Via electronic filing

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

cc: Scott Mandirola, West Virginia Department of Environmental Protection

RE: Relevance for Mountain Valley Pipeline Project (CP16-10-000) of the recent Leach Xpress Pipeline explosion and PHMSA Notice of Proposed Safety Order

Indian Creek Watershed Association submits the Notice of Proposed Safety Order issued by the Pipeline and Hazardous Materials Safety Administration (PHMSA) and other related documents regarding the June 7, 2018 pipeline explosion of the 36-inch gas Leach Xpress pipeline near Moundsville, West Virginia.

The details of this explosion and PHMSA’s preliminary findings as to cause are clearly relevant to the Mountain Valley Pipeline project. The similarities of terrain—particularly the prevalence of steep slopes and landslide-prone areas along MVP’s 300-mile route through West Virginia and Virginia—make the Leach Xpress explosion yet another wake-up call about the dangers of MVP’s selected route. The MVP route, in fact, harbors significant additional hazards that further jeopardize pipeline stability and integrity. These hazards include karst, mines, and an active seismic zone, as acknowledged by the FERC in the project’s Final Environmental Impact Statement.

In addition to traveling a longer, more hazardous and landslide-prone route, the MVP is larger and will carry more gas at higher pressures. The 42-inch diameter MVP is 36% larger in cross-sectional area than the Leach Xpress. The MVP is designed to transport about 2.0 billion cubic feet per day of natural gas and has a maximum allowable operating pressure (MAOP) of 1,480 pounds per square inch gauge (psig) (FEIS 2-9). According to the PHMSA notice, the MAOP for the Leach Xpress is 1400 psig. At the time of failure, however, its actual operating pressure was considerably less, reported at 1280 psig upstream and 1244 psig downstream from the site of the rupture.

Given this new information, ICWA calls on the Commission to:

1. Order an immediate halt to construction of the MVP and instruct MVP to reanalyze its route and construction plans to identify locations with conditions similar to those involved in the Leach Xpress explosion and to other sites subsequently identified by TransCanada as areas of concern.
2. Reconsider its Rehearing Order, issued June 15, 2018 on a 3-to-2 vote, that rejected, dismissed or denied all Requests for Rehearing of the MVP Certificate (FERC Accession No. 20180615-3053).

The following information provides a summary of the explosion incident, the PHMSA Notice and Advisory Bulletin, and news reports of the incident and PHMSA report; FEIS findings related to subsidence and landslides; deficiencies of MVP’s Landslide Mitigation Plan; and recent evidence of landslide potential and activity on the MVP route.

The Leach Xpress Explosion Incident, PHMSA Notice, and PHMSA Advisory Bulletin highlight the dangers of subsidence and landslides to newly constructed as well as older pipelines:

1. On June 7, 2018 a section of the 36-inch natural gas Leach Xpress interstate transmission pipeline exploded near Moundsville, WV. Leach Xpress, owned by TransCanada, is part of the Columbia Gas Transmission system. The pipeline was completed in 2017 and placed into service in early 2018. The early morning explosion was seen and felt for miles, but fortunately there were no injuries, in part because it took place in a remote area with no residences within a mile of the site.

2. On July 9, 2018 PHMSA issued a Notice of Proposed Safety Order to the pipeline company [EXHIBIT 1]. While PHMSA indicates that the investigation is ongoing and the cause of failure is unknown at this time, its preliminary findings state:
   a. "The preliminary investigation suggests that the failure was the result of land subsidence causing stress on a girth weld."
   b. “At the time of the Failure, the actual operating pressure of the pipeline upstream from the Failure was 1280 psig.”
   c. “The Failure resulted in the ejection of approximately 83 feet of 36-inch pipe from the ditch onto the right of way and the loss of 165 MMCF of natural gas.”
   d. “Since the Failure, TransCanada has identified six other points along the pipeline that, based on their geotechnical flyover, are areas of concern due to the existence of large spoil piles, steep slopes, or indications of slips."

3. The PHMSA Notice also referred to the fact that it has issued several Advisory Bulletins of note, including Advisory Bulletin ADB 97-03 on March 4, 1997 entitled "Potential Soil Subsidence on Pipeline Facilities" [EXHIBIT 2], cautioning owners and operators of possible hazards relating to soil subsidence on pipeline facilities, and advising the need to monitor the potential impact of flooding and soil subsidence on those facilities.

4. News reports about the explosion and PHMSA’s order are also included in this submission [EXHIBIT 3].

FEIS findings related to Subsidence and Landslides identify clear dangers along the MVP route:

1. Seismicity. “Earthquake shaking alone does not pose a significant threat to the integrity of modern buried welded steel pipelines. ... However, the level of ground shaking is a factor in determining potential for permanent ground displacement hazards that can threaten a pipeline integrity such as liquefaction, settlement, slope instability (particularly along steep sided
slopes), lateral spread displacement, and dynamic compaction.” (FEIS 4-22)

2. Landslides. “Landslides are defined as the movement of rock, debris, or soil down a slope. Slope failure causing a landslide can be initiated by precipitation, seismic activity, slope disturbance due to construction, or a change in groundwater conditions, such as a seasonal high groundwater table and soil characteristics. ... Construction factors that may increase the potential for slope failure could include trenching along slopes and the burden of construction equipment on unstable surfaces.” (FEIS 4-27)

3. Landslides, Mountain Valley Project. (FEIS 4-28 to 4-32)
   a. “About 152 miles (77 percent) of the MVP pipeline route in West Virginia is considered to have a high incidence of and high susceptibility to landslides [and] in Virginia, about 51 miles (48 percent) of the proposed alignment... (see table 4.1.1-10).” [EXHIBIT 4a].
   b. “Ground failure and slope movement are typically associated with steep slopes. The MVP would cross 22.3 miles of slopes ranging from 15 percent to 30 percent and 75.4 miles of slopes greater than 30 percent. Mountain Valley identified [33] areas of potential landslide concern along the proposed MVP route (see table 4.1.1-1)” [EXHIBIT 4b].

   a. “Karst features, such as sinkholes, caves, and caverns, ... could present a hazard to the pipeline due to cave or sinkhole collapse. ... Karst areas are also associated with seeps and springs, which could experience temporary changes in flow characteristics from construction of the pipeline. Seeps and springs along steep slopes could likewise contribute to and be the cause of landslides or other earth movements.” (FEIS 4-33)
   b. “Areas of minor karst development have been identified from about MPs 172 to 174 and significant karst development from about MPs 191 to 239.” (FEIS 4-34)
   c. Table 4.1.1-14 identifies 31 known named caves within about 0.25 mile of the MVP pipeline(FEIS 4-35) [EXHIBIT 4c].

   a. “Landslides (such as debris slides, debris flows, rockslides, slumps and rockfalls) are geologic processes shaping Peters Mountain, Sinking Creek Mountain, and Brush Mountain. ... Debris flows are a dominant natural landslide process in Giles and Montgomery Counties. Debris flows can also result from failure of constructed slopes, where excavated material is placed on steep slopes. For example, in 2014, storm-triggered debris flows occurred along the CGV [Columbia of Gas Virginia] pipeline construction corridor located on the south and north sides of Peters Mountain within the Jefferson National Forest. The proposed MVP pipeline would be located within a similar geologic setting on Peters Mountain approximately 5 miles northeast of the CGV pipeline.”
   b. “The largest known landslides in eastern North American are on the south flank of Sinking Creek Mountain where the pipeline route would cross the Jefferson National Forest.”
c. “The MVP would cross the Jefferson National Forest within the GCSZ (Giles County Seismic Zone).”

   a. “In total, 67 mining operations were identified in proximity of the MVP. ... Underground coal mines that would be crossed by the MVP could be longwall mines where subsidence occurs as part of the mining process or room and pillar mines where supports are left in place.” (FEIS 4-14)
   b. “Subsidence can be a result of active underground mining (planned subsidence) or from historic underground mines where voids exist under the ground. Eight underground mines would be crossed by the MVP. Of those, four are of unknown status, two are new or renewed, and two are no longer being mined.” (FEIS 4-48)

7. Seismicity and Potential for Liquefaction. “Soil liquefaction could also result if a significant seismic event were to occur. The potential for soil liquefaction exists mainly in the area of the GCSZ between MPs 161 [located in Summers County, WV] and 239 [located in Roanoke County, VA]. (FEIS 4-51)

8. Slopes and Landslide Potential. “Several steep slopes along Mountain Valley’s proposed pipeline route have experienced landslide activity in the past. Additionally, there are areas along the pipeline route that are characterized by both steep slopes and red shale bedrock, which are prone to landslides. ... The potential for landslides or slope failure could be triggered by seismicity from the GCSZ or from intense and/or prolonged rainfall events. The USGS identified a clustering of landslides near the GCSZ suggesting that recent seismic shaking may have triggered these landslides, and that topographic effects on seismic shaking may have been amplified on mountain crests by a factor of 1.7 to 3.4 (Schultz and Southworth, 1989).
   “Construction of the MVP could alter the surface and near surface drainage along the pipeline trench, which could increase pre-existing landslide hazard potential on natural slopes.” (FEIS-4-52)

9. From a section devoted to Landslides in the Jefferson National Forest that includes input by Forest Service staff. “Mitigation measures would reduce but not eliminate the potential project-induced landslide hazards. Staff of the FS conclude that restoring a slope to original contour is not restoring a slope to original condition, though it may appear so and create a false sense of security. Further, FS staff believe that the MVP on steep slopes could result in permanent, irreversible alterations of geologic conditions affecting slope stability such as changes in the quantity, spatial distribution, and mass strength properties of unconsolidated materials overlying bedrock ....” (FEIS 4-71)

Despite direction from FERC and Jefferson National Forest staff, MVP failed to develop an adequate Landslide Mitigation Plan at the time FERC issued its Certificate Order. Concerned pipeline stakeholders have never had the opportunity to review and comment on the final submitted plan:

1. In their October 2017 Certificate Order for MVP the FERC included the following Condition: “However, because the Mountain Valley’s Landslide Mitigation Plan does not adopt some industry best management practices to reduce the potential for landslides in steep slope areas, we require, as Environmental Condition No. 19, that Mountain Valley revise its Landslide Mitigation Plan to outline construction measures to be used when crossing steep
slopes at angles perpendicular to contours and to include a more robust monitoring program.”
(Order Issuing Certificates and Granting Abandonment Authority, 2017101319-2058-CP16-10-000, Section 145)

2. MVP’s revised Landslide Mitigation Plan (Rev. 7) finally appeared on the FERC Docket as part of a massive unindexed submission on December 6, 2017 (Attachment F Landslide Mitigation Plan, 20171206-5004 (32561073). Even in that revision, MVP ignored the Commissioners’ Order, submitting drawings of BMPs where the pipeline crosses private land that were identical to those submitted with the applicant’s initial October 2016 LMP. However, in another document submitted in the same large filing, for pipeline construction on land owned by the Jefferson National Forest on Peters Mountain, MVP submitted drawings of landslide mitigation and erosion and sedimentation controls that were site-specific and extremely detailed—presumably responding to JNF staff refusal to issue a permit without such assurances. (Attachment K, unlabeled, 20171206-5004(32561084) Given the Leach Xpress explosion, all enhanced landslide mitigation BMPs should be universally applied. Even these should be questioned as to efficacy.

