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Mountain Valley Pipeline, LLC

Docket No. CP21-12-000

Mountain Valley Pipeline Project Amendment

Environmental Assessment

Washington, DC 20426

**MOUNTAIN VALLEY PIPELINE PROJECT AMENDMENT
ENVIRONMENTAL ASSESSMENT**

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TECHNICAL ABBREVIATIONS AND ACRONYMS

ACHP	Advisory Council on Historic Preservation
AFM	acid forming material
AFM Plan	Acid Forming Materials Mitigation Plan
Amendment Project	Mountain Valley Pipeline Project Amendment Project
APE	area of potential effects
CAA	Clean Air Act
Certificates	Order Issuing Certificates
CFR	Code of Federal Regulations
CH ₄	methane
CO	carbon monoxide
CO ₂	carbon dioxide
CO ₂ e	carbon dioxide equivalents
COE	U.S. Army Corps of Engineers
dB	decibels
dBA	decibels on the A-weighted scale
EA	environmental assessment
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
EI	environmental inspector
EEP	Equitrans Expansion Project
Equitrans	Equitrans, L.P.
EO	Executive Order
FERC	Federal Energy Regulatory Commission
FEIS	final environmental impact statement
FWS	U.S. Fish and Wildlife Service
GHG	greenhouse gases
HAP	hazardous air pollutants
L _{dn}	day-night sound level
L _{eq}	equivalent sound level
MBTA	Migratory Bird Treaty Act
MP	mileposts
Mountain Valley	Mountain Valley Pipeline, LLC
N ₂ O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NGA	National Gas Act
NHPA	National Historic Preservation Act
NOA	Notice of Application and Establishing Intervention Deadline
NO _x	nitrogen
NSA	Noise Sensitive Area
OEP	Office of Energy Projects
Order	Order Issuing Certificates

PA	Programmatic Agreement
Plan	<i>Upland Erosion Control, Revegetation, and Maintenance Plan</i>
PM _{2.5}	particles with an aerodynamic diameter less than or equal to 2.5 microns
PM ₁₀	particles with an aerodynamic diameter less than or equal to 10 microns
Procedures	<i>Wetlands and Waterbody Construction and Mitigation Procedures</i>
SO ₂	sulfur dioxide
SPCC	Spill Prevention, Control, and Countermeasures Plan
SHPO	State Historic Preservation Office
USGCRP	U.S. Global Change Research Program
VOC	volatile organic compounds

SECTION A – PROPOSED ACTION

1.0 Introduction

The staff of the Federal Energy Regulatory Commission (Commission or FERC) prepared this environmental assessment (EA) to assess the environmental impacts of the proposed Mountain Valley Pipeline Project Amendment (Amendment Project). On October 13, 2017, the FERC published an Order Issuing Certificates (Certificate or Order) to Mountain Valley Pipeline, LLC (Mountain Valley) and Equitrans, L.P. (Equitrans) to construct and operate pipeline, compression, metering facilities, and related infrastructure as part of the Mountain Valley Pipeline Project and Equitrans Expansion Project (EEP). The Mountain Valley Pipeline Project facilities consist of approximately 303.5 miles of new natural gas pipeline and multiple aboveground facilities located in West Virginia and Virginia.

On November 18, 2020, Mountain Valley; pursuant to section 7(c) of the Natural Gas Act, in FERC Docket No. CP21-12-000, filed an application seeking to amend the Certificate granted in Docket No. CP16-10-000 for its Mountain Valley Pipeline Project in West Virginia and Virginia. Mountain Valley proposes to cross waterbodies and wetlands between mileposts (MP) 0 and 77 using conventional bore rather than the open-cut method authorized by the Certificate. Mountain Valley is proposing to use 41 conventional bores to complete 69 waterbody and wetland crossings.

We¹ prepared this EA in compliance with the requirements of the National Environmental Policy Act (NEPA); the Council on Environmental Quality's (CEQ) regulations for implementing NEPA (Title 40 Code of Federal Regulations (CFR), Parts 1500-1508 [40 CFR 1500-1508]); and the Commission's regulations at 18 CFR 380.

The FERC is the lead federal agency for authorizing interstate natural gas transmission facilities under the National Gas Act (NGA), and the lead federal agency for preparation of this EA, in accordance with NEPA (40 CFR 1501) and the Energy Policy Act of 2005.

The assessment of environmental impacts is an integral part of the Commission's decision-making process to determine whether to authorize Mountain Valley's proposal. Our principal purposes in preparing this EA are to:

- identify and assess potential impacts on the natural and human environment that could result from implementation of the proposed action;
- identify and recommend reasonable alternatives and specific mitigation measures, as necessary, to avoid or minimize project-related environmental impacts; and
- facilitate public involvement in the environmental review process.

¹ "We," "us," and "our" refer to the environmental staff of the FERC's Office of Energy Projects.

The environment affected by the action proposed by Mountain Valley was not considered in the final environmental impact statement (FEIS) issued in FERC Docket No. CP16-10-000. In the FEIS, staff assessed the impacts that would result from open-cut crossings of the waterbodies and wetlands considered here. The FEIS concluded that no long-term or significant impacts on surface waters were anticipated and that impacts on wetlands would not be significant. As described in the analyses below, this amendment proposal would result in less impact to resources than the action considered in the aforementioned docket.

2.0 Purpose and Need

On October 13, 2017, the Commission issued joint Certificates to Mountain Valley and Equitans to construct and operate pipeline, compression, metering facilities, and related infrastructure as part of the Mountain Valley Pipeline Project and EEP. The original Mountain Valley Pipeline Project was filed at FERC under Docket No. CP16-10-000, and the EEP Project was filed under Docket No. CP16-14-000. Mountain Valley stated it has reevaluated the approved project facilities and now proposes certain modifications (which are more specifically described below) to facilitate the completion of the Mountain Valley Pipeline Project.

This EA supplements the Commission staff's June 23, 2017 FEIS for the Mountain Valley Pipeline Project and EEP. The purpose of the proposed amendment is to allow Mountain Valley to change the crossing method for all remaining wetlands and waterbodies from MPs 0 to 77 from open-cut crossings that were authorized by the Certificate to conventional bore methods. Mountain Valley states that the reason for the change in crossing method is a stay issued by the United States Court of Appeals for the Fourth Circuit of Mountain Valley's U.S. Army Corps of Engineers (COE) Clean Water Act permits, and the continuing uncertainty regarding options available to complete waterbody and wetland crossings for the Mountain Valley Pipeline Project. In addition to the conventional bore crossings, Mountain Valley would shift the originally certificated pipeline centerline to avoid one wetland (A-002) at MP 0.70. This shift would occur within the existing authorized construction workspace for the Mountain Valley Pipeline Project.

3.0 Public Review and Comment

On November 30, 2020, the Commission issued a *Notice of Application and Establishing Intervention Deadline* (NOA). The NOA established a 21-day comment and intervention period and requested comments on specific concerns about the Amendment Project or issues that should be considered during the preparation of the EA. The comment period ended on December 21, 2020.

In response to the NOA, the Commission received approximately 80 discrete comments from individuals, environmental non-profit groups, and an industry group. We also received several hundred form letters from individuals. Several commenters requested the comment period be extended. We have reviewed all comment letters submitted prior to issuance of this EA, regardless of whether comments were received during or after the notice period.

The pertinent comments received in response to the NOA are summarized in table 1 below and are further addressed, as applicable, in the relevant sections of this EA. However, other comments received that are not specific to resources that may be affected by the actions requested in Mountain Valley's amendment application will be addressed in the subsequent Commission order in this proceeding. These comments address:

- the need for the Amendment Project, the Mountain Valley Pipeline Project, and express opposition to fossil fuels in favor of renewable energy;
- requests that a Supplemental Environmental Impact Statement be prepared for the Amendment Project;
- the potential for community spread of COVID-19 by construction workers; and
- requests that Commission not issue a Certificate for the Amendment Project until Mountain Valley obtains all necessary permits, including a permit under Section 404 of the Clean Water Act.

Table 1 Issues Identified From Public Comments	
Issue	EA Section Addressing Issue
Air quality, greenhouse gases, climate change (including fugitive emissions)	section B.6 Air Quality and Noise
Aquatic resources (including sedimentation impacts)	section B.3.1
Cultural resources (including adherence to Section 106)	section B.5
Geology (including karst; conventional bore constructability; blasting; steep terrain; and acid-producing rock)	section B.1
Environmental Justice	section B.4.1
Noise	section B.6.2
Safety	section B.7
Soils (including spoil storage, sedimentation, and constructability)	section B.1.
Surface water, groundwater, and wetlands (including water quality, sedimentation, subsidence, and riparian buffers)	section B.2
Vegetation and wildlife (including riparian impacts)	section B.3
Threatened and endangered species	section B.3.5

4.0 Proposed Facilities and Land Requirements

Mountain Valley proposes to conduct 41 conventional bore crossings of 25 wetlands and 44 streams in Wetzel, Harrison, Doddridge, Lewis, and Braxton counties, West Virginia. Appendix A provides a list of each of these crossings and maps of each of the crossings are included in Appendix B. The change in crossing methods would not result in a change of land requirements as authorized by the October 13, 2017 certificate. However, Mountain Valley proposes to avoid one wetland, A-002, via a shift in the permanent operation right-of-way. This shift would result in a change of 0.23 acre that was certificated as temporary construction workspace to permanent workspace. This is a minor shift that would occur entirely within the previously approved construction

workspace and would move the pipeline closer to an existing meter station adjacent to the construction right-of-way. The total permanent certificated workspace amount would not change.

5.0 Conventional Bore Construction Procedures

The conventional bore method requires excavation of launching and receiving bore pits located within the existing construction right-of-way on each side of the feature(s) being crossed. We received multiple comments concerning bore-pit collapse and maintaining the integrity of the bore-pits during construction activities. The bore-pit excavations would be sloped or shored to comply with all local, state, and federal safety regulations, which will minimize the possibility of collapse or a lack of integrity.

Once the bore pits were excavated, the construction crew, working from the launching side, would advance a jacking pipe and a rotating cutting head that is attached to the leading edge of the auger string. The spoil would be transported back by the rotation of auger flights within the steel jacking pipe. The conventional bore method is non-steerable and is subject to deflection. We received multiple comments regarding the potential for deflection of the bore intersecting the bottom of the resource (i.e. streambed). The correcting deviation systems used on horizontal auger boring machines have been used in the industry for over 20 years and have control accuracies reaching about 1 inch (H Lu, et al., 2020), reducing the potential for deflection. Potential impacts to streambeds are further discussed in section B.2.2 below.

Auger boring can be used to install pipes ranging from 4 to 60 inches in diameter and spanning lengths of up to several hundred feet. The major advantage of conventional auger borings over other boring technologies is that the drill pipe is installed as the boring is advanced and the line pipe is installed immediately behind the bore pipe once the boring is completed, leaving no unsupported hole that could potentially collapse. Because the borehole is continuously supported by pipe throughout the process, the risk of bore collapse is minimized. Accordingly, the circulation of drilling fluids to transport drill cuttings and support the wall of the borehole are not necessary for the drilling of conventional bores. If the conventional auger bore encounters excessively hard rock, an air-driven rock hammer drill can be deployed at the bore face, as needed. Boulders and cobbles up to one third of the diameter of the installed pipe can be accommodated.

Auger boring typically requires the least amount of areal footprint (workspace) of mechanical trenchless technologies because large frac tanks and mud-mixing systems are not required. Cuttings (spoil) generated by boring operations would be stockpiled temporarily at the site but would ultimately be reused to backfill the bore pits. Prior to boring operations, wetlands and waterbodies adjacent to each work site would be protected using the erosion and sediment control devices and best management practices appropriate to the specific site.

We received multiple comments concerning the possibility of off right-of-way sedimentation due to the storage of spoil from the bore pits and from the boring activities. The excavated material to create the pit would be placed in spoil piles within the existing pipeline right-of-way. Stockpiled soils would be stored away from existing slopes, in flatter locations or along ridges, and placed such that they do not exceed the material's angle of repose. Mountain Valley would implement the Project's Erosion and Sediment Control Plans² to enhance stockpile stability and protect environmental resources downstream of bore pits and stockpiles. Such measures would include installation of silt fence or super silt fence and temporary mulching of stockpiles. Any spoil remaining following the completion of the bore would evenly spread on the right-of-way or hauled to an off-site facility. Thus, off-right-of-way sedimentation should be unlikely. Environmental impacts associated with excavation of the bore pits are discussed in section B.1.

Once the boring begins, the 24-hour operation at limited crossings may be required until completed in order to avoid freeze up of the pipe within the bore. The June 23, 2017 FEIS acknowledge the possibility of 24-hour operation for conventional bores at road crossings and railroads. Mountain Valley states that it would conduct boring activities during overnight hours only in circumstance where the integrity of the borehole would be compromised by stopping the boring process. Such circumstances are determined by geological conditions and length of bore. To reduce potential impacts from 24-hour operation, Mountain Valley would perform as much work as possible during daylight hours, including preparation of the workspace, excavation of bore pits, and moving heavy equipment to the crossing locations.

Mountain Valley stated that it would implement a contingency plan should insurmountable issues be encountered during auger boring, including excessive torqueing, poor cutting returns, mechanical failure of the bore, deviation from the planned bore path, and unanticipated geological or hydrological conditions. Should Mountain Valley encountered one or more of these issues, it would notify the appropriate FERC compliance monitor and attempt another conventional bore ten feet to either side of the original bore path. Should the failure involve a stuck pipe and a standard recovery fails, the pipeline in this area would be abandoned in place. Should all attempts at the conventional bore crossing fail, Mountain Valley would seek necessary variances or approvals from FERC and any applicable agency including the COE, to revise the crossing method. We find this contingency plan acceptable.

Bore-pit dewatering would be required to provide for a dry workspace. Dewatering would be conducted in accordance with all existing plans and procedures

² Mountain Valley's Erosion and Sediment Control Plans are available on the FERC's eLibrary website, located at <https://elibrary.ferc.gov/eLibrary/search>, by searching Docket Number CP20-21 and the applicable Accession No. (20171206-5004)

reviewed and approved for the Mountain Valley Pipeline Project. Mountain Valley would utilize 3-inch to 6-inch diameter submersible pumps in each of the bore pits to control groundwater infiltration rates up to 2,750 gallons per minute. In some instances, pumping may require 24-hour operation to keep up with water infiltration and ensure personnel are able to enter the bore pits safely and efficiently when beginning bore activities each day. Environmental impacts associated with bore-pit dewatering on local groundwater and surface water conditions are discussed in section B.2.

Based on Mountain Valley's estimates, the average length of time required for each of the bores is just over 3 weeks (23.8 days), with median duration being slightly less, 19 days. About 27 percent of the bores would be completed within 2 weeks. About 73 percent would be completed within 4 weeks and 90 percent would be completed within 6 weeks. Four bores are expected to require between 44 and 67 days to complete. Mountain Valley's duration estimates are based primarily on the length of the bore. The actual duration could increase to some extent by weather delays or slow boring rates due to unexpectedly hard rock or changing geological makeup that may necessitate equipment change-outs.

Mountain Valley states that four crossings still require the installation of equipment bridges to allow for the passage of equipment across the sensitive resource. Three of these crossings (B-001, B-014, and B-015) would involve the installation of mat bridges over waterbodies and flat mats over wetland areas. One crossing, B-008, would involve the installation of a rail car bridge over a waterbody. These actions would be conducted in accordance with the Procedures and any applicable agency approvals. In addition, 30 of the conventional bore crossings already have equipment bridges installed as part of a travel lane over the sensitive resources.

In contrast to open-cut trenching, the use of a conventional bore to cross an environmental resource such as a waterbody or wetland, avoids direct impacts associated with working directly within the resource. Conventional bores allow for uninterrupted existing streamflow and undisturbed wetland soils and scrub-shrub and herbaceous vegetation, thereby minimizing impacts on aquatic resources and preserving wetland and wildlife habitat. Additionally, the proposed conventional bore crossings would result in reduced in-stream sedimentation as compared to the in-water construction approved for the Mountain Valley Pipeline Project. This reduction results from less disturbance of the riparian areas adjacent to the waterbodies, and avoidance of impacts to the streambed. Lastly, conventional bore crossings would avoid the ground disturbance associated with trenching and backfilling in the subject wetlands and reduce longer-term impacts by accelerating the post-construction revegetation period.

6.0 Environmental Compliance Inspection and Monitoring

We received multiple comments on environmental compliance and issues surrounding erosion and sediment control during construction activities. Mountain Valley personnel and its contractors would be required to comply with any conditions of a FERC order and the existing Mountain Valley Pipeline Project certificate, all mitigation measures identified in its application, and any other federal and state permits and authorizations. At least one environmental inspector (EI) per spread would be responsible for Mountain Valley's environmental compliance. The EIs performing environmental oversight would serve to monitor the implementation of all environmental requirements during construction. The EIs would have the authority to enforce permit conditions and considerations and comments from FERC. The FERC third-party compliance monitoring program would also continue to be implemented. Under this program, a contractor is selected by, managed by, and reports solely to the FERC staff to provide environmental compliance monitoring services. The FERC Compliance Monitor would provide daily reports to the FERC Project Manager on compliance issues and make recommendations on how to deal with compliance issues and construction changes, should they arise.

