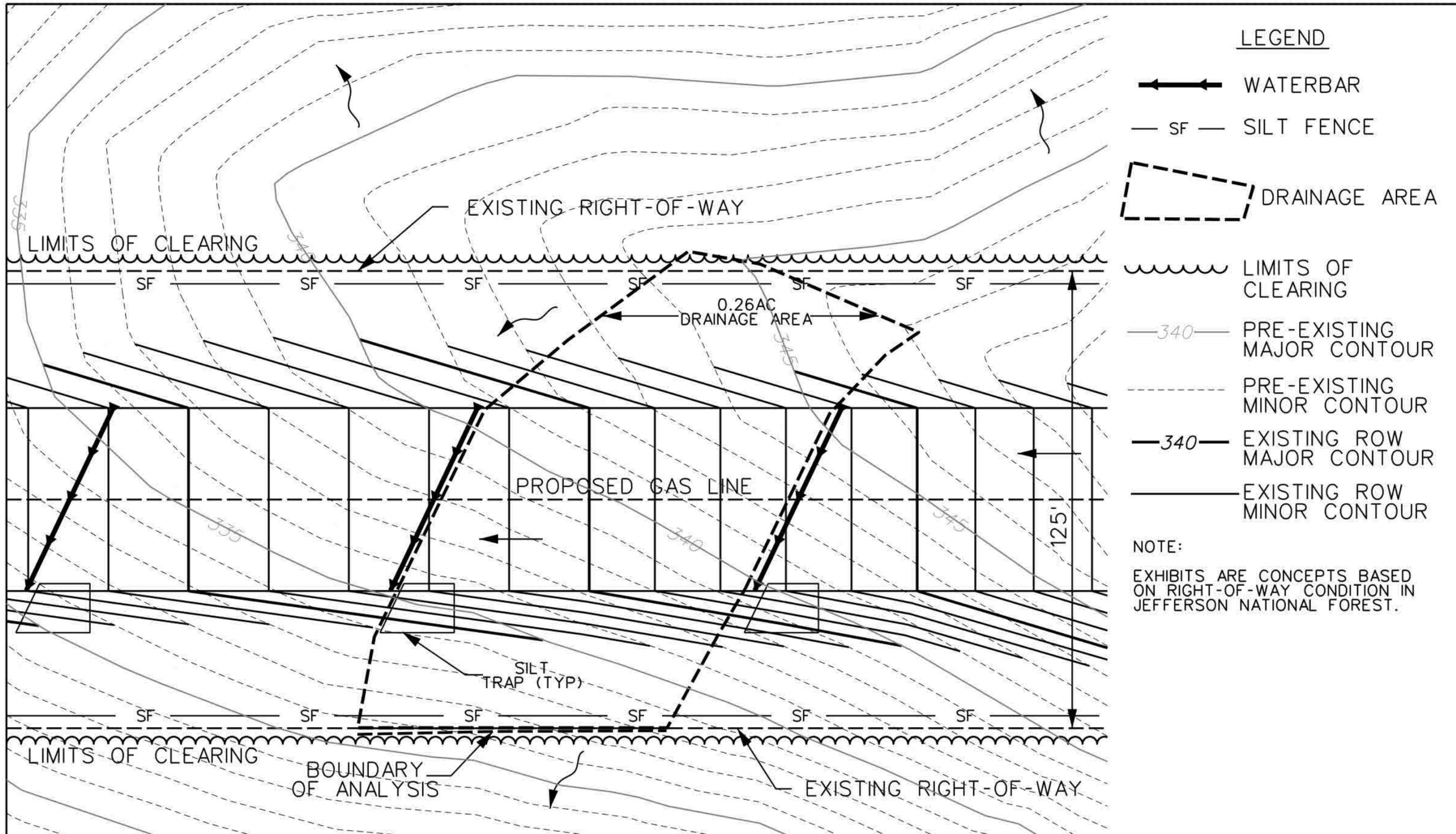
Exhibit 2 - HydroCAD Output

EXHIBIT 1

DRAWINGS



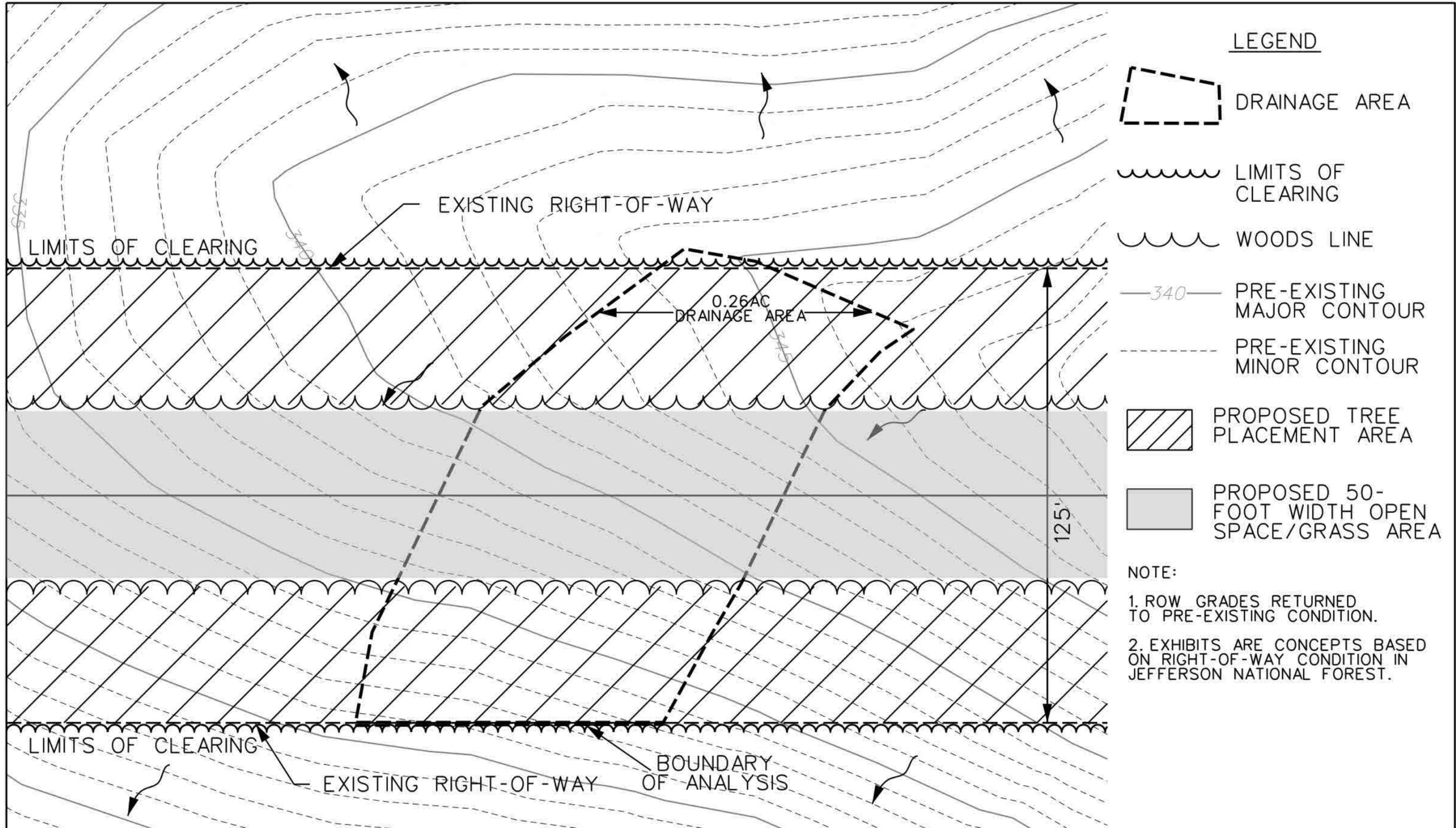
Project No.		MV1674	PRE-EXISTING CONDITION (WOODED)	Figure No.