3. In spite of MVP’s omission of new BMPs for landslides in steep slope areas, the FERC’s MVP Environmental Project Manager issued Notices to Proceed on the entire pipeline route beginning in January 2018. Concerned stakeholders have been deprived of their right to review and comment on the “final” Landslide Mitigation Plan.

4. In light of the Leach Xpress explosion, ICWA asks once again for a reopening of a comment period to address crucial mitigation plans, including the Landslide Mitigation Plan, that were submitted after the FEIS and FERC Commission order.

Recent Evidence of Landslide-prone Terrain and Seismicity along the MVP have provided warning signals:

1. In September 2014 construction of the Columbia-Celanese pipeline resulted in a mudslide on Peters Mountain that was described in notes by Forest Service staff as “like a lava flow”. The MVP route travels over similar terrain across Peters Mountain about 5 miles to the north.

2. On May 12, 2017 a 2.8 M earthquake occurred in Giles County, VA, approximately 10 miles from the proposed MVP route. The earthquake was followed on May 13th by a rock-and-landslide 6 miles from the earthquake’s epicenter. As reported by Maury Johnson in FERC Accession No. 20170619-5063, there is reason to suggest that the two events were related. (See also map in 4 below.)

3. On September 13, 2017 a 3.2 M earthquake occurred in the Lindside, Monroe County, WV within 1 mile of the MVP route. In a comment to FERC following that incident, the community organization Save Monroe called on the FERC “to recognize that the MVP route through this region is fundamentally flawed. The known geology of this region has led other pipeline companies to reject this route. This earthquake is yet another wake-up call—like the flooding of the Greenbrier River in 2016 following an intensive rainfall; like the uncontrolled erosion and run-off caused by construction of the 12-inch Columbia-Celanese pipeline over Peters Mountain only 5 miles from the proposed MVP crossing; like the contamination of Monroe County’s largest public water system (the Red Sulphur Public Service District) due to construction of that same smaller Columbia pipeline through the karst band that extends along Peters Mountain.” (Accession No. 20171002-5076)
4. Three maps from the Save Monroe comment show the locations of the May 12, May 13 and September 13 events and other related notes on vulnerable features in the vicinity [EXHIBIT 5].

5. In early May, 2018, the Virginia Department of Environmental Quality (DEQ) halted MVP construction in Franklin County following a rain-induced mudslide along the MVP construction corridor that sent up to 8 inches of mud onto both lanes of a nearby county road, as reported in the Roanoke Times. [EXHIBIT 6]

6. In West Virginia, MVP’s failure to properly install and maintain erosion control devices, often involving steep slopes, figures prominently in four Notices of Violation issued by the Department of Environmental Protection (DEP). [EXHIBIT 7]

Try as they might, MVP cannot mitigate the risks to pipeline and people:

While ICWA recognizes that the FERC, responding to comments from Forest Service staff, professional geologists, and concerned groups and individuals along the route, required MVP to submit a Landslide Mitigation Plan that introduces enhanced mitigation and monitoring measures, two facts remain:

1. MVP’s inability to develop an acceptable Landslide Mitigation Plan indicates a lack of commitment, competence, or both. As evidenced in the docket, the public does not trust MVP to build this pipeline with the high level of expertise and rigorous safety measures required.

2. MVP’s selection of the proposed route across West Virginia and Virginia regions of steep slopes, landslide-prone soils, and karst was arbitrary; it was not driven by a pressing need to attempt this path. Despite warnings about its hazards, both for pipeline integrity and the environment, MVP chose to resist all alternative options.

The most significant long-term risks being taken by MVP’s routing decision are not ones that seriously affect MVP, its owners, or investors. FERC has granted a guaranteed 14% return on investment. The deadliest risks are being imposed (in many cases by threat or use of eminent domain) on the individuals, families, farms, and communities—as well as the forests, streams, and wetlands—that lie in path of the largest pipeline attempted across the State of West Virginia.

TransCanada and Columbia Gas were fortunate that the Leach Xpress explosion occurred in a location without any residences within a mile. That is not the case where the larger MVP crosses some of the most hazardous portions of its route, carrying high-pressure gas of up to 1,480 pounds per square inch through farms and communities in West Virginia and Virginia.

The country is not at war, nor are we experiencing an energy emergency. Although rural counties may be more sparsely populated than the environs of EQT’s headquarters in Pittsburgh, or FERC’s in Washington DC, or our state governments in Charleston and Richmond, rural lives should not be treated so callously and bluntly as “expendable”—mere costs of doing business.
CONCLUSION: For the above reasons, ICWA respectfully calls on the Commission to:

1. Order an immediate halt to construction of the MVP to allow for a thorough review of the July 9, 2018 Notice of Proposed Safety Order issued by PHMSA to Columbia Gas Transmission, LLC, as well as all other relevant investigation materials and findings about the explosion. This should be undertaken jointly by FERC, PHMSA, and other federal and state agencies familiar with the MVP project, including the USFS, WVDEP, VADEQ, and the U.S. Army Corps of Engineers. The review and comparison with the Leach Xpress should identify similarities of threats along the MVP route as well as similarities of construction and mitigation plans.

2. On the basis of this review, instruct MVP to submit a revised Landslide Mitigation Plan and revised Construction Plans that include detailed drawings of state of the art BMPs that would prevent landslide damage on all vulnerable segments of the pipeline route.
   a. These segments should include all locations listed as areas of concern in the current (Rev. 7) Landslide Mitigation Plan, as well as others identified in a new review of the pipeline route.
   b. The revised Plans should incorporate remedies to deficiencies similar to those involved in the Leach Xpress explosion and to other sites subsequently identified by TransCanada as areas of concern.

3. Require approval of the proposed plans by independent engineers and opportunity for public comment before allowing MVP to restart construction.

4. Reconsider the Commission’s Rehearing Order, issued June 15, 2018 on a 3-to-2 vote, that rejected, dismissed or denied all Requests for Rehearing of the MVP Certificate (FERC Accession No. 20180615-3053) and open a Public Comment Period for review of plans submitted after the issuance of the FEIS including the MVP Landslide Mitigation Plan.

5. Order an assessment of the flaws in FERC’s existing permitting, inspection and construction procedures, and require changes in FERC staff procedures to prevent outcomes such as the Leach Xpress explosion.

Thank you for your attention to this request.

Sincerely,

Indian Creek Watershed Board of Directors
Howdy Henritz, President; Scott Womack, Vice President; Nancy Bouldin, Secretary; Judy Azulay, Treasurer
EXHIBIT 1
VIA FEDERAL EXPRESS MAIL AND FAX TO: (403) 920-2200

July 9, 2018

Mr. Randal Broussard  
SVP, US Gas Operations East  
Columbia Gas Transmission, LLC  
201 Energy Parkway, Suite 100  
Lafayette, LA 70508

Dear Mr. Broussard:

Enclosed is a Notice of Proposed Safety Order (Notice) issued by the Pipeline and Hazardous Materials Safety Administration (PHMSA) in the above-referenced case. The Notice proposes that TransCanada take certain measures with respect to Columbia Gas Transmission, LLC’s Leach Xpress (LEX) pipeline system, near Moundsville, WV. Your options for responding are set forth in the Notice. Your receipt of the Notice constitutes service of that document under § 190.5.

We look forward to a successful resolution to ensure pipeline safety. Please direct any questions on this matter to me at 609-771-7809.

Thank you for your cooperation in this matter.

Sincerely,

Robert Burrough  
Director, Eastern Region  
Pipeline and Hazardous Materials Safety Administration

Enclosure: Notice of Proposed Safety Order  
Copy of 49 C.F.R. § 190.239

cc: Ms. Linda Daugherty, Deputy Associate Administrator for Field Operations, PHMSA  
Mr. Stanley Chapman III, President, US Gas Pipelines, Columbia Midstream Group, LLC;  
700 Louisiana Street, Suite 700, Houston, TX 77002
NOTICE OF PROPOSED SAFETY ORDER

Background and Purpose:

Pursuant to Chapter 601 of Title 49, United States Code, the Pipeline and Hazardous Materials Safety Administration (PHMSA), U.S. Department of Transportation, has initiated an investigation and information review of the safety of Columbia Gas Transmission, LLC’s, a subsidiary of TransCanada Corporation (TransCanada or Respondent), Leach Xpress (LEX) gas pipeline system.

The investigation was prompted after PHMSA was notified on June 7, 2018, by the National Response Center of a reportable incident that occurred on the LEX pipeline system, which resulted in the release of approximately 165 million cubic feet (MMCF) of natural gas, an ignition of natural gas, and a fire (the Failure). The Failure resulted in the ejection of approximately 83 feet of 36-inch pipe from the ditch onto the right of way. The Failure occurred in a remote, Class 1 rural location and there were no reported injuries, fatalities or evacuations. The cause of the Failure has not yet been determined.

As a result of the investigation, it appears conditions exist on your pipeline system that pose an integrity risk to public safety, property, or the environment. Pursuant to 49 U.S.C. § 60117(1), PHMSA, Office of Pipeline Safety (OPS), issues this Notice of Proposed Safety Order (Notice), notifying you of the preliminary findings of the investigation, and proposing that you take certain measures to ensure that the public, property, and the environment are protected from this integrity risk.
For the purposes of this Notice:

"Affected Segment" means the approximately 50 miles of TransCanada’s 30-inch and 36-inch LEX Pipeline from the upstream Lone Oak Compressor Station (Mile Post 7.2) near Lone Oak, WV within Marshall County through the downstream Summerfield Compressor Station (MP 57.2) near Summerfield, OH in Noble County. The “Affected Segment” generally runs westerly through portions of Noble and Monroe Counties in OH, and Marshall County in WV.

"Isolated Segment" means the approximately 14.35-mile segment of the LEX pipeline from the upstream valve LEX-500 (MLV 2) at MP 18.5 to the downstream valve LEX-600 (MLV 3) at MP 32. It is the portion of the “Affected Segment” that was shut-in after the failure on June 7, 2018 by closing MLV 2 (upstream of the failure) and MLV 3 (downstream of the failure) and that must remain shut-in until a restart plan is approved by the “Director”.

"Director" means the Director, Pipeline and Hazardous Materials Safety Administration (PHMSA), Office of Pipeline Safety, Eastern Region, 820 Bear Tavern Road Suite 103, West Trenton, NJ 08628

Preliminary Findings:

- Columbia Gas Transmission, LLC, a subsidiary of TransCanada Corporation, operates over 10,468 miles of interstate natural gas transmission pipelines, 37 storage fields across four states, and transports an average of three billion cubic feet of natural gas per day through New York, New Jersey, Pennsylvania, Maryland, Virginia, West Virginia, Ohio, Kentucky, North Carolina and Delaware. Columbia Gas was acquired by TransCanada in 2016.¹

- The failed pipeline is a 36-inch diameter line that transports natural gas and runs from Majorsville, PA, to Crawford, OH, approximately 130 miles. The Failure occurred near milepost 20.6, approximately seven miles south of Moundsville, WV (Failure Site).