Mountain Valley would construct the Amendment Project in accordance with the methods described in the Mountain Valley Pipeline Project FEIS, including implementing FERC's *Erosion and Sediment Control Plan*, its *Upland Erosion Control, Revegetation, and Maintenance Plan* (Plan) and its *Wetlands and Waterbody Construction and Mitigation Procedures* (Procedures), its *Spill Prevention, Control, and Countermeasures Plan* (SPCC), its *General Blasting Plan*, and its *Acid Forming Materials Mitigation Plan* (AFM Plan). Other resource-specific plans have been developed for the larger Mountain Valley Pipeline Project. We reviewed these plans and found them acceptable.

8.0 Permit Approvals and Regulatory Consultations

Mountain Valley would be required to continue compliance with all authorizations issued for the original project under Section 7 of Endangered Species Act, Section 106 of the National Historic Preservation Act, and the pending FERC certificate, if the amendment application is approved.

SECTION B – ENVIRONMENTAL ANALYSIS

We incorporate by reference the FEIS in Docket No. CP16-10-000. The Amendment Project would continue to be designed, operated and maintained in accordance with the U.S. Department of Transportation pipeline safety regulations, 49 CFR 192 and all applicable permits, as identified in the FEIS.

As mentioned above, the Amendment Project would be constructed entirely within the existing Mountain Valley Pipeline Project construction and permanent right-of-way from mileposts 0 to 77. According to the most recent Mountain Valley Pipeline Project weekly construction report from the reporting period of December 5, 2020 to December 11, 2020³ this portion of the right-of-way has approximately 100 percent of tree felling, vegetation clearing, upland right-of-way-preparation, trenching, stringing, welding, and coating and wrapping completed. Mountain Valley states that at areas of waterbody crossings, trees were cleared but that a 50-foot buffer of other vegetation was maintained. These areas currently consist of tree stumps along with the scrub shrub and herbaceous vegetation. According to the status report for construction spreads A, B, and C, which encompass mileposts 0 to approximately 98.6 (which extends beyond the Amendment Project work area), approximately 95.0 percent of the right-of-way has been backfilled and 72.4 percent is in the final restoration stage. The remaining areas include the waterbody and wetland crossings discussed in the Amendment Project.

Throughout the construction process, Mountain Valley requested a change in crossing method from open cut crossings to trenchless techniques for over 70 wetlands and waterbodies. FERC staff have reviewed and approved each of these crossings, determining that the crossings provided an equal or greater protection of resources than the previously proposed open cut crossings. Mountain Valley has completed approximately 51 conventional bore crossings of waterbodies and wetlands as part of the Mountain Valley Pipeline Project. This includes 35 crossings completed from MP 0 to 77. Mountain Valley has been able to complete all of these crossings in the construction workspaces granted by the certificate for the Mountain Valley Project.

The Amendment Project would not result in any changes to the following resources that were analyzed in the Mountain Valley Pipeline Project FEIS and certificated by FERC in the Order:

- hazardous waste sites;
- wellhead protection areas, sole source aquifers, springs, or public surface water intakes;

³ See Accession Number 20201217-5227

- federally owned or managed lands;
- National or state wild or scenic rivers, national trails, nature preserves, wilderness areas, registered natural landmarks, or Native American reservations;
- recreational and visual resources; and
- socioeconomics.

1.0 Geologic Hazards and Soils

The geology along the planned conventional bore crossings consists of sedimentary bedrock comprised predominantly of shales and sandstone of the Pennsylvanian-Period Dunkard, Monongahela and Conemaugh Groups. Minor, unconsolidated materials consisting of Holocene-age alluvium is present along streams. Karst-forming bedrock, such as limestones and dolomite, are not known to occur along the route between MP 0 and 77.

The proposed conventional bore crossings would occur entirely within previously authorized workspace and would not result in a change in general impacts to or from geologic hazards and to soils compared to the Mountain Valley Pipeline Project. As discussed in section A.5, the conventional bore crossings would require excavation of bore pits on each side of the resource crossing. Individual bore pits may be excavated to depths as shallow as 8 feet and as deep as 67 feet, depending on the depth of the boring beneath the resource, and the local topography immediately adjacent to the individual bore pit location. In some cases, the depth of the bores could result in encountering shallow bedrock, and potential acid forming material (AFM) such as coal seams, and other sulfide-rich materials such as pyrite-bearing shales and sandstone.

We received comments regarding the adequacy of the information provided by Mountain Valley, and the need for site-specific characterization of the subsurface material at each individual crossing. Mountain Valley provided a summary of geologic conditions present at each of the crossings based on a literature review. This information would be field checked, and if necessary augmented through examination of the subsurface lithology encountered during the excavation of the bore pits, and drill plans modified to overcome obstacles such as the presence of boulders or the need for blasting to reach the depths of the pits due to the presence of hard competent bedrock, and/or the need for air-hammer drilling in the place of conventional auger drilling. Thus, the available information will be adequate.

Construction of the bore pits and stockpiling of soils could be impacted by the presence of steep slopes. Mitigation to avoid or minimize impacts from geologic hazards during construction and operation of the proposed conventional bore crossings would be the same as for the Mountain Valley Pipeline Project and should be sufficient.

The estimated volume of spoil for each bore pit is provided in appendix 3. Mountain Valley would relay bore-pit spoils away from the bore site and up or down the right-of-way to a nearby flat section of pipeline right-of-way or additional temporary workspace. In steep terrain, equipment may need to be winched down to and back from the bore-pit site to remove spoil material. Where possible, Mountain Valley would temporarily spread spoil along those flatter portions of the limits of disturbance to avoid creating large stockpiles until bore operations are complete and the bore pits can be backfilled.

In the event that AFM is encountered during excavation of the bore pits, Mountain Valley would implement its AFM Plan. As outlined in the plan, field observations and assessment would be implemented to identify potential AFM. A Mountain Valley EI would be deployed on-site during excavation of the bore pits and any land disturbance to conduct field observations of the bore pit and excavated materials. The EI would identify potential AFM, including conducting an evaluation of the soil horizon and strata, depths and colors (hue/value/chroma), depth and thickness of partially weathered “saprolite” zone, and would identify whether one or more coal seams are encountered (coal possesses the highest susceptibility for acid forming characteristics in the local and regional geological formations likely to be encountered by bore-pit excavation).

Where deemed necessary by Mountain Valley, the EI would conduct field analytical procedures to identify moderate- and high-risk AFM and identify corresponding lime (i.e., acid-neutralizing material) application rates. A 30 percent hydrogen peroxide test is well-documented for rapid determination in the field of potentially reactive AFM (i.e., rapidly oxidizes sulfidic materials) via evolution of heat, vigorous frothing, and water vapor. A moderate reaction would be characterized as representing moderate-risk AFM, while highly reactive results would be characterized as high-risk AFM. Mountain Valley would apply agricultural lime to bore pit walls, floor, and spoils at a rate commensurate with either moderate- or high-risk AFM per their AFM Plan.

Once applied, the treated material would be used as normal backfill, with final land reclamation covering the treated material. Return of treated AFM to the bore-pit backfill would be compacted to limit internal permeability. The upper 12 to 18 inches of backfill would be left loosened to support plant growth for post-construction reclamation.

Excess AFM material that cannot be returned to the pit backfill due to construction factors or concerns over net swell, would be bulk-blended with agricultural lime at the applicable moderate-risk or high-risk rate and placed in accordance with Mountain Valley’s standard practice for excess spoils, and managed per Mountain Valley’s standard erosion and sediment control measures in order to contain run-off and leachate and would not be placed within an area that may become saturated.

Mountain Valley would protect against slope failure resulting from the weight of spoil stockpiles by placing stockpiles away from slopes and on flatter terrain. Mountain Valley would implement the Project's Erosion and Sediment Control Plans to enhance stockpile stability and protect environmental resources downstream of bore pits and stockpiles. Protective measures include installation of silt fence or super silt fence and temporary mulching of stockpiles. Bore pits would be backfilled as soon as practicable upon completion of the bores to avoid having stockpiles exposed to excessive precipitation and erosional forces and to minimize the time over which existing slopes are subjected to additional loading. Lastly, in the event that bedrock is encountered that cannot be excavated by standard construction practices and blasting becomes necessary, Mountain Valley would conduct any blasting required to establish bore pits according to the General Blasting Plan approved in the Mountain Valley Pipeline Project. Based on these measures, we do not anticipate long-term or significant impacts on geological or soil resources as a result of construction or operation of the Amendment Project.

2.0 Water Resources

2.1 Groundwater

Aquifer conditions along the pipeline alignment between MP 0 and 77 consists of the Appalachian Plateau Regional Aquifer System. The Appalachian Plateau Regional Aquifer System is comprised of consolidated sedimentary bedrock of the Dunkard, Monongahela and Conemaugh Groups. With the exception of the sandstone aquifers, primary porosity and permeability are for all practical purposes negligible, and groundwater flow is predominantly through secondary permeability such as bedding planes, bedrock fractures and joints. Karst groundwater is not known to occur between MP 0 and 77. Local groundwater flow within these bedrock aquifers occurs within small local drainage basins where flow originates in groundwater recharge areas within and along hilltops and hillsides, and discharges to local streams. Fractured bedrock aquifers in the Project area typically have low permeability and are characterized by small groundwater capture areas⁴. However, there are exceptions, and wells completed in fractured-rock aquifers that are in close proximity to streams may be affected by induced recharge from the stream when the stream is within the radius of influence of groundwater pumping (Kozar and Paybins 2016).

We received comments regarding the bore-pit dewatering and boring activities impacts on the local groundwater systems and local drinking water wells. The proposed conventional bore crossings could result in a minor change in temporary impacts to shallow groundwater compared to the Mountain Valley Pipeline Project as a result of the bore-pit dewatering. As discussed, Mountain Valley would utilize 3-inch to 6-inch

⁴ Three-dimensional volumetric portion of a groundwater-flow field that discharges water to a well.

diameter submersible pumps in each of the bore pits with the capability to control groundwater infiltration rates up to 2,750 gallons per minute. However, given the intrinsic permeability constraints of the fractured bedrock aquifers, and the depths of the borings and bore pits, much lower pumping rates are expected to maintain dry working conditions in the drill pits. Mountain Valley has successfully completed several conventional bore crossings of streams in similar terrain for the Mountain Valley Pipeline Project using this dewatering methodology.

Groundwater withdrawal could potentially result in short term water-level drawdown of shallow groundwater in wells within the vicinity of the bore pits, and temporary reduction in the discharge rate of nearby springs. The amount of and lateral distance of water-level drawdown, and spring-flow impacts would depend on the existing groundwater levels at each site at the time of construction and site-specific aquifer characteristics. However, any groundwater-level drawdown and related impacts would be short-term and temporary and are expected to recover to non-pumping conditions following construction.

We also received comments from stakeholders concerned with the potential for creating preferential groundwater flow conduits from the drilling and installation of the project pipeline, permanent changes to groundwater flow patterns, and the potential for the permanent loss of surface water (leakage) to these preferential flow conduits.

The planned Amendment Project crossings are small and in the range of 17 and 286 feet in length, all are positioned with their entry and exit points adjacent to the resource, outside of the high-water mark for streams, and outside the wetland areas. The drilling of the borehole and installation of the product pipeline would not permanently alter the groundwater flow or groundwater/surface water interactions near the resource. These interactions are governed by the location of the resource, relative to the course of recharge-discharge flow pattern within the basin. For example, stream sections that receive perennial flow, intermittent flow or ephemeral flow would remain as such following construction, and not be permanently altered by the drilling and pipeline construction. Additionally, although the borehole and pipeline may represent a small linear permeability contrast relative to the surrounding aquifer matrix, its presence begins and terminates into undisturbed aquifer material on each side of the resource. An aquifer's thickness and lateral extent varies but is much greater than the space that would be occupied by the pipeline proposed for the project. The physical pipeline would occupy only a negligible portion of the aquifer and have no permanent influence on groundwater flow.

Further, during the boring process, and in conjunction with bore-pit dewatering there is the potential for temporary, pumping-induced infiltration of surface water to enter the borehole through the bottom of the streambed and into the bore pits, and a temporary reduction in stream flow, or wetland saturation. However, any water entering the bore hole would be pumped from the bore pits and into sediment-removal structures

constructed within the same drainage basin. As such, any water pumped from the bore pits during dewatering activities would be released back into the same drainage basin and would not be a consumptive use of groundwater from the basin, or a permanent impact to surface water flow or wetland saturation.

Mountain Valley has identified only one private groundwater well (which is not currently in use) within 150 feet of the bore pits. The private well is located at MP 25.8 approximately 30 feet southwest of the bore pit on the northern side of crossing A-013. This well is on a vacant parcel that previously contained a house trailer that was removed in 2017, and the well is currently not in use. No known springs or public groundwater wells are located within 150 feet of the proposed bore pits. We received comments from stakeholders stating that other documentation provided by Mountain Valley related to noise impacts shows at least two additional residences within 150 feet and 10 additional residences within 300 feet of the drilling locations, and given the rural setting it is likely that additional drinking water wells, and possibly springs are located near to pit dewatering locations. Commenters also stated that drinking water wells may be impacted by boring operations. Potential impacts on water wells are discussed below.

As stated above, Mountain Valley would construct the Amendment Project in accordance with the methods described in the Mountain Valley Pipeline Project FEIS, including its commitments to protecting drinking water of nearby residents. As discussed in the FEIS, in the event of landowner complaints that nearby wells or springs are impacted by the dewatering activities, Mountain Valley would evaluate any complaints and identify a suitable solution with the landowner. If it is determined by Mountain Valley through the use of qualified groundwater and surface water scientists and engineers that suitable potable water is no longer available due to construction related activities, Mountain Valley would provide adequate quantities of potable water during repair or replacement of the damaged water supply. In the event that an impact occurs to a livestock well, Mountain Valley would provide a temporary water source to sustain livestock while a new water supply well is constructed. Mountain Valley would also need to continue to fully comply with its Water Resources Identification and Testing Plan⁵ for identifying and assessing water supplies in the vicinity of the Amendment Project.

We also received multiple comments discussing the possibility of off right-of-way sedimentation caused by dewatering activities. As noted in the FEIS, water would be discharged through sediment-removal devices in well-vegetated upland areas away from waterbodies and wetlands. As discussed above, any water pumped from the bore pits during dewatering activities would be released back into the same drainage basin and would not be a consumptive use of groundwater from the basin, or a permanent impact to surface water flow. We received comments concerning impacts to soils. During final

⁵ See Accession Number 20171101-5042

restoration, Mountain Valley would restore any disturbed upland areas in accordance with FERC's Plan and its Procedures including backfilling the bore pits with the removed and stored soil. Based on these measures and the others described previously, we do not anticipate long-term or significant impacts on groundwater resources as a result of construction or operation of the Amendment Project.

2.2 Surface Water

The Amendment Project would consist of 36 conventional bore crossings of 43 surface waterbodies. These crossings are included in Appendix 1. The conventional bore crossings range in length from 17 feet to 286 feet. The installation of the pipeline via conventional bore would avoid all in-water construction at these locations. This would also avoid the disturbance of stream beds and banks and would not result in downstream turbidity.

As mentioned above, the crossings would involve the excavation of bore pits on either side of the crossing. The bore pits would be located outside the ordinary high-water mark for each of the streams. Soil excavated from the bore pits, as well as from the drilled borehole would be relayed away from the bore site and located in a nearby flat section of right-of-way or within an additional temporary workspace. Where possible, this spoil will be spread along the right-of-way or it will be stored within spoil storage piles. These piles would be stored away from existing slopes and erosion control devices and mulch would be used to prevent the piles from becoming unstable and sediment entering sensitive resources.

We received comments concerning the potential for bore hole collapse, impacts to the stream bottoms from drilling activities, and stating that Mountain Valley provided no information regarding the depths of water bodies or an understanding of bank conditions and how these compare to the depth of the bore hole [and bore pits]. As with other trenchless crossing techniques there is a chance of borehole collapse and/or streambed and wetland subsidence. However, the drill pipe is installed as the bore is advanced and the pipeline is installed immediately behind the drill pipe, the potential for subsidence is low. This is because there is no unsupported hole during boring activities. Additionally, Mountain valley provided in Appendix C of their amendment application, plan and profile views of topographic conditions at each of the planned crossing relative to borehole and bore pit depths below the resource.

Lastly, there is the potential that the bore could deflect to such an extent that it breaches the stream bottom. Surface water would then flow into the borehole and be pumped from the bore pits. If this should happen and the water flow can be controlled, Mountain Valley would grout the hole and reattempt the bore crossing at an adjacent location. If too much water enters the bore pit to maintain a dry workspace, Mountain Valley would work with the appropriate agencies to establish a repair methodology. This would most likely include grouting the bore hole and rebuilding the streambed.

Mountain Valley does not anticipate the need to conduct vegetation clearing, including riparian vegetation, between the bore pits. However, if clearing is needed due to surveying or engineering concerns, all vegetation would be cleared via hand tools or mowing.

We received comments concerning the use and handling of drilling mud for the bores. The use of conventional bores to cross waterbodies avoids the risk of inadvertent returns as there is no high-pressure drilling fluid slurry needed. However, in some situations, especially in long bores or in bores through mixed ground or clay, Mountain Valley may use small amounts of bentonite or polymer-based lubricant on the cutting head and exterior casing to reduce friction and to increase the success of the crossing. There is a chance these materials may enter surface waterbodies during drilling or through inadvertent spills. Mountain Valley stated that these materials would be in small quantities and would be nonpetrochemical-based, non-hazardous, and NSF-60 compliant, and thus are not expected to negatively impact waterbodies. Mountain Valley would submit a request to the FERC for the use of any polymer-based lubricants prior to their use.