Drawn by:	YHH			1
Date:	09/10/18			
Scale:	N.T.S.			

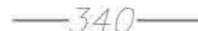
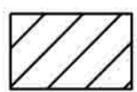
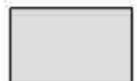


- LEGEND**
- ←←← WATERBAR
 - SF — SILT FENCE
 - ▭ DRAINAGE AREA
 - ~~~~~ LIMITS OF CLEARING
 - 340 — PRE-EXISTING MAJOR CONTOUR
 - PRE-EXISTING MINOR CONTOUR
 - 340 — EXISTING ROW MAJOR CONTOUR
 - EXISTING ROW MINOR CONTOUR

NOTE:
 EXHIBITS ARE CONCEPTS BASED ON RIGHT-OF-WAY CONDITION IN JEFFERSON NATIONAL FOREST.

Drawn by: YHH		Project No. MV1674	TEMPORARY STABILIZATION CONDITION	Figure No. 2
Date: 09/10/18				
Scale: N.T.S.				

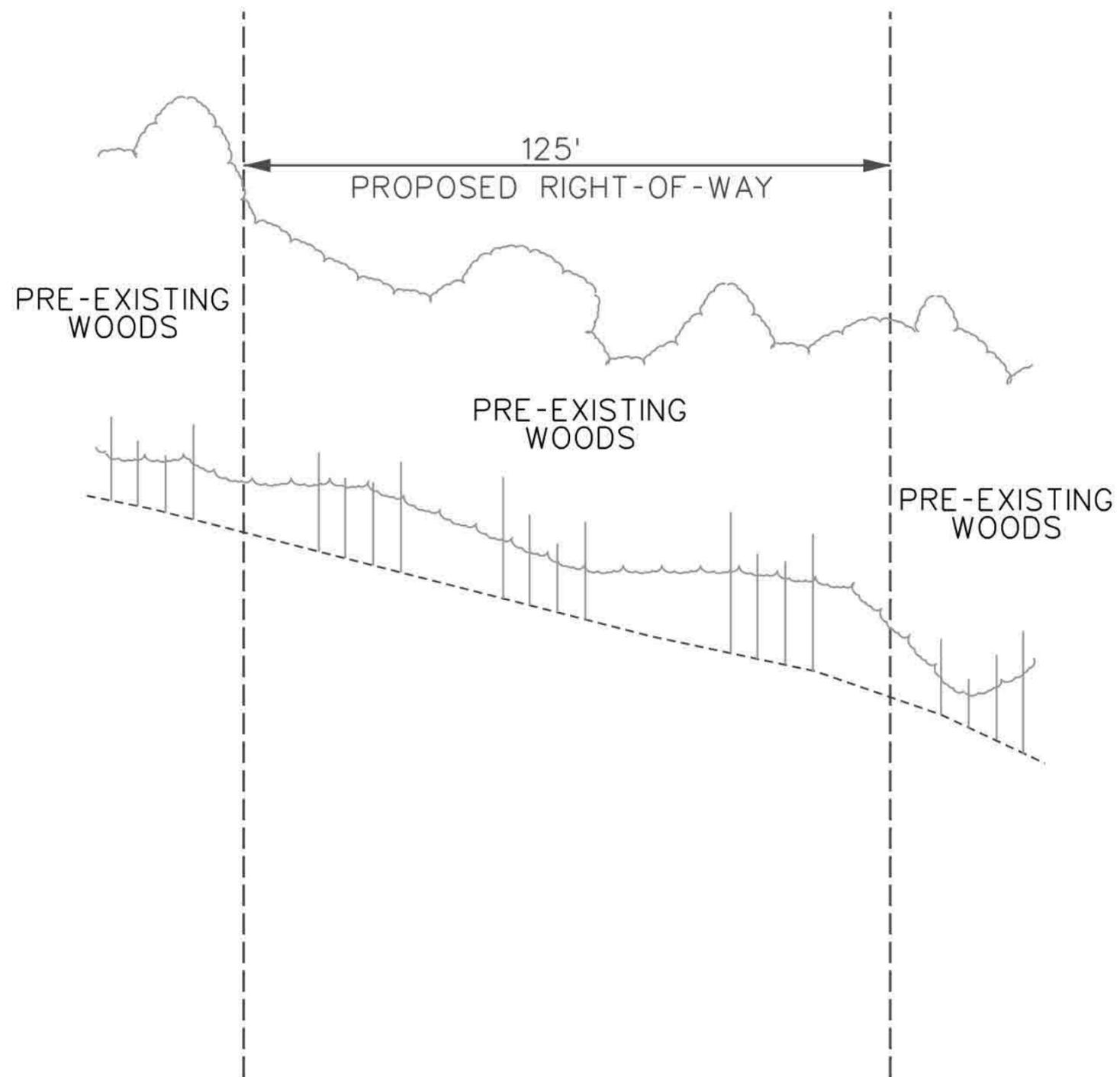


- LEGEND**
-  DRAINAGE AREA
 -  LIMITS OF CLEARING
 -  WOODS LINE
 -  340 PRE-EXISTING MAJOR CONTOUR
 -  PRE-EXISTING MINOR CONTOUR
 -  PROPOSED TREE PLACEMENT AREA
 -  PROPOSED 50-FOOT WIDTH OPEN SPACE/GRASS AREA

NOTE:

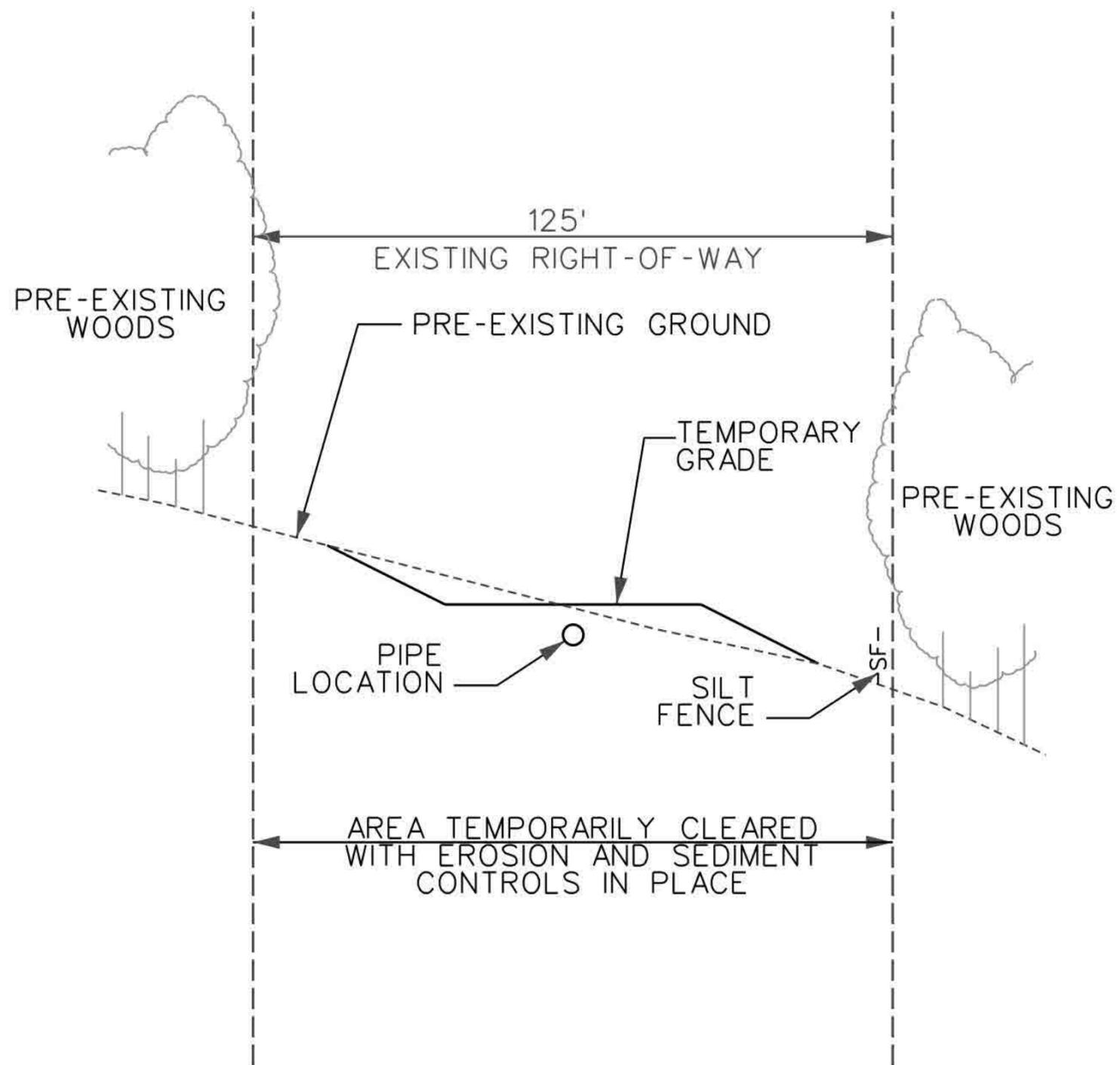
1. ROW GRADES RETURNED TO PRE-EXISTING CONDITION.
2. EXHIBITS ARE CONCEPTS BASED ON RIGHT-OF-WAY CONDITION IN JEFFERSON NATIONAL FOREST.

Drawn by: YHH		Project No. MV1674	PERMANENTLY STABILIZED CONDITION	Figure No. 3
Date: 09/10/18				
Scale: N.T.S.				



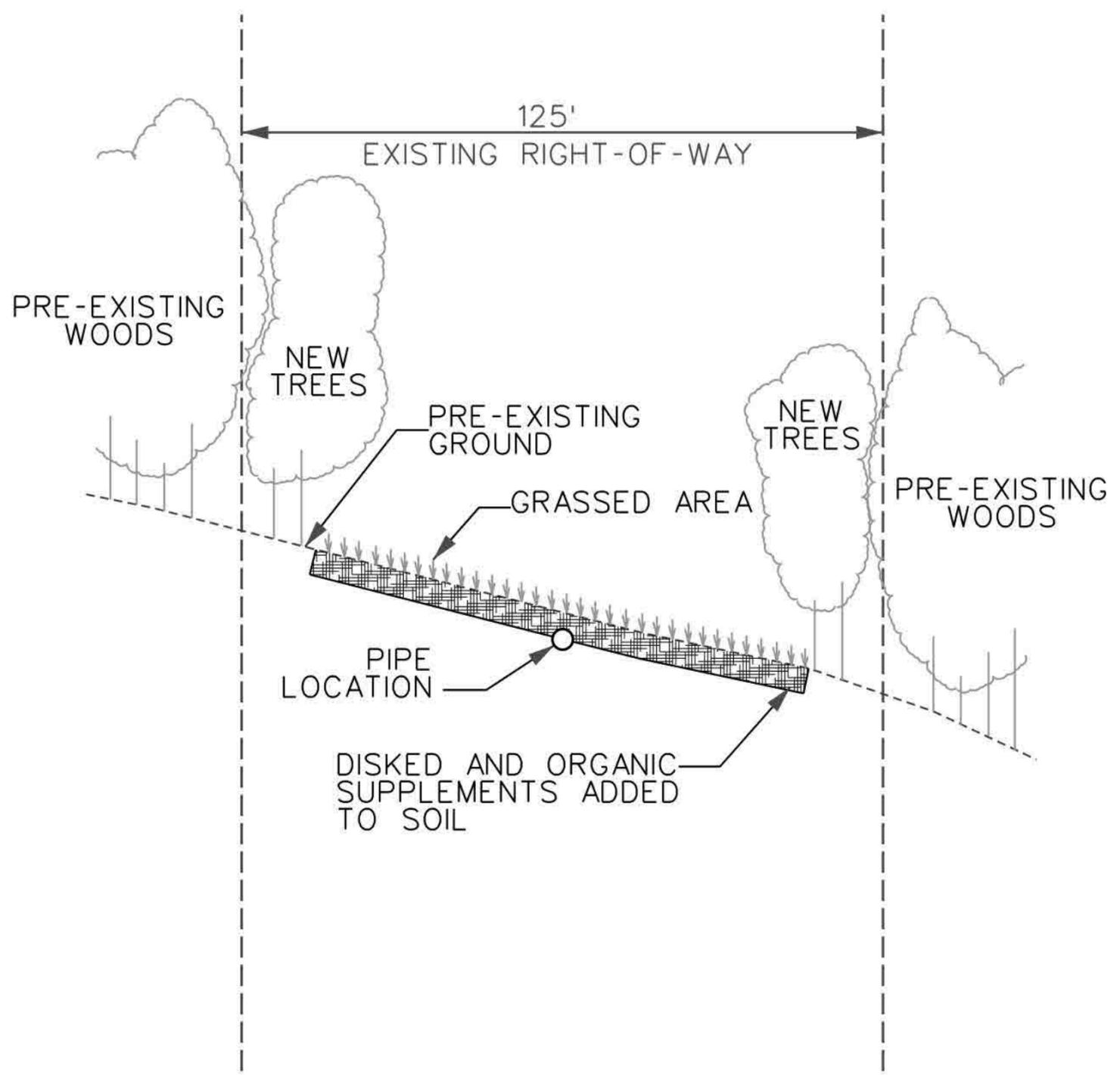
NOTE:
 EXHIBITS ARE CONCEPTS BASED
 ON RIGHT-OF-WAY CONDITION IN
 JEFFERSON NATIONAL FOREST.

Project No.		MV1674	PRE-EXISTING SECTION (WOODED)	Figure No.
Drawn by:	YHH			1A
Date:	09/10/18			
Scale:	NTS			



NOTE:
 EXHIBITS ARE CONCEPTS BASED
 ON RIGHT-OF-WAY CONDITION IN
 JEFFERSON NATIONAL FOREST.

Project No.		TEMPORARY STABILIZATION CONDITION SECTION	Figure No. 1B
Drawn by:	YHH		
Date:	09/10/18		
Scale:	NTS	MV1674	



NOTE:
EXHIBITS ARE CONCEPTS BASED
ON RIGHT-OF-WAY CONDITION IN
JEFFERSON NATIONAL FOREST.