- The Affected Segment runs along several hills and ridges with steep elevation changes. The Failure Site is located on Nixon Ridge.

- The section of the Affected Segment near the Failure Site was constructed in 2017. The pipeline at the Failure Site section consists of grade X-70, 36" steel pipe with a wall thickness of 0.515" and 0.618". The pipeline, which was manufactured by Durabond in 2015, has fusion bonded epoxy coating and double submerged arc welded (DSAW) seams. The impressed current cathodic protection system has not been energized, but


Page 3 of 12
TransCanada is in the process of having it commissioned. Galvanic anodes were installed at foreign lines crossings.

- The maximum allowable operating pressure (MAOP) of the Affected Segment is 1440 psig, as established by hydrostatic test in 2017. At the time of the Failure, the actual operating pressure of the pipeline upstream from the Failure was 1280 psig; downstream of the Failure at Eureka Metering Station, the operating pressure was 1243.7 psig.

- At approximately 4:55 a.m. EDT on June 7, 2018, TransCanada discovered a failure on the LEX pipeline system, as determined by its gas controller, from a pressure drop observation. The incident was determined to be a natural gas release, an ignition of natural gas, and fire in the area of Moundsville, West Virginia. The Failure resulted in the ejection of approximately 83 feet of 36-inch pipe from the ditch onto the right of way and the loss of 165 MMCF of natural gas. The Failure occurred in a remote, Class 1 rural location. There were no reported injuries, fatalities or evacuations. The Failure was reported to the National Response Center (NRC Report No. 1214458) on June 7, 2018 at approximately 6:12 a.m. EDT.

- TransCanada isolated the Affected Segment via manual closure of LEX-500, a main line valve (MLV) known as MLV 2, and LEX-600 (MLV 3) (Isolated Segment). MLV 2 is located approximately 1.6 miles upstream of the Failure Site and was manually closed at approximately 5:20 a.m. EDT. MLV 3 is located approximately 12.75 miles downstream of the Failure Site and automatically closed at approximately 4:55 a.m. EDT. The upstream Lone Oak compressor station’s compressor units were shut down via a command issued from TransCanada’s Gas Control at approximately 4:36 a.m. EDT. In addition, LEX-700, MLV 4, further downstream from MLV 3, automatically closed at approximately 5:32 a.m. EDT.

- PHMSA, Roberts Ridge Volunteer Fire Department, West Virginia Department of Environmental Protection, West Virginia Division of Forestry, and the Federal Energy Regulatory Commission responded to the scene. PHMSA inspectors initiated an investigation of the Failure on June 7, 2018.

- The Isolated Segment was shut-in via the closure of MLVs 2 and 3. The Isolated Segment currently remains out of service.

- On December 12, 2017, TransCanada completed a hydrostatic test on test section LX1-3A of the LEX pipeline, which includes the location of Failure. The section was successfully tested for a duration of 8 hours to a minimum test pressure of 1880 psig. In addition, on December 14, 2017, TransCanada ran an Enduro Digital Data Logger Caliper tool from the Taylor B (746+11) launch site near Glen Easton, WV to Games Ridge (1139+34.9) receive site near Moundsville, WV. The report was generated on
December 20, 2017. On May 17th, 2018, a combo High-Resolution Magnetic Flux Leakage (HR MFL) + Geo Tool was run with IMU. TransCanada has not yet received the report from the combo HR MFL + Geo Tool run, but the vendor has been asked to provide an expedited preliminary inline inspection report as soon as practicable due to the Failure. PHMSA has not yet received the preliminary inline inspection report or any analysis from the report.

- Since the Failure, TransCanada has identified six other points along the pipeline that, based on their geotechnical flyover, are areas of concern due to the existence of large spoil piles, steep slopes, or indications of slips. TransCanada has also performed minor repair work and grading of the Failure Site.

- The PHMSA investigation is ongoing and the cause of the failure is unknown at this time. The preliminary investigation suggests that the Failure was the result of land subsidence causing stress on a girth weld.

- PHMSA has issued several Advisory Bulletins of note, including Advisory Bulletin ADB 97-03 on March 4, 1997 entitled “Potential Soil Subsidence on Pipeline Facilities,” cautioning owners and operators of possible hazards relating to soil subsidence on pipeline facilities, and advising the need to monitor the potential impact of flooding and soil subsidence on those facilities. PHMSA also issued Advisory Bulletin, ADB 12-06 on May 7, 2012, entitled “Verification of Records Establishing MAOP and MOP,” advising operators of gas transmission pipelines and associated facilities to verify that their records confirm their MAOP and MOP.

**Proposed Issuance of Safety Order:**

Section 60117(1) of Title 49, United States Code, provides for the issuance of a safety order, after reasonable notice and the opportunity for a hearing, requiring corrective action, which may include physical inspection, testing, repair, replacement, or other action, as appropriate. The basis for making the determination that a pipeline facility has a condition or conditions that pose a pipeline integrity risk to public safety, property, or the environment is set forth both in the above referenced statute and 49 C.F.R. § 190.239, a copy of which is enclosed.

After evaluating the foregoing preliminary findings of fact and considering the location of the Failure Site on Nixon Ridge, the identification of six additional areas of concern based on the existence of large spoil piles, steep slopes, or indications of slips, the fact that subsidence or slippage could lead to additional failures of the pipeline in areas with similar geological conditions, the fact that the Affected Segment was operating between approximately 86-89% of its MAOP at the time of the Failure, the hazardous nature of the natural gas transported, the age of the pipe, and the ongoing investigation to determine the cause of the failure, it appears that the continued operation of the Affected Segment, without corrective measures, poses a pipeline integrity risk to
public safety, property, and the environment.

Accordingly, PHMSA issues this Notice of Proposed Safety Order to notify Respondent of the proposed issuance of a safety order and to propose that Respondent take measures specified herein to address the potential risk

**Proposed Corrective Actions:**

Pursuant to 49 U.S.C. § 60117(1) and 49 C.F.R. § 190.239, PHMSA proposes to issue to TransCanada Corporation a safety order incorporating the following remedial requirements with respect to the *Affected Segment* and *Isolated Segment*:

1. **Review of Isolated Segment.** TransCanada must review and inspect the *Isolated Segment* for conditions similar to those of the Failure including a review of construction, operating and maintenance (O&M) and integrity management records such as in-line inspection (ILI) results, hydrostatic tests, root cause failure analysis of the Failure, aerial and ground patrols, cathodic protection, excavations and pipe replacements. Respondent must address any findings that require remedial measures to be implemented within 30 days of discovery.

2. **Enhanced surveillance and monitoring.** TransCanada must provide for enhanced patrolling and surveillance of the *Isolated Segment* until the cause of the Failure is determined.

3. **Installation of Strain Gauges.** Within 45 days of receipt of the final Safety Order, TransCanada must install at least six (6) strain gauges on the pipeline in the immediate area of the Failure. TransCanada must also determine if additional locations exist along the *Affected Segment* with conditions similar to the Failure site and install strain gauges.

4. **Hydrostatic Testing.** TransCanada must provide for hydrostatic pressure testing of any pipe installed in the *Isolated Segment*.

5. **Weather Contingency Plan.** Within 30 days of receipt of the final Safety Order, TransCanada must submit to the Director a contingency plan to operate and monitor the *Isolated Segment* during saturated soil or flooding conditions, including enhanced patrolling and surveillance.

6. **Instrumented Leakage Survey.** Within 30 days of receipt of the final Safety Order, TransCanada must perform an aerial or ground instrumented leakage survey of the *Affected Segment*. TransCanada must investigate all leak indications and remedy all leaks discovered. TransCanada must submit documentation of this survey to the Director within 45 days of receipt of the final Safety Order.

7. **Records Verification.** As recommended in PHMSA Advisory Bulletin 2012-06, TransCanada must verify the records for the *Affected Segment* to confirm the maximum
operating pressure or MAOP. TransCanada must submit documentation of this record verification to the Director within 45 days of receipt of the final Safety Order.

8. **Review of Prior Inline Inspection (ILI) Results.** Within 30 days of receipt of the final Safety Order, TransCanada must conduct a review of any previous inline inspection (ILI) results of the Affected Segment. TransCanada must re-evaluate all ILI results, including a review of the ILI vendors' raw data and analysis. TransCanada must determine whether any features were present in the failed pipe joint and any other pipe removed. Also, TransCanada must determine if any features with similar characteristics are present elsewhere on the Affected Segment. TransCanada must submit documentation of this ILI review to the Director within 45 days of receipt of the final Safety Order as follows:

   A. List all ILI tool runs, tool types, and the calendar years of the tool runs.

   B. List, describe (type, size, wall loss, etc.), and identify the specific location of all ILI features present in the failed joint and/or other pipe removed.

   C. List, describe (type, size, wall loss, etc.), and identify the specific location of all ILI features with similar characteristics present elsewhere on the Affected Segment.

   D. Explain the process used to review the ILI results and the results of the reevaluation.

9. **Mechanical and Metallurgical Testing.** Within 45 days of receipt of the final Safety Order, TransCanada must arrange for third-party mechanical and metallurgical testing and failure analysis of the failed pipe, including an analysis of soil samples and any foreign materials. TransCanada must complete the testing and analysis as follows:

   A. Document the chain-of-custody when handling and transporting the failed pipe section and other evidence from the failure site.

   B. Within 10 days of receipt of the final Safety Order, develop and submit the testing protocol and the proposed testing laboratory to the Director for prior approval.

   C. At least five days prior to beginning the mechanical and metallurgical testing, provide the Director with the scheduled date, time, and location of the testing to allow for a PHMSA representative to witness the testing.

   D. Ensure the testing laboratory distributes all reports whether draft or final in their entirety to the Director at the same time they are made available to TransCanada.

10. **Root Cause Failure Analysis.** Within 90 days following receipt of the final Safety Order, TransCanada must complete a root cause failure analysis (RCFA) and submit a final report of this RCFA to the Director. The RCFA must be supplemented and facilitated by an independent third party with prior written approval of the Director, and must document the decision-making process used in the analysis and all factors contributing to the Failure. The final report must include findings, any lessons learned, and whether the
findings and any lessons learned are applicable to other locations within TransCanada pipeline system.

11. Remedi al Work Plan. Within 90 days following receipt of the final Safety Order, TransCanada must submit a Remedi al Work Plan (RWP) to the Director for approval. The Director may approve the RWP incrementally without approving the entire RWP. TransCanada must revise the RWP as necessary to incorporate new information obtained during the failure investigation and remedial activities, to incorporate the results of actions undertaken pursuant to the final Safety Order, and to incorporate modifications required by the Director. TransCanada must submit any such plan revisions to the Director for prior approval. The Director may approve plan revisions incrementally. Once approved by the Director, the RWP, and any revisions, will be incorporated by reference into the final Safety Order. TransCanada must implement the RWP as approved by the Director, including any revisions to the plan. The RWP must:

A. Specify the tests, inspections, assessments, evaluations, and remedial measures TransCanada will use to verify the integrity of the Affected Segment. It must address all known or suspected factors and causes of the June 7, 2018 failure. TransCanada should consider both the risk of another failure and the consequence of another failure to develop a prioritized schedule for RWP related work along the Affected Segment.