To avoid and reduce impacts on surface waterbodies, Mountain Valley would implement FERC's Plan and its Procedures. This includes the installation of erosion and sediment controls per its Erosion and Sediment Control Plan. Lastly, Mountain Valley's adherence to measures within its SPCC, including locating hazardous material storage and equipment refueling activities at least 100 feet from waterbodies, would reduce the potential for hazardous materials to enter waterbodies.

During final restoration, Mountain Valley would restore any disturbed upland areas and any disturbed riparian areas in accordance with FERC's Plan and its Procedures. Any areas disturbed would be restored to pre-construction contours to the maximum extent possible. Implementation of the Procedures would minimize and mitigate impacts on surface waters. Therefore, we conclude that the Amendment Project would not have a significant impact on surface waters and would result in a reduction of the impacts already disclosed and analyzed in the FEIS.

2.3 Wetlands

The Amendment Project would consist of 21 conventional bore crossings of 24 wetlands. These crossings are included in Appendix 1. The conventional bore crossings range in length from 30 feet to 286 feet. The installation of the pipeline via conventional bore would avoid all in-wetland construction at these locations. This would also avoid the disturbance of directly adjacent upland areas.

As mentioned above, the crossings would involve the excavation of bore pits on either side of the crossing. The bore pits would be located outside the wetland areas. Soil excavated from the bore pits or as a result of the crossings would be relayed away

from the bore site and located in a nearby flat section of right-of-way or within an additional temporary workspace. Where possible this spoil would be spread along the right-of-way or it would be stored within spoil storage piles. These piles would be stored away from existing slopes and erosion control devices and mulch would be used to prevent the piles from becoming unstable and sediment entering sensitive resources.

As with other trenchless crossing techniques there is a chance of borehole collapse and/or subsidence. However, as mentioned above, the drill pipe is installed as the bore is advanced and the pipeline is installed immediately behind the drill pipe and the potential for subsidence and collapse is low. This is because there is no unsupported hole during boring activities.

Mountain Valley does not anticipate the need to conduct vegetation clearing, including wetland vegetation, between the bore pits. However, if clearing is needed due to surveying or engineering concerns, all vegetation would be cleared via hand tools or mowing without ground disturbance.

As discussed above, the use of conventional bores to cross wetlands avoids the risk of inadvertent returns as there is no high-pressure drilling fluid slurry.

To avoid and reduce impacts on wetlands, Mountain Valley would implement FERC's Plan and its Procedures. This includes the installation of erosion and sediment controls per its Erosion and Sediment Control Plan. Lastly, Mountain Valley's adherence to measures within its SPCC, including locating hazardous material storage and equipment refueling activities at least 100 feet from wetlands, would reduce the potential for hazardous materials to enter waterbodies.

During final restoration, Mountain Valley would restore any disturbed upland areas and any wetland areas in accordance with FERC's Plan and its Procedures. Any areas disturbed would be restored to pre-construction contours to the maximum extent possible. Implementation of the Procedures would minimize and mitigate impacts on wetlands. Therefore, we conclude that the Project would not have a significant impact on wetlands and would result in a reduction of the impacts already disclosed and analyzed in the FEIS.

3.0 Fisheries, Vegetation, and Wildlife

3.1 Fisheries and Aquatic Resources

In general, the proposed conventional bore crossings would result in less impact on fisheries and aquatic resources in the subject waterbody crossings compared to the open cut crossings originally approved for the Mountain Valley Pipeline Project. Completing the waterbody crossings using conventional bore methods would avoid in-water construction and the associated short-term impacts on fisheries and aquatic species

that are described in the FEIS for the Mountain Valley Pipeline Project. The proposed conventional bore crossings would result in less disturbance of the riparian areas adjacent to the waterbodies and avoid impacts on the streambed. Therefore, habitat for many aquatic and semi-aquatic species would remain undisturbed. In addition, the bore pits may act as a sediment trap for upland sediment, thereby reducing sediment loading into the subject streams. This would result in less sedimentation and suspended sediment in the subject streams that has the potential to alter aquatic habitat and affect aquatic species both physiologically and behaviorally as described in the FEIS. As described above, dewatering would be necessary where water accumulates in the bore-pits. However, Mountain Valley would discharge the water into well vegetated uplands or through haybale-lined dewatering structures in order to minimize any sedimentation impacts on the nearby aquatic ecosystems.

Construction activities for the proposed conventional bores could result in an inadvertent release of fuel, oil, or other hazardous materials from construction equipment into waterbodies that could have impacts on fish and aquatic species. A leak of hazardous material into a waterbody could result in direct mortality to aquatic species, altered behavior, changes in physiological processes, or effects on food sources. As described in the FEIS, Mountain Valley would implement their SPCC, which would include preventive measures such as personnel training, equipment inspection, and refueling procedures to reduce the likelihood of spills, as well as mitigation measures such as containment and cleanup to minimize potential impacts should a spill occur. Adherence to the SPCC would prevent a spill from occurring near surface waters because construction equipment fueling, and bulk hazardous material storage would be prohibited within 100 feet of the waterbody banks. In addition, portable equipment such as water pumps would be placed in secondary containment structures in order to contain any leaks or spills.

In order to protect all waterbody and wetland habitat near the areas where ground disturbance would occur, Mountain Valley would implement erosion, sediment, and spill control measures in compliance with the Plan and Procedures, Erosion and Sediment Control Plans, and SPCCs. Additionally, Mountain Valley would restore riparian areas to preconstruction condition once boring operations are completed. Given all factors discussed above, we conclude that Mountain Valley's proposed Amendment Project would not result in significant impacts on fisheries and aquatic resources.

3.2 Vegetation

The proposed conventional bore crossings would occur entirely within previously authorized workspace. Impacts on vegetation within these workspaces would not substantially differ from the impacts considered in the FEIS, excluding the minimization of impacts to riparian scrub shrub and herbaceous vegetation

As described in the FEIS, areas of temporary workspace would be allowed to revegetate to preconstruction condition. Herbaceous and scrub shrub areas are expected to return to preconstruction condition within a 1-3 years. In upland areas, the 50-foot-wide permanent right-of-way would be maintained in an herbaceous state. In wetland areas, native vegetation would be allowed to regenerate; however, to facilitate periodic corrosion/leak surveys, a corridor centered on the pipeline and up to 10 feet wide may be cleared at a frequency necessary to maintain the 10-foot corridor in an herbaceous state. In addition, trees that are located within 15 feet of the pipeline that have roots that could compromise the integrity of the pipeline coating may be cut and removed from the permanent right-of-way.

3.2.1 Riparian Areas

Riparian areas are functionally defined as three-dimensional ecotones of interaction that include terrestrial and aquatic ecosystems along perennial stream corridors. All riparian areas possess some similar ecological characteristics such as energy flow, hydrologic function, nutrient cycling, and plant and animal habitat. These functions give riparian areas unique values relative to the surrounding landscape. Riparian ecosystems are extremely productive and have diverse habitat values for wildlife. The linear nature of riparian ecosystems provides migration and dispersal corridors and connect habitats for wildlife. The presence and movement of the surface and ground water enhance the recycling of nutrients and other chemical reactions beneficial to plant growth within the riparian zone. A 50-foot riparian buffer had been maintained on each side of the surface waterbodies. Tree clearing has already occurred in the areas subject to the Amendment Project, including in these riparian areas. Approximately 8.9 acres of riparian buffer is currently present on the right-of-way within the Amendment Project work areas. The existing vegetation in the buffer includes tree stumps where trees were felled and a mix of herbaceous and shrub species. Approximately 5.4 acres of this vegetation would remain undisturbed due to the conventional bore crossing of these resources as opposed to the previously certificated open cut crossings. It should be noted that these acreages do not account for travel lanes as these will need to be determined on a site by site basis during construction operations.

In riparian areas, Mountain Valley is required to allow a riparian strip of at least 25 feet to permanently revegetate with native species. Mountain Valley has stated that it does not anticipate that vegetation clearing would occur between entry and exit points of the conventional bore. If any vegetation needs to be cleared between the bore-pits, Mountain Valley confirmed that it would be done by using hand tools or mowing without ground disturbance.

Mountain Valley would conduct restoration activities in accordance with landowner agreements, permit requirements, and written recommendations on seeding mixes, rates, and dates obtained from the Wildlife Habitat Council and measures outlined

in Mountain Valley's *Exotic and Invasive Species Control Plan* and *Migratory Bird Conservation Plan*.

Because the majority of vegetation clearing, including all tree clearing, has already occurred in the subject areas and Mountain Valley would follow restoration protocols outlined in the FERC Plan and in accordance with all permits and recommended seeding requirements, we conclude that the amendment to the Certificated Project would not result in a significant impact on vegetation.

3.3 Wildlife

Because the proposed conventional bore crossings would occur entirely within previously authorized workspace the impacts and mitigation for wildlife would generally be the same as compared to the Mountain Valley Pipeline Project as described in the FEIS. Because construction work for the conventional bores could occur overnight, there could be additional noise and light pollution impacts on wildlife. Noise from conventional bores would be similar to general construction noise. The FEIS described potential impacts on wildlife from construction related noise in Section 4.5.2.3.

Wildlife generally relies on hearing for courtship and mating, prey location, predator detection, and/or homing. These behaviors and interactions could be affected by noise resulting from construction activities. Specifically, construction noise could lead to nest abandonment, egg failure, reduced juvenile growth and survival, or malnutrition or starvation of the young. During construction, the effects of noise on wildlife would be greatest immediately adjacent to the construction work areas. Wildlife inhabiting the areas surrounding the bores might be temporarily displaced due to noise during construction but would be able to return to the area after the bores are completed.

Another impact that the conventional bores would have on wildlife during nighttime construction is ecological light pollution. If the construction work for the conventional bores occurs at night, construction crews would need artificial lighting. As described in the FEIS, artificial lighting could affect natural patterns of light and dark in ecosystems, which in turn may affect wildlife. The effects of ecological light pollution may include causing disorientation in nocturnal animals, disrupting migratory patterns of birds, altering seasonal day-length cues, which some wildlife may rely on as a trigger for critical behavior (e.g., migration).

To reduce potential noise and lighting impacts from nighttime activities, Mountain Valley committed to completing as much work as possible during daylight hours. Mountain Valley would also use "full cut-off" lighting fixtures to maximize shielding to prevent unintentional lighting of surrounding areas. With these proposed measures and the fact that noise and light pollution would be temporary and localized to the immediate areas surrounding the bores, we conclude that impacts on wildlife would be minimal and not significant.

3.4 Migratory Birds

Migratory birds are species that nest in the United States and Canada during the summer and then migrate to and from tropical regions of Mexico, Central and South America, and the Caribbean for the non-breeding season. Migratory birds are protected under the Migratory Bird Treaty Act (16 U.S Code [U.S.C.] 703-711) (MBTA); bald and golden eagles are additionally protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668-668d). Executive Order (EO) 13186 (66 FR 3853) directs federal agencies to identify where unintentional take is likely to have a measurable negative effect on migratory bird populations and to avoid or minimize adverse impacts on migratory birds through enhanced collaboration with the U.S. Fish and Wildlife Service (FWS).

On March 20, 2011, the FWS and the Commission entered into a Memorandum of Understanding that focuses on avoiding or minimizing adverse effects on migratory birds and strengthening migratory bird conservation through enhanced collaboration between the two agencies. This voluntary Memorandum of Understanding does not waive legal requirements under the MBTA, Endangered Species Act of 1973 (ESA), NGA, or any other statutes and does not authorize the take of migratory birds.

All tree clearing from MP 0 to MP 77 has already occurred for the Mountain Valley Pipeline Project. Impacts on migratory birds and Mountain Valley's mitigation measures to protect migratory birds during construction and operation were discussed and evaluated in the FEIS. Noise and ground disturbing activities from the conventional bores could affect birds that might be nesting, foraging, or sheltering nearby. Bird species inhabiting the surrounding area would be temporarily displaced during construction but would be able to return to the area after the bores are completed. Mountain Valley would follow its *Migratory Bird Conservation Plan* to minimize any potential impacts on migratory birds. No bald or golden eagle nests were identified in the vicinity of the proposed conventional bore crossings. Based on these measures we conclude that construction of the Amendment Project would not cause adverse impacts on migratory bird populations in the project area.

3.5 Special Status Species

Special status species are those species for which state or federal agencies afford an additional level of protection by law, regulation, or policy. Special status species include federally listed species protected under the ESA, species proposed or candidates for listing by the FWS, and those species that are state listed as threatened or endangered, or other special status. Section 7(a)(2) of the ESA requires the Commission to ensure that any action it authorizes, funds, or carries out would not jeopardize the continued existence of federally listed or proposed listed species, or result in the adverse modification or destruction of critical habitat for federally listed and proposed species.

We received multiple comments stating that special status species may be impacted due to the Amendment Project. These impacts are addressed below.

3.5.1 Federally Listed Species

There are two federally listed species that could occur in the areas where the conventional bores are proposed: the Indiana bat and northern long-eared bat. There are no other federally listed species (including species proposed for listing and candidate species) that occur in the areas where the conventional bores are proposed.

As described in the FEIS, the Indiana bat is a federally listed endangered species and state-listed endangered species in Pennsylvania and Virginia. It hibernates during winter in caves or, occasionally, in abandoned mines from November through March. In Spring, Indiana bats emerge and migrate to summer habitat areas where they roost in dead trees, dying trees, or live trees with exfoliating bark. Indiana bats forage at night in forested stream corridors, upland and bottomland forests, forested wetlands, and along wooded edges of agricultural fields, pastures, and impounded bodies. Indiana bats use echolocation (the location of objects by reflected sound) to feed on terrestrial and aquatic insects. Mating occurs in the fall before they enter hibernation. There are no known or presumed occupied Indiana bat hibernacula in the counties crossed by the Amendment Project workspaces. Additionally, all trees have already been cleared from the workspaces.

As described in the FEIS, the northern long-eared bat is a federally listed threatened species and state-listed endangered species in Virginia. It hibernates during the winter in small crevices and cracks within caves and mines with constant temperatures, high humidity, and no air currents. In the Spring, northern long-eared bats emerge from hibernacula and migrate to summer habitat where they roost singly or in colonies beneath the bark or in cavities or crevices of live and dead trees (snags). Northern long-eared bats typically forage at dusk through the understory of forested areas feeding on insects, which they catch using echolocation. Mating occurs in the late summer and fall before the bats enter hibernation.

One known northern long-eared bat hibernaculum occurs near the Amendment Project workspaces. All tree clearing within 0.25 mile of this hibernaculum has already occurred, and no further tree clearing would be required for the proposed change to conventional bore crossings. Mountain Valley would complete the three bores within 2.0 miles of this hibernaculum after March 31 to avoid any potential impacts to hibernating bats.

As previously mentioned, all tree clearing has occurred in the Mountain Valley Pipeline Project workspaces from MP 0 to MP 77, with no additional tree clearing required for the proposed change to conventional bore crossings. Therefore, there would

be no additional tree clearing impacts on bats that was not already accounted for in the 2020 Biological Opinion.

Nighttime construction has the potential to affect bats since they are nocturnal animals and use echolocation to forage and sound to communicate⁶. Most bores would be conducted in the winter months while bats are not active. We therefore determined that bores conducted during the winter months would not affect the Indiana bat or northern long-eared bat.

However, the bores conducted after March 31 as described above have the potential to affect bats during spring migration and summer roosting if nighttime construction occurs. Because noise and light from nighttime construction would be localized to the immediate area of the bores and would last for only a few weeks, at most, any impacts are likely discountable. Additionally, as tree clearing has already occurred in the Amendment Project workspaces, and as stated in the 2020 Biological Opinion that “bats are not likely to be exposed to consequences as a result of increased noise, lighting or dust within the areas of habitat removal,” the impacts from possible overnight work may affect but is not likely to adversely affect Indian bats or northern long-eared bats. Following issuance of this EA, Commission staff will seek concurrence from FWS with this determination. Therefore, **we recommend that:**

- **Mountain Valley should not commence construction activities associated with the conventional boring until Commission staff completes consultation with the FWS regarding potential impacts on the Indiana bat and the northern long-eared bat.**

3.5.2 Other Special Status Species

Impacts on state-listed and other species designated as sensitive were identified and described for the Mountain Valley Pipeline Project in the FEIS. The proposed conventional bores would not result in any new or additional impacts other than an increase in the amount of noise and light pollution occurring at night. As described above, the conventional bore crossings would lessen the impact on aquatic species that may occur in and around the subject streams. Bore pits would occur in upland areas and Mountain Valley would erect erosion and sediment control devices to protect waterbodies and any surrounding wetland habitat that could provide habitat for state-listed or special status sensitive species. In addition, because tree clearing has already occurred in the subject areas, the impacts on any sensitive bird species potentially inhabiting the

⁶ It should be noted that based on our recommendation in section 6.2.2 below, nighttime work would be limited to bore locations that are able to conduct boring operations at noise limits at or below a day-night averaged sound level of 55 decibels on the A-weighted scale.

surrounding area would be limited to temporary displacement due to noise from construction as discussed above.