Project No.		PERMANENTLY STABILIZATION CONDITION SECTION	Figure No. 1C
Drawn by:	YHH		
Date:	09/10/18		
Scale:	NTS	MV1674	

EXHIBIT 2

HYDROCAD OUTPUT

Summary for Subcatchment EX.: PRE-EXISTING CONDITION

Runoff = 0.21 cfs @ 12.13 hrs, Volume= 0.012 af, Depth> 0.55"

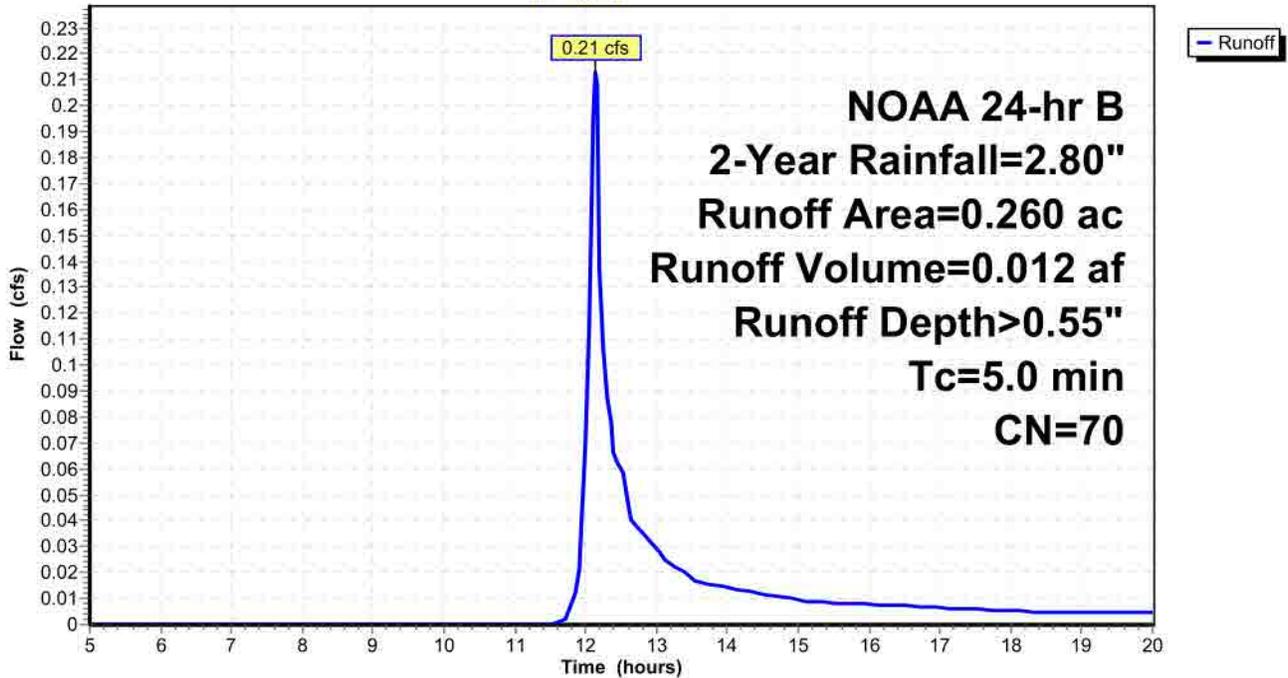
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 NOAA 24-hr B 2-Year Rainfall=2.80"

Area (ac)	CN	Description
0.260	70	Woods, Good, HSG C
0.260		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Subcatchment EX.: PRE-EXISTING CONDITION

Hydrograph



Summary for Subcatchment TEMP.: TEMPORARY STABILIZATION

Runoff = 0.71 cfs @ 12.11 hrs, Volume= 0.039 af, Depth> 1.78"

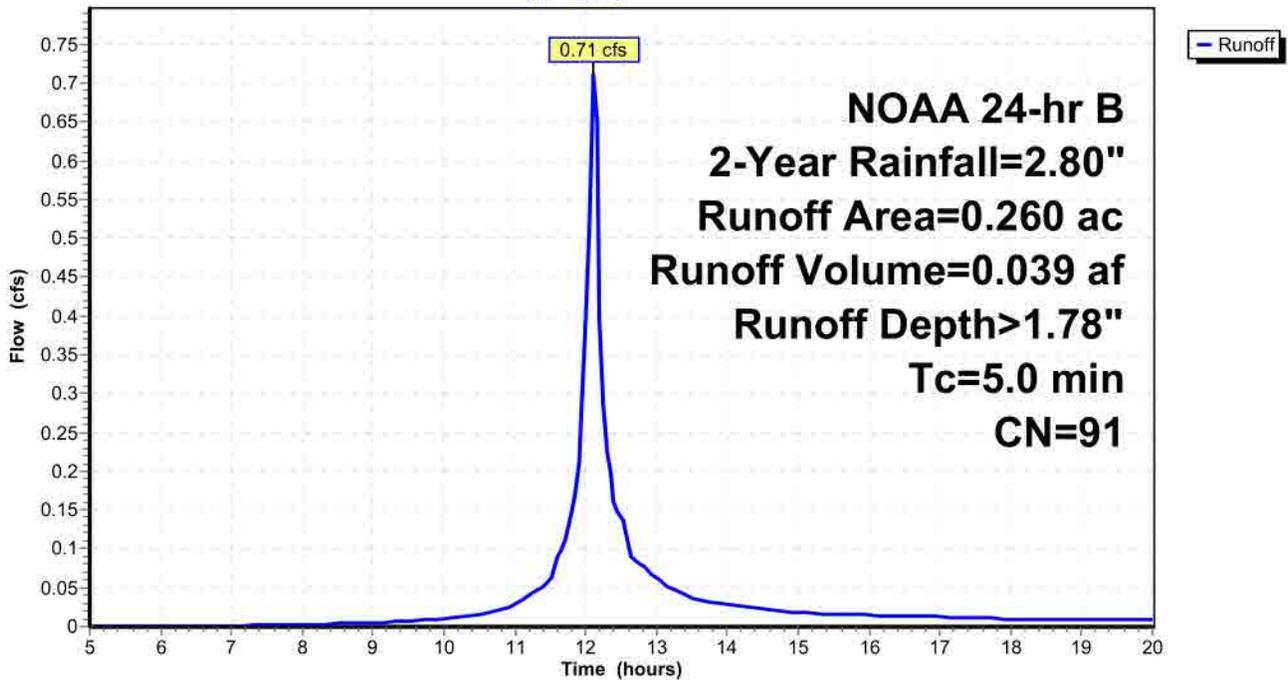
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 NOAA 24-hr B 2-Year Rainfall=2.80"

Area (ac)	CN	Description
0.260	91	Fallow, bare soil, HSG C
0.260		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Subcatchment TEMP.: TEMPORARY STABILIZATION

Hydrograph



Summary for Subcatchment PROP.: PERMANENT STABILIZATION

Runoff = 0.31 cfs @ 12.13 hrs, Volume= 0.017 af, Depth> 0.76"

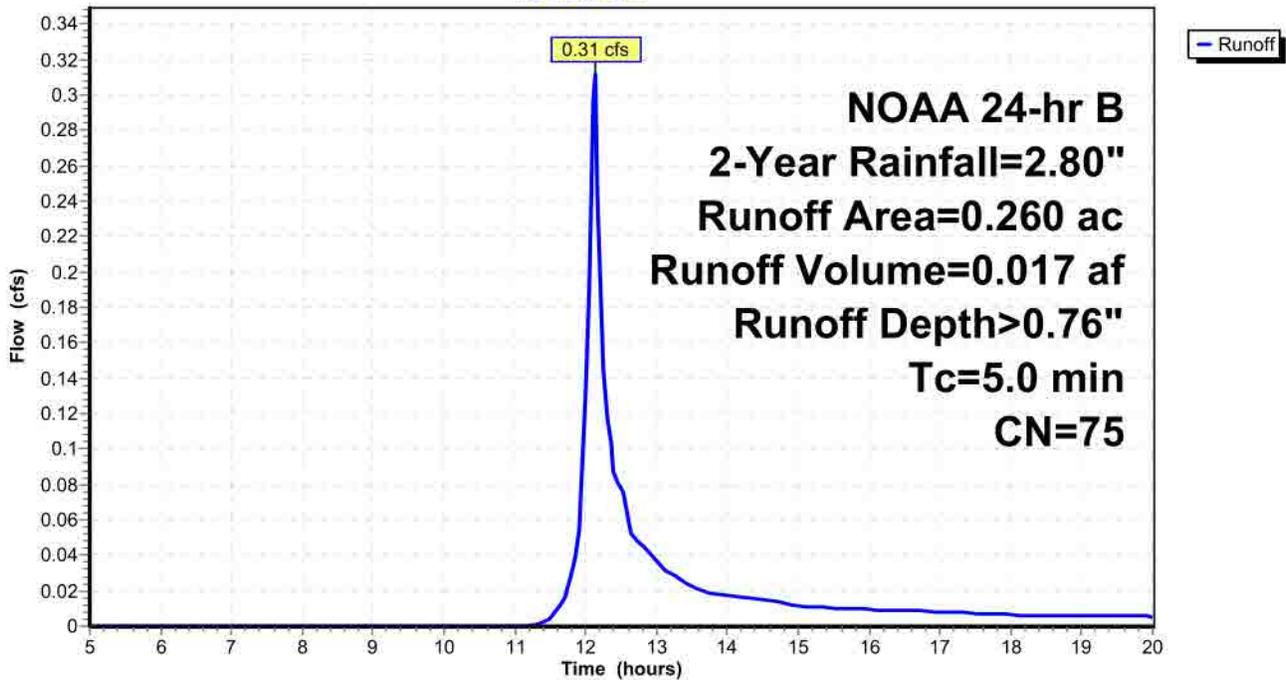
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 NOAA 24-hr B 2-Year Rainfall=2.80"

Area (ac)	CN	Description
0.100	79	50-75% Grass cover, Fair, HSG C
0.160	73	Woods, Fair, HSG C
0.260	75	Weighted Average
0.260		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Subcatchment PROP.: PERMANENT STABILIZATION