B. Include a procedure or process to identify pipe in the Affected Segment with characteristics similar to the contributing factors identified for the June 7, 2018 failure.

C. Include a procedure or process to gather all data necessary to review the failure history (in service and pressure test failures) of the Affected Segment and to prepare a written report containing all the available information such as the locations, dates, and causes of leaks and failures.

D. Include a procedure or process to integrate the results of the metallurgical testing, root cause failure analysis, and other corrective actions required by the final Safety Order with all relevant pre-existing operational and assessment data for the Affected Segment. Pre-existing operational data includes, but is not limited to, construction, operations, maintenance, testing, repairs, prior metallurgical analyses, and any third-party consultation information. Pre-existing assessment data includes, but is not limited to, ILI tool runs, hydrostatic pressure testing, direct assessments, close interval surveys, and DCVG/ACVG surveys.

E. Include a procedure or process to determine if conditions similar to those contributing to the failure on June 7, 2018 are likely to exist elsewhere on the Affected Segment.

F. Include a procedure or process to conduct additional field tests, inspections,
assessments, and/or evaluations to determine whether, and to what extent, the conditions associated with the failure on June 7, 2018 or any other integrity threats are present elsewhere on the Affected Segment. At a minimum, this process must consider all failure causes and specify the use of one or more of the following:

i. Inline inspection (ILI) tools that are technically appropriate for assessing the pipeline system based on the cause of failure on June 7, 2018, and that can reliably detect and identify anomalies,

ii. Hydrostatic pressure testing,

iii. Close-interval surveys,

iv. Cathodic protection surveys, to include interference surveys in coordination with other utilities (e.g. underground utilities, overhead power lines, etc.) in the area,

v. Coating surveys,

vi. Stress corrosion cracking surveys,

vii. Selective seam corrosion surveys; and,

viii. Other tests, inspections, assessments, and evaluations appropriate for the failure causes.

Note: TransCanada may use the results of previous tests, inspections, assessments, and evaluations if approved by the Director, provided the results of the tests, inspections, assessments, and evaluations are analyzed with regard to the factors known or suspected to have caused the June 7, 2018 failure.

G. Describe the inspection and repair criteria TransCanada will use to prioritize, excavate, evaluate, and repair anomalies, imperfections, and other identified integrity threats. Include a description of how any defects will be graded and a schedule for repairs or replacement.

H. Based on the known history and condition of the Affected Segment, describe the methods TransCanada will use to repair, replace, or take other corrective measures to remediate the conditions associated with the pipeline failure on June 7, 2018, and to address other known integrity threats along the Affected Segment. The repair, replacement, or other corrective measures must meet the criteria specified in paragraph G, above.

I. Include a procedure or process to implement continuing long-term periodic testing and integrity verification measures to ensure the ongoing safe operation of the Affected Segment considering the results of the analyses, inspections, evaluations, and corrective measures undertaken pursuant to the final Safety Order.

J. Include a proposed schedule for completion of the RWP.
12. **Monthly Reports.** TransCanada must submit monthly reports to the Director that: (1) include analysis of all available data and results of the testing and evaluations required by the final Safety Order; (2) describe the progress of repairs and other remedial actions being undertaken; and (3) document all mandated actions and management of change plans to ensure that all procedural modifications are incorporated into TransCanada's operations and maintenance procedures manual. The first report will be due 30 days from issuance of the final Safety Order.

13. **Safety Order Documentation Report (SODR).** When TransCanada has completed all the items in the final Safety Order it will submit a final SODR in its entirety to the Director. This will allow the Director to conduct a thorough review of all actions taken by TransCanada with regards to the final Safety Order prior to approving the closure of the final Safety Order. The intent is for the SODR to summarize all activities and documentation associated with the final Safety Order in one document.

   A. The Director may approve the SODR incrementally without approving the entire SODR.

   B. Once approved by the Director, the SODR will be incorporated by reference into the final Safety Order.

   C. The SODR must include but is not limited to:

      1. Table of Contents;
      2. Summary of the pipeline failure of June 7, 2018, and the response activities;
      3. Summary of pipe data/properties and all prior assessments of the *Affected Segment*;
      4. Summary of all tests, inspections, assessments, evaluations, and analysis required by the final Safety Order;
      5. Summary of the Mechanical and Metallurgical Testing as required by the final Safety Order;
      6. Summary of the RCFA with all root causes as required by the final Safety Order;
      7. Documentation of all actions taken by TransCanada to implement the RWP, the results of those actions, and the inspection and repair criteria used;
      8. Documentation of any revisions to the RWP including those necessary to incorporate the results of actions undertaken pursuant to the final Safety Order and whenever necessary to incorporate new information obtained during the failure investigation and remedial activities;
      9. Lessons learned while completing the final Safety Order;
10. A path forward describing specific actions TransCanada will take on its entire pipeline system as a result of the lessons learned from work on the final Safety Order; and

11. Appendices (if required).

With respect to each submission under the final Safety Order that requires the approval of the Director, the Director may: (a) approve, in whole or part, the submission; (b) approve the submission on specified conditions; (c) modify the submission to cure any deficiencies; (d) disapprove, in whole or in part, the submission, directing that Respondent modify the submission; or (e) any combination of the above. In the event of approval, approval upon conditions, or modification by the Director, Respondent shall take all required actions in the submission as approved or modified by the Director. If the Director disapproves all or any portion of the submission, Respondent shall correct all deficiencies within the time specified by the Director, and resubmit it for approval. If a resubmitted item is disapproved in whole or in part, the Director may again require Respondent to correct the deficiencies in accordance with the foregoing procedure, and the Director may otherwise proceed to enforce the terms of the final Safety Order.

The Director may grant an extension of time for compliance with any of the terms of the final Safety Order upon a written request timely submitted demonstrating good cause for an extension. TransCanada may appeal any decision of the Director to the Associate Administrator for Pipeline Safety. Decisions of the Associate Administrator shall be final.

The actions proposed by this Notice are in addition to and do not waive any requirements that apply to Respondent's pipeline system under 49 C.F.R. Parts 190 through 199, under any other order issued to Respondent under authority of 49 U.S.C. § 60101 et seq., or under any other provision of Federal or state law.

After receiving and analyzing additional data in the course of this investigation, PHMSA may identify other corrective measures that need to be taken. In that event, Respondent will be notified of any additional measures required and amendment of the final Safety Order will be considered. To the extent consistent with safety, Respondent will be afforded notice and an opportunity for a hearing prior to the imposition of any additional corrective measures.

**Response to this Notice:**

In accordance with § 190.239, you have 30 days following receipt of this Notice to submit a written response to the Director. If you do not respond within 30 days, this constitutes a waiver of your rights to contest this Notice and authorizes the Associate Administrator for Pipeline Safety to find facts as alleged in this Notice without further notice to you and to issue a final Safety Order. In your response, you may indicate that you intend to comply with the terms of the Notice as proposed, or you may request that an informal consultation be scheduled (you will also have the opportunity to request an administrative hearing before a final Safety Order is issued). Informal consultation provides you with an opportunity to explain the circumstances associated with the risk conditions alleged in the Notice and, as appropriate, to present a proposal for a work plan or other remedial measures, without prejudice to your position in any subsequent hearing.

If you and PHMSA agree within 30 days of informal consultation on a plan and schedule for you
to address each identified risk condition, the parties may enter into a written consent agreement, in which case PHMSA would then issue an administrative Consent Order incorporating the terms of the agreement. If a consent agreement is not reached, or if you have elected not to request informal consultation, you may request an administrative hearing in writing within 30 days following receipt of the Notice or within 10 days following the conclusion of an informal consultation that did not result in a consent agreement, as applicable. Following a hearing, if the Associate Administrator finds the facility to have a condition that poses a pipeline integrity risk to the public, property, or the environment in accordance with § 190.239, the Associate Administrator may issue a final Safety Order.

Be advised that all material submitted in response to this enforcement action is subject to public availability. If you believe that any portion of your responsive material qualifies for confidential treatment under 5 U.S.C. § 552(b), along with the complete original document, you must provide a second copy of the document with the portions you believe qualify for confidential treatment redacted and an explanation of why you believe the redacted information qualifies for confidential treatment under 5 U.S.C. § 552(b).

In your correspondence on this matter, please refer to CPF No. 1-2018-1016S and for each document you submit, please provide a copy in electronic format whenever possible.

Robert Burrough
Director, Eastern Region
Pipeline and Hazardous Materials Safety Administration

Date issued
7/9/2018
EXHIBIT 2
Advisory Bulletin ADB-97-03

March 4, 1997

PIPELINE SAFETY ADVISORY BULLETIN

(Expanded to Nationwide Coverage)

Advisory Bulletin: ADB-97-03 DATE: 03/4/97

To: Owners and Operators of Hazardous Liquid and Natural Gas Pipelines

Subject: Potential Soil Subsidence on Pipeline Facilities.

Purpose:

Inform system owners and operators of possible hazards relating to soil subsidence on pipeline facilities, and to monitor the potential impact of flooding and soil subsidence on those facilities.

Advisory:

Heavy rainfall and flooding have increased the potential for damage to pipeline facilities. Several accidents have occurred on natural gas transmission facilities that appear to be related to the stress of soil movement on the facilities. Accordingly, the Department of Transportation's Pipeline and Hazardous Materials Safety Administration (PHMSA) is advising operators of pipeline facilities, regardless whether those facilities are regulated by PHMSA, of the need for caution associated with excessive flooding and soil movement. In particular, pipeline operators should conduct training, and patrol their rights-of-way to identify areas of potential soil subsidence that could adversely affect the safe operation of their pipelines. Additionally, emergency plans should be reviewed to assure they adequately address conditions possible in areas of soil subsidence.

In conducting patrolling and reviewing emergency plans and procedures for natural disasters, operators should consider, as appropriate to their pipeline systems, each of the actions outlined below:

Be alert to weather patterns and conditions that are precursors to soil movement/subsidence and have personnel available for patrolling, preventative maintenance activities, and emergency response actions such as shutdown, isolation, and containment in case of a pipeline failure.

Conduct training of personnel responsible for patrolling the pipeline right-of-ways to identify areas that are potentially susceptible to soil movement/subsidence that could be detrimental to the safe operation of a pipeline.
Evaluate the accessibility of pipeline facilities, such as valves, needed to isolate pipeline segments or sections of pipelines that might be jeopardized by soil movement/subsidence.

Evaluate areas of potential soil movement/subsidence and, as appropriate, monitor soil movement/subsidence and take preventative actions to assure the safe operation of the pipeline.

**Background:**

Damage to a pipeline may occur as a result of additional stresses imposed on piping by soil movement/subsidence. Record rains resulting in saturated soil conditions may result in soil movement/subsidence in some areas. Training of pipeline patrol personnel and using effective patrolling methods are essential elements for success in identifying areas of potential movement/subsidence. The impact of moving soil against buried pipeline may result in forces sufficient to cause a failure. Soil movement/subsidence has been identified as the primary contributor to two recent failures of a pipeline in the State of Washington.


**Richard B. Felder**

*Associate Administrator*

Office of Pipeline Safety

Pipeline and Hazardous Materials Safety Administration
No injuries were reported Thursday after an explosion in a newly installed natural gas line near Moundsville, W.Va., shot flames into the sky that could be seen for miles.

