Resource Report 6
Geological Resources

FERC Docket No. CP22-___-000

Equitrans, L.P.
Ohio Valley Connector Expansion Project
Greene County, Pennsylvania
Wetzel County, West Virginia
and Monroe County, Ohio

January 2022

EQUITRANS℠

Public Information

RESOURCE REPORT 6 - GEOLOGICAL RESOURCES	
SUMMARY OF FERC FILING INFORMATION	
Information	**Found In**
Minimum Filing Requirements	
1. Identify the location (by milepost) of mineral resources and any planned or active surface mines crossed by the proposed facilities — Title 18 Code of Federal Regulations (CFR) part (§) 380.12 (h)(1&2)	Section 6.3
2. Identify any geologic hazards to the proposed facilities — 18 CFR § 380.12 (h)(2)	Section 6.4
3. Discuss the need for and locations where blasting may be necessary in order to construct the proposed facilities — 18 CFR § 380.12 (h)(3)	Section 6.2
4. For liquified natural gas (LNG) projects in seismic areas, the materials required by "Data Requirements for the Seismic Review of LNG Facilities," National Bureau of Standards Information Report 84-2833 — 18 CFR § 380.12 (h)(5)	Not applicable
5. For underground storage facilities, how drilling activity by others within or adjacent to the facilities would be monitored, and how old wells would be located and monitored within the facility boundaries — 18 CFR § 380.12 (h)(6)	Not applicable
Additional Information Often Missing and Resulting in Data Requests	
6. Identify any sensitive paleontological resource areas crossed by the proposed facilities. (Usually only if raised in scoping or if the project affects federal lands.)	Section 6.5
7. Briefly summarize the physiography and the bedrock geology of the project.	Section 6.1
8. If proposed pipeline crosses active drilling areas, describe plan for coordinating with drillers to ensure early identification of other companies planned new wells, gathering lines, and aboveground facilities.	Section 6.3
9. If the application is for underground storage facilities: • Describe monitoring of potential effects of the operation of adjacent storage or production facilities on the proposed facility, and vice versa; • Describe measures taken to locate and determine the condition of old wells within the field and buffer zone and how the applicant would reduce risk from failure of known and undiscovered wells; and • Identify and discuss safety and environmental safeguards required by state and federal drilling regulations.	Not applicable

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Acronyms and Abbreviations

BMP	Best Management Practice
Equitrans	Equitrans, L.P.
FEMA	Federal Emergency Management Agency
FERC	Federal Energy Regulatory Commission
MP	Milepost
USDA-NRCS	United States Department of Agriculture Natural Resources Conservation Service
ODNR	Ohio Department of Natural Resources
ODNR-DGS	Ohio Department of Natural Resources-Division of Geological Survey
OH	Ohio
OVC	Ohio Valley Connector
PA	Pennsylvania
PADCNR	PA Department of Conservation and Natural Resources
PADEP	PA Department of Environmental Protection
PAGS	Pennsylvania Geological Survey
PASDA	Pennsylvania Spatial Data Access
Plan	*FERC's Upland Erosion Control, Revegetation, and Maintenance Plan*
Procedures	*FERC's Wetland and Waterbody Construction and Mitigation Procedures*
Project	Ohio Valley Connector Expansion Project
PSU	Pennsylvania State University
ROW	Right-of-way
SPCC	Spill Prevention, Control and Countermeasure Plan
USGS	United States Geological Survey
WV	West Virginia
WVDEP	WV Department of Environmental Protection
WVGES	WV Geological and Economic Survey
US	United States
USNPS	United States National Park Service

6.0 Geological Resources

A detailed description and overview map of Equitrans, L.P.'s (Equitrans') Ohio Valley Connector Expansion Project (Project) are provided in Resource Report 1, General Project Description.

Resource Report 6 describes the geologic setting and resources of the Project area for the pipeline facilities and the new aboveground facilities. Where appropriate, mitigation measures intended to reduce the impact of the Project on geological resources and/or reduce the impact of geological hazards on Project facilities are identified.

6.1 Geologic Setting

This section describes the geologic setting of the Project area, including physiography, topographic relief, and geologic formations.

6.1.1 Physiography

Physiographic provinces are regions within the contiguous lower-48 United States (US) which are divided based on geomorphology, which is shaped by geology, climate, and topography. The Project is located within the Waynesburg Hills and Kanawha sections of the Appalachian Plateau Province. The Waynesburg Hills Section is a dissected plateau of horizontally bedded sedimentary rocks shaped by fluvial erosion and landslides to form a very hilly landscape with steeply sloping narrow valleys and narrow hilltops (US National Park Service [USNPS] 2017; USNPS 2018; Fenneman 1938). The Kanawha Section is on a dissected plateau that is underlain mainly by horizontally bedded sedimentary rocks. The narrow, level valleys and narrow, sloping ridgetops are separated by long, steep, and very steep side slopes (United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) 2006a).

6.1.2 Topography

Topography was reviewed using the US Geologic Survey (USGS) 7.5 Minute Quadrangle Maps for New Freeport, Pennsylvania (PA) (USGS 2016a), Waynesburg, PA (USGS 2016b), Holbrook, PA (USGS 2016c), Hundred, PA (USGS 2016d), Big Run, West Virginia (WV) (USGS 2016e), Pine Grove, WV (USGS 2016f), and Powhatan Point, Ohio (OH) (USGS, 2016g). The Waynesburg Hills and Kanawha sections are part of the Western Allegheny Plateau, which has a local relief of about 160 to 330 feet (USDA-NRCS 2006b). Along the pipeline route in PA, the topographic elevation ranges from approximately 1,140 to 1,540 feet with an average slope of 9.4%. The pipeline route in WV follows an elevation range from approximately 875 feet to 1650 feet with an average slope of 21.3%.

6.1.3 Geology

A geologic review of the area to be crossed by the Project was conducted using topographic and geologic maps and lithologic descriptions published by the USGS (USGS 2012), the USDA-NRCS (USDA-NRCS 2017), the PADCNR (PADCNR 2021a), and the WV Geological and Economic Survey (WVGES) (WVGES 2016a). The Project overlies a sequence of sedimentary rocks composed of sandstone, shale, and limestone which may produce oil, gas, and/or coal. Holocene and late and middle Pleistocene age colluvium (frost-broken surficial bedrock) comprise the surficial geology in the area (USDA-NRCS 2006b).

The following geologic formations are crossed by the Project [United States Geological Survey ("USGS") 2021e; PA Department of Environmental Protection (PADEP) 2004]:

- Dunkard Group: The Dunkard Group is of Permian/Pennsylvanian age and contains the Greene, Washington, and Waynesburg formations. It contains non-marine cyclic sequences of sandstone, red and gray shale, limestone, and coal. It extends from the top of the exposed bed rock section to the top of the Waynesburg coal and includes the Washington coals and limestones.

- Greene Formation: Along with the Washington and Waynesburg Formations, the Greene Formation is within the Dunkard Group of Permian age, cyclic sequences of sandstone, shale, red-beds, limestone, and impure coal, with the base occurring at the top of the Upper Washington Limestone.

These formations and their occurrence along the pipeline routes are included in Table 6.1-1 in Appendix 6-A.

6.2 Blasting

Equitrans, L.P. (Equitrans) does not currently anticipate blasting on the Project. In the event that blasting becomes necessary, Equitrans will identify those areas and adhere to the General Blasting Plan included as Appendix 6-B.

As further discussed in Resource Report 7, areas of stony/rocky and/or shallow bedrock are expected to be encountered during Project construction. Equitrans expects to use mechanical rippers or other mechanical means for trench construction, such as conventional excavation with a track-mounted excavator (trackhoe), trencher, or hammering with a trackhoe-attached device followed by excavation to remove bedrock encountered in the trench. In the event that blasting is necessary, Equitrans will adhere to the General Blasting Plan. Blasting activities, if required, would be completed in accordance with the General Blasting Plan and would meet federal, state, and local requirements, limits, permits, and guidelines for explosives usage and management. The General Blasting Plan includes details on procedures, inspections, and monitoring. The entire Project is underlain by sedimentary rock, which is composed of cemented clastic particles which can be broken apart, thus is typically less hard and resistant than igneous or metamorphic rocks (USGS 2017). Because they are easier to break apart, the previously mentioned alternative methods may be used on sedimentary bedrock if it is shallow in the Project area.