Hydrograph



Summary for Subcatchment EX.: PRE-EXISTING CONDITION

Runoff = 0.53 cfs @ 12.12 hrs, Volume= 0.028 af, Depth> 1.29"

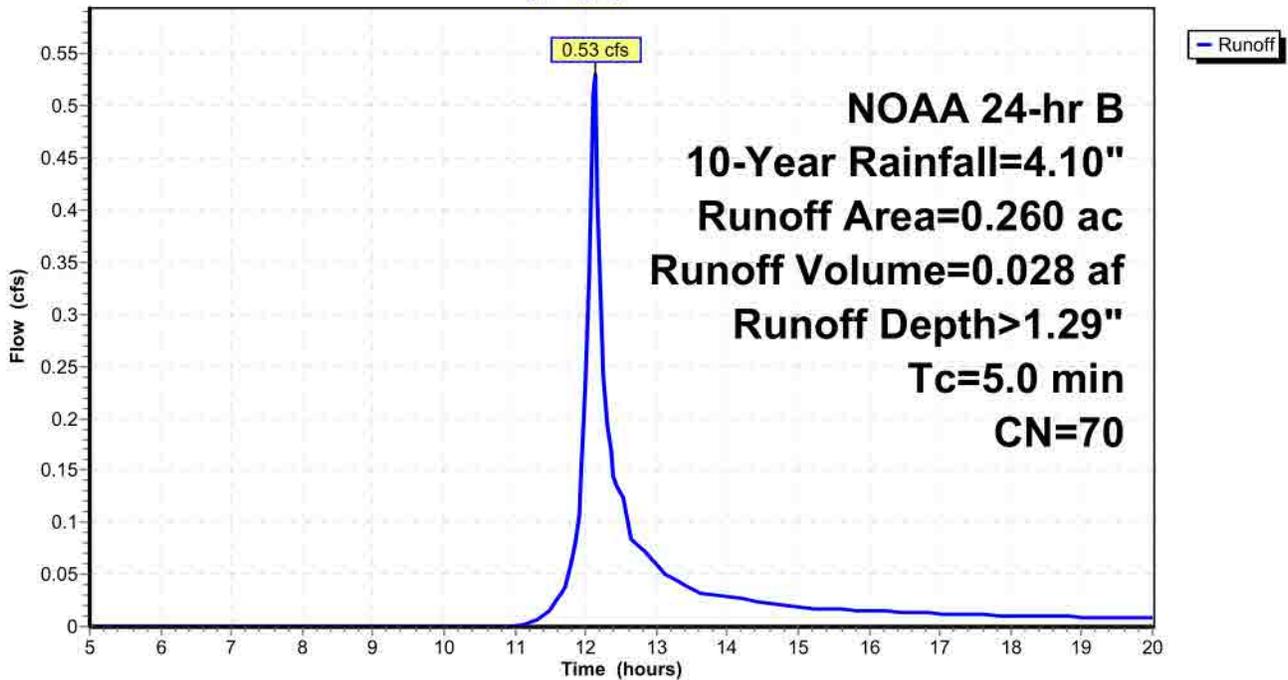
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 NOAA 24-hr B 10-Year Rainfall=4.10"

Area (ac)	CN	Description
0.260	70	Woods, Good, HSG C
0.260		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Subcatchment EX.: PRE-EXISTING CONDITION

Hydrograph



Summary for Subcatchment TEMP.: TEMPORARY STABILIZATION

Runoff = 1.14 cfs @ 12.11 hrs, Volume= 0.064 af, Depth> 2.95"

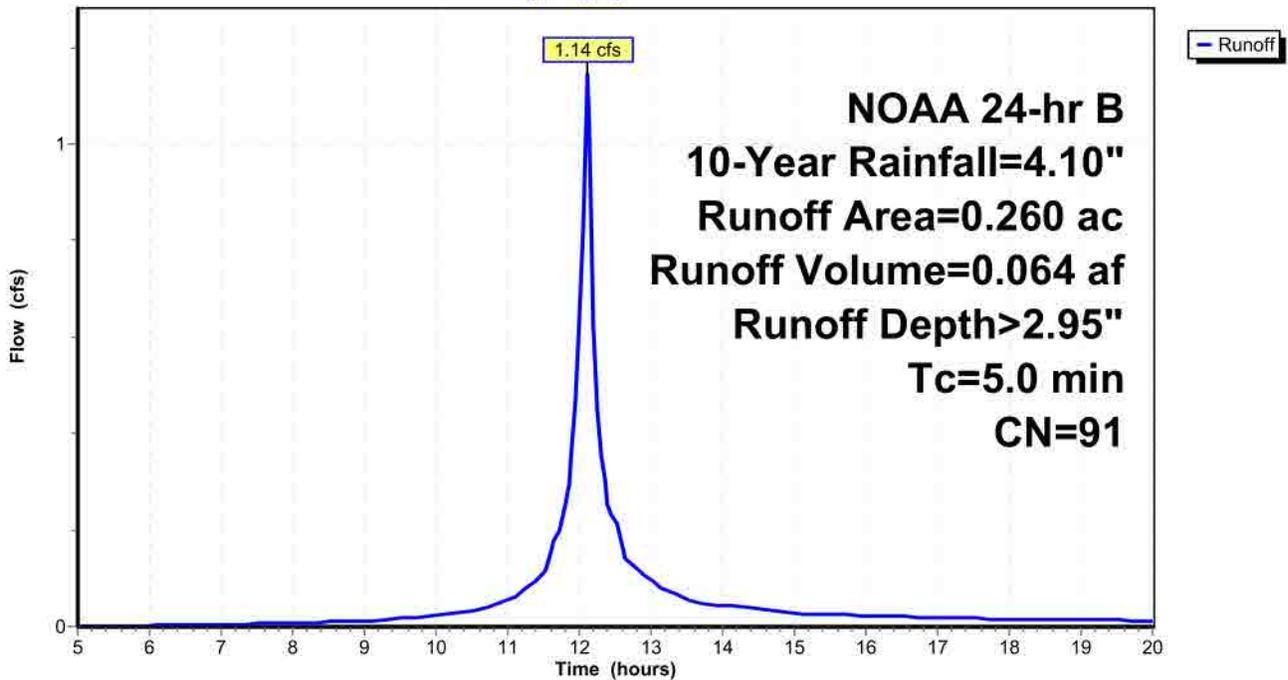
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NOAA 24-hr B 10-Year Rainfall=4.10"

Area (ac)	CN	Description
0.260	91	Fallow, bare soil, HSG C
0.260		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Subcatchment TEMP.: TEMPORARY STABILIZATION

Hydrograph



Summary for Subcatchment PROP.: PERMANENT STABILIZATION

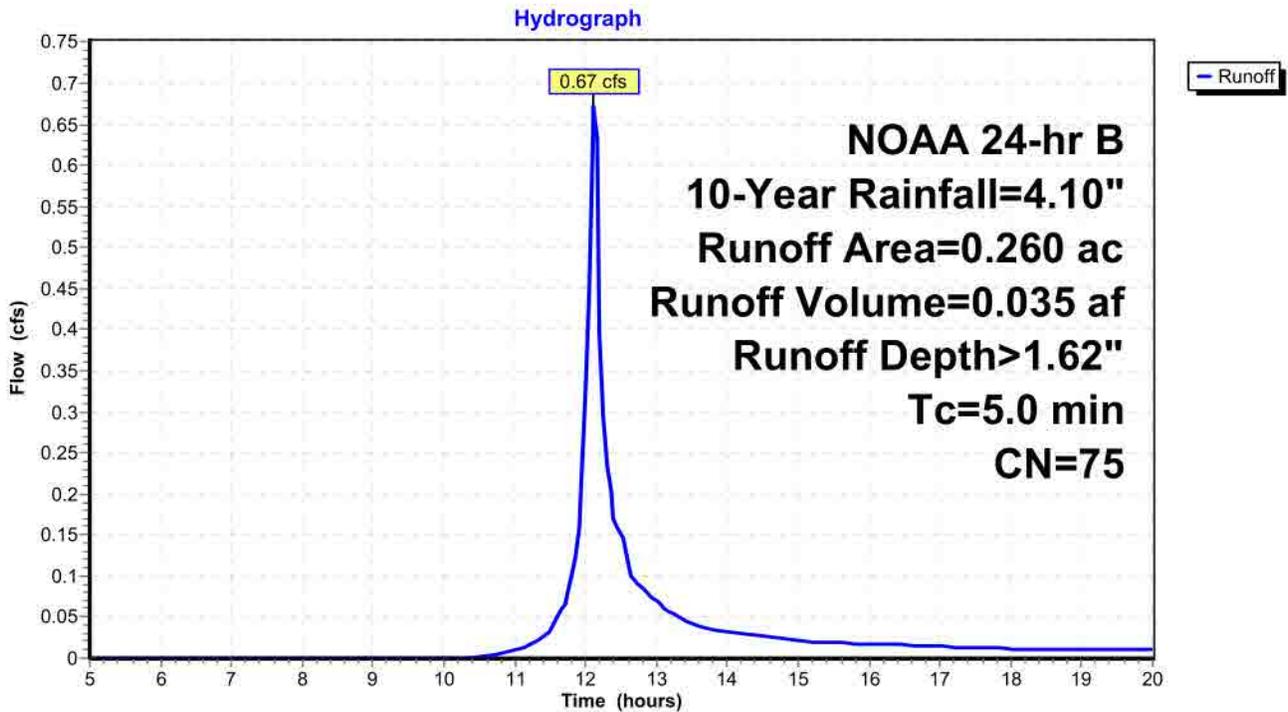
Runoff = 0.67 cfs @ 12.12 hrs, Volume= 0.035 af, Depth> 1.62"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 NOAA 24-hr B 10-Year Rainfall=4.10"

Area (ac)	CN	Description
0.100	79	50-75% Grass cover, Fair, HSG C
0.160	73	Woods, Fair, HSG C
0.260	75	Weighted Average
0.260		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Subcatchment PROP.: PERMANENT STABILIZATION



MV1674-SWM

Prepared by SCCM-01

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NOAA 24-hr B 25-Year Rainfall=4.90"

Printed 9/11/2018