Based on the information discussed above, and with our recommendation, we conclude that the proposed Amendment Project would not result in significant impacts on special status species.

4.0 Land Use

As described previously, the Amendment Project would take place entirely within the previously authorized limits of disturbance. The Amendment Project would require a bore pit to be excavated on each side of the resource(s) being crossed as well as areas to store the excess spoil from the excavation and boring activities. The bore pits would be located within the existing construction right-of-way and average approximately 16.7 feet by 41.9 feet in size. The excess soil would be stored in soil piles along the right-of-way or spread out on the right-of-way. Therefore, the land use for the Amendment Project consists entirely of right-of-way excluding existing riparian vegetation that was maintained as a 50-foot buffer at waterbodies. However, as mentioned above, approximately 3.4 acres of existing riparian vegetation would be impacted due to the boring operations.

Mountain Valley also proposes to avoid one wetland, A-002, via a shift in the permanent operation right-of-way. This shift would result in 0.23 acres that was certificated as temporary construction workspace but would change to permanent workspace. The total permanent certificated workspace amount would not change.

The conventional boring activities would result in short-term impacts on adjacent residential areas, including increased construction related traffic on local roads, as well as dust and noise generated during construction. Mountain Valley would minimize these potential impacts through implementation of mitigation measures specified in its site-specific Residential Construction Plans for residences within 50-feet of the right-of-way.

As the Amendment Project would not impact land use outside of the already certificated Mountain Valley Pipeline Project right-of-way, we do not anticipate significant impacts to this resource as a result of the project activities.

4.1 Environmental Justice

EO 12898, which requires certain federal agencies to identify and address disproportionately high and adverse human or environmental health effects on low-income and minority populations, does not apply to the Commission. Nonetheless, Commission staff will address environmental justice concerns in the review of proposed projects when it is warranted or when these concerns are raised during the public environmental review process. We received one comment requesting that FERC identify environmental justice communities in the vicinity of the Amendment Project activities.

Executive Order 12898 encourages independent agencies to identify and address, as part of their NEPA review, “disproportionately high and adverse human health or environmental effects” of their actions on minority and low-income populations. Section 4.9.1.8 of the 2017 FEIS provides an analysis of minority and low-income populations in the vicinity of the larger Mountain Valley Pipeline Project. In section 4.9.2.8 of the FEIS we conclude that none of the counties or census blocks crossed by the Mountain Valley Pipeline Project have minority populations exceeding 50 percent nor have minority populations meaningfully greater than the minority population percentage in their respective states. However, we note that low-income communities do exist along the Mountain Valley Pipeline route and that these populations may be affected by construction and operation of the larger Mountain Valley Pipeline Project. However, we determined that as there would be no significant environmental impacts from the Mountain Valley Pipeline Project because such impacts would not appreciably exceed impacts on the general population.

The Amendment Project is located entirely within the already certificated limits of disturbance. The construction activities associated with the conventional bore crossings are anticipated to take between 6 and 67 days to complete. As such, the impacts associated with the Amendment Project are temporary and do not involve the construction of any permanent, aboveground structures. Based on the temporary nature of the impacts and the information provided above, we conclude that the Amendment Project would not result in a disproportionately high and adverse impact on environmental justice populations.

5.0 Cultural Resources

Section 106 of the National Historic Preservation Act (NHPA) requires that FERC take into account the effect of its undertakings⁷ (including authorizations under Sections 3 and 7 of the NGA) on historic properties,⁸ and afford the Advisory Council on Historic Preservation (ACHP) an opportunity to comment. Mountain Valley, as a non-federal applicant, is assisting FERC staff in meeting our obligations under Section 106 by providing data, analyses, and recommendations in accordance with Title 36 CFR Part 800.2(a)(3) and FERC’s regulations at 18 CFR Part 380.12(f).

⁷ “Undertaking means a project activity, or program funded in whole or in part under the direct or indirect jurisdiction of a Federal agency, including those carried out by or on behalf of a Federal agency; those carried out with Federal financial assistance; those requiring a Federal permit, license or approval; and those subject to state or local regulation administered pursuant to a delegation or approval by a Federal agency,” as defined in 36 CFR 800.16(y).

⁸ Historic properties include prehistoric or historic sites, districts, buildings, structures, objects, landscapes, or properties of traditional religious or cultural importance listed on or eligible for listing on the National Register of Historic Places, as defined in 36 CFR 800.16(l).

FERC staff examined the 41 proposed bore locations to determine if those activities may have impacts on historic properties. As documented in our FEIS issued on June 23, 2017, and the Programmatic Agreement (PA) executed December 15, 2017, for the Mountain Valley Mainline Pipeline Project in Docket No. CP16-10-000, the areas where the bores are proposed were previously inventoried for cultural resources. The FEIS also documented our consultations with the West Virginia State Historic Preservation Office (SHPO), interested Indian tribes, and other consulting parties for this project. The PA was signed by the SHPO and ACHP. Below we identify the cultural resources previously recorded in proximity to the bores, provide their NRHP status, and assess the Amendment Project effects.

5.1 Identification of Historic Properties

5.1.1 Area of Potential Effect

In the 2017 FEIS, we defined the direct area of potential effects (APE) as a 300-foot-wide corridor along the pipeline route, a 100-foot-wide corridor along access roads, and the limits of ground disturbance at aboveground facilities, yards, and other extra workspaces. The indirect APE was defined as 0.25-mile on each side of the pipeline centerline, and a 0.5-mile radius around proposed compressor stations.

We received comments stating that Mountain Valley's cultural attachment study for the Peters Mountain area was never filed in the docket. Mountain Valley's cultural attachment report (Bengston and Austin, 2016) was filed on January 27, 2016 in Docket CP16-10-000, and the findings of that report were discussed in detail in our FEIS for the Mountain Valley Pipeline Project.

The comments also stated that FERC did not consult with the ACHP on the Mountain Valley Pipeline Project. The ACHP signed the PA for this project on December 15, 2017. Section 4.10.1 of our FEIS documented our consultations with the ACHP and numerous consulting parties about cultural resources, including, but not limited to local, state, and federal agencies, interested Indian tribes, regional historical organizations, landowners, and the public, prior to the Commission making a decision about the Mountain Valley Pipeline Project.

5.2 Inventory Results

On December 2 and 16, 2020, staff sent out environmental information requests, which Mountain Valley responded to on December 11 and 22, 2020. We asked Mountain Valley to file maps showing the location of all previously recorded features within the indirect APE (archaeological sites within 150 feet and historic architectural sites within 0.25 mile) of the bores, and additional site information. Independently, staff reviewed data on previously recorded site locations in the APE near bores. We identified 37

cultural resources within the direct and indirect APE at the proposed bore locations. However, only four of these are considered eligible.

The Amendment Project would have no effect on sites that are not eligible⁹. Stipulation IIB of the PA states: “Those cultural resources which FERC staff determines do not meet the NRHP criteria, after consultations with [the SHPO] (and federal land managing agencies for sites on federal lands, interested Indian Tribes, and other consulting parties, as appropriate), will require no further considerations.”

Four eligible historic properties (H-WZ-154, H-LE-150, 46LE92, and H-BX-351) were identified near the bores. Historic architectural site H-WZ-154 is the Mobley School, dating to about 1920. We agree with the SHPO, that the Mobley School is eligible for the NRHP under Criteria 36 CFR 60.4 A and C. It is related to important regional historical events and settlement and is an architectural example of early twentieth century school-house design in rural northern West Virginia. The boundary for this historic property is about 432 feet away from the Mountain Valley Mainline Pipeline, and the structure itself is about 700 feet away from the proposed bore. The school building was avoided during construction. The proposed bore would be underground, and after restoration, the Amendment Project would not change the general character of the landscape that may affect the setting or elements that make the site significant.

Archaeological site 46LE92 contains multi-cultural remains, including a Prehistoric Early Archaic occupation and an historic isolated find. We agree with the SHPO, that archaeological site 46LE92 is eligible for the NRHP under Criterion 36 CFR 60.4 D, for the information it contains about Early Archaic occupations in the Amendment Project Area. During Mainline Pipeline construction, site 46LE92 was fenced and avoided. The proposed bore would have no additional impacts on this property, as the pipeline would be installed underground, resulting, after restoration, in no changes to the general character of the landscape that may affect the setting or elements that make the site significant. Stipulation IIIA1 of the PA states that “FERC staff and [the SHPO] (and federal land managing agencies for sites on federal lands) agree that the Mountain Valley [Mainline Pipeline Project] would have no effect (in accordance with 36 CFR 800.4(d)(1)) upon historic properties that are avoided.

Historic architectural site H-LE-150 is the Underwood or Gum farmstead, dating to about 1900. While the bore is near the boundary of this site, it is not close to any structures. In accordance with Stipulation IIIB1 of the PA, project impacts on Underwood farmstead were mitigated through implementation of measures outlined in the site-specific treatment plan that was accepted by the SHPO on January 8, 2018. On September 23, 2019, Mountain Valley filed its final treatment report for historic

architectural site H-LE-150, that was accepted by the SHPO. We also found the treatment plan and treatment report for the Underwood farmstead acceptable.

Historic architectural site H-BX-351 is the Losch or Cunningham farmstead, dating to about 1890. While the bore is near the boundary of this site, it is not close to any structures. In accordance with Stipulation IIIB1 of the PA, project impacts on the Losch farmstead were mitigated through implementation of the measures outlined in the site-specific treatment plan that was accepted by the SHPO on January 8, 2018. On September 23, 2019, Mountain Valley filed its final treatment report for historic architectural site H-BX-351, that was accepted by the SHPO. We also found the treatment plan and treatment report for the Losch farmstead acceptable.

5.3 Compliance with the NHPA

We completed the process of complying with Section 106 of the NHPA, when we executed the PA for the Mountain Valley Pipeline Project. The PA required mitigation for adversely affected historic properties that could not be avoided. There are four historic properties (H-WZ-154, H-LE-150, 46LE92, and H-BX-351) near the Amendment Project proposed bores. Both historic architectural site H-WZ-154 and archaeological site 46LE92 were avoided during pipeline construction, in keeping with Stipulation IIIA1 of the PA. The proposed bores would also avoid these two historic properties and would not result in any additional impacts. In the case of historic architectural sites H-LE-150 and H-BX-351, Mountain Valley implemented measures of approved individual treatment plans for those properties, in accordance with Stipulation IIIB1 of the PA. Thus, project impacts at those two historic properties were properly mitigated, and the proposed bores would no result in any further impacts on these properties.

6.0 Air Quality and Noise

6.1 Air Quality

The Amendment Project would result in emissions of regulated air pollutants and other air contaminants during construction. There would be no operational emissions from the Project except very minor fugitive methane emissions previously identified in the FEIS.

6.1.1 Air Quality Regulations

The Clean Air Act (CAA) of 1970, as amended in 1977 and 1990, is the basic federal statute governing air quality. The provisions of the CAA that are potentially relevant to the Project include National Ambient Air Quality Standards (NAAQS) and General Conformity.

Federal and state air quality standards are designed to protect human health. The U.S. Environmental Protection Agency (EPA) has developed NAAQS for criteria air pollutants such as oxides of nitrogen (NO_x) and carbon monoxide (CO), sulfur dioxide (SO₂), and inhalable particulate matter (PM_{2.5} and PM₁₀). PM_{2.5} includes particles with an aerodynamic diameter less than or equal to 2.5 micrometers, and PM₁₀ includes particles with an aerodynamic diameter less than or equal to 10 micrometers. The NAAQS were set at levels the EPA believes are necessary to protect human health and welfare. Volatile organic compounds (VOC) are regulated by EPA mostly to prevent the formation of ozone, a constituent of photochemical smog. Many VOCs form ground-level ozone by reacting with sources of oxygen molecules such as NO_x in the atmosphere in the presence of sunlight. NO_x and VOCs are referred to as ozone precursors. Hazardous air pollutants (HAP) are also emitted during fossil fuel combustion and are suspected or known to cause cancer or other serious health effects; such as reproductive effects or birth defects; or adverse environmental effects.

Greenhouse gases (GHG), the most common of which are carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), ozone, hydrofluorocarbons, and perfluorocarbons, are naturally occurring pollutants in the atmosphere and products of human activities, including burning fossil fuels. Fossil fuel combustion emits CO₂, CH₄, and N₂O. GHGs status as a pollutant is not related to toxicity. GHGs are non-toxic and non-hazardous at normal ambient concentrations, and there are no applicable ambient standards or emission limits for GHG under the Clean Air Act. Emissions of GHGs are typically expressed in terms of CO₂ equivalents (CO_{2e}) where the atmospheric heating potential of each gas is expressed as a multiple of the atmospheric heating potential of CO₂.

If measured ambient air pollutant concentrations for a subject area remain below the NAAQS criteria, the area is considered to be in attainment with the NAAQS. The proposed conventional bore crossings are located in the counties of Wetzel, Harrison, Doddridge, Lewis, and Braxton, West Virginia. All counties listed are in attainment with the NAAQS for all criteria pollutants. Therefore, a CAA General Conformity Analysis is not required.

No county or local air quality regulations have been identified as being potentially applicable to the Project.

6.1.2 Construction Emissions and Impacts

During construction, a temporary reduction in ambient air quality may result from criteria pollutant emissions and fugitive dust generated by construction equipment. The quantity of fugitive dust emissions would depend on the moisture content and texture of the soils that would be disturbed. Fugitive dust and other emissions due to construction activities generally do not pose a significant increase in regional pollutant levels; however, local pollutant levels could increase. Dust suppression techniques, such as watering the right-of-way and working area may be used as necessary in construction

zones near residential and commercial areas to minimize the impacts of fugitive dust on sensitive areas. In addition, Mountain Valley committed to implement the same measures to reduce construction emissions as described in the FEIS.

Mountain Valley conducted an analysis of estimated emissions from the proposed trenchless crossing methods compared to open-cut crossings. Generally, the emissions for each crossing, whether bore or open-cut, are very small. The conventional bore crossing would result in slightly higher levels of emissions per crossing and for the entire project. Table 2 below shows the total emissions as well as the emissions increase for the Amendment Project.

Table 2 Construction Emissions Comparison Open-Cut vs. Conventional Bore (tons)							
	NO_x	CO	SO₂	VOC	PM₁₀	PM_{2.5}	CO_{2e}
Open-Cut	8.2	2.87	0.0205	0.082	0.41	0.41	2,691.24
Conventional Bore	12.71	3.69	0.0205	0.082	0.82	0.82	2,797.02
Emissions Increase	4.51	0.82	0	0	0.41	0.41	105.78

Based on the short duration of construction activities; our review of the estimated emissions from construction of the proposed Amendment Project; as no change in operational emissions, we conclude that there would be no significant impacts on air quality.

6.1.3 Climate Change

We received comments regarding the Project’s impact on climate change. Specifically, the GHG emissions from the project as well as exploration, production, transport as burning (downstream) emissions of natural gas.

The Commission’s practice is to conduct an environmental review for each proposed project or several projects that are interrelated or connected. Although the gas would be directed to other pipeline systems or delivered to a local distribution system, the ultimate end use is not known. The gas could be used to replace existing gas sources, replace higher carbon sources such as oil and coal; or be used as an industrial feedstock. The Commission’s policy is that upstream and downstream GHG emissions,

unless use for a known end-use; provides no additional information to inform the NEPA analysis or the determination of Public Convenience and Necessity.

Climate change is the variation in climate (including temperature, precipitation, humidity, wind, and other meteorological variables) over time, whether due to natural variability, human activities, or a combination of both, and cannot be characterized by an individual event or anomalous weather pattern. Recent research has begun to attribute certain extreme weather events to climate change (USGCRP 2018).

In 2017 and 2018, the U.S. Global Change Research Program (USGCRP) issued its *Climate Science Special Report: Fourth National Climate Assessment*, Volumes I and II (Fourth Assessment Report) (USGCRP, 2017; and USGCRP, 2018, respectively). The Fourth Assessment Report states that climate change has resulted in a wide range of impacts across every region of the country. Those impacts extend beyond atmospheric climate change alone and include changes to water resources, transportation, agriculture, ecosystems, and human health. The U.S. and the world are warming; global sea level is rising and acidifying; and certain weather events are becoming more frequent and more severe. These changes are driven by accumulation of GHG in the atmosphere through combustion of fossil fuels (coal, petroleum, and natural gas), combined with agriculture, clearing of forests, and other natural sources. These impacts have accelerated throughout the end 20th and into the 21st century (USGCRP 2018). The FEIS discussed the existing and estimated future climate change impacts in the Mountain Valley Pipeline Project area.

The GHG emissions associated with construction and operation of the Amendment Project were identified and quantified in section B.6.1.2 above. The change from open-cut to conventional boring would result in minor increases in GHG emissions, equaling approximately 105 tons. However, this minor amount from construction of the Amendment Project would increase the atmospheric concentration of GHGs in combination with past, current, and future emissions from other sources globally and contribute incrementally to future climate change impacts. Calculating the specific impact of this small amount of GHG emissions is not feasible, even if there were a universally accepted methodology. Similarly, the comparison to any GHG emission reduction goals established either at the federal level¹⁰ or by States¹¹ is not practicable as

¹⁰ The national emissions reduction targets expressed in the EPA's Clean Power Plan and the Paris Climate Accord are repealed and withdrawn, respectively.