6.3 Mineral Resources

There are extensive natural mineral resources in PA, OH, and WV including anthracite and bituminous coal, oil and natural gas, and industrial minerals mining (including aggregate, salt, clay, and iron). Mining in PA has occurred since the late 1700s, the world's first commercial oil well was drilled in Titusville, PA in 1859, and the development of PA's natural gas field has occurred since 1881 (PADEP 2017; PA Independent Oil and Gas Association 2019). Mining and oil and gas development in WV also extends back to the 1800s (WVGES 2017; WVGES 2004). Currently WV is ranked as the second highest coal producing state behind Wyoming, and the 12th and sixth highest for oil and natural gas, respectively (US Energy Information Administration (EIA) 2021a). Similarly, PA is ranked as the third highest coal producing state, and the 17th and second highest in oil and natural gas production, respectively (EIA 2021b). Ohio is ranked 15th in coal, 13th in oil, and 5th in natural gas productions (EIA 2021c). The occurrence of mineral resources including rocks/minerals, aggregates, coal, oil, and natural gas was assessed by a review of USGS Mineral Resources Data System, the WV Department of Environmental Protection (WVDEP) Data Download mining and oil and gas datasets, and the PA Department of Environmental Protection (PADEP) Open Data Portal mining and oil and gas datasets (USGS 2011; WVDEP 2021a; PADEP 2021a). The Ohio Department of Natural Resources (ODNR) Division of Geological Survey (DGS) Geologic Map Viewer and Division of Oil and Gas Ohio Oil and Gas Well Locator, WV Geological and Economic Survey (WVGES) Oil and Gas Wells of WV, Underground and Surface Coal Mines, and the Pennsylvania State University (PSU) Mine Map Atlas interactive online maps were also reviewed (ODNR-DGS 2021; ODNR 2021; WVGES 2021a; WVGES 2021b; PSU 2021; and PADEP 2021c). The locations of known oil and gas wells, coal mines, and rock and mineral/mineral aggregate mines within 0.25-mile of the Project are shown by milepost (MP) in Table 6.3-1 in Appendix 6-A. Equitrans compared the Project route to these datasets to determine the potential of impacts to mineral resources or from previous extraction of resources.

6.3.1 Mining and Mineral Resources

Active, completed, and abandoned mine lands within 0.25-mile of the Project are included in Table 6.3-1 in Appendix 6-A. Ten active mining operations are located within 0.25-mile of the

Project. In addition, 18 abandoned and four completed mining operations are within 0.25-mile of the Project. Of these, fifteen mines are crossed by the Project LOD.

6.3.1.1 Impacts and Mitigation of Mining and Mineral Resources

Active, inactive, reclaimed, and abandoned mine lands are crossed by the Project in PA, WV and OH. The University of Pittsburgh and the PADEP are currently researching the effects of subsidence in PA, primarily due to underground coal mining activity, which can destabilize surface layers, causing them to sink or collapse. This research includes a series of five-year studies (from 2003 to 2008 and 2008 to 2013). One known abandoned underground mine is located underneath the existing Plasma Compressor Station in OH (ODNR-DGS 2021); however, no impacts to the underground mine are anticipated as all work will be confined to previously disturbed and graded areas of the existing compressor station.

Mining activities could constitute a threat to the integrity of the proposed pipelines by way of surface subsidence and soil strains if mitigation measures are not implemented and will affect restoration efforts. Because of the narrow construction footprint of the proposed Project, impacts to the recovery of aggregates and coal will be minimal. Equitrans will work with each mining company crossed by the Project to devise a mining mitigation plan as the need arises.

Abandoned mine lands may or may not have been subject to reclamation efforts, which may make these areas more susceptible to geologic hazards including slippage (if disturbed surface mining material is present), subsidence (if sub-surface mining occurred), and contamination (if a spoil or refuse site has been left). For construction within or adjacent to abandoned or reclaimed mines, Equitrans will implement a Spill Prevention, Control, and Countermeasure (SPCC) Plan which will include measures to prevent contamination and procedures if unanticipated contamination is discovered. The SPCC Plan is included in Resource Report 2. As discussed in Resource Report 11, Equitrans routinely inspects the pipeline right-of-way (ROW) and pipeline integrity, which will provide monitoring in the event subsidence develops under the pipeline. If observations indicating subsidence are found, Equitrans will begin corrective measures to maintain the integrity of the pipeline. These measures include determining the allowable stresses on unsupported pipe spans, importing fill for pipe support, and evaluating whether recurrence is likely. If it is determined recurrence is likely, Equitrans would evaluate the potential of relocating the pipeline.

6.3.2 Oil and Natural Gas Resources

Records from WVGES indicate that there are currently 1,384 active wells within Wetzel County, WV (WVDEP 2021b). Records from the PADEP Oil and Gas Operator Well Inventory Database indicates that there are 3,581 active oil and gas wells in Greene County, PA (PADEP 2021b). Based on a review of the oil and gas databases, 128 oil or gas well records were located within 0.25 mile of the Project, of these, 43 are active, 36 are inactive, and 13 are planned for future use and/or have permits issued. Seven oil or gas wells recorded as active are located within the Project LOD. All active oil and gas wells crossed by the Project are owned by Equitrans. See Table 6.3-1 in Appendix 6-A for additional information regarding oil and gas wells (PADEP 2021a; WVDEP 2021c; ODNR 2021).

6.3.2.1 Impacts and Mitigation of Oil and Natural Gas Resources

Forty-three active oil wells are located within 0.25-mile of the Project LOD. Equitrans will avoid these wells during construction, and no impact is anticipated.

Sixteen oil and gas resources (wells, fields, etc.) are located within the Project LOD, seven of which are recorded as active wells, as previously discussed in Section 6.3.2. All active wells crossed by the Project are owned by EQT Production Company. Equitrans will take the appropriate precautions to protect the integrity of the facilities. Mitigation measures will be implemented to avoid damage to oil and gas wells during construction and would include installation of exclusion fencing. Since blasting is not proposed for the Project, the likelihood of

well damage occurring as a result of the Project is not anticipated. If unexpected damage occurs to oil and gas well facilities during construction or operation of the Project, facilities would be repaired to preconstruction condition in coordination with the well owner.

The mitigation procedures described above would be implemented for wells located within the LOD or adjacent (within 100 feet) to the Project. Because the proposed Project facilities are surficial, the impacts on oil and gas resource recovery also will be minimal. The Project is not expected to affect the ability of active wells to produce oil or gas.

6.4 Geologic Hazards

Geologic hazards are natural physical conditions that, when active, can impact environmental features and man-made structures and may present public safety concerns. General geologic hazards potentially associated with the Project are described in the sections below.