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Summary for Subcatchment EX.: PRE-EXISTING CONDITION

Runoff = 0.76 cfs @ 12.12 hrs, Volume= 0.039 af, Depth> 1.82"

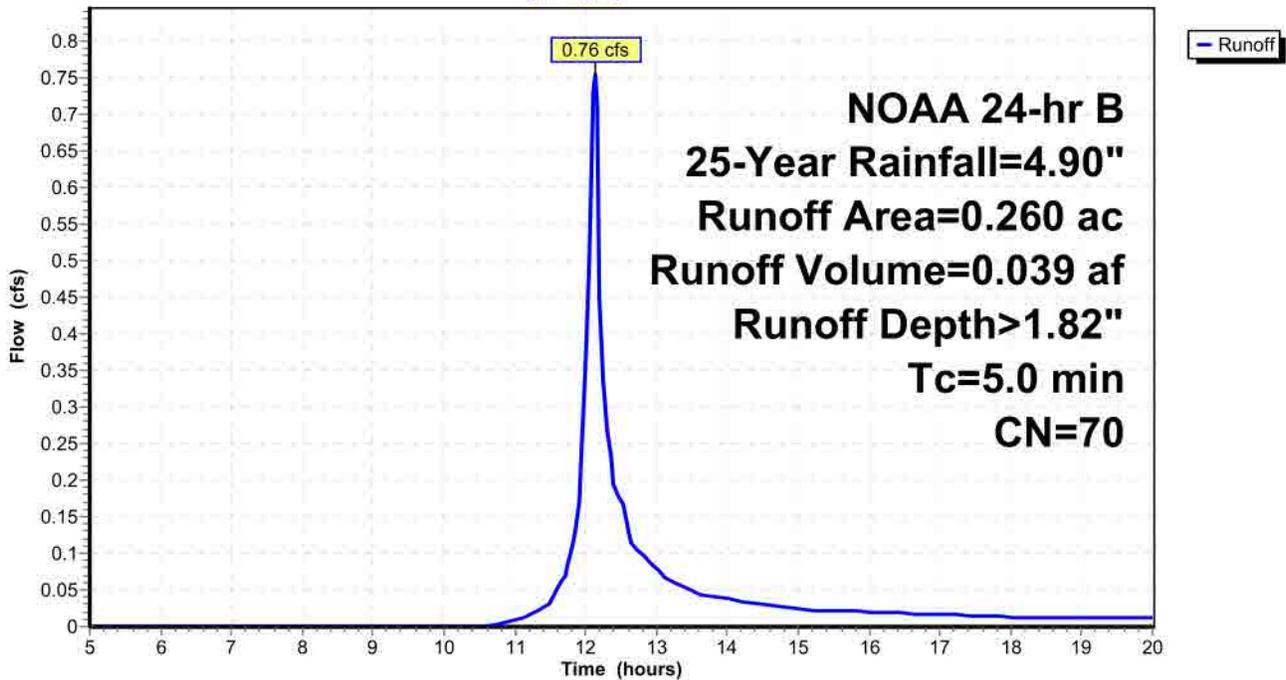
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NOAA 24-hr B 25-Year Rainfall=4.90"

Area (ac)	CN	Description
0.260	70	Woods, Good, HSG C
0.260		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Subcatchment EX.: PRE-EXISTING CONDITION

Hydrograph



Summary for Subcatchment TEMP.: TEMPORARY STABILIZATION

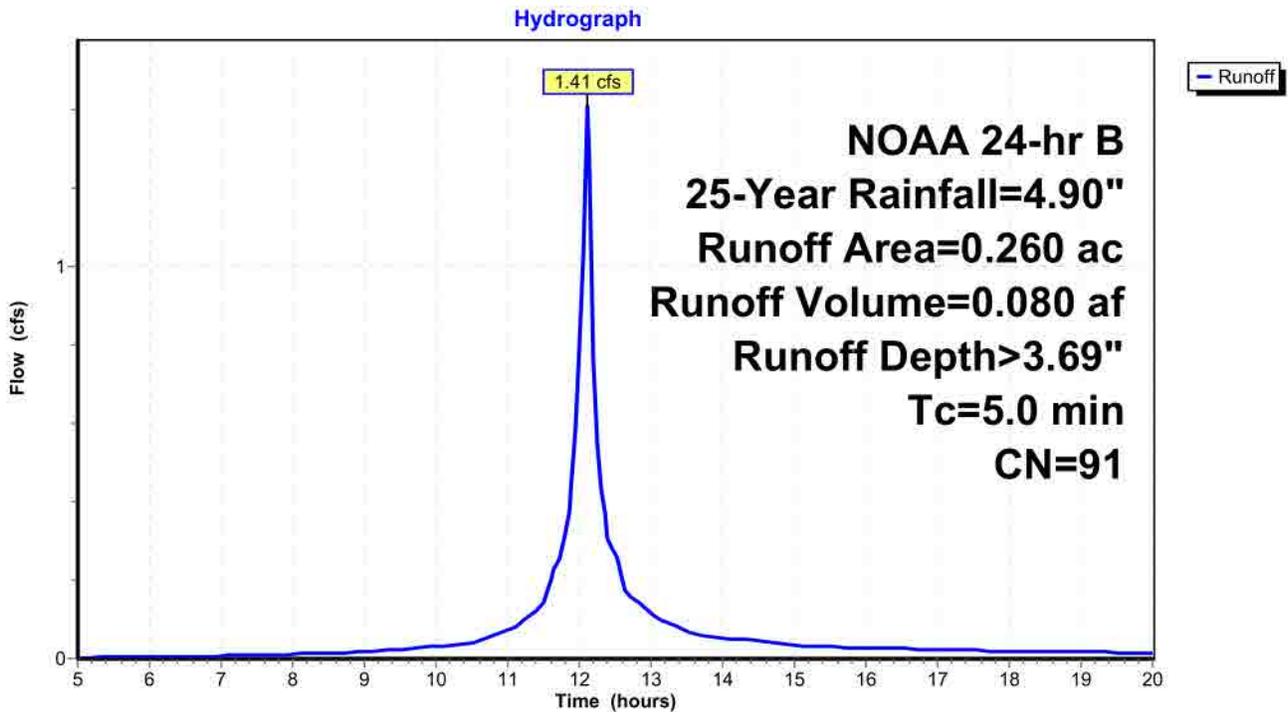
Runoff = 1.41 cfs @ 12.11 hrs, Volume= 0.080 af, Depth> 3.69"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 NOAA 24-hr B 25-Year Rainfall=4.90"

Area (ac)	CN	Description
0.260	91	Fallow, bare soil, HSG C
0.260		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Subcatchment TEMP.: TEMPORARY STABILIZATION



Summary for Subcatchment PROP.: PERMANENT STABILIZATION

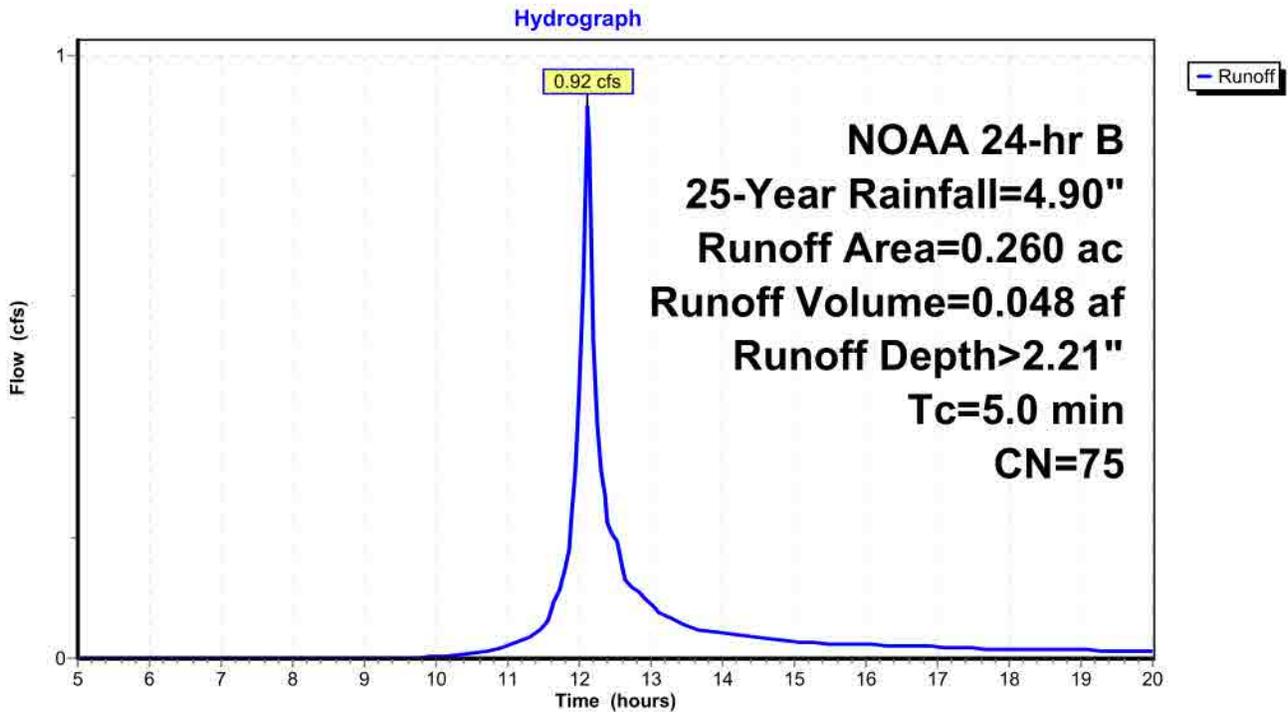
Runoff = 0.92 cfs @ 12.12 hrs, Volume= 0.048 af, Depth> 2.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 NOAA 24-hr B 25-Year Rainfall=4.90"

Area (ac)	CN	Description
0.100	79	50-75% Grass cover, Fair, HSG C
0.160	73	Woods, Fair, HSG C
0.260	75	Weighted Average
0.260		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Subcatchment PROP.: PERMANENT STABILIZATION



Attachment 2
Mountain Valley Pipeline's Stabilization Plan
for the Jefferson National Forest

September 11, 2018