¹¹ We reviewed the U.S. State Greenhouse Emission Targets site for individual state requirements located at: <https://www.c2es.org/document/greenhouse-gas-emissions-targets/>

no reduction emissions goals have been established at the federal level or by the state of West Virginia.

6.2 Noise

The noise environment can be affected both during construction and operation of pipeline projects. The magnitude and frequency of environmental noise may vary considerably over the course of the day, throughout the week, and across seasons, in part due to changing weather conditions and the effects of seasonal vegetative cover. For the Amendment Project, there would be no operational noise that would result from the change in pipeline installation methods.

6.2.1 Noise Characteristics and Regulations

Decibels (dB) are the units of measurement used to quantify the intensity of noise. To account for the human ear's sensitivity to low level noises the decibel values are corrected to weighted values known as decibels on the A-weighted scale (dBA). The A-weighting scale was developed and has been shown to provide a good correlation with the human response to sound and is the most widely used descriptor for community noise assessments. The faintest sound that can be heard by a healthy ear is about 0 dBA, while an uncomfortably loud sound is about 120 dBA. A 3 dBA change of sound level is considered to be barely perceivable by the human ear, a 5 or 6 dBA change of sound level is considered noticeable, and a 10 dBA increase is perceived as if the sound intensity has doubled.

Two measures used by FERC relate the time-varying quality of environmental noise with its known effect on people are the equivalent continuous sound level (L_{eq}) and the day-night average sound level (L_{dn}). The preferred single value figure to describe sound levels that vary over time is L_{eq} , which is defined as the sound pressure level of a noise fluctuating over a period of time, expressed as the amount of average energy. L_{dn} is defined as the 24-hour average of the equivalent average of the sound levels during the daytime (L_d – from 7:00 a.m. to 10:00 p.m.) and the equivalent average of the sound levels during the nighttime (L_n – 10:00 p.m. to 7:00 a.m.). Specifically, in the calculation of the L_{dn} , late night and early morning (10:00 p.m. to 7:00 a.m.) noise exposures are increased by 10 decibels (dB) to account for people's greater sensitivity to sound during nighttime hours. In general, if the sound energy does not vary over the given time period, the L_{dn} level will be equal to the L_{eq} level plus 6.4 dB. The 6.4 dB difference between the L_{dn} and the L_{eq} is a result of the 10 dB nighttime addition for the L_{dn} calculation.

FERC guidelines require that the sound attributable to new or modified compressor equipment, or LNG-related equipment not exceed an L_{dn} of 55 dBA at any nearby noise sensitive area (NSA) such as a residence, hospital, place of worship, etc. Also, a sound level of 55 dBA (L_{dn}) can be used as a benchmark sound criterion or guideline for assessing the noise impact of other sources of noise, such as certain

construction noise, including drilling or boring noise. We have not identified any state or local regulations or ordinances as being potentially applicable to the Amendment Project.

6.2.2 Noise Impacts

The Amendment Project will have 2 distinct phases of construction that would generate high levels of noise: 1) excavation of entry and exit bore pits; and 2) active boring. Noise from backfilling would be similar to excavation, although it would be of much shorter duration. Restoration would also generate noise however the noise would be of short duration and involve less equipment.

Mountain Valley has proposed to use conventional boring at 41 locations. Mountain Valley provided a “generic” noise analysis for a bore assuming standard equipment using the Cadna/A version 2020 MRI noise model (noise model). The noise model assumed conventional bore equipment construction, equipment for each phase, standard bore pit size, and concentrated the equipment around the trench entry. The noise model was not site-specific and did not include terrain effects, site-specific geometry effects, or vegetation sound absorption. It did assume an average value for ground absorption. Mountain Valley provided noise levels at a specific distance of 500 feet from the bore pits. In response to a staff issued data request, Mountain Valley provided specific noise impacts at the nearest NSAs for each of the 41 bore locations¹². Mountain Valley did not rerun the noise model, and instead conservatively estimated the noise impact at the nearest NSAs using hemispherical spreading as noise reduction with no other noise absorption or mitigation.

The analysis indicated a potential for elevated noise levels of both excavation and bore pit operations at the nearest NSAs as indicated in Attachment 11-A and 11-B of Mountain Valley’s *Responses to FERC Environmental Information Request* filed on December 11, 2020.

The EPA has indicated that an Ldn of 55 dBA protects the public from indoor and outdoor activity interference. We have adopted this criterion and use it to evaluate the potential noise impacts from construction and operation of projects. In the information filed by Mountain Valley, both day-night averaged noise levels as well as exclusively nighttime noise impacts were in excess of 55 dBA L_{dn} at the NSAs for every bore location with NSAs within 0.5 mile. Eight of the bores would have estimated nighttime noise impacts in excess of 70 dBA L_{eq}¹³ with L_{dn} noise impacts in excess of 80-90 dBA.

¹² See Accession No. 20201211-5164

¹³ Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety, EPA, April 2, 1974, 550/9-74-002, Table 1

As indicated, Mountain Valley's analysis was not site-specific and did not include many mitigation factors, including topography and vegetation, which would reduce the noise impacts from the excavation and boring activities.

Mountain Valley has indicated that it would "*conduct boring activities during overnight hours only for the circumstance where the integrity of the borehole would be compromised by stopping the boring process.*" Mountain Valley has stated that it would notify nearby NSAs if nighttime boring is necessary as well as offer relocation compensation to the nearest NSAs. Mountain Valley stated that if the NSA residents and Mountain Valley cannot reach agreement regarding compensation, then sound barriers would be erected.

However, after analyzing the estimated noise impacts on NSAs, we find that the proposed boring would result in potential noise impacts and we are not convinced of the feasibility of Mountain Valley's mitigation measures. Specifically, it may not be practical for Mountain Valley to reach agreement with nearby residents in a timely manner once it determines that 24-hour operations are needed to protect the integrity of the borehole. In addition, we are concerned with the logistics surrounding the time needed for the installation of sound barriers deemed necessary by Mountain Valley while boring is underway.

As stated in the FEIS, noise sources during typical pipeline construction would come from internal combustion engines used by construction equipment. Construction equipment noise levels would typically be around 85 dBA at 50 feet when the equipment is operating at full load, which could be heard by people in nearby buildings. Although construction of a typical pipeline spread¹⁴ would generally last for about 10 months, noise impacts would be mostly transient as pipe installation progresses from one location to the next. As such, most pipeline construction noise would be localized, short-term, and temporary, and no NSA would be expected to be exposed to significant noise levels for an extended period of time.

The conventional boring activities proposed in the Amendment Project are temporary and would not result in a change to the operational noise of the Mountain Valley Pipeline Project as compared to that discussed in the FEIS. However, the boring activities are stationary and would take place over several days to several weeks, and thus may impact NSAs for a longer period than the formerly proposed open-cut construction at the same locations.

¹⁴ Construction spreads are discrete segments of the pipeline that are constructed concurrently or separately from other portions of the route). The construction spreads for Mountain Valley average about 34 miles in length.

Therefore, in order to mitigate the noise impacts at the NSAs, we recommend that:

Prior to commencing any construction activities associated with the conventional boring activities, Mountain Valley should file with the Secretary, for the review and written approval by the Director of OEP, or the Director's designee, a Conventional Bore Noise Mitigation Plan to reduce noise impacts attributable to conventional bore construction to no more than 55 dBA L_{dn} at all NSAs. During excavation and boring operations, Mountain Valley shall implement the approved plan, monitor noise levels, and document the noise levels in the weekly status reports.

Because of the temporary nature of construction activities, and with our recommendation, we conclude that no significant noise impacts are anticipated from construction of the proposed Amendment Project.

7.0 Reliability and Safety

The transportation of natural gas by pipeline involves some risk to the public in the event of an accident and subsequent release of gas. The greatest hazard is a fire or explosion following a major pipeline rupture. Methane, the primary component of natural gas, is colorless, odorless, and tasteless. It is not toxic, but is classified as a simple asphyxiate, possessing a slight inhalation hazard. If breathed in high concentration, oxygen deficiency can result in serious injury or death.

The pipeline facilities associated with the Amendment Project must be designed, constructed, operated, and maintained in accordance with the U.S. Department of Transportation Minimum Federal Safety Standards in 49 CFR Part 192 and other applicable federal and state regulations. The regulations are intended to ensure adequate protection for the public and to prevent natural gas facility accidents and failures. The DOT pipeline standards are published in Parts 190-199 of Title 49 of the CFR. For example, Part 192 of 49 CFR specifically addresses natural gas pipeline safety issues, prescribes the minimum standards for operating and maintaining pipeline facilities, and incorporates compressor station design, including emergency shutdowns and safety equipment. Part 192 also requires a pipeline operator to establish a written emergency plan that includes procedures to minimize the hazards in a natural gas pipeline emergency.

The operator must also establish a continuing education program to enable customers, the public, government officials, and those engaged in excavation activities to recognize a gas pipeline emergency and report it to appropriate public officials. Mountain Valley would provide the appropriate training to local emergency service personnel before the facilities are placed in service.

We received several comments concerning the integrity of the pipeline coating on portions of the pipeline that have been exposed to the elements. As FERC noted in its October 9, 2020 Order Partially Lifting Stop Work Order and Allow Certain Construction to Proceed, Mountain Valley has stated previously, the coating thickness on its stored pipes is above the manufacturer's recommendation, and the coating on each pipe segment is inspected for damage and thickness before the pipe is installed in the trench. Based on Commission staff's review of the FBE (fusion bonded epoxy) chalking analysis submitted by Mountain Valley and all other pertinent materials¹⁵, we found no basis for supplementing the 2017 FEIS to analyze potential toxicity associated with FBE coating or including an analysis in this EA.

Mountain Valley's use of conventional boring in lieu of typical open cut would offer the pipeline an equivalent level of protection. We conclude there would be no increase in risk to the public.

¹⁵ Letters to the Virginia Department of Health, the Virginia Department of Environmental Quality, and the North Carolina Dept. of Health and Human Services' for both the Mountain Valley Pipeline and the Atlantic Coast Pipeline regarding FBE coatings. Accession Nos. 20201008-3000 and 20201008-3001, October 8, 2020

SECTION C – ALTERNATIVES

In accordance with NEPA and Commission policy, we consider and evaluate alternatives to the proposed action, including the no-action alternative. These alternatives are evaluated using a specific set of criteria. The evaluation criteria applied to each alternative include a determination whether the alternative:

- meets the objective of the proposed Amendment Project;
- is technically and economically feasible and practical; and
- offers a significant environmental advantage over the proposed Amendment Project.

Through environmental comparison and application of our professional judgment, each alternative is considered (in the sequence identified above) to a point where it becomes clear if the alternative could or could not meet the three evaluation criteria. An alternative that cannot achieve the purpose for the Amendment Project cannot be considered as an acceptable replacement for the Amendment Project.

Because the proposed action does not involve the siting and construction of new facilities, our alternatives analysis is limited to considering the no-action alternative.

No-Action Alternative:

The no-action alternative is a Commission decision to not authorize the proposal. Selecting the no-action alternative means that the impacts disclosed in this EA would not occur, at the cost of not meeting the purpose, need, and goals of the proposed action. If the no-action alternative is selected, then Mountain Valley would not be authorized to change the crossing technique from open-cut to conventional bore for the 69 waterbody and wetland crossings. As a result of the Commission selecting the no-action alternative, Mountain Valley could conduct the crossings via open cut crossing techniques; modify and resubmit an application for a similar or different crossing technique; or not construct the crossings. Given the status of construction of the Mountain Valley Pipeline, it is unlikely that Mountain Valley would choose to not complete the crossings. Consequently, the use of the already authorized open-cut crossing technique is the likeliest outcome of the Commission selecting the no-action alternative.

As discussed in Sections A and B above, the conventional bore crossings would not change the overall footprint of the Mountain Valley Pipeline Project as all boring activities, including the bore pit excavations, would occur entirely within the Mountain Valley Pipeline Project's already certificated right-of-way. Performing the open-cut crossings would result in the impacts as discussed in the 2017 FEIS. These include

temporary increases in sediments mobilized downstream due to in-stream impacts and the clearing and grading of stream banks and wetlands.

The conventional bore crossing technique would reduce environmental impacts to surface waterbodies, wetlands, and aquatic resources as conventional bores do not result in impacts associated with constructing directly in waterbodies and wetlands, including increased turbidity and disruption to wetland vegetation. The conventional bores would cause increases in air emissions and noise during the excavation and boring activities as compared to the no-action alternative; however, these impacts would be temporary and would persist for only the short duration required to complete the bores.

Neither the no-action alternative nor the proposed Amendment Project are anticipated to result in significant environmental impacts. We have determined that completing the 69 waterbody and wetland crossings by open cut crossings would not offer a significant environmental advantage over the proposed Amendment Project.

SECTION D – STAFF’S CONCLUSIONS AND RECOMMENDATIONS

Based on the analysis in this EA, we have determined that if Mountain Valley completes the waterbody and wetland crossings via conventional bores in accordance with its application and supplements, and the staff’s recommended mitigation measures below, approval of the Amendment Project would not constitute a major federal action significantly affecting the quality of the human environment. We recommend that the Commission Order contain a finding of no significant impact and include the measures listed below as conditions in any authorization the Commission may issue to Mountain Valley. We also recommend that Mountain Valley continue to comply with environmental conditions set forth in Appendix C to the Mountain Valley Pipeline Certificate Order.

1. Mountain Valley shall follow the construction procedures and mitigation measures described in its application and supplements including responses to staff data requests and as identified in the environmental assessment, unless modified by the Order. Mountain Valley must:
 - a. request any modification to these procedures, measures, or conditions in a filing with the Secretary;
 - b. justify each modification relative to site-specific conditions;
 - c. explain how that modification provides an equal or greater level of environmental protection than the original measure; and
 - d. receive approval in writing from the Director of OEP, or the Director’s designee, **before using that modification.**
2. The Director of OEP, or the Director’s designee, has delegated authority to address any requests for approvals or authorizations necessary to carry out the conditions of the Order, and take whatever steps are necessary to ensure the protection of environmental resources during construction of the project. This authority shall allow:
 - a. the modification of conditions of the Order;
 - b. stop-work authority; and
 - c. the imposition of any additional measures deemed necessary to ensure continued compliance with the intent of the conditions of the Order as well as the avoidance or mitigation of unforeseen adverse environmental impact resulting from project construction.
3. Mountain Valley shall **not commence construction activities** associated with the conventional boring **until** Commission staff completes consultation with the U.S. Fish and Wildlife Service regarding potential impacts on the Indiana bat and the northern long-eared bat.

4. **Prior to commencing any construction activities** associated with the conventional boring activities, Mountain Valley shall file with the Secretary, for the review and written approval by the Director of OEP, or the Director's designee, a Conventional Bore Noise Mitigation Plan to reduce noise impacts attributable to conventional bore construction to no more than 55 dBA Ldn at all NSAs. During excavation and boring operations, Mountain Valley shall implement the approved plan, monitor noise levels, and document the noise levels in the weekly status reports.