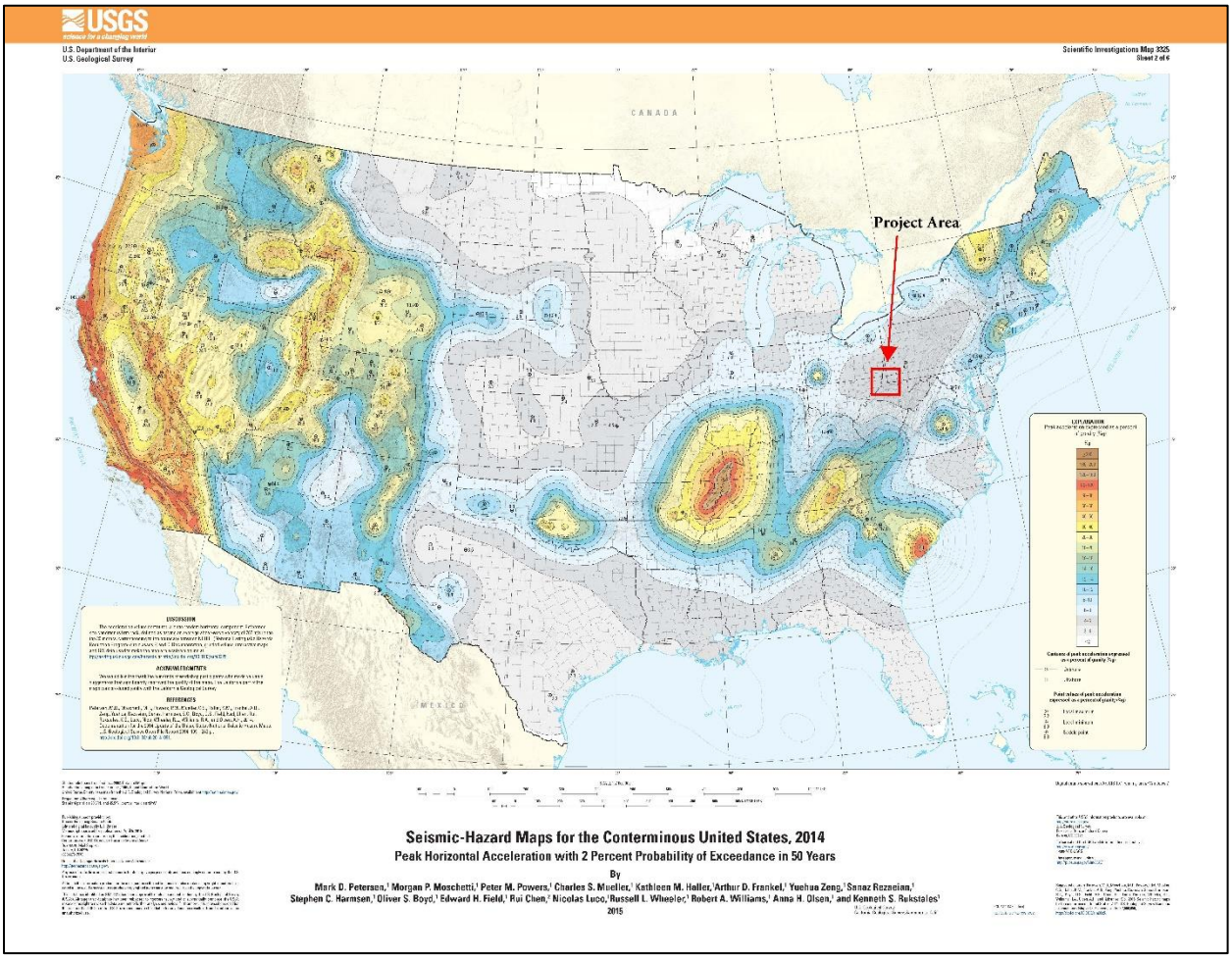
6.4.1 Seismic Environment and Risk

Seismicity refers to the frequency, intensity, and distribution of earthquakes within a given area. Earthquakes generally occur when the two sides of a fault suddenly slip past each other. Tectonic plates are always slowly moving, but sometimes they get stuck at their edges due to friction. When the friction is overcome by the stress on the edges of the tectonic plates, an earthquake occurs that releases energy in waves. These energy waves travel through the earth's crust and creates the shaking that is felt during an earthquake. This shaking creates ground motion, which can damage property and structures if the motion is sufficiently intense. (Scharnberger 2003). In Eastern North America, seismic waves are able to travel further than they are in the West due to the older age of rocks in the East. Rocks in the West are younger and broken up by younger faults. This allows more of the seismic wave energy from an earthquake to be absorbed by the faults, which prevents the energy from spreading as efficiently. Since faults in the Eastern US are less active, the Eastern states experiences earthquakes less frequently than those in the West (USGS 2018).

Within the central and eastern US, the number of earthquakes has dramatically increased over the past decade. The USGS is studying the possibility of induced earthquakes as an indirect result of fracking and wastewater disposal (USGS 2021a). However, since the establishment of the USGS Earthquake Hazards Program and the USGS Advanced National Seismic System, no earthquakes have been reported within approximately 19 miles of the Project. The closest earthquake was a magnitude 2.2 in 2019, approximately 25 miles north of the Project pipelines in PA (USGS 2021d). Based on the low seismic risk and occurrence assigned to the Project region, the risk of damage to Project facilities by earthquakes and seismic hazards is anticipated to be low, and no mitigation is currently proposed.

Figure 6.4-1

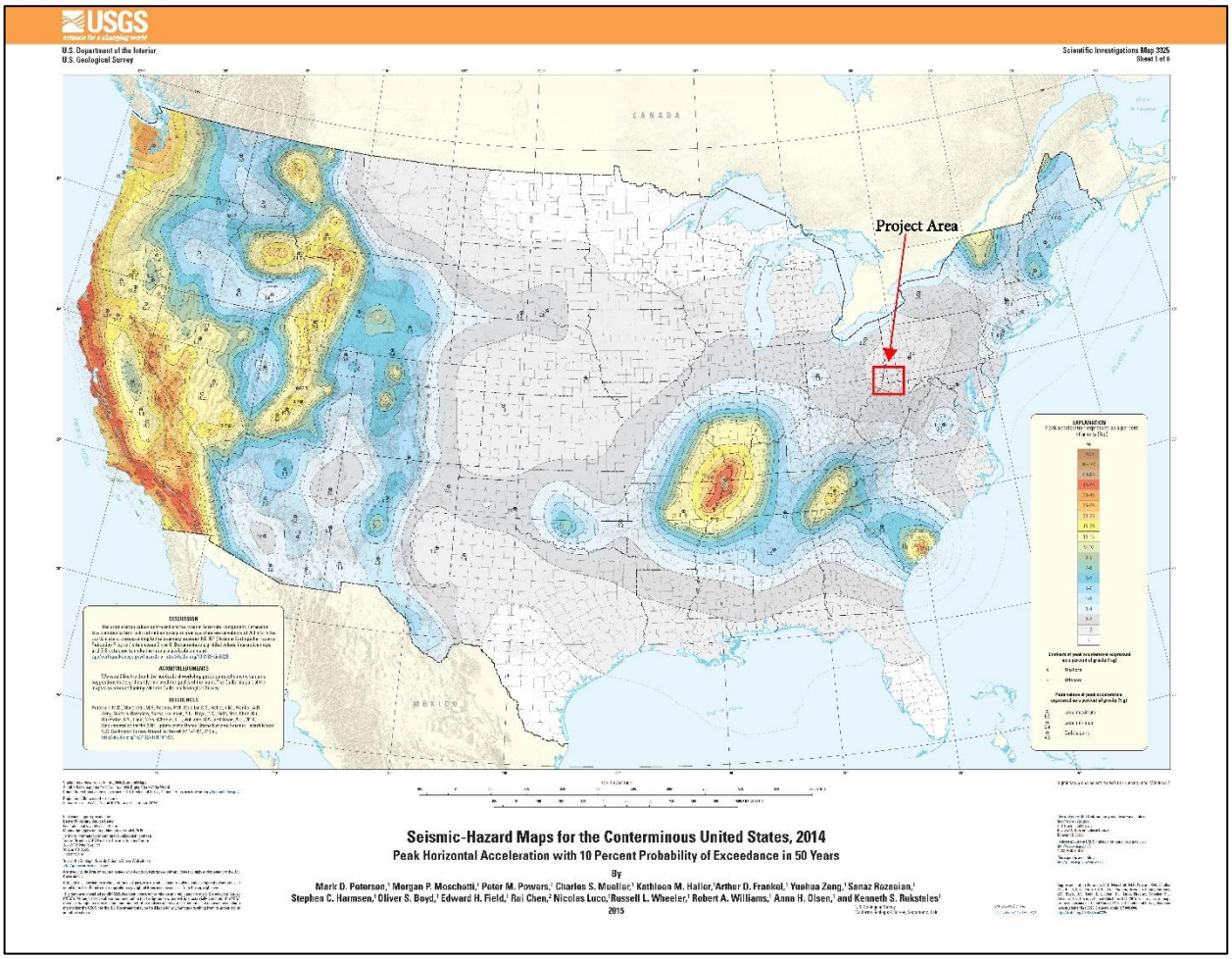
Seismic Hazard: Two-Percent Probability of Exceedance in 50 Years



Source: USGS 2014.

Figure 6.4-2

Seismic Hazard: Ten-Percent Probability of Exceedance in 50 Years



Source: USGS 2014.

6.4.1.1 Active Faults

The USGS Quaternary Faults Interactive Map was searched to identify Quaternary faults that would be crossed or encountered by the Project facilities. There were no active faults identified within the Project area, which corroborates the lack of seismic activity and risk in the Project area (USGS 2021b).

6.4.2 Soil Liquefaction

Soil liquefaction occurs when loose sand and silt that are saturated with water behave like a liquid due to the intense shaking of an earthquake. Many significant earthquake zones also have the landform types that are prone to liquefaction. In order for liquefaction to occur, the land needs to be made up of loose, granular, sediments, like those found in swamps, marshlands, riverbanks, beaches, or floodplains made up of river deposits. The land also must be saturated with water, which occurs in areas such as those with high water tables and large amounts of groundwater, and the earthquake strike must produce very strong shaking (USGS 2016h). The probability of strong tremors from earthquakes is low within the Project area; therefore, soil liquefaction is not a significant concern.

6.4.3 Flash Flooding and Scouring

Flooding occurs in two primary modes: flash floods and river floods. River flooding is common for large rivers in wet climatic conditions, where run off from long rainstorms or wet seasons can induce comparatively slow and consistent water level rise over a large area. Typically found within dry, rocky terrains with little soil or vegetation, flash floods occur when runoff from heavy and sudden rainfall induces a quick increase in the water stage of a stream and the water flows over land instead of infiltrating into the ground (USGS 2021c). Flash flooding is a common occurrence in PA and WV, and it can induce scouring. Scouring is the thorough removal of sediment from an area, typically by fast-moving water. The Project crosses Flood Hazard Zone A, as reported in Resource Report 2, where flooding and scouring may occur (Federal Emergency Management Agency (FEMA) 2021). Scour may also occur in soil series crossed by the Project that are characterized by steep slopes, as discussed in Resource Report 7. Steep slopes are further discussed in Section 6.4.4. During field surveys, no streams crossed by the Project exhibited scouring, and therefore, streams were contained within their defined channels.

6.4.3.1 Impacts and Mitigation of Flooding and Scouring

Along the pipeline route, flash flooding may occur in areas where the proposed route crosses a floodplain, and scour may occur where the pipeline is positioned on steep slopes or soils susceptible to water erosion, which is discussed further in Resource Report 7. The pipeline crossings of waterbodies will be designed to comply with the Federal Energy Regulatory Commission's (FERC's) *Upland Erosion Control, Revegetation, and Maintenance Plan* (Plan), and *Wetland and Waterbody Construction and Mitigation Procedures* (Procedures). Equitrans will employ Best Management Practices (BMPs) at waterbody crossings to maintain riparian vegetation as prescribed by the state permitting agencies. These BMPs will also help protect against streambank instabilities during construction and restoration of the Project and mitigate against damage due to high velocity flows or potential erosion resulting from seasonal and flash flooding.