“Thank God nobody is hurt. Everything else can be taken care of,” said Larry Newell, 911 director for Marshall County, W.Va.
His center was flooded with calls after the TransCanada gas line — on Nixon Ridge in a remote part of the area — exploded at 4:20 a.m.

“Within a matter of three minutes, we received 37,911 calls,” he said.

TransCanada said in a statement that the cause was unknown and that it had a crew on the scene. The company said there was “an issue” with a pipeline on its Columbia Gas Transmission system in Marshall County.

“Our first priority is to protect the public and the environment. Emergency response procedures have been activated and the impacted area of pipeline has been isolated at this time,” the company said.

Officials with the West Virginia Department of Environmental Protection and the U.S. Forestry Service also were on site.

There was a boom followed by a roar, “like a big wind,” that lasted for about an hour, said Shark Martin, who lives about a mile from where the line ruptured.

The explosion woke him and he found the sky ablaze with colors, “almost like a rainbow.”

Right away, Mr. Martin said, he knew two things for sure: A natural gas pipeline had blown up and he was in no danger.

So he went back to bed.

“It’s happened around here before,” he said ticking off other pipeline explosions in the region in recent years. “They [also] had a well out there catch fire and it lit up the sky.

“It’s getting to where you look around and it’s like, there goes another one.”

His wife slept through the whole thing, as did his son and grandchildren, who live across the street from him, Mr. Martin said.

In the morning, Mr. Martin’s wife asked him why he hadn’t roused her to see the flames.

“What for?” he said. “You would have asked me, ‘Why did you wake me up?’”

Tom Hart, Marshall County’s director of emergency management, said the line was shut down and the fire burned itself out by about 6 a.m.

“The fire department did not attempt to put the fire out,” Mr. Hart said. “They basically just secured the perimeter” and let the remaining gas in the pipeline burn, as is the protocol in such situations.
Companies that operate other pipelines nearby, some within a few hundred feet of the ruptured line, were also on the scene checking their assets, Mr. Hart said. Some of them also shut off the flow in their pipelines, he said.

Natural gas well operators also shut down nearby wells as a precaution, he said.

![Site of pipeline explosion near Moundsville, W.Va.](image)

A few residents fled their homes voluntarily, Mr. Hart said, but there was no mandatory evacuation and the fire was at least a mile from the nearest residence.

Mr. Hart said he and other first-responders, during a debriefing later in the day, all marveled at how lucky it had been that the explosion occurred in a rural location with nothing but woods around.

The pipeline, known as the Leach XPress, was put into service in January. It’s 36 inches in diameter and has a maximum operating pressure of 1,440 pounds per square inch.
TransCanada had conducted what is called pigging work on the line last month. A pig is an instrument sent through the pipeline to clean it and collect data about its condition.

The company told its clients in postings that it would be pigging the pipeline between May 15 and May 24. It reduced capacity on the pipeline and at some compressor stations during that time.

After an initial run, the company notified customers it would need to extend its pigging work until May 25.

The results of those pig runs likely will prove valuable for inspectors at the Pipeline and Hazardous Materials Safety Administration, which was collecting data at the scene.

The Leach XPress spans 160 miles and, according to TransCanada, cost $1.6 billion to build.

In announcing its start in January, TransCanada president and CEO Russ Girling said: “This is truly a best-in-class pipeline and we look forward to many years of safe, reliable and efficient operation on behalf of our customers.”

The pipeline is part of a larger Columbia Gas Transmission system that has more than 10,000 miles of lines across Appalachian states, including about 2,000 in West Virginia and close to 1,700 in Pennsylvania, according to the Pipeline and Hazardous Materials Safety Administration.

In 2012, another Columbia Gas Transmission pipeline burst into flames in rural Sissonville, W.Va., just north of Charleston. The fire destroyed three homes, but no one was injured.

The cause was later determined to be external corrosion.

In 2015, a 2-year-old natural gas liquids pipeline burst in Follansbee, W.Va., sending a sizable fireball skyward. That incident has been brought up many times by pipeline opponents, most recently during a court case against the Sunoco Mariner East 2 project.

Last year, there was a fire at an EQT Corp. well site in Marshall County. Again, no injuries were reported.

Western Pennsylvania also has seen several explosive episodes in recent years, including a 2016 pipeline rupture in Westmoreland County that badly burned one man and destroyed his home. That Spectra Energy pipeline was found to have corrosion at the weld that burst.

Correction, posted June 7, 2018: In an earlier version of this story, the U.S. Forestry Service was incorrectly identified.

Anya Litvak: alitvak@post-gazette.com; Karen Kane: kkane@post-gazette.com

First Published June 7, 2018, 6:16am
Landslide caused West Virginia pipeline explosion, TransCanada reports

July 11, 2018 5:30 AM
By Anya Litvak / Pittsburgh Post-Gazette

Columbia Gas Transmission has told federal pipeline regulators that a landslide was the apparent cause of the rupture and explosion of a new natural gas pipeline in Marshall County, W.Va., last month.

The site of the break was at the bottom of a steep hill on Nixon Ridge, just south of Moundsville.

The Pipeline and Hazardous Materials Safety Administration incident report, provided to the Post-Gazette by environmental activist organization Climate Investigations Center, indicates that officials inside Columbia’s control room got an alert about low pressure on the line at 4:16 a.m. on June 7 and sent someone to investigate. Marshall County 911 reported getting calls just a few minutes later reporting an explosion. At 4:37 a.m., the emergency agency called Columbia to report the news.

The carbon steel pipe, manufactured by Durabond in 2015, was not operating above its maximum pressure at the time of the incident. When it burst, it spewed $437,250 worth of natural gas. No one was injured.

TransCanada, which owns the Columbia Gas Transmission system, has been working on repairing the pipeline, pushing back the expected in-service date from early July to the middle of the month.

“The weather in the region has continued to create challenging conditions during the remediation process,” the company said on a website it uses to communicate with customers.

Lindsey Fought, a spokesperson with TransCanada, said the company is continuing to cooperate with federal authorities in the investigation.

She confirmed that the federal pipeline agency and TransCanada’s "internal findings point to land subsidence as the cause of the rupture."

It may take months or years for federal regulators to complete their investigation of the Marshall
County incident. When a natural gas liquids pipeline burst into flames in Follansbee, W.Va., in 2015, it took PHMSA more than a year to close the case, declaring that the root cause was subsidence.

A final report for the Spectra Energy pipeline that ruptured in Salem Township, Westmoreland County in 2016 is still not posted on the federal site.

*Any* *Litvak: alitvak@post-gazette.com or 412-818-7970.*
Explosion triggers safety notice for TransCanada

Jenny Mandel and Mike Soraghan, E&E News reporters

Published: Friday, July 13, 2018

Federal regulators yesterday said that land movement may have triggered a natural gas pipeline explosion at a remote West Virginia site last month and that similar conditions exist at a half dozen other spots along the line.

The Pipeline and Hazardous Materials Safety Administration warned TransCanada yesterday that it intends to impose new safety-related requirements on a portion of the Leach XPress pipeline in response to the risk of land subsidence, which might have been responsible for an explosion last month that blew an 83-foot section of pipe into the air, released 165 million cubic feet (mmcf) of natural gas and triggered a fireball that burned for several hours.

The incident took place in a remote area and no injuries or damage to private property was reported (Greenwire, June 7).

PHMSA's notice of proposed safety order, issued to TransCanada Corp. subsidiary Columbia Gas Transmission LLC, points to geological factors in the incident and could pose a challenge for other projects proposed for construction in similar steep, unstable Appalachian terrain.

The pipeline that failed was constructed last year and went into service early this year, raising questions around why it failed so quickly and dramatically.

"The preliminary investigation suggests that the failure was the result of land subsidence causing stress on a girth weld," PHMSA said in the notice. An initial report on the incident filed by TransCanada and released earlier this week notes the cause of the failure as a landslide not related to heavy rains or floods.

"Since the failure, TransCanada has identified six other points along the pipeline that, based on their geotechnical flyover, are areas of concern to the existence of large spoil piles, steep slopes, or indications of slips," it said.

Those six additional locations, combined with the fact that the pipeline was operating well below its maximum rated pressure when the explosion took place, led PHMSA to conclude that "the continued operation of the affected segment, without corrective measures, poses a pipeline integrity risk to public safety, property and the environment."

PHMSA's notice of proposed safety order comes more than a month after the explosion.

Inspections, analyses and enhanced monitoring

The order does not reflect a completed investigation of the incident but puts TransCanada on notice that PHMSA intends to impose new safety-related requirements in light of what is now known about the incident. It also spells out a series of inspections and analyses that the company must conduct.
PHMSA proposes to require that TransCanada conduct extra surveillance and analysis of the roughly 50-mile section of the pipeline system that runs through terrain similar to that in the area where the rupture took place.

The Leach XPress pipeline system consists of 36-inch and 30-inch diameter carbon steel pipe that carries natural gas about 130 miles from Majorsville, W.Va., to Crawford, Ohio. The section of the route that PHMSA called out "runs along several hills and ridges with steep elevation changes." The rupture took place near Moundsville, W.Va., on a feature known as Nixon Ridge.

TransCanada has 30 days to review the proposed safety order and request "informal consultation" about the agency's proposed remedy and may also request a hearing to contest the facts and actions laid out by the regulator.

PHMSA recently committed to providing public notice of its hearings for pipeline safety enforcement actions, but it was not immediately clear if a hearing on the safety order would also be publicly announced under the same commitment (Energywire, July 5).

Barring changes to the proposed safety order, TransCanada has 30 days before requirements for enhanced monitoring in that higher-risk area kick in, and 45 days to install extra gauges to monitor for pipeline stress. Other requirements of the order include conducting a range of assessments of the pipeline segment that ruptured and of conditions at the time of the incident, and completing a root cause failure analysis.

TransCanada has already completed "minor repair work and grading of the failure site," PHMSA noted.

Service on portions of the Leach XPress line has been restored following an initial shutdown. TransCanada initially told customers it would resume full service on the line in early July but later pushed that timeline back to midmonth.

TransCanada did not respond to questions about the safety order.

'A minor miracle'

Opponents of two pipelines being built through the Appalachian Mountains in Virginia and West Virginia said authorities need to take another look at the approvals for those projects in light of the explosion.

"If things are likely to blow up, that's certainly something they should take into account in their analysis going forward," said David Sligh, an environmental attorney for Wild Virginia fighting the Atlantic Coast pipeline, a 600-mile system to run from northern West Virginia to North Carolina. "Thank God that one wasn't next to someone's house. Some of these are."

The developers of the Atlantic Coast pipeline said they are confident that the project is safe.

"Dominion Energy will review and learn from the PHMSA safety order," said Jen Kostyniuk, spokeswoman for Dominion Energy, the lead company on the project. She said the company and its construction contractor "have more than 200 years' experience safely building pipelines in steep mountainous terrains all across the United States," including more than 2,000 miles in the mountains of West Virginia and western Pennsylvania.
Roberta Bondurant, a lawyer fighting the Mountain Valley pipeline, a 300-mile pipeline to run from northern West Virginia to southern Virginia, agreed that the terrain is "a huge concern." She said there have already been landslides during construction, including one that blocked a road.