SECTION E – REFERENCES

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SECTION F – LIST OF PREPARERS

Fink, Jennifer – Environmental Project Manager, Water Resources, and Land Use

M.S., Environmental Policy, 2016, George Washington University

B.S., Environmental Science, 2010, University of Delaware

Friedman, Paul – Cultural Resources

M.A., History, 1980, University of California at Santa Barbara

B.A., Anthropology and History, 1976, University of California at Santa Barbara

Mardiney, Amanda – Fisheries, Vegetation, and Wildlife

M.A., Environmental Resource Policy, 2012, George Washington University

B.S. Biology, 2009, University of Maryland, College Park

Rana, Tony – Geology and Soils

M.S., International Development, 2012, Tulane University

B.S., Geology, 1984, New Jersey City University

Graduate Studies, Hydrogeology and Geochemistry, 1988, Oklahoma State University

Tomasi, Eric – Air Quality, Noise

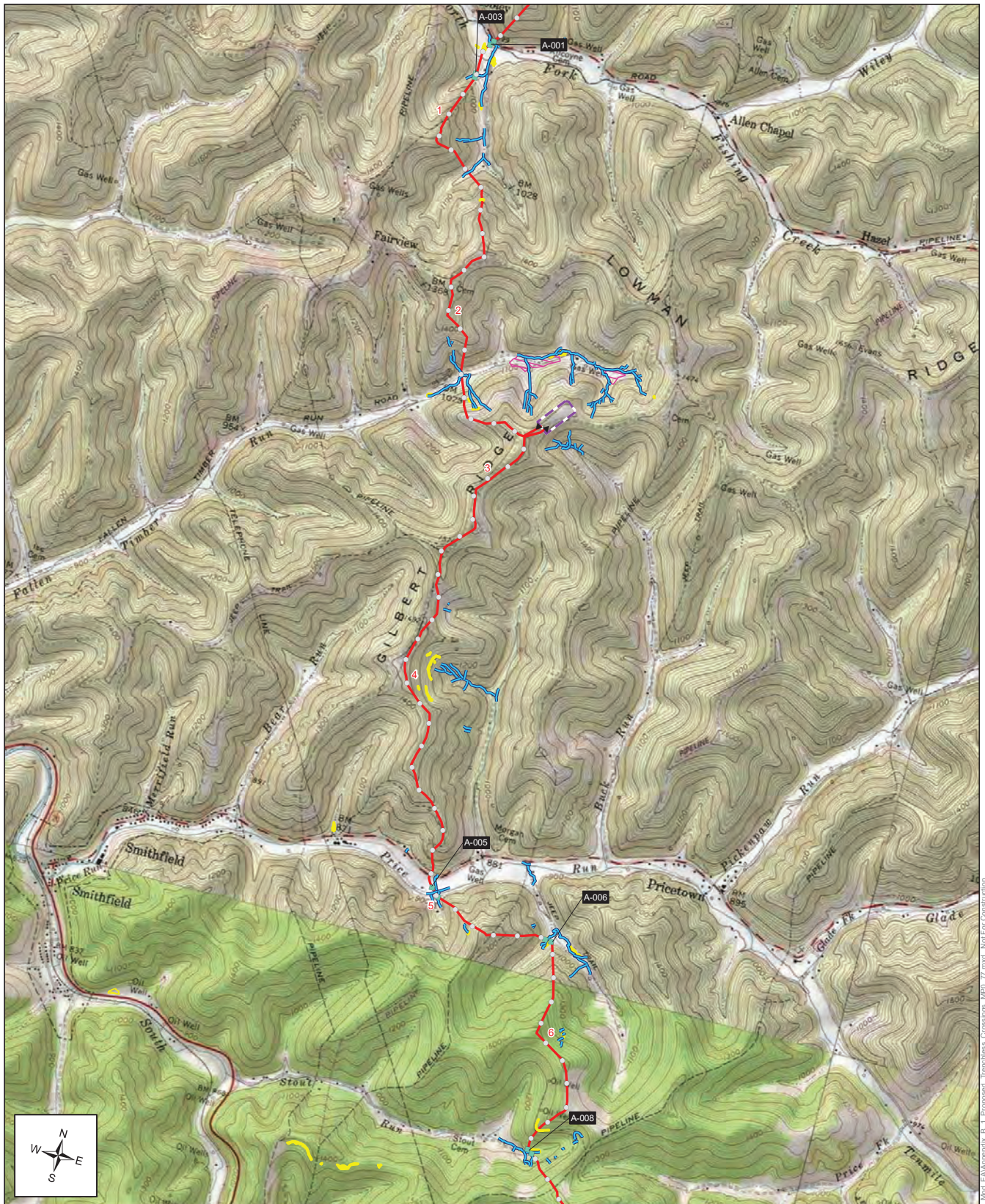
B.S. Aerospace Engineering, 1994, Boston University

Appendix A: Table of Crossings

Spread	State	County	Crossing Number	Crossing Length (feet)	Wetland or Waterbody Crossed	Wetland or Waterbody Milepost
A	WV	Wetzel	A-001	69	W-A1a	0.60
					S-A1a	0.65
A	WV	Wetzel	A-003	47	S-A3a	0.80
A	WV	Wetzel	A-005	203	S-A125	4.98
					S-A124	5.00
A	WV	Wetzel	A-006	95	W-A27-PFO	5.50
					W-A27-PEM	5.50
					S-A118	5.53
A	WV	Wetzel	A-008	85	S-A120	6.41
					S-A119	6.41
					W-A34	6.41
A	WV	Harrison	A-009	40	W-B1a	18.70
A	WV	Harrison	A-010/A-011	243	S-B2a	18.72
					W-A40	18.58
					S-B3a	18.58
A	WV	Harrison	A-012	96	S-A11a	21.44
					S-A11a-Braid-1	21.44
					S-A11a-Braid-2	21.44
A	WV	Harrison	A-013	30	W-UU3	25.9
A	WV	Harrison	A-014	73	S-UU3	25.74
A	WV	Harrison	A-015	190	S-UU5	29.92
					W-UU4	29.92
A	WV	Harrison	A-016	286	W-K43	31.08
					W-K43	31.08
					S-K73	31.08
					S-K74	31.08
					S-K75	31.08
W-K44	31.08					
A	WV	Harrison	A-017	38	W-K45	32.25
					S-K77	32.25
A	WV	Harrison	A-018	36	S-K67	34.12
A	WV	Harrison	A-019A	37	S-K65	34.00
B	WV	Doddridge	B-001	238	S-A110/K62	34.80
					W-A23	34.80
					S-A109	34.80
B	WV	Doddridge	B-001A	38	S-A111	34.84
B	WV	Lewis and Harrison	B-002	223	W-J40	38.00
					S-K82	38.01
					S-K94	38.02
B	WV	Lewis	B-003	46	S-J44	42.92
B	WV	Lewis	B-005	117	W-K33-PEM	44.49
B	WV	Lewis	B-006	96	W-K31	45.80

B	WV	Lewis	B-007	143	W-B46	45.80
B	WV	Lewis	B-008	45	S-H180	46.54
B	WV	Lewis	B-009	260	W-H112	46.67
					W-H112	46.67
B	WV	Lewis	B-010	74	S-I63	54.95
B	WV	Lewis	B-011	56	W-I15	55.03
B	WV	Lewis	B-012	148	W-H103	58.50
					S-H160	58.54
B	WV	Lewis	B-013	42	S-H153	59.41
B	WV	Lewis	B-014A	32	S-H145	59.89
B	WV	Lewis	B-014B	17	S-H165	59.93
B	WV	Lewis	B-015A	193	S-CD16	61.21
					S-VV13	60.67
					S-VV12	61.26
B	WV	Lewis	B-015B	132	W-CD16	61.30
					W-VV8	61.30
B	WV	Lewis	B-016	54	S-UV11	62.18
C	WV	Lewis	C-001	42	S-L60	68.50
C	WV	Braxton	C-002	66	S-LL1	68.54
C	WV	Braxton	C-003	47	S-QR30	69.85
C	WV	Braxton	C-004	62	S-J70	72.26
C	WV	Braxton	C-005	130	S-H123	73.79
C	WV	Braxton	C-006	135	W-H90	73.89
					S-H123	73.89
C	WV	Braxton	C-007	146	S-H117	76.51
B	WV	Lewis	B-017	145	W-VV3-PEM	65.40
					W-VV3-PFO	65.40
					S-VV2	65.45

Appendix B: Project Location Maps



Mountain Valley Pipeline Project

NAD 1983 UTM 17N

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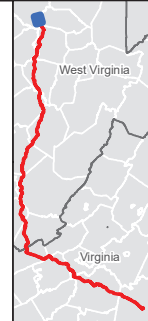
**Appendix B-1
Wetland and Waterbodies
Proposed Trenchless Crossings**

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November 2020

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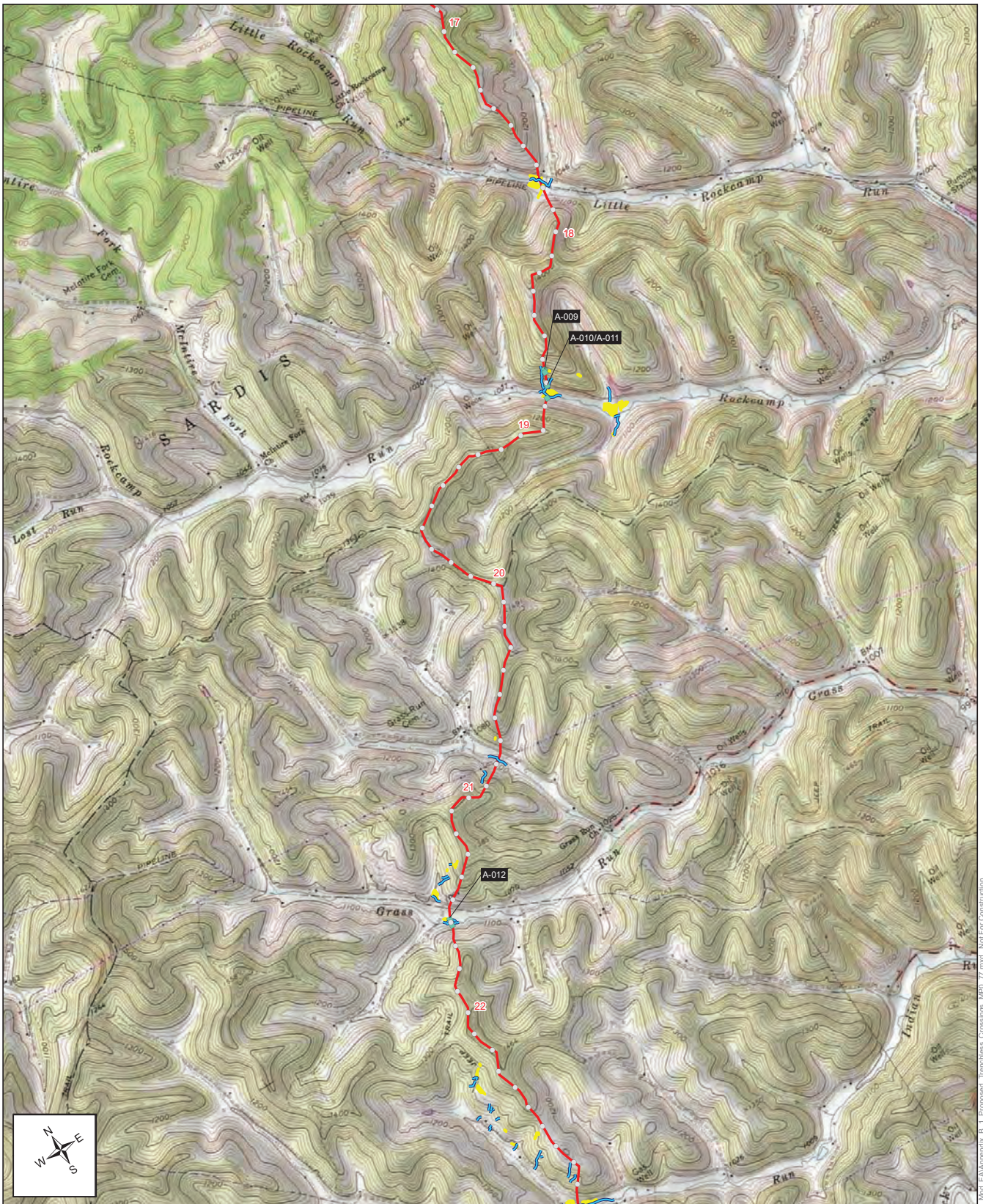
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- Milepost
- Certified Route
- ▶ Mainline Block Valve
- Proposed Bore Pit
- Surveyed Waterbody*
- Surveyed Wetland*
- ▭ Parking Area
- ▭ Rock Disposal
- Certified Compressor Station
- ▭ Bradshaw Station



Data Sources: ESRI Streaming Data, 2020, ESRI, 2018, Ventyx, 2014, USDA 2017, NPS 2017, ATC 2019, USGS 2019.

*Surveys conducted prior to 10/15/20

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Mountain Valley Pipeline Project

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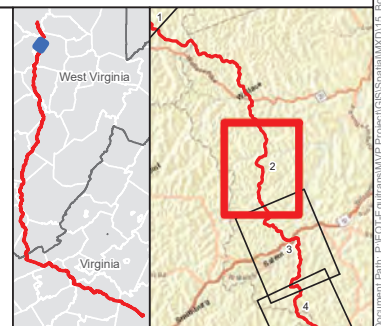
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Wetland and Waterbodies
Proposed Trenchless Crossings**

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November 2020

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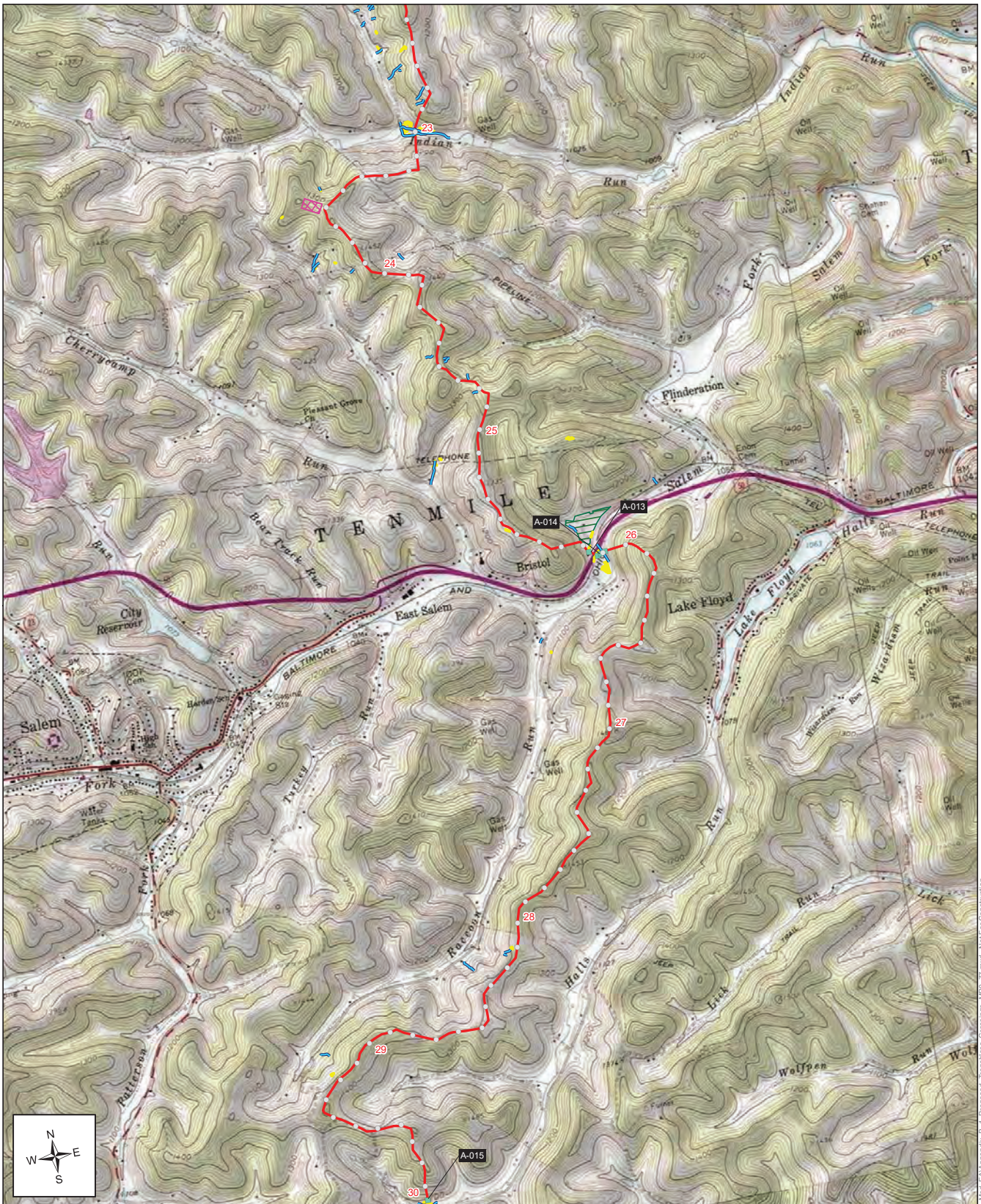
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- o Milepost
- Certified Route
- Proposed Bore Pit
- Surveyed Waterbody*
- Surveyed Wetland*



Data Sources: ESRI Streaming Data, 2020, ESRI, 2018, Ventyx, 2014, USDA 2017, NPS 2017, ATC 2019, USGS 2019.