Measures will be implemented to provide the necessary equipment to handle waterbody flow increases during pipeline installation activities such as having additional pumps on stand-by for dam-and-pump crossings or appropriately sizing flumes to handle storm flows for flume crossings. After construction is completed, each crossing will be inspected periodically and after significant rainfall events (e.g., tropical storm) for signs of erosion and will be remediated as necessary, in accordance with the FERC's Procedures and conditions of permits from PADEP and WVDEP.

6.4.4 Landslides

Landslides occur when rock, sediments, soils, and debris move down slopes. Such gravity-induced flow usually is precipitated by heavy rains, erosion by rivers, earthquakes, or human activities (e.g., man-made structures or piles of rock or ore). Areas of unstable soils that may be susceptible to landslides may be characterized by soils which shrink or swell with changes in moisture content and are located in areas with steep relief. Landslide incidence and susceptibility mapping for southwestern PA by the USGS and the Pennsylvania Department of Conservation and Natural Resources (PADCNR) were reviewed for the Project area. The Dunkard Group (Greene, Washington, and Waynesburg Formations), which underlies the Project, is particularly susceptible to landslide events (USGS 1984). A review of previously active documented landslides in southwestern PA from PSU's Geospatial Database and the USGS Landslide Hazard Program's U.S. Landslide Inventory indicated that no historic landslides have occurred directly along the proposed pipeline ROW in PA and WV (PASDA 2017; USGS 2021g). Equitrans is developing a Landslide Mitigation Plan and anticipates providing to FERC in March 2022. As seen in Figure 6.4-3, a landslide hazard map for the region, there is a high landslide incidence in the Project area (PADCNR 2001).

Areas of slopes greater than 32% present a higher risk for landslides resulting from earth disturbance activities. A summary of slopes crossed by the pipeline are summarized in Table 6.4-1. Areas of steep slopes (greater than 32%) by MP are included in Table 6.4-2 (Appendix 6-A). Equitrans has expanded and solidified their landslide mitigation measures to include all slopes greater than 16 degrees and active slide areas and sidehill locations to protect the integrity of the pipeline and ROW.

Table 6.4-1

Summary of Slopes Crossed by the Proposed Pipeline Route[1, 2]

Slope Range/County, State	Pipeline Length (miles)	Pipeline Length (percent)
H-327 and H-328 Pipelines, Greene County, PA[3]		
0-15%	0.15	32.1
15-32%	0.24	52.7
>32%[4]	0.07	15.2
H-327 and H-328 Pipelines Subtotal	***0.46***	***100.0***
H-326 Pipeline, Wetzel County, WV[4]		
0-15%	0.89	25.5
15-32%	1.28	36.4
>32%[4]	1.34	38.1
H-326 Pipeline Subtotal	***3.51***	***100.0***
H-329 Pipeline, Wetzel County, WV		
0-15%	0.01	24.6
15-32%	0.01	31.0
>32%[4]	0.01	44.4
H-329 Pipeline Subtotal	***0.02***	***100.0***
H-330 Pipeline, Wetzel County, WV[4]		
0-15%	0.27	39.2
15-32%	0.12	17.8
>32%[4]	0.30	43.05
H-330 Pipeline Subtotal	***0.69***	***100.0***
H-330 Spur, Wetzel County, WV		
0-15%	***0.09***	***97.9***
15-32%	***<0.01***	***1.4***
>32%[4]	***<0.01***	***0.7***
H-330 Spur Subtotal	***0.09***	***100.00***
Project Total	**4.70**	**100.0**

Notes:

1 Slope analysis based on DEM and Lidar data collected between 2006 and 2020. Slope breakdowns are as follows: 0% to less than 15%; greater than or equal to 15% to less than 32%; greater than or equal to 32%. Numbers may not sum exactly due to rounding.

2 As detailed in Resource Report 1, Logansport Spur consists of modifications within the existing aboveground facility area (Logansport Station) to install approximately 160 feet of 12-inch-diamter pipeline and therefore is not included in this table.

3 H-327 and H-328 are parallel pipelines located within shared permanent pipeline ROW.

4 Portions of H-326 and H-330 that share ROW are accounted for under H-330.

Figure 6.4-3

Regional Landslide Hazards

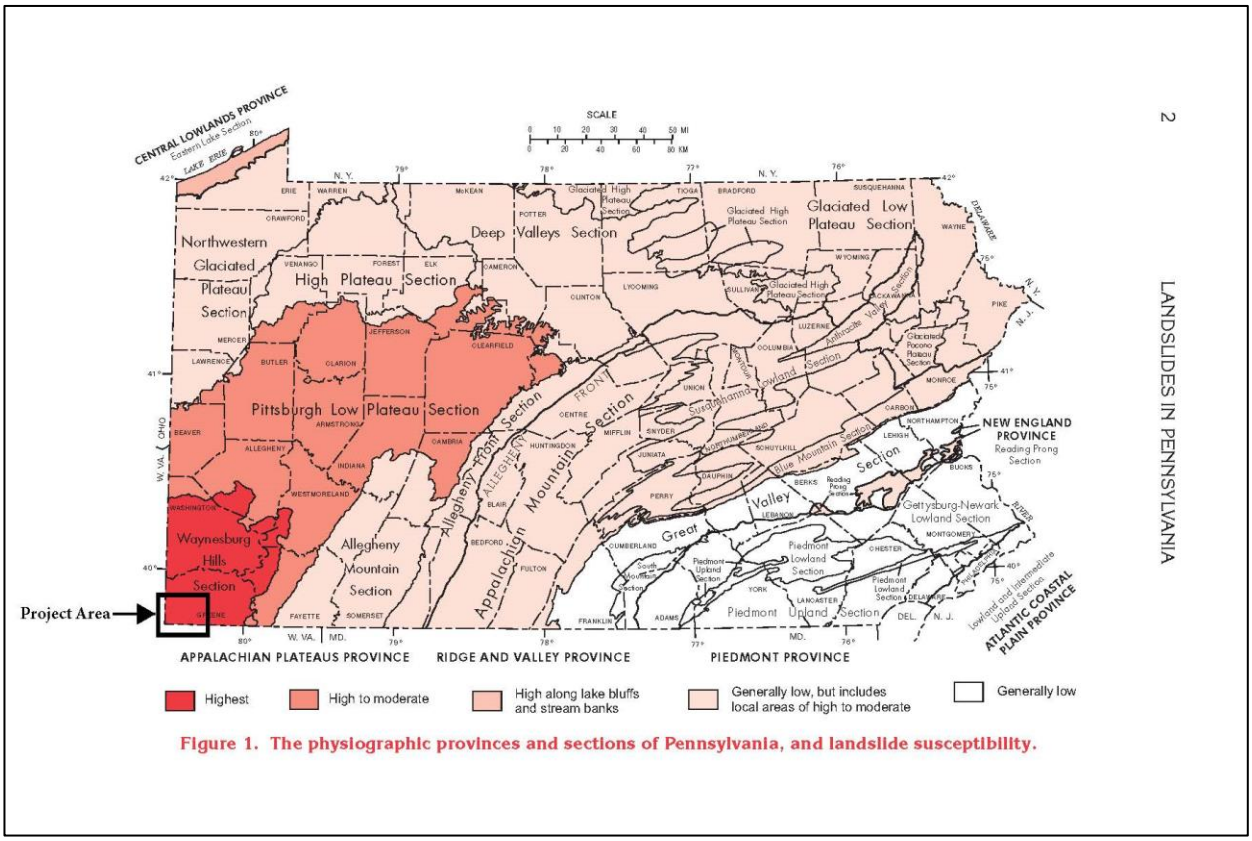


Figure 1. The physiographic provinces and sections of Pennsylvania, and landslide susceptibility.

Source: PADCNR 2001.

6.4.4.1 Impacts and Mitigation of Landslides

As shown in Table 6.4-1, the proposed pipeline crosses areas of steep slopes. These areas may be more prone to slippage. Equitrans has designed the pipeline route to avoid side slope and steep slope construction, where possible, to minimize risk of landslides. Where this was not possible, measures will be implemented to minimize the potential risks from landslides and soil erosion. These measures may include: installing temporary erosion control measures at closer intervals; benching the construction ROW to allow for a level surface for operation of construction equipment and return to previous contours to the extent practicable during ROW restoration; using additional temporary workspace downslope to accommodate the storage of excavated material during construction; completing more frequent maintenance of erosion control measures until post-construction erosion controls can be established; and diverting surface and groundwater from the construction ROW. To limit the potential for landslides, Equitrans will avoid undercutting susceptible slopes to the extent practicable.

Additional mitigation measures may be implemented during construction or restoration to reduce the potential for saturated soils. These may include horizontal drains, trench plug drains, stair-stepped grading, and the use of aggregate, cement, or free-draining rock to stabilize subsoil, where appropriate. Trench breakers, which may be used to slow the flow of subsurface water along the trench, and permanent slope breakers, intended to reduce runoff velocity and divert water off the construction ROW, may be used to prevent erosion. In areas of severely compacted soils, paraplows or other deep tillage implantation will be used to plow and till the ground in order to reduce soil compaction, allowing infiltration and reducing sheet flow. The ROW will be graded

during final restoration to restore pre-construction contours, to the extent practicable, leaving the soil in the proper condition for planting. Equitrans may also utilize hydroseeding and scarify the seedbed to facilitate lodging and germination of seed, as outlined by the FERC Plan and Procedures, to prevent and/or mitigate landslides. Permanent vegetation seeding will be performed within the recommended seeding dates, or appropriate temporary erosion control measures, discussed in the FERC Plan Section IV.F, will be used until the next recommended seeding season. Soils and erosion are further discussed in Resource Report 7.