Cat McCue, a spokeswoman for Appalachian Voices, said the proposed projects are the largest-diameter pipelines ever to be built across rugged sections of the Allegheny and Blue Ridge mountains.

"It's a minor miracle no one was injured or killed in that explosion. Are the MVP and ACP companies asking landowners in the path of these massive industrial projects to count on miracles to keep their families safe for the next 30, 40 years?" she asked.

Bill Limpert lives on the front line of that development, as the Atlantic Coast pipeline is slated to run along a mountain ridge on his property in Bath County, Va., coming within 250 feet of a landslide that occurred three years ago.

Limpert said a PHMSA inspector visited the property last year and dismissed concerns about landslides.

"His only comment was that pipeline companies can put pipelines about anywhere they want these days," Limpert recalled. "That sounded to me like the pipeline company's running the show."

Click here for the notice of proposed safety order.
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<td>20.5</td>
<td>5.2</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>15.3</td>
<td>0.0</td>
</tr>
<tr>
<td>Craig</td>
<td>1.7</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>1.7</td>
<td>0.0</td>
</tr>
<tr>
<td>Montgomery</td>
<td>19.6</td>
<td>7.1</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>12.53</td>
<td>0.0</td>
</tr>
<tr>
<td>Roanoke</td>
<td>8.4</td>
<td>4.4</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>4.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Franklin</td>
<td>37.47</td>
<td>34.7</td>
<td>2.7</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Pittsylvania</td>
<td>19.5</td>
<td>0.0</td>
<td>19.5</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Virginia Total</td>
<td>107.1</td>
<td>51.3</td>
<td>22.2</td>
<td>0.0</td>
<td>0.0</td>
<td>33.50</td>
<td>0.0</td>
</tr>
<tr>
<td>MVP Total</td>
<td>303.5</td>
<td>203.4</td>
<td>22.2</td>
<td>0.0</td>
<td>0.0</td>
<td>34.1</td>
<td>43.7</td>
</tr>
</tbody>
</table>

Source: Godt, 2014
<table>
<thead>
<tr>
<th>Start MP</th>
<th>End MP</th>
<th>Distance</th>
<th>Percent Slope a/</th>
<th>Slope Movement b/</th>
<th>Notes c/</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.3</td>
<td>3.8</td>
<td>2,147</td>
<td>33</td>
<td>No</td>
<td>Dormant slide and/or soil prone to movement. Intersects at least three natural drains.</td>
</tr>
<tr>
<td>28.0</td>
<td>28.2</td>
<td>967</td>
<td>29</td>
<td>No</td>
<td>Near well appurtenances. Side cut would run across at least three natural drains.</td>
</tr>
<tr>
<td>32.4</td>
<td>32.6</td>
<td>749</td>
<td>32</td>
<td>No</td>
<td>Dormant slide and/or soil prone to movement. Located at toe of slope. Hillside previously cleared.</td>
</tr>
<tr>
<td>33.4</td>
<td>33.6</td>
<td>570</td>
<td>42</td>
<td>No</td>
<td>Dormant slide and/or soil prone to movement. Located at toe of slope. Hillside previously cleared.</td>
</tr>
<tr>
<td>34.2</td>
<td>34.4</td>
<td>377</td>
<td>28</td>
<td>No</td>
<td>Moderate side slope, includes slight pipe bend. Cuts across at least one natural drain.</td>
</tr>
<tr>
<td>34.4</td>
<td>34.6</td>
<td>907</td>
<td>28</td>
<td>No</td>
<td>Downslope of ridge. Cuts across at least three, possibly four or five natural drains and one or two four-wheeler paths.</td>
</tr>
<tr>
<td>35.1</td>
<td>35.3</td>
<td>869</td>
<td>40</td>
<td>No</td>
<td>Construction equipment may need to be staged on sidehill here. Southeastern side less steep, may be better to stage.</td>
</tr>
<tr>
<td>43.3</td>
<td>43.5</td>
<td>494</td>
<td>30</td>
<td>No</td>
<td>Steep side slope, but ridge within right-of-way.</td>
</tr>
<tr>
<td>46.2</td>
<td>46.5</td>
<td>1,113</td>
<td>15-33</td>
<td>Yes</td>
<td>Gravitropism and natural drains on moderate side slope</td>
</tr>
<tr>
<td>46.6</td>
<td>46.8</td>
<td>448</td>
<td>36</td>
<td>Yes</td>
<td>Existing dormant slide possibly upslope, and active within past 20 years. Cuts across at least one natural drain, possibly two.</td>
</tr>
<tr>
<td>53.0</td>
<td>53.3</td>
<td>872</td>
<td>22</td>
<td>No</td>
<td>Adjacent slopes composed of dormant slides. Moderate side slope directly below cemetery. Cuts across some kind of existing right-of-way or road, and at least two natural drains.</td>
</tr>
<tr>
<td>55.1</td>
<td>55.2</td>
<td>224</td>
<td>35</td>
<td>No</td>
<td>Moderate side slope, cuts across slope. No signs of recent movement.</td>
</tr>
<tr>
<td>57.2</td>
<td>57.7</td>
<td>806</td>
<td>18-40</td>
<td>No</td>
<td>Right-of-way would run alongside hill with 32% grade and a 40% grade directly below it.</td>
</tr>
<tr>
<td>66.8</td>
<td>67.0</td>
<td>826</td>
<td>15-34</td>
<td>No</td>
<td>Moderate side slope subjacent to the Weston and Gauley Bridge Turnpike Trail.</td>
</tr>
<tr>
<td>69.2</td>
<td>69.5</td>
<td>1,128</td>
<td>29</td>
<td>No</td>
<td>Cuts across one large natural drainage. No signs of recent movement.</td>
</tr>
<tr>
<td>81.8</td>
<td>82.1</td>
<td>1,462</td>
<td>35</td>
<td>No</td>
<td>Route crosses dormant slide area. Moderate side slope. No natural drains, but is directly above house or farm structure. Landowner issues may force it to be on the east side below the road, intersecting at least three natural drains.</td>
</tr>
</tbody>
</table>
### TABLE 4.1.11 (continued)

**Areas of Landslide Concern along the Mountain Valley Project**

<table>
<thead>
<tr>
<th>Start MP</th>
<th>End MP</th>
<th>Distance</th>
<th>Percent Slope a/</th>
<th>Slope Movement b/</th>
<th>Notes c/</th>
</tr>
</thead>
<tbody>
<tr>
<td>82.5</td>
<td>82.6</td>
<td>602</td>
<td>45</td>
<td>No</td>
<td>Route cuts through a colluvial slope, which is very prone to sliding. Very steep side slope, right above ravine, possibly crossing one natural drain.</td>
</tr>
<tr>
<td>122.5</td>
<td>123.0</td>
<td>2,547</td>
<td>7 – 43</td>
<td>No</td>
<td>Crosses at least 5 streams or natural drains. Cuts through dormant slide or material prone to sliding.</td>
</tr>
<tr>
<td>123.1</td>
<td>123.2</td>
<td>362</td>
<td>22</td>
<td>No</td>
<td>Route crosses soil prone to movement. Mild side slope directly below power line right-of-way. Cuts across one natural drain.</td>
</tr>
<tr>
<td>124.3</td>
<td>124.8</td>
<td>648</td>
<td>15-20</td>
<td>Yes</td>
<td>Possible recent landslides, and this portion of route crosses through soil prone to movement.</td>
</tr>
<tr>
<td>127.2</td>
<td>127.4</td>
<td>631</td>
<td>12 – 39</td>
<td>No</td>
<td>Moderately steep slope below ridge. Cuts through dormant slide or material prone to sliding. Cuts across an existing logging road.</td>
</tr>
<tr>
<td>127.9</td>
<td>128.0</td>
<td>423</td>
<td>10 – 60</td>
<td>No</td>
<td>Moderately steep slope below ridge. Cuts through dormant slide or material prone to sliding.</td>
</tr>
<tr>
<td>132.0</td>
<td>132.1</td>
<td>646</td>
<td>25</td>
<td>No</td>
<td>Portion of route is adjacent to soil prone to movement to the west and a dormant slide to the east. Moderate side slope. Cuts across at least one natural drain.</td>
</tr>
<tr>
<td>145.3</td>
<td>146.1</td>
<td>8000</td>
<td>30-35</td>
<td>No</td>
<td>Steep and very long side slope. Cuts across at least three natural drains. Two hard 90’s one after the other in route.</td>
</tr>
<tr>
<td>164.6</td>
<td>165.1</td>
<td>1320</td>
<td>33-43</td>
<td>No</td>
<td>Steep slide slopes outside of construction right-of-way. Two gullies at saddles are outside of the construction right-of-way.</td>
</tr>
<tr>
<td>182.4</td>
<td>182.8</td>
<td>808</td>
<td>18-28</td>
<td>Yes</td>
<td>Some slope movement is indicated on historical imagery within the past 20 years.</td>
</tr>
<tr>
<td>197.4</td>
<td>197.6</td>
<td>1800</td>
<td>18-26</td>
<td>No</td>
<td>Jefferson National Forest.</td>
</tr>
<tr>
<td>198.4</td>
<td>199.1</td>
<td>2300</td>
<td>18-35</td>
<td>No</td>
<td>Very steep slopes with little cover. Active erosion occurring onsite with intermittent streams nearby.</td>
</tr>
<tr>
<td>204.4</td>
<td>204.8</td>
<td>1,120</td>
<td>39</td>
<td>No</td>
<td>Lateral slope side cut, paralleling transmission power line.</td>
</tr>
<tr>
<td>211.53</td>
<td>211.8</td>
<td>1,184</td>
<td>32 – 53</td>
<td>No</td>
<td>Very steep slope, centerline may or may not be on ridge. Directly above U.S. 460.</td>
</tr>
<tr>
<td>219.9</td>
<td>220.9</td>
<td>1200</td>
<td>25-40</td>
<td>No</td>
<td>Jefferson National Forest.</td>
</tr>
<tr>
<td>229.2</td>
<td>229.3</td>
<td>640</td>
<td>28</td>
<td>No</td>
<td>Slight sidehill. Crosses stream.</td>
</tr>
<tr>
<td>261.2</td>
<td>261.2</td>
<td>179</td>
<td>40</td>
<td>No</td>
<td>Steep side slope, but just for small section. Running just below ridge line through a gulley. Crosses one natural drain.</td>
</tr>
</tbody>
</table>
TABLE 4.1.1-11 (continued)

Areas of Landslide Concern along the Mountain Valley Project

<table>
<thead>
<tr>
<th>Start MP</th>
<th>End MP</th>
<th>Distance</th>
<th>Percent Slope</th>
<th>Slope Movement</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>a/</td>
<td>b/</td>
<td>c/</td>
</tr>
</tbody>
</table>

a/ Design slope is based on desktop and field review, or range from map analysis of alignment.
b/ Based on historical imagery.
c/ Based on available landslide mapping.