*Surveys conducted prior to 10/15/20

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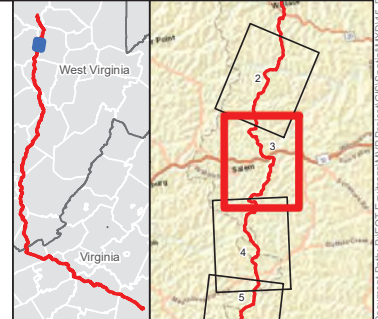
**Appendix B-1
Wetland and Waterbodies
Proposed Trenchless Crossings**

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November 2020

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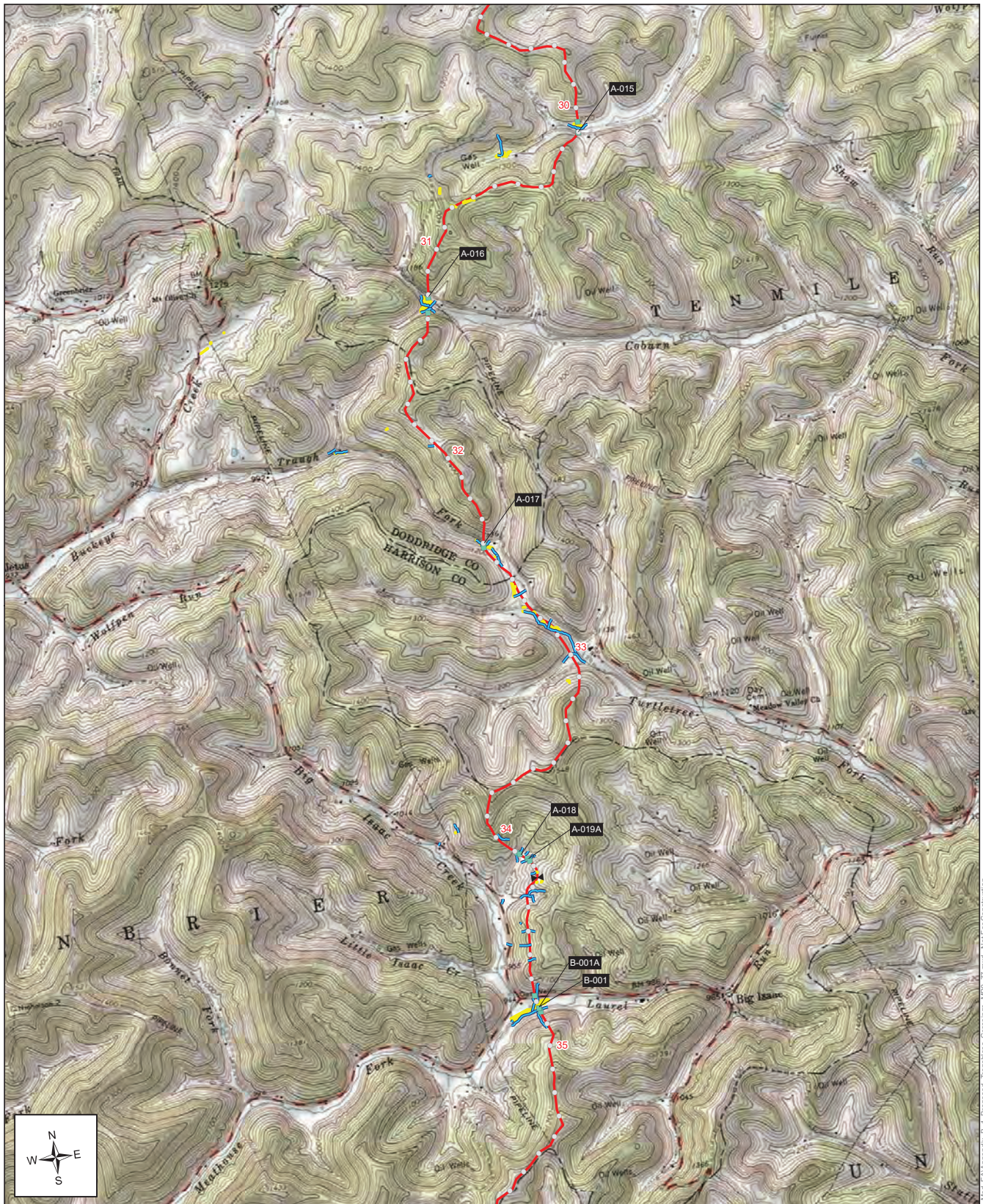
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- Milepost
- Certified Route
- Proposed Bore Pit
- Surveyed Waterbody*
- Surveyed Wetland*
- Laydown Yard
- Certified Meter Station Location
- ⊠ Sherwood Interconnect receipt Permanent Area of Disturbance



Data Sources: ESRI Streaming Data, 2020, ESRI, 2018, Ventyx, 2014, USDA 2017, NPS 2017, ATC 2019, USGS 2019.

*Surveys conducted prior to 10/15/20

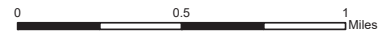
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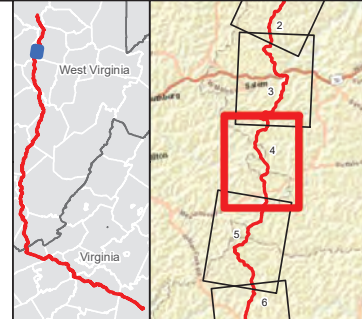
**Appendix B-1
Wetland and Waterbodies
Proposed Trenchless Crossings**

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November 2020

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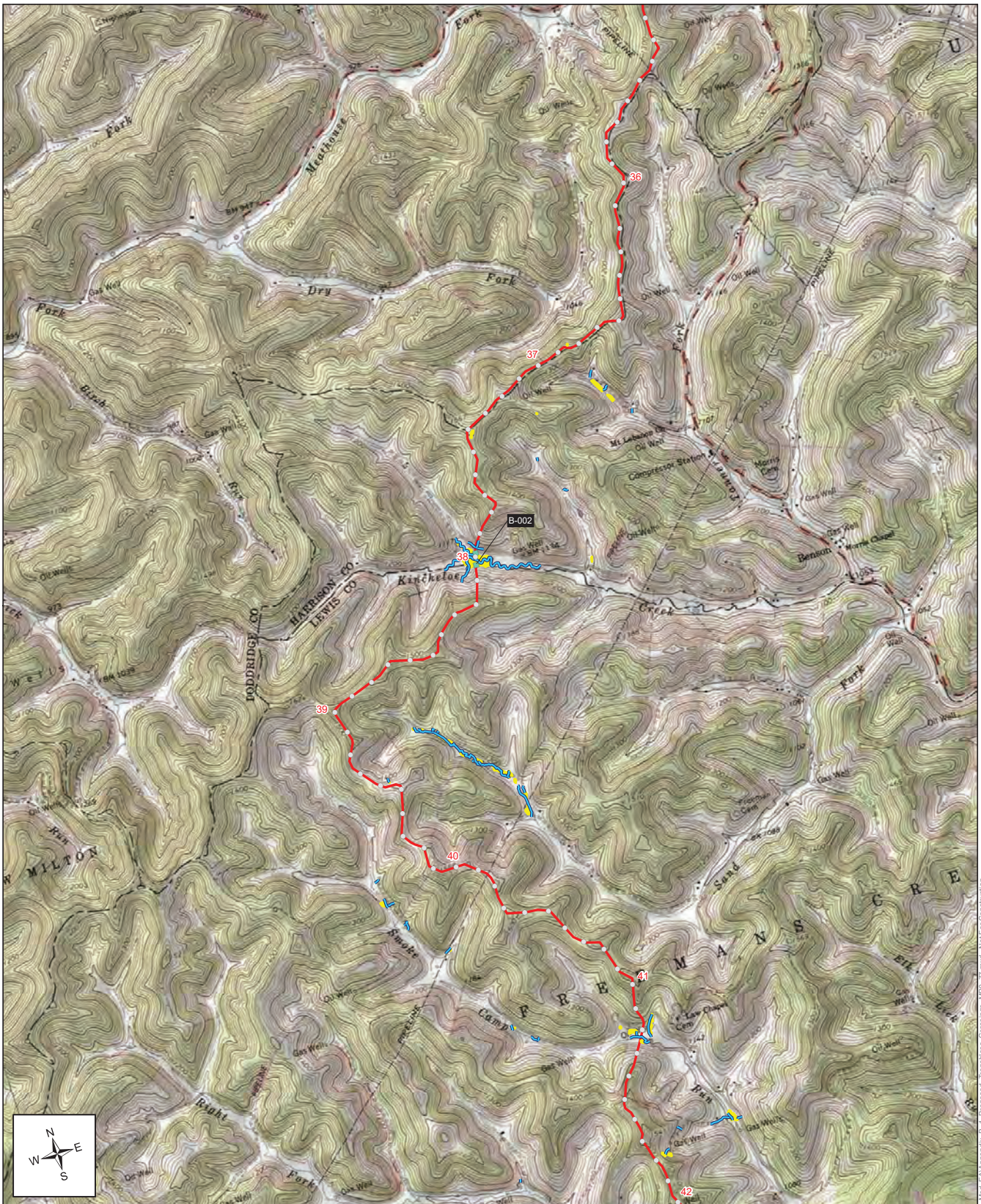
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- o Milepost
- Certified Route
- ▶ Mainline Block Valve
- Proposed Bore Pit
- Surveyed Waterbody*
- Surveyed Wetland*



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Data Sources: ESRI Streaming Data, 2020, ESRI, 2018, Ventyx, 2014, USDA 2017, NPS 2017, ATC 2019, USGS 2019.

*Surveys conducted prior to 10/15/20



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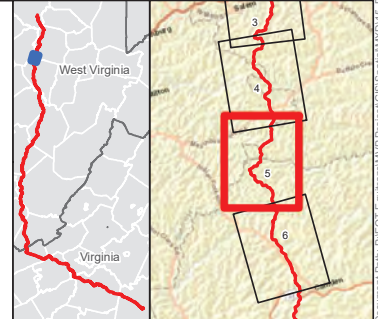
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Wetland and Waterbodies
Proposed Trenchless Crossings**

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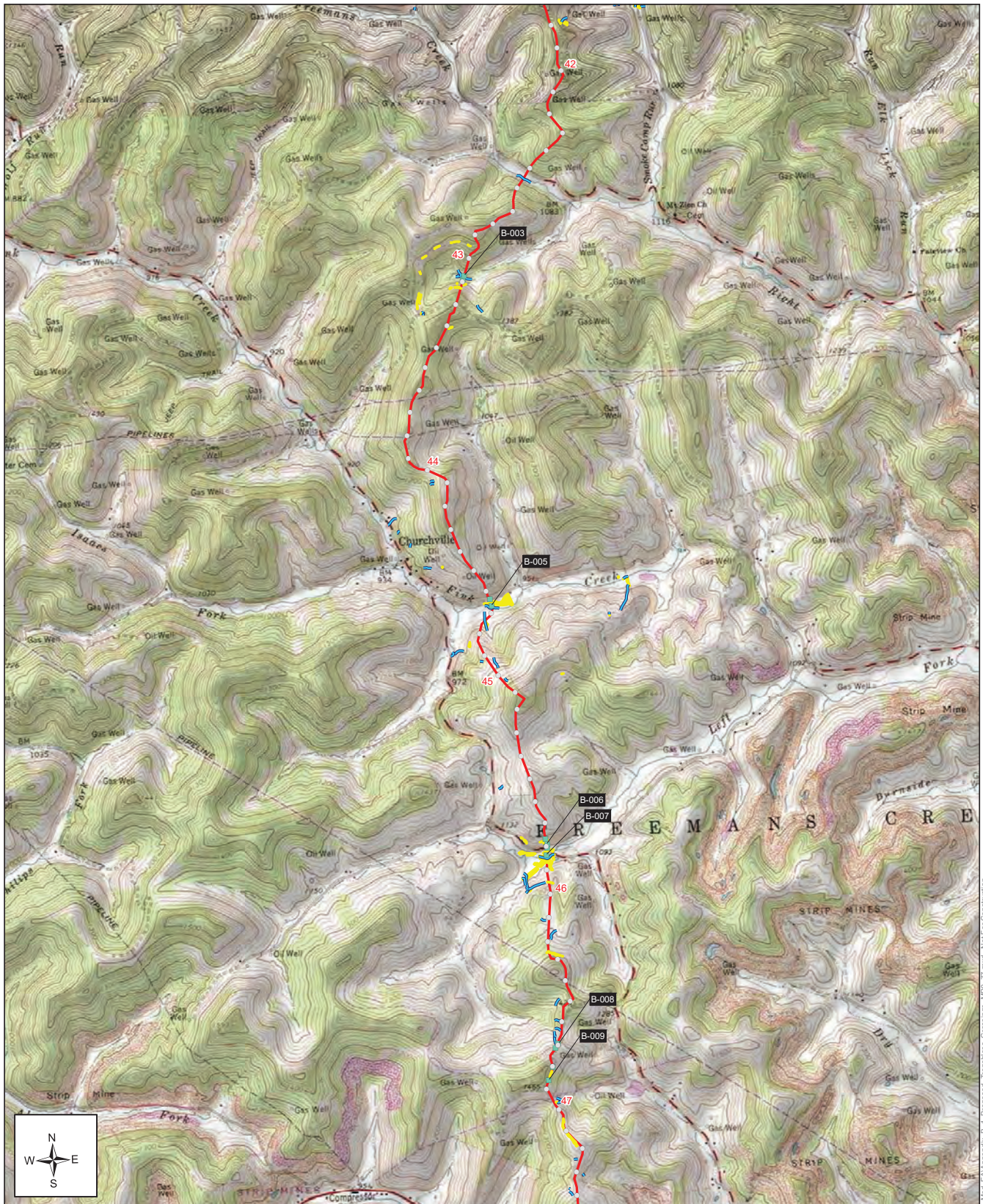
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- o Milepost
- Certified Route
- Proposed Bore Pit
- Surveied Waterbody*
- Surveied Wetland*




Data Sources: ESRI Streaming Data, 2020, ESRI, 2018, Ventyx, 2014, USDA 2017, NPS 2017, ATC 2019, USGS 2019.

*Surveys conducted prior to 10/15/20

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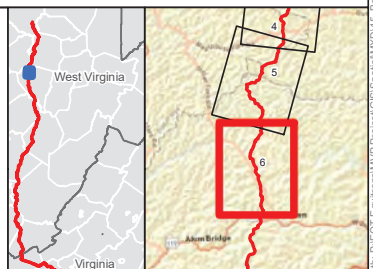


**Appendix B-1
Wetland and Waterbodies
Proposed Trenchless Crossings**

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November 2020

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- xxx Proposed Trenchless Crossing Number
- o Milepost
- Certified Route
- Proposed Bore Pit
- Surveyed Waterbody*
- Surveyed Wetland*

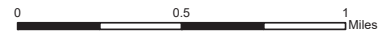




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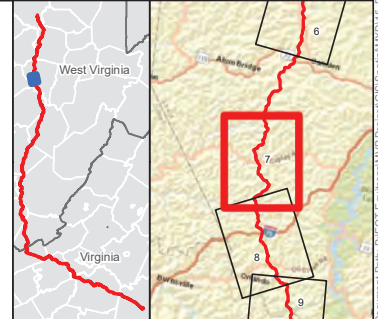
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Wetland and Waterbodies
Proposed Trenchless Crossings**

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November 2020

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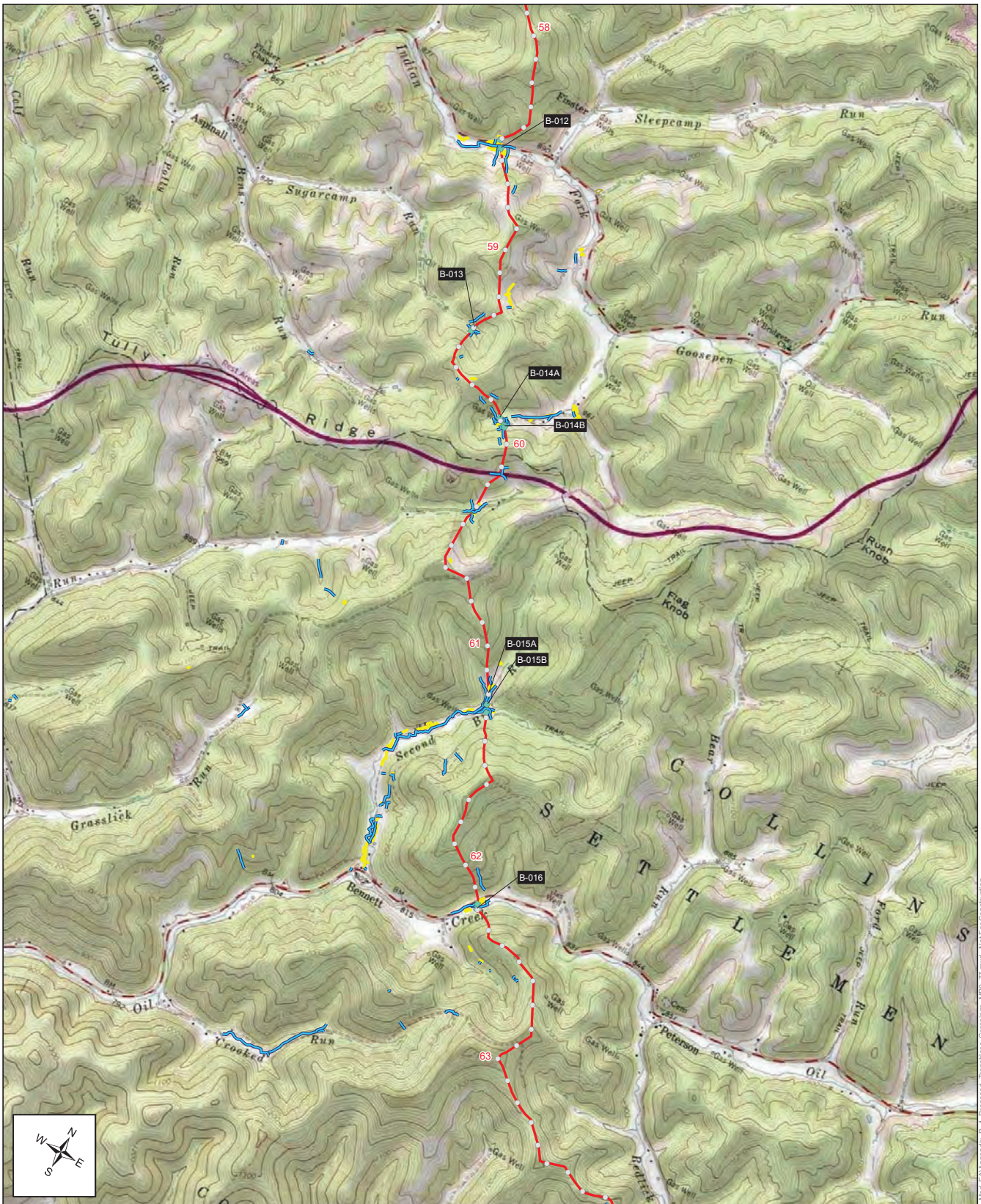
- XXX Proposed Trenchless Crossing Number
- Milepost
- Certified Route
- ▶ Mainline Block Valve
- Proposed Bore Pit
- Surveyed Waterbody*
- Surveyed Wetland*
- Additional Parking
- Log Storage



Data Sources: ESRI Streaming Data, 2020, ESRI, 2018, Ventyx, 2014, USDA 2017, NPS 2017, ATC 2019, USGS 2019.