As discussed in Resource Report 1, temporary workspace associated with the Cygrymus Compressor Station modification will be utilized to install additional post-construction stormwater management controls to accommodate the expansion area. Much of this temporary workspace had been previously approved by the PADEP for construction of the original station with a small increase proposed to accommodate the compressor area expansion. As part of an existing recent project at the Cygrymus Compressor Station, Equitrans is coordinating with the PADEP to address existing slips at the site as soon as possible. Equitrans is developing a Landslide Mitigation Plan and anticipates providing to FERC in March 2022. Prior to commencement of construction, Project personnel will be trained for the identification and management of potential landslides. The training will provide the appropriate protocol for work stoppage if a landslide occurs, and a communication plan to alert appropriate company personnel and agencies.

During operations, periodic inspection of the ROW will be completed for the life of the pipeline. Restoring the construction ROW to original contours to the extent practicable, reestablishing vegetation and existing drainage patterns (as prescribed by the Erosion and Sediment Control Plans), as well as implementing FERC's Plan and Procedures will minimize the potential for human-induced landslides and erosion in the Project area.

6.4.5 Karst

Water readily reacts with carbon dioxide to form carbonic acid, which is only mildly acidic, but over time is strong enough to dissolve susceptible calcareous minerals and formations like limestone, dolomite, or gypsum. This dissolution forms karst topography, which may manifest on the surface or in the subsurface and include sinkholes, swallets, caves, enlarged joints, and underground drainage networks. In PA and WV, sinkholes are the primary karst feature observed. Active sinkhole formations and karst topography are not found in the Project area in PA and WV (PA Geological Survey (PAGS) 2015; PADCNR 2021b; WVGES 2016b; WVGES 1968). The ODNR-DGS indicates that, because of the sandstone bedrock of the Project area, the presence of karst topography in OH is not probable (ODNR-DGS 1999). Due to the lack of known karst formations intersecting the Project, karst mitigation is not proposed. However, while no known karst formations exist within the Project area, about one-third or less of the Project area is underlain by geological formations that are susceptible to forming karst formations. Per Equitrans' previous project experience in the vicinity of the proposed Project, no karst features have been identified to-date. The Environmental Inspector will monitor construction for karst features.

As discussed in Resource Report 11, Equitrans routinely inspects the pipeline ROW and pipeline integrity during operation, which will provide monitoring in the event karst features or subsidence develops under the pipeline. If observations indicating subsidence are found, Equitrans will begin corrective measures to maintain the integrity of the pipeline. These measures include determining the allowable stresses on unsupported pipe spans, importing fill for pipe support, and evaluating whether recurrence is likely. If it is determined recurrence is likely, Equitrans would evaluate the potential of relocating the pipeline. A discussion regarding spill mitigation near karst is included in the SPCC Plan in Resource Report 2, Appendix 2-B.

6.4.6 Acid-Producing Rocks and Soils

The Project is located in an area where coal and carbonaceous shales may contain iron sulfide minerals, primarily pyrite. Pyrite and similar minerals consist of iron and sulfur, and when exposed to the atmosphere, can weather and produce iron oxides and sulfuric acid (PADCNR 2005). The sulfuric acid can dissolve other elements in the rocks such as aluminum and manganese, which

can then impact nearby waterbodies, wetlands, and groundwater. In addition, areas where strip mining occurred could have strip mine backfill at the surface, which could include acid producing rock.

6.4.6.1 Impacts and Mitigation of Acid-Producing Rocks and Soils

Surface mining areas are not anticipated to be crossed by the Project. Therefore, due to the shallow excavation anticipated for this Project, the majority of the Project should not encounter acid-producing rock. However, in areas where potential surface mining may have occurred, acid-producing rock could be encountered. Exposure of acid-producing rocks or soils during construction excavations could result in the oxidation of iron sulfide minerals in the subsoil or bedrock and production of sulfuric acid. This could increase the acidity of affected waterbodies, wetlands. In addition, introduction of acid-producing rocks or subsoils to topsoil could affect plant growth and revegetation.

According to the PADEP's Fact Sheet for *How to Avoid and Handle Acid-Producing Rock Formations Encountered During Well Site Development*, typically the upper 25 to 35 feet of bedrock does not contain pyrite, which is typically the primary iron sulfide mineral (PADEP 2018). Excavations associated with the pipeline trench are generally less than 10 feet from the surface, and therefore the risk of exposing acid-producing rock will be minimized.

If coal or acid-producing rock is encountered during construction, Equitrans will identify the approximate percent sulfur and develop remedial strategies, which may include:

- segregating the top 12 inches of topsoil or the total depth of soil to the top on an acid producing layer in the trench, whichever is reached first;
- segregating the acid-producing rock or soil from the trench separately from other soil stockpiles;
- placing a cover of sand or other clean material over the pipeline to minimize the potential for corrosion;
- mixing acid-producing rock or subsoil averaging more than 0.5 percent sulfur with a sufficient amount of neutralizing materials such as limestone, quick lime, or hydrated lime prior to replacement within the trench; and
- utilizing clay to create a layer of low permeability above the acid producing rock to reduce contact and oxygen.

Equitrans will adhere to the Project-specific erosion and sediment control plans and FERC's Plan. Equitrans will attempt to minimize the length of time that acid-producing rock or soils, if encountered, are stockpiled to reduce the likelihood of iron sulfide mineral oxidation and production of sulfuric acid.

6.5 Paleontology

Project components in OH are located within previously graded and disturbed compressor station areas and therefore, no paleontological resources are anticipated. Prominent paleontological resources in PA are generally restricted to the southeastern section of PA (PADCNR 1999). Based on regional geology, Equitrans does not anticipate the proposed Project will adversely impact paleontological resources in WV or the Project area in general. Equitrans' Environmental Inspector(s) will note paleontological material (i.e., fossilized vertebrate remains such as bones, teeth, etc.) should it be encountered during construction activities. If significant specimens are discovered during construction, Equitrans will notify the appropriate agencies.

6.6 Liquified Natural Gas Facilities in Seismic Risk Areas

No Liquefied Natural Gas facilities are proposed as part of this Project.

6.7 Geotechnical Investigations

Geotechnical investigations had previously been completed during the original construction at the existing Cygrymus, Corona, and Plasma compressor stations. Geotechnical investigations were not performed as part of the engineering design to expand the existing compressor stations. The Project does not include trenchless waterbody crossings, such as horizontal directional drill.

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Appendix 6-A
Tables

Table 6.1-1

Bedrock Geology in the Project Area

Facility, County, State / Approximate MP, CY	Map Unit	Geology	Lithology
Pipeline Facilities			
H-327 and H-328 Pipelines, Greene County, PA[1]			
0-0.46	Pg	Greene Formation	Sandstone, shale, limestone, coal
H-326 Pipeline, Wetzel County, WV[2]			
0-3.51	Pd	Dunkard Group	Sandstone, siltstone, shale, limestone, coal
H-329 Pipeline, Wetzel County, WV			
0.00-0.02	Pd	Dunkard Group	Sandstone, siltstone, shale, limestone, coal
H-330 Pipeline, Wetzel County, WV[2]			
0.00-0.69	Pd	Dunkard Group	Sandstone, siltstone, shale, limestone, coal
H-330 Spur, Wetzel County, WV			
0.00-0.09	Pd	Dunkard Group	Sandstone, siltstone, shale, limestone, coal
Logansport Spur, Wetzel County, WV[3]			
Logansport Spur Facility Area (0-0.03)	Pd	Dunkard Group	Sandstone, siltstone, shale, minor limestone, coal
Aboveground Facilities			
PA Aboveground Facilities			
Shough Creek Valve Yard	Pg	Greene Formation	Sandstone, shale, limestone, coal
Cygrymus Compressor Station	Pg	Greene Formation	Sandstone, shale, limestone, coal
WV Aboveground Facilities			
Corona Compressor Station	Pd	Dunkard Group	Sandstone, siltstone, shale, limestone, coal
Pickenpaw Interconnect	Pd	Dunkard Group	Sandstone, siltstone, shale, limestone, coal
Ohio Valley Connector (OVC) Interconnect	Pd	Dunkard Group	Sandstone, siltstone, shale, limestone, coal
Mobley Run Tap Site	Pd	Dunkard Group	Sandstone, siltstone, shale, limestone, coal
Liberty Valve Yard	Pd	Dunkard Group	Sandstone, siltstone, shale, limestone, coal
OH Aboveground Facilities			
Plasma Compressor Station	PIPd	Dunkard Group (Permian-Pennsylvanian)	Sandstone, siltstone, shale, limestone, coal

Table 6.1-1 (continued)