Source: Godt, 2014

Equitrans Expansion Project

The entirety of the EEP facilities would be in an area identified as having a high susceptibility to landslides (Godt, 2014). The EEP would cross about 3.0 miles of 15 percent to 30 percent slopes and about 0.3 mile of slopes greater than 30 percent (see table 4.1.1-12).

TABLE 4.1.1-12

Steep Slopes crossed by the Equitrans Expansion Project

<table>
<thead>
<tr>
<th>Component</th>
<th>15-30% Slope (miles)</th>
<th>Slope Greater than 30% (miles)</th>
</tr>
</thead>
<tbody>
<tr>
<td>H-158</td>
<td>0.1</td>
<td>0.0</td>
</tr>
<tr>
<td>M80</td>
<td>0.1</td>
<td>0.0</td>
</tr>
<tr>
<td>H-316</td>
<td>1.5</td>
<td>0.2</td>
</tr>
<tr>
<td>H-318</td>
<td>1.2</td>
<td>0.1</td>
</tr>
<tr>
<td>H-305</td>
<td>0.1</td>
<td>0.0</td>
</tr>
<tr>
<td>H-319</td>
<td>0.0</td>
<td>0.0</td>
</tr>
</tbody>
</table>

Source: USGS, 2015a

Additionally, landslides that have occurred within areas crossed by the EEP were identified. Four landslide areas would be crossed by the H-316 pipeline, and seven landslide areas would be crossed by the H-318 pipeline. Table 4.1.1-13 identifies landslide areas crossed by the EEP.
<table>
<thead>
<tr>
<th>Cave Name</th>
<th>Distance from Pipeline (feet)</th>
<th>County</th>
<th>State</th>
<th>Known to be Used Recreationally</th>
</tr>
</thead>
<tbody>
<tr>
<td>Greenville Glenray Cave</td>
<td>827</td>
<td>Monroe</td>
<td>WV</td>
<td>Unknown</td>
</tr>
<tr>
<td>Bobcat Cave</td>
<td>1,053</td>
<td>Monroe</td>
<td>WV</td>
<td>No</td>
</tr>
<tr>
<td>Rich Creek Cave</td>
<td>1,509</td>
<td>Monroe</td>
<td>WV</td>
<td>No</td>
</tr>
<tr>
<td>Lhoist Cave</td>
<td>336</td>
<td>Giles</td>
<td>VA</td>
<td>No</td>
</tr>
<tr>
<td>Crooks Crevice</td>
<td>800</td>
<td>Giles</td>
<td>VA</td>
<td>No</td>
</tr>
<tr>
<td>Eight Point Pit</td>
<td>250</td>
<td>Giles</td>
<td>VA</td>
<td>No</td>
</tr>
<tr>
<td>Williams Contact Shaft</td>
<td>242</td>
<td>Giles</td>
<td>VA</td>
<td>No</td>
</tr>
<tr>
<td>High Voltage Cave</td>
<td>103</td>
<td>Giles</td>
<td>VA</td>
<td>No</td>
</tr>
<tr>
<td>Conklin Sink Cave</td>
<td>457</td>
<td>Giles</td>
<td>VA</td>
<td>No</td>
</tr>
<tr>
<td>Pighole Cave</td>
<td>1,638</td>
<td>Giles</td>
<td>VA</td>
<td>Yes / limited access</td>
</tr>
<tr>
<td>Echols Cave</td>
<td>7</td>
<td>Giles</td>
<td>VA</td>
<td>No</td>
</tr>
<tr>
<td>Tawney’s Cave</td>
<td>131</td>
<td>Giles</td>
<td>VA</td>
<td>Yes / limited access</td>
</tr>
<tr>
<td>Hog Hole Cave</td>
<td>73</td>
<td>Giles</td>
<td>VA</td>
<td>No</td>
</tr>
<tr>
<td>Canoe Cave</td>
<td>902</td>
<td>Giles</td>
<td>VA</td>
<td>No / closed</td>
</tr>
<tr>
<td>Newport Cave</td>
<td>454</td>
<td>Giles</td>
<td>VA</td>
<td>Unknown</td>
</tr>
<tr>
<td>Mahaffey Trash Cave</td>
<td>625</td>
<td>Giles</td>
<td>VA</td>
<td>Unknown</td>
</tr>
<tr>
<td>Plumb Bob Pit</td>
<td>632</td>
<td>Giles</td>
<td>VA</td>
<td>Unknown</td>
</tr>
<tr>
<td>Hoges Farm Cave</td>
<td>824</td>
<td>Giles</td>
<td>VA</td>
<td>Unknown</td>
</tr>
<tr>
<td>Missing Link Cave</td>
<td>950</td>
<td>Giles</td>
<td>VA</td>
<td>Unknown</td>
</tr>
<tr>
<td>Big Stony Canyon Cave</td>
<td>967</td>
<td>Giles</td>
<td>VA</td>
<td>Unknown</td>
</tr>
<tr>
<td>Jimzuther Cave</td>
<td>996</td>
<td>Giles</td>
<td>VA</td>
<td>Unknown</td>
</tr>
<tr>
<td>Links Cave</td>
<td>1,004</td>
<td>Giles</td>
<td>VA</td>
<td>Unknown</td>
</tr>
<tr>
<td>Kimballton Cave</td>
<td>1,145</td>
<td>Giles</td>
<td>VA</td>
<td>Unknown</td>
</tr>
<tr>
<td>Smokehole Cave</td>
<td>1,331</td>
<td>Giles</td>
<td>VA</td>
<td>Unknown</td>
</tr>
<tr>
<td>Conklin Air Hole</td>
<td>1,443</td>
<td>Giles</td>
<td>VA</td>
<td>Unknown</td>
</tr>
<tr>
<td>Kanodes Pit</td>
<td>1,555</td>
<td>Giles</td>
<td>VA</td>
<td>Unknown</td>
</tr>
<tr>
<td>Terrible Tortoise Cave</td>
<td>1,577</td>
<td>Giles</td>
<td>VA</td>
<td>Unknown</td>
</tr>
<tr>
<td>Jones Cave</td>
<td>126</td>
<td>Giles/Craig</td>
<td>VA</td>
<td>No</td>
</tr>
<tr>
<td>Mill Creek Pit</td>
<td>176</td>
<td>Montgomery</td>
<td>VA</td>
<td>Unknown</td>
</tr>
<tr>
<td>Slusser’s Chapel Cave</td>
<td>541</td>
<td>Montgomery</td>
<td>VA</td>
<td>No / closed</td>
</tr>
<tr>
<td>Johnson’s Cave</td>
<td>403</td>
<td>Montgomery</td>
<td>VA</td>
<td>No</td>
</tr>
</tbody>
</table>

Source: Draper Aden Associates, 2016, NSS, 2017
EXHIBIT 5
M 3.2 Earthquake near Lindside, WV (9/13/17) -- 1.6 miles from MVP

LINDSIDE EARTHQUAKE
M 3.2
Depth: 20.8 km
37.455 N, 80.7015 W

RECENT EARTHQUAKE ACTIVITY IN VICINITY
5/12/2017 -- M 2.8 Earthquake, followed by Rocksride on 5/13/2017

BOTH EARTHQUAKES WITHIN "GILES COUNTY SEISMIC ZONE"

Map source: ICWA Interactive Environmental Map
www.InlandCreekWatershedsAssociation.org
3.2 Earthquake 9/13/17 - MVP Route

THE WARNING SIGNS ARE CLEAR: THIS IS A NO-BUILD ZONE FOR MASSIVE PIPELINES

- Steep slopes, slip-prone soils, karst and seismic activity are inter-related hazards that make this Valley and Ridge region a “no-build” zone – unsafe for the integrity of the pipeline and the environment, according to geologists Ernst Kastning, Alfred Ziegler, Pamela Dodds and others.

- The Rich Creek Cave & Spring, in an unmapped karst complex at the base of Peters Mountain, supports a fish hatchery and is a critical secondary public water source for thousands of Monroe County residents. The cave extends an unknown distance towards the proposed pipeline route.

- FEIS Table 4.1.1-11 (Areas of Landslide Concern), cites several locations between Peters and Brush Mountains, including one “directly above U.S. 460.” Intensive rainfall incidents, already prevalent in this area and expected to increase, will compound existing geological hazards along this route.
Lindside, WV (24951) is in Monroe County near the WV/VA border on Peters Mountain.

- The earthquake epicenter is 1.6 miles from the MVP route at its closest location.
- The pipeline would run within 2 miles of the epicenter for nearly 5 miles of its route.
- The majority of Lindside’s business and social center lies within the evacuation zone of the MVP route as it runs along Little Mountain parallel to US-219.
- Fire Department (FD) and United Methodist Church & Community Center, an important site for large meetings, day care, and local food pantry, are not included in MVP’s High Consequence Area (HCA-8).
- The county’s regional high school and a nursing home are 1 mile from the MVP route.
EXHIBIT 6
Construction halted at Mountain Valley Pipeline work site following severe erosion in Franklin County

By Laurence Hammack laurence.hammack@roanoke.com 981-3239  May 20, 2018

State regulators have put a stop to construction of part of the Mountain Valley Pipeline swamped by a rainstorm, saying work cannot continue until proper erosion control measures are established.

Crews were using heavy equipment to cut trees and clear land along the natural gas pipeline's right of way in Franklin County when heavy rains Thursday night and Friday morning swept away much of the soil they had unearthed.

Both lanes of nearby Cahas Mountain Road were covered by up to eight inches of mud.
“It’s clearly unacceptable,” Ann Regn, a spokeswoman for the Virginia Department of Environmental Quality, said Sunday.

According to both DEQ and Mountain Valley officials, none of the mudflow reached streams, where it could have done the most damage. Nonetheless, the agency is investigating how check dams and other erosion control measures failed to prevent the mess.

Environmental regulators received several calls last week, before the rain started, from members of the public who were concerned that heavy equipment being used to remove trees and clear a 125-foot swath for pipeline construction was exposing the land to potential runoff problems.

Although Mountain Valley crews had erosion control devices in place, “there were some things that completely disappeared” after the rains, including concrete barriers, Regn said.

“Initial reviews indicate the controls were installed properly; however, the circumstances appear unusual and an ultimate cause is under investigation,” Mountain Valley spokeswoman Natalie Cox wrote in an email Friday.

“Upon learning of the issue, MVP crews promptly began remediation activities,” Cox wrote. “The project team remains committed to the safe and responsible construction of this important underground infrastructure project.”

Opponents have predicted that building a 303-mile buried pipeline along steep mountain slopes will dislodge sediment, which can contaminate private wells and public water supplies if it is allowed to enter nearby streams and wetlands.

Already, regulators have pointed to problems with erosion control in Wetzel County, West Virginia, where the pipeline will start a path that will take it through Southwest Virginia before connecting with an existing pipeline in Pittsylvania County.

On April 25, the West Virginia Department of Environmental Protection issued a notice of violation against Mountain Valley after an inspection found sediment-laden water that had flowed beyond the perimeters of where a compressor station is under construction.

Out-of-control runoff from a hill on a second site caused part of the slope to give way, according to records filed with the Federal Energy Regulatory Commission.
And an environmental firm that is monitoring pipeline work for the U.S. Forest Service documented inadequate maintenance on two access roads in the Jefferson National Forest that are being used by Mountain Valley officials. The report noted deep ruts in the road and noncompliance with erosion and sediment control requirements.