Mountain Valley Pipeline, LLC (MVP) proposes the following stabilization plan for the portions of the right-of-way (ROW) for the Mountain Valley Pipeline Project ("Project") in the Jefferson National Forest (JNF). MVP's primary goal of stabilization is to minimize erosion and sediment runoff from the ROW during the pendency of the remand ordered by the United States Court of Appeals for the Fourth Circuit on July 27, 2018.

Current Status in the Jefferson National Forest

The Project's crossing of the JNF consists of two segments of ROW totaling approximately 3.6 miles. The first segment, known as the Peters Mountain Segment, includes approximately 9,211 feet in Giles County, Virginia and 558 feet in Monroe County, West Virginia. The second segment, known as the Sinking Creek Mountain and Brush Mountain Segment, includes approximately 9,810 feet in Montgomery County, Virginia.

Peters Mountain. For the Peters Mountain Segment, MVP has only completed tree felling on the ROW to date. Trees have been hand-felled and left laying across the ROW. There has been no significant ground disturbance at this point. The ground in this segment is stable and poses no threat to erosion and sediment impacts the environment. This area also includes Pocahontas and Mystery Ridge Roads, which have been exposed to light vehicular traffic. Erosion and sediment control devices (ECDs) have been installed along the roads and regular maintenance activity is ongoing as required.