Facility, County, State / Approximate MP, CY	Map Unit	Geology	Lithology
Contractor Yards			
PA Contractor Yards			
CY-PA18-South	Pg	Greene Formation	Sandstone, shale, limestone, coal
CY-PA18-North	Pw	Washington Formation	Sandstone, shale, limestone, coal
CY-PA221-East	Pw	Washington Formation	Sandstone, shale, limestone, coal
CY-PA221-West	Pw	Washington Formation	Sandstone, shale, limestone, coal
WV Contactor Yards			
CY-WV19	Pd	Dunkard Group	Sandstone, siltstone, shale, limestone, coal
CY-WV20	Pd	Dunkard Group	Sandstone, siltstone, shale, limestone, coal

Sources: (ODNR-DGS 2006 and USGS Geologic Units 2005)

Notes:

1 H-327 and H-328 are parallel pipelines located within shared permanent pipeline ROW.

2 Portions of H-326 and H-330 that share ROW are accounted for under H-330.

3 Logansport Spur consists of 0.03-mile of pipeline located withing existing fenced facility area.

Table 6.3-1

Mineral Resources within 0.25-Mile of the Project[1, 2]

Facility, County, State	Nearest MP	Mineral Resource	Distance and Direction from Construction ROW (feet)		Description	Status	Comment
H-327 and H-328 Pipelines, Greene County, PA[3]							
Access Road, PAR-327/328-01	0.00	Underground Permit Boundary of Active Bituminous Coal Mine	0	N/A	Monongalia County Mine - Longwall	Active	Monongalia County Coal Company
Access Road, PAR-327/328-02	0.46	Underground Permit Boundary of Active Bituminous Coal Mine	0	N/A	Monongalia County Mine - Longwall	Active	Monongalia County Coal Company
Cygrymus Compressor Station	0.00	Underground Permit Boundary of Active Bituminous Coal Mine	0	N/A	Monongalia County Mine - Longwall	Active	Monongalia County Coal Company
Pipeline ROW	0.00 - 0.46	Underground Permit Boundary of Active Bituminous Coal Mine	0	N/A	Monongalia County Mine - Longwall	Active	Monongalia County Coal Company
SA-327/328-01	0.46	Underground Permit Boundary of Active Bituminous Coal Mine	0	N/A	Monongalia County Mine - Longwall	Active	Monongalia County Coal Company
Shough Creek Valve Yard	0.44	Underground Permit Boundary of Active Bituminous Coal Mine	0	N/A	Monongalia County Mine - Longwall	Active	Monongalia County Coal Company
H-326 Pipeline, Wetzel County, WV							
Access Road, PAR-326-01	0.0	Horizontal Lateral	519	NE	Gas Production, New Drill	Active Well	EQT Production Company
Access Road, PAR-326-01	0.00	Horizontal Lateral	809	NW	Gas Production, New Drill	Active Well	EQT Production Company
Access Road, PAR-326-01	0.00	Oil and Gas Well	1,022	SE	-	-	-
Access Road, PAR-326-01	0.00	Horizontal Lateral	1,138	NE	Gas Production, New Drill	Active Well	EQT Production Company
Access Road, PAR-326-01	0.00	Oil and Gas Well	1,297	SE	-	-	-
Access Road, PAR-326-01	0.01	Oil and Gas Well	1,273	NW	-	-	-
Access Road, TAR-326-01	0.00	Oil and Gas Well	1,246	SE	-	-	-
Access Road, TAR-326-01	0.00	Horizontal Lateral	1,265	NE	Gas Production, New Drill	Active Well	EQT Production Company
Access Road, TAR-326-01	0.01	Oil and Gas Well	1,151	NW	-	-	-
Access Road, TAR-326-03	1.03	Horizontal Lateral	980	SW	Gas Production, Horizontal 6A Well	Active Well	EQT Production Company
Access Road, TAR-326-03	1.11	WVDEP Well	1,036	SW	Unknown, Vertical	Never Drilled	CNG Producing Company
Access Road, TAR-326-03	1.13	WVDEP Well	553	SW	Unknown, Vertical	Active Well	Diversified Production LLC
Access Road, TAR-326-03	1.20	Oil and Gas Well	226	SW	-	-	-
Access Road, TAR-326-03	1.88	Horizontal Lateral	927	NW	Gas Production, Horizontal 6A Well	Active Well	EQT Production Company
Access Road, TAR-326-04	1.03	Horizontal Lateral	190	SW	Gas Production, Horizontal 6A Well	Active Well	EQT Production Company
Access Road, TAR-326-04	1.11	WVDEP Well	156	SW	Unknown, Vertical	Never Drilled	CNG Producing Company
Access Road, TAR-326-04	1.13	WVDEP Well	425	SE	Unknown, Vertical	Active Well	Diversified Production LLC
Access Road, TAR-326-04	1.20	Oil and Gas Well	888	SE	-	-	-
Access Road, TAR-326-04	1.53	WVDEP Well	710	NE	Unknown, Vertical	Abandoned Well	EQT Production Company
Access Road, TAR-326-04	1.53	WVDEP Well	710	NE	Unknown, Vertical	Abandoned Well	EQT Production Company
Access Road, TAR-326-04	1.53	WVDEP Well	710	NE	Unknown, Vertical	Abandoned Well	-
Access Road, TAR-326-04	1.88	Horizontal Lateral	0	N/A	Gas Production, Horizontal 6A Well	Active Well	-
Access Road, TAR-326-05	1.03	Horizontal Lateral	50	SE	Gas Production, Horizontal 6A Well	Active Well	-
Access Road, TAR-326-05	1.88	Horizontal Lateral	50	SE	Gas Production, Horizontal 6A Well	Active Well	-
Access Road, TAR-326-05	1.91	WVDEP Well	430	NE	Unknown, Vertical	Never Drilled	-
Access Road, TAR-326-05	2.18	WVDEP Well	163	SE	Gas Production, Coal Bed Methane Well	Plugged	-
Access Road, TAR-326-05	2.18	WVDEP Well	163	SE	Gas Production, Coal Bed Methane Well	Plugged	-
Access Road, TAR-326-05	2.49	WVDEP Well	50	SE	Gas Production, Horizontal 6A	Active Well	-
Access Road, TAR-326-05	2.19	WVDEP Well	50	SE	Gas Production, Horizontal 6A	Active Well	-

Table 6.3-1 (continued)