Earlier this year, the Virginia General Assembly passed a law that gave DEQ the authority to order work on the pipeline to cease immediately if there has been, or is likely to be, a “substantial adverse impact to water quality.”

The suspension of construction in Franklin County over the weekend did not rise to that level, with Regn saying that state and Mountain Valley officials agreed informally that stabilization of the area must happen before regular work can proceed.

Del. Chris Hurst, D-Blacksburg, said he believes it’s time for DEQ to issue a full stop-work order.

“I think it’s well past time,” Hurst said Sunday. “For a lot of people, they think it’s too late already — a day late and a dollar short.”

Hurst made his comments after attending a rally where about 50 people decried the Forest Service’s decision to cut off food and water to a protester who is blocking the pipeline’s route through Giles County.

Known by her Appalachian Trail nickname “Nutty,” the woman has been camped since March 28 in a platform suspended from a 50-foot pole erected in the middle of a construction access road.

“Shame USFS,” read one of the posters held by members of the crowd, which gathered outside of Forest Service headquarters in Roanoke County. “Feed Nutty Now,” another sign stated.

Since the Forest Service cut off supplies being sent up to the woman from a support team camped nearby, she has been living off a reserve of energy bars, applesauce and rainwater collected from a tarp that covers her tiny living space.

Last week, a lawsuit filed by the Rutherford Institute of Charlottesville raised questions about Nutty’s treatment.
The lawsuit was brought on behalf of a physician who became concerned about her medical condition and hiked nearly two miles to help her – only to be denied access by Forest Service law enforcement officers who have cordoned off the protest site.

In a recent statement posted to the Facebook page of Appalachians Against Pipelines, Nutty wrote about her opposition to the industrial and commercial forces that seek to destroy nature in the name of progress, and the government entities that support them.

“To hell with all that,” she wrote.

“To hell with comfort if it comes at the cost of complicity.”

Laurence Hammack
Laurence Hammack covers environmental issues, including the Mountain Valley Pipeline, and business and enterprise stories. He has been a reporter for The Roanoke Times for more than three decades.
EXHIBIT 7
STATE OF WEST VIRGINIA
Department of Environmental Protection
Environmental Enforcement
NOTICE OF VIOLATION

Violation No  **W18-52-021-RDD**

To the Operator or Agent of:

Facility Name: **Mountain Valley Pipeline Project**  Permit No. **WVR310667**
Permittee or Individual: **MOUNTAIN VALLEY PIPELINE, LLC**
Located at or near: **Wileville, West Virginia** in **Wetzel** County
Representative:  Date: **4/3/18**  Time: 1:37pm
Address / phone number:  **625 LIBERTY AVE, ST 1700, PITTSBURGH, PA 15222 /**

Whereas, an inspection of the above named operation by the undersigned, duly authorized agent of the Secretary, at which the following described condition or practice exists, in violation of Chapter **22**, Article **11**, Section(s) **1 et. Seq.** of the Code of West Virginia and/or Section(s) **of the Rules and Regulations and/or Section(s) B.D.G.** of the Permit referenced above promulgated thereunder in that you:

*Have violated the following terms and conditions of WV/NPDES General Water Pollution Control Permit No. WV0116815, Registration No. WVR310667:*

- **Section G.4.e.2.A.ii.j** - Permittee has failed to prevent sediment-laden water from leaving the site without going through silt sock located at the Bradshaw Compressor Station.
- **Section G.4.e.2.** - Permittee has failed to properly implement controls; lack of drop inlet protection at the Mobley Compressor Station.
- **Section G.4.e.2.A.ii.f.** - Permittee has failed to protect fill slopes at the Bradshaw Compressor Station.

The following corrective measures were discussed with you at the time of this inspection:

*Take measures to correct the aforementioned violations.*

- Install properly operate and maintain silt sock to prevent sediment laden water from leaving the site.
- Provide proper inlet protection.
- Install erosion control devices to protect fill slopes.

Within **20** days provide a written response to the inspector named below, at the address indicated, detailing the actions taken to abate this violation.

Received by:

**Sent Certified Mail -- 9171999991703840801638**

<table>
<thead>
<tr>
<th>Signature</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>304-238-1220 ext. 3512</td>
<td><strong><a href="mailto:Ryan.d.dague@wv.gov">Ryan.d.dague@wv.gov</a></strong></td>
</tr>
</tbody>
</table>

**Send Response to the Inspector at the address indicated below:**
WV Department of Environmental Protection
Environmental Enforcement / WW
131 Peninsula St
Wheeling, WV 26003
STATE OF WEST VIRGINIA
Department of Environmental Protection
Environmental Enforcement
NOTICE OF VIOLATION

Violation No  W18-52-002-CP

To the Operator or Agent of:

Facility Name: Mountain Valley Pipeline Project  Permit No. WVR310667
Permittee or Individual: MOUNTAIN VALLEY PIPELINE, LLC
Located at or near: Leivasy in Nicholas County
Representative: MATTHEW HOOVER  Date: 5/9/2018  Time: 1545
Address / phone number: 625 LIBERTY AVE, ST 1700, PITTSBURG, PA 15222 / 7248733645

Whereas, an inspection of the above named operation by the undersigned, duly authorized agent of the Secretary, at which the following described condition or practice exists, in violation of Chapter 22, Article 11, Section(s) 1 et. Seq. of the Code of West Virginia and/or Section(s) ___ of the Rules and Regulations and/or Section(s) G. of the Permit referenced above promulgated thereunder in that you:

Have violated the following terms and conditions of WV/NPDES General Water Pollution Control Permit No. WV0116815, Registration No. WVR310667:

- **Section G.4.c.** - Permittee has failed to modify your SWPPP when the SWPPP proves to be ineffective in achieving the general objectives of controlling pollutants in storm water discharges. Additional controls were not added to areas where installed controls failed.
- **Section G.4.e.2.** - Permittee has failed to implement controls: water bars/slope breakers were improperly installed - did not have outlets, outlet was directed down denuded slope, slope of water bar was inappropriate, and inadequate number of bars were installed.
- **Section G.4.e.2.A.ii.** - Permittee has failed to prevent sediment-laden water from leaving the site without going through an appropriate device from control failure at stations 6812+58 (sheet 6.38) and 6854+00 (sheet 6.39).

The following corrective measures were discussed with you at the time of this inspection:

Take measures to correct the aforementioned violations.

Within 20 days provide a written response to the inspector named below, at the address indicated, detailing the actions taken to abate this violation.

Received by:

Sent Certified Mail—7018004000047935194

______________________________
Signature

______________________________
Title

______________________________
Duly Authorized Agent / Inspector

______________________________
304-816-2453  Christy.e.pitsenbarger@wv.gov
Telephone  E-mail

Send Response to the Inspector at the address indicated below:

WV Department of Environmental Protection
Environmental Enforcement / WW
1159 Rahall Greenway, Fayetteville, WV 25840
STATE OF WEST VIRGINIA
Department of Environmental Protection
Environmental Enforcement
NOTICE OF VIOLATION

Violation No  W18-52-001-CP
To the Operator or Agent of:
Facility Name: Mountain Valley Pipeline Project Permit No. WVR310667
Permittee or Individual: MOUNTAIN VALLEY PIPELINE, LLC
Located at or near: 39° 33' 45" N, 80° 32' 34" W in Wetzel County
Representative: MATTHEW HOOVER Date: 5/9/2018 Time: 1545
Address / phone number: 625 LIBERTY AVE, ST 1700, PITTSBURG, PA 15222 / 7248733645

Whereas, an inspection of the above named operation by the undersigned, duly authorized agent of the Secretary, at which the following described condition or practice exists, in violation of Chapter 22, Article 11, Section(s) 1 et. Seq. of the Code of West Virginia and/or Section(s) 47CSR2 3.2b of the Rules and Regulations and/or Section(s) G. of the Permit referenced above promulgated thereunder in that you:
Have violated the following terms and conditions of WV/NPDES General Water Pollution Control Permit No. WV0116815, Registration No. WVR310667:

- Section G.4.e.2. - Permittee has failed to implement appropriate controls which allowed a failure of controls at station 9492+92.85 allowed sediment laden water to leave site without going through an appropriate device.
- Section G.4.e.2.A.ii.ii - Permittee has failed to prevent sediment-laden water from leaving the site without going through an appropriate device.

Have violated the following WV Legislative Rules (Requirements Governing Water Quality Standards): Title 47, Series 2, Section 3.2.b. - Section 3.2.b. - Permittee has caused conditions not allowable in waters of the State by allowing sediment deposits on the bottom of the stream.

The following corrective measures were discussed with you at the time of this inspection:
Take measures to correct the aforementioned violations.

Within 20 days provide a written response to the inspector named below, at the address indicated, detailing the actions taken to abate this violation.

Received by:
Sent Certified Mail--70180040000047938676


Duly Authorized Agent / Inspector 304-816-2453 Christy.e.pitsenbarger@wv.gov
Telephone E-mail

Send Response to the Inspector at the address indicated below:
WV Department of Environmental Protection
Environmental Enforcement / WW
1159 Rahall Greenway, Fayetteville, WV 25840
STATE OF WEST VIRGINIA
Department of Environmental Protection
Environmental Enforcement
NOTICE OF VIOLATION

Violation No  W18-17-065-TJC
To the Operator or Agent of:
Facility Name: Mountain Valley Pipeline Project  Permit No. WVR310667
Permittee or Individual: MOUNTAIN VALLEY PIPELINE, LLC
Located at or near: Wallace, in Harrison County
Representative: MATTHEW HOOVER  Date: 6/6/2018  Time: 09:15
Address / phone number: 625 LIBERTY AVE, ST 1700, PITTSBURG, PA 15222 / (724)873-3645

Whereas, an inspection of the above named operation by the undersigned, duly authorized agent of the Secretary, at which the following described condition or practice exists, in violation of Chapter 22, Article 11, Section(s) 1 et. Seq. of the Code of West Virginia and/or Section(s) _____ of the Rules and Regulations and/or Section(s) B of the Permit referenced above promulgated thereunder in that you:

Have violated the following terms and conditions of WV/NPDES General Water Pollution Control Permit No. WV0116815, Registration No. WVR310667:

1. Section B- failed to comply with the General Permit and approved Storm Water Pollution Prevention Plan (SWPPP). Perimeter controls and treatment at water bar outlets are not in place as detailed by the SWPPP from 513+64 to 556+00. There are no BMPs in place to prevent sediment laden water from leaving the site in this area in violation of the issued permit.

The following corrective measures were discussed with you at the time of this inspection:
Take measures to correct the aforementioned violations.

Within 20 days provide a written response to the inspector named below, at the address indicated, detailing the actions taken to abate this violation.

Received by:

Sent Certified Mail—70180040000047935286

______________________________  ________________
Signature  Title

Duly Authorized Agent / Inspector  (304)288-6219  tim.j.castro@wv.gov

Telephone  E-mail

Send Response to the Inspector at the address indicated below:
WV Department of Environmental Protection
Environmental Enforcement / WW
2031 Pleasant Valley Road, Fairmont, WV 26554