Sinking Creek Mountain and Brush Mountain. On the Sinking Creek Mountain and Brush Mountain Segment, the ROW has been fully cleared, graded, and prepared for construction. Pipe has been strung and bent in preparation for welding for the entire length of this segment. All of the pipe necessary to complete this segment of the ROW has already been staged and bent along the right-of-way. Topsoil generally has been segregated and stockpiled on the non-working side of the right-of-way. Due to pipe strung along the trench line, topsoil is not currently accessible in most locations. Equipment access to the non-working side for environmental maintenance is also limited. No trench has been dug or pipe installed in the ground.

On Brush Mountain, MVP has welded a total of 1,290 feet of pipe in five different sections. In addition to those welded sections, there are 20 loose joints of equaling approximately 800 feet of pipe on the top of Brush Mountain. Another 79 joints totaling approximately 3,160 feet have been strung along the ROW, bent, and placed on skids waiting to be welded. On Sinking Creek Mountain, 114 joints totaling approximately 4,560 feet have been strung along the ROW, bent, and placed on skids waiting to be welded, but no welding has occurred.

MVP's Proposed Stabilization Plan

Peters Mountain Segment

MVP's stabilization plan for the Peter's Mountain Segment is as follows:

1. Leave felled trees in place within the ROW.
2. Maintain and monitor installed ECDs every seven calendar days and within 24 hours after any storm event greater or equal to 0.5 inch in a 24-hour period. ECDs will be enhanced, repaired, and replaced as necessary.
3. Monitor and control invasive species consistent with the Exotic and Invasive Species Control Plan included in the Plan of Development.
4. Ensure that maintenance and monitoring activities do not preclude the use of Pocahontas or Mystery Ridge Roads for other purposes.

Sinking Creek Mountain and Brush Mountain Segment

To stabilize the ROW on Sinking Creek and Brush Mountains, MVP proposes to install the pipe that is currently staged on the ROW and undertake final restoration activities. Achieving final restoration in the fall will allow for vegetation regrowth on the ROW before winter. Without strung pipe impeding access, MVP will have full access to the ROW to maintain ECDs and address any environmental concerns. More importantly, with the ROW restored to its final state and growth established prior to winter, minimal maintenance of ECDs will be required throughout the winter months.

This plan will take approximately 60 days and will be completed by two composite crews on each mountain simultaneously. The work will consist of the following activities. Note that equipment operating on steep slopes will be secured with a winch line attached to an upslope dozer.

1. **Complete Welding of Pipe.** Individual pipe segments will be welded together to form segments between 80 feet and 500 feet prior to being lowered into the trench. This will include the following type of equipment and activities on the ROW:
 - a. Pipe bevel preparation using a beveling machine.
 - b. Placement of pipe on cribbing in preparation for welding using excavators and side booms.
 - c. Completion of welding using a combination of manual welding techniques and automatic welding shacks. Welding rigs on skids or tack rigs are used for manual welding. Both tack rigs and automatic welding shacks are transported and placed for welding by excavators or dozers.
 - d. Non-destructive testing of welds using X-ray equipment.
2. **Install Pipe Coating and Protective Covering.** The new weld joints will be coated for protection from corrosion prior to being lowered in the trench. The pipe coating will also be tested for anomalies, and any defects in the coating will be repaired. Additionally, pipe

that will be installed in a rocky trench will be wrapped with a protective covering to shield the coating from abrasion. This will include the following type of equipment and activities on the ROW:

- a. Use of manual brush-on and automatic spray application shacks to coat welds.
 - b. Testing for coating damage using hand-held jeeping equipment.
3. Trenching. Once the pipe is prepared, MVP will construct the pipe trenches and prepare the bed of the trench for the pipe installation. This will include the following type of equipment and activities on the ROW:
- a. Removal of soil from the trench line using an excavator with a bucket attachment.
 - b. Breaking up of hard rock within a trench line using an excavator with a rock hammering attachment.
4. Installing Pipe in Trench. Once the trench is prepared, MVP will lower the pipe into the trench. This will include the following type of equipment and activities:
- a. Set up of supports and trench breakers in the trench using sand bags. Sand bags will be hauled in on skids using an excavator or dozer. Sandbags are placed by hand.
 - b. Installation of landslide mitigation systems, including various drains and subsoil support systems. Most landslide mitigation systems are installed by hand while using a small excavator for drain line trench excavation. Materials for drains will be hauled in on Marookas (rubber-track carriers) or skids.
 - c. Lifting of welded pipe sections from the skids using multiple side boom cranes and excavators and lowering of those pipe sections onto the supports within the trench.
5. Tie In and Backfill. Once the pipe sections are lowered into the trench, MVP will weld the sections welded together and will install pipe coating on the welded connections. This will include the following type of equipment and activities on the ROW:
- a. Use of excavators and side boom cranes to support and align the pipe for a tie-in weld.
 - b. Potential use of a trench box, which would be lowered into the trench by an excavator at the weld, to protect workers in the trench from collapse of unstable trench walls.
 - c. Placement of a tack rig or automatic weld shack at the weld by an excavator to complete the weld.
 - d. Non-destructive testing of the completed weld with an X-ray rig, which will then be coated and possibly wrapped with a protective abrasive covering.
 - e. Backfilling of the pipe with an excavator using the stockpiled native subsoils. Rocky fill will be broken down using a sifting bucket on an excavator. If there are insufficient suitable soils for backfill, select backfill material may need to be brought in using Marookas.

6. Final Restoration. Once the trench is backfilled, MVP will restore subsoil displaced for construction purposes back to as close to original contours as possible. The top layer of subgrade will be loosened by discing, and topsoil will be disced to establish a final grade conducive to seed mixes taking root. Seeding and mulching prior to the fall growing season will promote healthy growth on the ROW prior to winter. This will include the following type of equipment and activities on the ROW:
 - a. Replacement of subsoil and rough grading and restoration of the ROW to original contours using dozers and excavators. Temporary E&S controls will be removed.
 - b. Spreading of topsoil with dozers.
 - c. Discing, which will be completed by a tractor or dozer with a discing attachment.
 - d. Hydraulic spreading of seed and fertilizer. Water and seeding materials will be hauled in on a Marooka and applied with hydroseeding equipment.
 - e. Hydraulic application of mulch. Fiber-matrix hydromulch will be hauled in on a Marooka and sprayed on the right-of-way.

7. Ongoing Environmental Maintenance. During all phases of construction, environmental maintenance will continue as required. This will include the following type of equipment and activities on the ROW:
 - a. Removing and replacing water bars on a daily basis using excavators.
 - b. Cleaning out of sumps by hand or using excavators.
 - c. Installing new ECDs as required. ECDs are typically installed by hand but may use excavators or dozers to aid in excavation. Materials will be hauled in on skids or Marookas.
 - d. Placing timber mats using excavators.
 - e. Placing stone using excavators.

Alternative Stabilization Plan for the Sinking Creek Mountain and Brush Mountain Segment

MVP believes that installation of all welded pipe and loose pipe joints in the Sinking Creek Mountain and Brush Mountain Segment of the ROW in the JNF will achieve the best outcome in terms of stabilizing the ROW and minimizing the potential for erosion and sedimentation issues. A less advantageous option would be to install only the welded pipe segments, while removing the loose pipe joints to a staging area off the JNF. This approach would not allow MVP to achieve final restoration and thus is not as desirable from a stabilization standpoint as complete installation. However, it would still be preferable to securing the welded pipe segments in place on the ROW, because it would remove a significant impediment to maintaining the ECDs along the ROW.