Facility, County, State	Nearest MP	Mineral Resource	Distance and Direction from Construction ROW (feet)		Description	Status	Comment
Access Road, TAR-326-05	2.20	WVDEP Well	0	N/A	Unknown, Horizontal	Active Well	-
Access Road, TAR-326-05	2.20	WVDEP Well	0	N/A	Unknown, Horizontal	Active Well	-
Access Road, TAR-326-04	1.53	WVDEP Well	710	NE	Unknown, Vertical	Abandoned Well	-
Access Road, TAR-326-04	1.88	Horizontal Lateral	0	N/A	Gas Production, Horizontal 6A Well	Active Well	-
Access Road, TAR-326-05	1.03	Horizontal Lateral	50	SE	Gas Production, Horizontal 6A Well	Active Well	-
Access Road, TAR-326-05	1.88	Horizontal Lateral	50	SE	Gas Production, Horizontal 6A Well	Active Well	-
Access Road, TAR-326-05	1.91	WVDEP Well	430	NE	Unknown, Vertical	Never Drilled	-
Access Road, TAR-326-05	2.18	WVDEP Well	163	SE	Gas Production, Coal Bed Methane Well	Plugged	-
Access Road, TAR-326-05	2.18	WVDEP Well	163	SE	Gas Production, Coal Bed Methane Well	Plugged	-
Access Road, TAR-326-05	2.19	WVDEP Well	50	SE	Gas Production, Horizontal 6A	Active Well	-
Access Road, TAR-326-05	2.19	WVDEP Well	50	SE	Gas Production, Horizontal 6A	Active Well	-
Access Road, TAR-326-05	2.20	WVDEP Well	0	N/A	Unknown, Horizontal	Active Well	-
Access Road, TAR-326-05	2.20	WVDEP Well	0	N/A	Unknown, Horizontal	Active Well	-
Access Road, TAR-326-05	2.20	WVDEP Well	0	N/A	Unknown, Horizontal	Active Well	EQT Production Company
Access Road, TAR-326-05	2.20	WVDEP Well	0	N/A	Unknown, Horizontal	Active Well	EQT Production Company
Access Road, TAR-326-05	2.20	WVDEP Well	1	SE	Unknown, Horizontal	Active Well	EQT Production Company
Access Road, TAR-326-05	2.20	WVDEP Well	4	SE	Unknown, Horizontal	Active Well	EQT Production Company
Access Road, TAR-326-05	2.20	WVDEP Well	5	SE	Unknown, Horizontal	Active Well	EQT Production Company
Access Road, TAR-326-05	2.20	WVDEP Well	382	SW	Unknown, Horizontal	Never Issued	EQT Production Company
Access Road, TAR-326-05	2.20	WVDEP Well	396	SW	Unknown, Horizontal	Never Issued	EQT Production Company
Access Road, TAR-326-05	2.20	WVDEP Well	382	SW	Unknown, Horizontal	Never Issued	EQT Production Company
Access Road, TAR-326-05	2.20	WVDEP Well	396	SW	Unknown, Horizontal	Never Issued	EQT Production Company
Access Road, TAR-326-05	2.20	WVDEP Well	404	SW	Unknown, Horizontal	Never Issued	EQT Production Company
Access Road, TAR-326-05	2.20	WVDEP Well	418	SW	Unknown, Horizontal	Never Issued	EQT Production Company
Access Road, TAR-326-05	2.20	WVDEP Well	440	SW	Unknown, Horizontal	Never Issued	EQT Production Company
Access Road, TAR-326-05	2.20	WVDEP Well	454	SW	Unknown, Horizontal	Never Issued	EQT Production Company
Access Road, TAR-326-05	2.37	WVDEP Well	952	NW	Gas Production, Vertical	Active Well	Diversified Production LLC
Access Road, TAR-326-06	1.03	Horizontal Lateral	251	SE	Gas Production, Horizontal 6A Well	Active Well	EQT Production Company
Access Road, TAR-326-06	1.88	Horizontal Lateral	245	SE	Gas Production, Horizontal 6A Well	Active Well	EQT Production Company
Access Road, TAR-326-06	1.91	WVDEP Well	624	SE	Unknown, Vertical	Never Drilled	CNG Producing Company
Access Road, TAR-326-06	2.18	WVDEP Well	404	SE	Gas Production, Coal Bed Methane Well	Plugged	CNX Gas Company LLC
Access Road, TAR-326-06	2.18	WVDEP Well	404	SE	Gas Production, Coal Bed Methane Well	Plugged	CNX Gas Company LLC
Access Road, TAR-326-06	2.19	WVDEP Well	245	SE	Gas Production, Horizontal 6A	Active Well	EQT Production Company
Access Road, TAR-326-06	2.19	WVDEP Well	251	SE	Gas Production, Horizontal 6A	Active Well	EQT Production Company
Access Road, TAR-326-06	2.20	WVDEP Well	141	SE	Unknown, Horizontal	Active Well	EQT Production Company
Access Road, TAR-326-06	2.20	WVDEP Well	148	SE	Unknown, Horizontal	Active Well	EQT Production Company
Access Road, TAR-326-06	2.20	WVDEP Well	156	SE	Unknown, Horizontal	Active Well	EQT Production Company
Access Road, TAR-326-06	2.20	WVDEP Well	157	SE	Unknown, Horizontal	Active Well	EQT Production Company
Access Road, TAR-326-06	2.20	WVDEP Well	158	SE	Unknown, Horizontal	Active Well	EQT Production Company
Access Road, TAR-326-06	2.20	WVDEP Well	159	SE	Unknown, Horizontal	Active Well	EQT Production Company
Access Road, TAR-326-06	2.20	WVDEP Well	159	SE	Unknown, Horizontal	Active Well	EQT Production Company
Access Road, TAR-326-06	2.20	WVDEP Well	307	SW	Unknown, Horizontal	Never Issued	EQT Production Company
Access Road, TAR-326-06	2.20	WVDEP Well	321	SW	Unknown, Horizontal	Never Issued	EQT Production Company
Access Road, TAR-326-06	2.20	WVDEP Well	327	SW	Unknown, Horizontal	Never Issued	EQT Production Company

Table 6.3-1 (continued)

Facility, County, State	Nearest MP	Mineral Resource	Distance and Direction from Construction ROW (feet)		Description	Status	Comment
Access Road, TAR-326-06	2.20	WVDEP Well	341	SW	Unknown, Horizontal	Never Issued	EQT Production Company
Access Road, TAR-326-06	2.20	WVDEP Well	360	SW	Unknown, Horizontal	Never Issued	EQT Production Company
Access Road, TAR-326-06	2.20	WVDEP Well	374	SW	Unknown, Horizontal	Never Issued	EQT Production Company
Access Road, TAR-326-06	2.37	WVDEP Well	472	NW	Gas Production, Vertical	Active Well	Diversified Production LLC
Access Road, TAR-326-07	2.15	WVDEP Well	405	SE	Unknown, Horizontal	Active Well	EQT Production Company
Access Road, TAR-326-07	2.15	WVDEP Well	419	SE	Unknown, Horizontal	Active Well	EQT Production Company
Access Road, TAR-326-07	2.15	WVDEP Well	455	SE	Unknown, Vertical	Never Drilled	CNG Producing Company
Access Road, TAR-326-07	2.15	Horizontal Lateral	464	SE	Gas Production, Horizontal 6A Well	Active Well	EQT Production Company
Access Road, TAR-326-07	2.15	WVDEP Well	464	SE	Gas Production, Horizontal 6A	Active Well	EQT Production Company
Access Road, TAR-326-07	2.15	Horizontal Lateral	477	SE	Gas Production, Horizontal 6A Well	Active Well	EQT Production Company
Access Road, TAR-326-07	2.15	WVDEP Well	477	SE	Gas Production, Horizontal 6A	Active Well	EQT Production Company
Access Road, TAR-326-07	2.20	WVDEP Well	1,234	NE	Unknown, Horizontal	Never Issued	EQT Production Company
Access Road, TAR-326-07	2.20	WVDEP Well	1,245	NE	Unknown, Horizontal	Never Issued	EQT Production Company
Access Road, TAR-326-07	2.20	WVDEP Well	1,267	NE	Unknown, Horizontal	Never Issued	EQT Production Company
Access Road, TAR-326-07	2.20	WVDEP Well	1,278	NE	Unknown, Horizontal	Never Issued	EQT Production Company
Access Road, TAR-326-07	2.20	WVDEP Well	1,288	NE	Unknown, Horizontal	Never Issued	EQT Production Company
Access Road, TAR-326-07	2.20	WVDEP Well	1,300	NE	Unknown, Horizontal	Never Issued	EQT Production Company
Access Road, TAR-326-07	2.37	WVDEP Well	1,091	SE	Gas Production, Vertical	Active Well	Diversified Production LLC
Access Road, TAR-326-07	2.56	Oil and Gas Well	184	SW	-	-	-
Access Road, TAR-326-07	2.56	Oil and Gas Well	586	SW	-	-	-
Access Road, TAR-326-07	2.56	WVDEP Well	1,097	SW	Unknown, Vertical	Plugged	Hope Gas, INC.
Access Road, TAR-326-07	2.56	WVDEP Well	1,097	SW	Unknown, Vertical	Plugged	Hope Gas, INC.
Access Road, TAR-326-07	2.65	DMR Permit Location	731	NE	WETZEL CO. DRILLING	Completely Released	Consolidation Coal Company, Permit ID: P201601
Access Road, TAR-326-07	2.68	Oil and Gas Well not in WVDEP	115	NW	-	-	-
Access Road, TAR-326-07	2.69	Oil and Gas Well	326	NW	-	-	-
Access Road, TAR-326-07	3.28	WVDEP Well	664	SW	House Gas, Vertical	Active Well	Ross and Wharton Gas Company, Inc.
Access Road, TAR-326-07	3.28	Oil and Gas Well	1,214	NW	-	-	-
Access Road, TAR-326-08	2.75	Horizontal Lateral	0	N/A	Unknown, New Drill	Permit Issued	EQT Production Company
Access Road, TAR-326-08	2.75	Horizontal Lateral	260	NE	Unknown, New Drill	Permit Issued	EQT Production Company
Access Road, TAR-326-08	2.75	Oil and Gas Well	887	NE	-	-	-
Access Road, TAR-326-08	2.75	WVDEP Well	968	SE	Unknown, Vertical	Plugged	EQT Production Company
Access Road, TAR-326-08	2.75	WVDEP Well	968	SE	Unknown, Vertical	Plugged	EQT Production Company
Access Road, TAR-326-08	2.75	Horizontal Lateral	1,259	NE	Unknown, New Drill	Permit Issued	EQT Production Company
Access Road, TAR-326-08	2.75	WVDEP Well	1,261	SE	Gas Production, Vertical	Active Well	Diversified Production LLC
Access Road, TAR-326-08	2.99	Oil and Gas Well	162	SE	-	-	-
Access Road, TAR-326-08	3.28	WVDEP Well	1,279	SW	Gas Production, Vertical	Abandoned Well	Diversified Production LLC
Corona Compressor Station	0.00	Horizontal Lateral	601	NW	Gas Production, New Drill	Active Well	EQT Production Company
Corona Compressor Station	0.00	Horizontal Lateral	768	NE	Gas Production, New Drill	Active Well	EQT Production Company
Corona Compressor Station	0.00	Oil and Gas Well	929	SE	-	-	-
Corona Compressor Station	0.00	Oil and Gas Well	1,243	SE	-	-	-
Corona Compressor Station	0.01	Oil and Gas Well	1,025	NW	-	-	-

Table 6.3-1 (continued)