*Surveys conducted prior to 10/15/20

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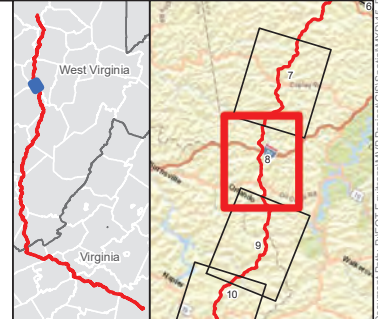
**Appendix B-1
Wetland and Waterbodies
Proposed Trenchless Crossings**

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Legend

- xxx Proposed Trenchless Crossing Number
- o Milepost
- Certified Route
- Proposed Bore Pit
- Surveyed Waterbody*
- Surveyed Wetland*
- Additional Parking
- Staging Area



Data Sources: ESRI Streaming Data, 2020; ESRI, 2018; Ventyx, 2014; USDA 2017; NPS 2017; ATC 2019; USGS 2019.

*Surveys conducted prior to 10/15/20

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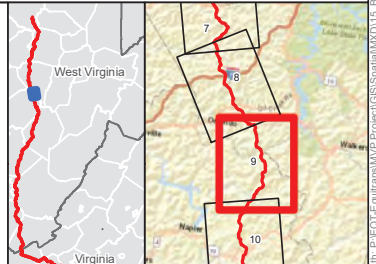


**Appendix B-1
Wetland and Waterbodies
Proposed Trenchless Crossings**

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November 2020

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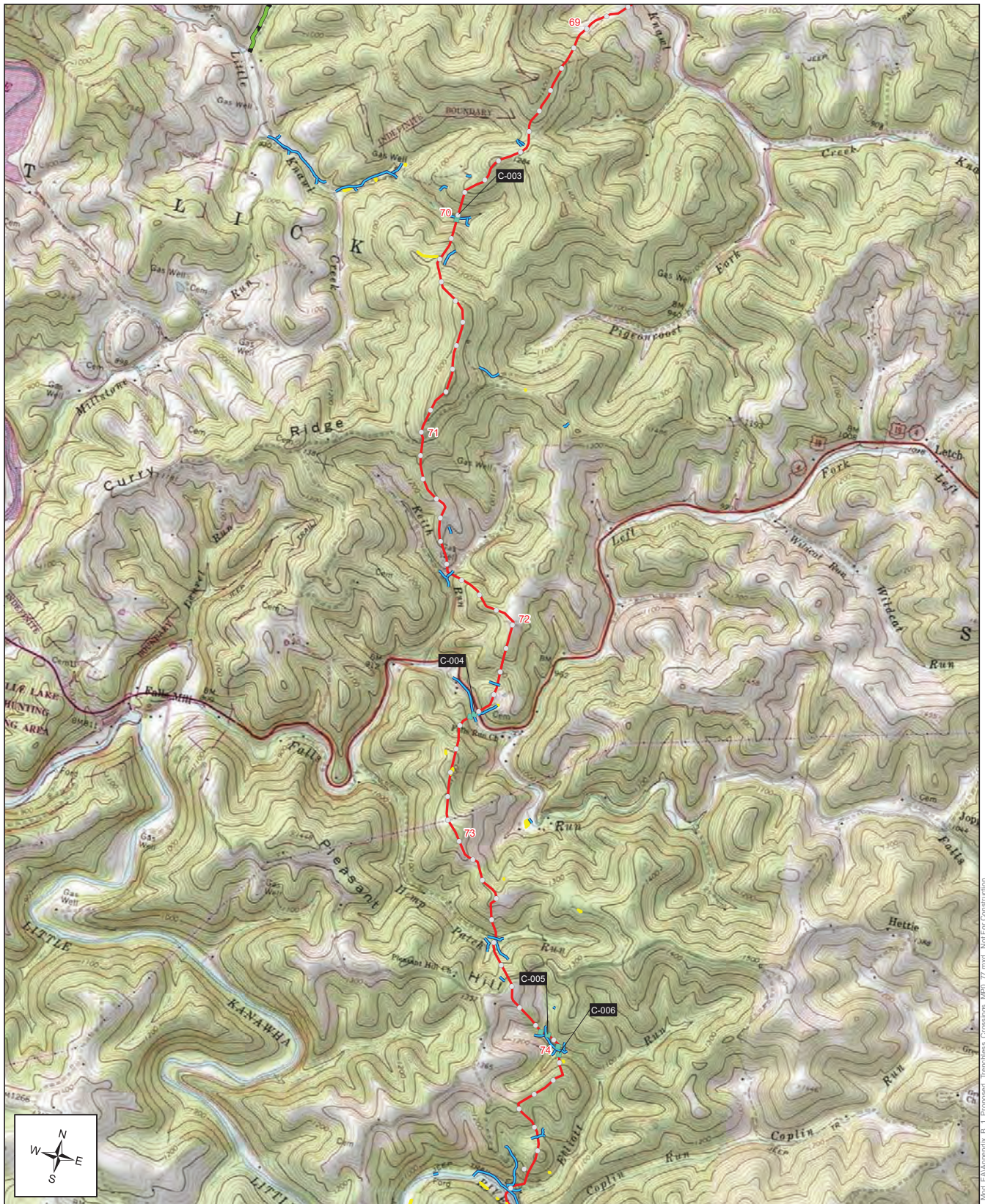
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- Milepost
- Certified Route
- ▶ Mainline Block Valve
- Proposed Bore Pit
- Surveyed Waterbody*
- Surveyed Wetland*
- Weston Gauley Turnpike Trail




Data Sources: ESRI Streaming Data, 2020, ESRI, 2018, Ventyx, 2014, USDA 2017, NPS 2017, ATC 2019, USGS 2019.

*Surveys conducted prior to 10/15/20

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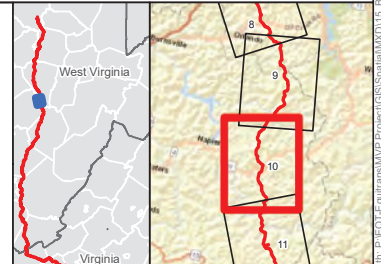


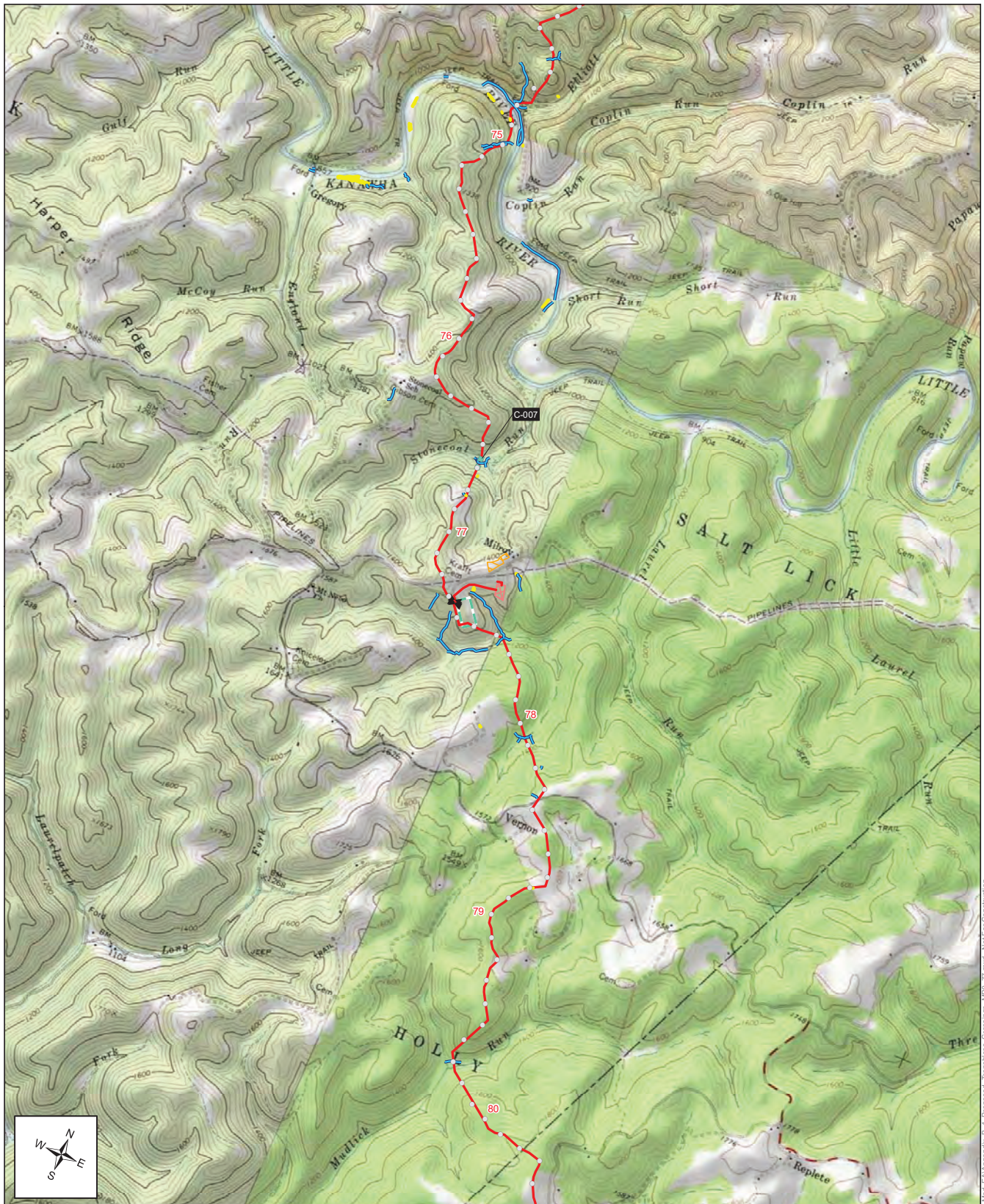
**Appendix B-1
Wetland and Waterbodies
Proposed Trenchless Crossings**

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November 2020

Legend

- xxx Proposed Trenchless Crossing Number
- o Milepost
- Certified Route
- Proposed Bore Pit
- Surveyed Waterbody*
- Surveyed Wetland*
- Weston Gauley Turnpike Trail





Mountain Valley Pipeline Project

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**Appendix B-1
Wetland and Waterbodies
Proposed Trenchless Crossings**

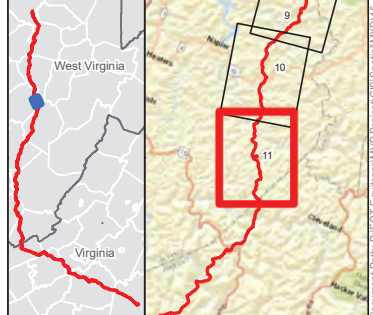
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November 2020

Legend

- XXX Proposed Trenchless Crossing Number
- Milepost
- Certified Route
- ▶ Mainline Block Valve
- Proposed Bore Pit
- Surveyed Waterbody*
- Surveyed Wetland*
- Compressor Yard
- Certified Compressor Station
- Harris Station

Certified Meter Station Location

- ⊠ TCO WB Interconnect delivery Permanent Area of Disturbance



Data Sources: ESRI Streaming Data, 2020, ESRI, 2018, Ventyx, 2014, USDA 2017, NPS 2017, ATC 2019, USGS 2019.

*Surveys conducted prior to 10/15/20

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Appendix C: Estimated Bore Pit Spoil Volumes

Crossing	Bore Pit #1 Depth, Face	Bore Pit #1 Depth, Back	Bore Pit Length	Bore Pit Width	Bore Pit Volume	Bore Pit #2 Depth, Face	Bore Pit #2 Depth, Back	Bore Pit Length	Bore Pit Width	Bore Pit Volume
A-001	15 ft	28 ft	33 ft	16 ft	425 cy	14 ft	14 ft	55 ft	16 ft	460 cy
A-003	11 ft	8 ft	55 ft	16 ft	310 cy	25 ft	34 ft	15 ft	16 ft	265 cy
A-005	20 ft	19 ft	55 ft	16 ft	640 cy	33 ft	48 ft	30 ft	16 ft	720 cy
A-006	18 ft	36 ft	30 ft	16 ft	480 cy	12 ft	24 ft	55 ft	16 ft	590 cy
A-008	19 ft	29 ft	55 ft	16 ft	785 cy	22 ft	29 ft	29 ft	16 ft	440 cy
A-009	15 ft	26 ft	30 ft	16 ft	365 cy	8 ft	4 ft	20 ft	16 ft	75 cy
A-010/011	31 ft	49 ft	42 ft	16 ft	1,000 cy	17 ft	33 ft	33 ft	16 ft	490 cy
A-012	14 ft	15 ft	55 ft	16 ft	475 cy	15 ft	43 ft	34 ft	16 ft	585 cy
A-013	16 ft	17 ft	83 ft	16 ft	815 cy	13 ft	13 ft	61 ft	16 ft	470 cy
A-014	17 ft	17 ft	42 ft	16 ft	425 cy	20 ft	36 ft	29 ft	16 ft	485 cy
A-015	22 ft	37 ft	54 ft	16 ft	945 cy	24 ft	35 ft	55 ft	16 ft	965 cy
A-016	19 ft	33 ft	56 ft	16 ft	865 cy	19 ft	36 ft	54 ft	16 ft	880 cy
A-017	12 ft	12 ft	51 ft	16 ft	365 cy	18 ft	28 ft	27 ft	16 ft	370 cy
A-018	21 ft	39 ft	27 ft	16 ft	480 cy	13 ft	14 ft	55 ft	16 ft	440 cy
A-019A	11 ft	10 ft	41 ft	16 ft	260 cy	24 ft	41 ft	28 ft	16 ft	540 cy
B-001	30 ft	39 ft	55 ft	16 ft	1,125 cy	12 ft	13 ft	55 ft	16 ft	410 cy
B-001A	13 ft	12 ft	55 ft	16 ft	410 cy	15 ft	37 ft	32 ft	16 ft	495 cy
B-002	15 ft	25 ft	33 ft	16 ft	395 cy	11 ft	24 ft	55 ft	16 ft	575 cy
B-003	12 ft	29 ft	55 ft	16 ft	670 cy	19 ft	39 ft	35 ft	16 ft	605 cy
B-005	26 ft	48 ft	24 ft	16 ft	530 cy	15 ft	15 ft	40 ft	12 ft	270 cy
B-006	20 ft	39 ft	35 ft	16 ft	615 cy	11 ft	6 ft	55 ft	16 ft	280 cy
B-007	19 ft	30 ft	29 ft	16 ft	425 cy	10 ft	6 ft	44 ft	16 ft	210 cy
B-008	14 ft	15 ft	55 ft	15 ft	445 cy	30 ft	39 ft	35 ft	15 ft	675 cy
B-009	15 ft	20 ft	55 ft	16 ft	575 cy	17 ft	20 ft	35 ft	16 ft	385 cy
B-010	18 ft	21 ft	38 ft	15 ft	415 cy	15 ft	52 ft	35 ft	15 ft	655 cy
B-011	20 ft	0 ft	55 ft	16 ft	330 cy	12 ft	30 ft	35 ft	16 ft	440 cy
B-012	17 ft	24 ft	35 ft	16 ft	430 cy	17 ft	17 ft	55 ft	16 ft	555 cy

B-013	19 ft	33 ft	35 ft	16 ft	540 cy	12 ft	36 ft	55 ft	16 ft	785 cy
B-014A	20 ft	36 ft	35 ft	16 ft	585 cy	18 ft	39 ft	29 ft	16 ft	490 cy
B-014B	11 ft	7 ft	27 ft	16 ft	145 cy	17 ft	31 ft	24 ft	16 ft	345 cy
B-015A	22 ft	25 ft	46 ft	16 ft	645 cy	19 ft	20 ft	39 ft	16 ft	455 cy
B-015B	20 ft	19 ft	39 ft	16 ft	455 cy	17 ft	35 ft	35 ft	16 ft	540 cy
B-016	14 ft	15 ft	55 ft	16 ft	475 cy	15 ft	23 ft	35 ft	16 ft	395 cy
B-017	17 ft	18 ft	55 ft	16 ft	575 cy	21 ft	30 ft	35 ft	16 ft	530 cy
C-001	13 ft	16 ft	35 ft	16 ft	305 cy	14 ft	15 ft	55 ft	16 ft	475 cy
C-002	14 ft	15 ft	55 ft	16 ft	475 cy	17 ft	30 ft	35 ft	16 ft	490 cy
C-003	23 ft	50 ft	55 ft	16 ft	1,190 cy	14 ft	35 ft	35 ft	16 ft	510 cy
C-004	15 ft	19 ft	55 ft	16 ft	555 cy	29 ft	49 ft	35 ft	16 ft	810 cy
C-005	35 ft	48 ft	55 ft	16 ft	1,355 cy	30 ft	37 ft	35 ft	16 ft	695 cy
C-006	42 ft	54 ft	35 ft	16 ft	1,000 cy	38 ft	53 ft	55 ft	16 ft	1,485 cy
C-007	32 ft	42 ft	55 ft	16 ft	1,210 cy	45 ft	67 ft	35 ft	16 ft	1,165 cy