Facility, County, State	Nearest MP	Mineral Resource	Distance and Direction from Construction ROW (feet)		Description	Status	Comment
Pipeline ROW	0.00	Oil and Gas Well	1,034	SE	-	-	-
Pipeline ROW	0.00	Horizontal Lateral	1,070	NW	Gas Production, New Drill	Active Well	EQT Production Company
Pipeline ROW	0.00	Horizontal Lateral	1,182	NE	Gas Production, New Drill	Active Well	EQT Production Company
Pipeline ROW	0.01	Oil and Gas Well	1,158	NW	-	-	-
Pipeline ROW	0.13	WVDEP Well	1,305	SE	Unknown, Vertical	Abandoned Well	Diversified Production LLC
Pipeline ROW	0.63	WVDEP Well	194	SE	Unknown, Vertical	Abandoned Well	Diversified Production LLC
Pipeline ROW	1.03 and 1.92	Horizontal Lateral	-	-	Gas Production, Horizontal 6A Well	Active Well	EQT Production Company
Pipeline ROW	1.11	WVDEP Well	540	NW	Unknown, Vertical	Never Drilled	CNG Producing Company
Pipeline ROW	1.13	WVDEP Well	83	NW	Unknown, Vertical	Active Well	Diversified Production LLC
Pipeline ROW	1.20	Oil and Gas Well	144	SE	-	-	-
Pipeline ROW	1.53	WVDEP Well	121	NE	Unknown, Vertical	Abandoned Well	EQT Production Company
Pipeline ROW	1.53	WVDEP Well	121	NE	Unknown, Vertical	Abandoned Well	EQT Production Company
Pipeline ROW	1.53	WVDEP Well	121	NE	Unknown, Vertical	Abandoned Well	EQT Production Company
Pipeline ROW	1.56	Horizontal Lateral	1,268	NE	Gas Production, New Drill	Active Well	EQT Production Company
Pipeline ROW	1.58	Oil and Gas Well	609	NE	-	-	-
Pipeline ROW	1.88	Horizontal Lateral	0	N/A	Gas Production, Horizontal 6A Well	Active Well	EQT Production Company
Pipeline ROW	1.91	WVDEP Well	857	NE	Unknown, Vertical	Never Drilled	CNG Producing Company
Pipeline ROW	2.02	Oil and Gas Well	619	SW	-	-	-
Pipeline ROW	2.18	WVDEP Well	530	NE	Gas Production, Coal Bed Methane Well	Plugged	CNX Gas Company LLC
Pipeline ROW	2.18	WVDEP Well	530	NE	Gas Production, Coal Bed Methane Well	Plugged	CNX Gas Company LLC
Pipeline ROW	2.19	WVDEP Well	309	NE	Gas Production, Horizontal 6A	Active Well	EQT Production Company
Pipeline ROW	2.19	WVDEP Well	324	NE	Gas Production, Horizontal 6A	Active Well	EQT Production Company
Pipeline ROW	2.20	WVDEP Well	45	SW	Unknown, Horizontal	Never Issued	EQT Production Company
Pipeline ROW	2.20	WVDEP Well	59	SW	Unknown, Horizontal	Never Issued	EQT Production Company
Pipeline ROW	2.20	WVDEP Well	68	SW	Unknown, Horizontal	Never Issued	EQT Production Company
Pipeline ROW	2.20	WVDEP Well	82	SW	Unknown, Horizontal	Never Issued	EQT Production Company
Pipeline ROW	2.20	WVDEP Well	104	SW	Unknown, Horizontal	Never Issued	EQT Production Company
Pipeline ROW	2.20	WVDEP Well	118	SW	Unknown, Horizontal	Never Issued	EQT Production Company
Pipeline ROW	2.20	WVDEP Well	153	NE	Unknown, Horizontal	Active Well	EQT Production Company
Pipeline ROW	2.20	WVDEP Well	162	NE	Unknown, Horizontal	Active Well	EQT Production Company
Pipeline ROW	2.20	WVDEP Well	84	NE	Unknown, Horizontal	Active Well	EQT Production Company
Pipeline ROW	2.20	WVDEP Well	198	NE	Unknown, Horizontal	Active Well	EQT Production Company
Pipeline ROW	2.20	WVDEP Well	212	NE	Unknown, Horizontal	Active Well	EQT Production Company
Pipeline ROW	2.20	WVDEP Well	225	NE	Unknown, Horizontal	Active Well	EQT Production Company
Pipeline ROW	2.20	WVDEP Well	225	NE	Unknown, Horizontal	Active Well	EQT Production Company
Pipeline ROW	2.37	WVDEP Well	125	NE	Gas Production, Vertical	Active Well	Diversified Production LLC
Pipeline ROW	2.65	DMR Permit Location	403	NE	WETZEL CO. DRILLING	Completely Released	Consolidation Coal Company, Permit ID: P201601
Pipeline ROW	2.68	Oil and Gas Well	1,143	SW	-	-	-
Pipeline ROW	2.69	Oil and Gas Well	559	SW	-	-	-
Pipeline ROW	3.28	WVDEP Well	365	SE	Gas Production, Vertical	Abandoned Well	Diversified Production LLC

Table 6.3-1 (continued)

Facility, County, State	Nearest MP	Mineral Resource	Distance and Direction from Construction ROW (feet)		Description	Status	Comment
Pipeline ROW	3.28	Oil and Gas Well	513	SE	-	-	-
Pipeline ROW	3.28	Oil and Gas Well	798	SE	-	-	-
SA-326-01	0.00	Horizontal Lateral	473	NW	Gas Production, New Drill	Active Well	EQT Production Company
SA-326-01	0.00	Horizontal Lateral	548	NE	Gas Production, New Drill	Active Well	EQT Production Company
SA-326-01	0.00	Oil and Gas Well	1,062	SE	-	-	-
SA-326-01	0.00	Horizontal Lateral	1,179	NE	Gas Production, New Drill	Active Well	EQT Production Company
SA-326-01	0.01	Oil and Gas Well	1,022	NW	-	-	-
SA-326-02	1.03	Horizontal Lateral	228	SW	Gas Production, Horizontal 6A Well	Active Well	EQT Production Company
SA-326-02	1.11	WVDEP Well	186	SW	Unknown, Vertical	Never Drilled	CNG Producing Company
SA-326-02	1.13	WVDEP Well	301	SE	Unknown, Vertical	Active Well	Diversified Production LLC
SA-326-02	1.20	Oil and Gas Well	789	SE	-	-	-
SA-326-02	1.88	Horizontal Lateral	369	NW	Gas Production, Horizontal 6A Well	Active Well	EQT Production Company
SA-326-03	1.03	Horizontal Lateral	786	SW	Gas Production, Horizontal 6A Well	Active Well	EQT Production Company
SA-326-03	1.11	WVDEP Well	1,069	SW	Unknown, Vertical	Never Drilled	CNG Producing Company
SA-326-03	1.13	WVDEP Well	1,142	SE	Unknown, Vertical	Active Well	Diversified Production LLC
SA-326-03	1.53	WVDEP Well	689	NE	Unknown, Vertical	Abandoned Well	EQT Production Company
SA-326-03	1.53	WVDEP Well	689	NE	Unknown, Vertical	Abandoned Well	EQT Production Company
SA-326-03	1.53	WVDEP Well	689	NE	Unknown, Vertical	Abandoned Well	EQT Production Company
SA-326-03	1.88	Horizontal Lateral	323	SW	Gas Production, Horizontal 6A Well	Active Well	EQT Production Company
SA-326-04	2.15	WVDEP Well	490	SE	Unknown, Horizontal	Active Well	EQT Production Company
SA-326-04	2.15	WVDEP Well	490	SE	Unknown, Horizontal	Active Well	EQT Production Company
SA-326-04	2.15	WVDEP Well	502	SE	Unknown, Horizontal	Active Well	EQT Production Company
SA-326-04	2.15	Horizontal Lateral	551	SE	Gas Production, Horizontal 6A Well	Active Well	EQT Production Company
SA-326-04	2.15	WVDEP Well	551	SE	Gas Production, Horizontal 6A	Active Well	EQT Production Company
SA-326-04	2.15	WVDEP Well	554	SE	Unknown, Vertical	Never Drilled	CNG Producing Company
SA-326-04	2.15	Horizontal Lateral	562	SE	Gas Production, Horizontal 6A Well	Active Well	EQT Production Company
SA-326-04	2.15	WVDEP Well	562	SE	Gas Production, Horizontal 6A	Active Well	EQT Production Company
SA-326-04	2.20	WVDEP Well	1,227	NE	Unknown, Horizontal	Never Issued	EQT Production Company
SA-326-04	2.20	WVDEP Well	1,239	NE	Unknown, Horizontal	Never Issued	EQT Production Company
SA-326-04	2.20	WVDEP Well	1,260	NE	Unknown, Horizontal	Never Issued	EQT Production Company
SA-326-04	2.20	WVDEP Well	1,271	NE	Unknown, Horizontal	Never Issued	EQT Production Company
SA-326-04	2.20	WVDEP Well	1,281	NE	Unknown, Horizontal	Never Issued	EQT Production Company
SA-326-04	2.20	WVDEP Well	1,293	NE	Unknown, Horizontal	Never Issued	EQT Production Company
SA-326-04	2.56	Oil and Gas Well	382	SW	-	-	-
SA-326-04	2.56	Oil and Gas Well	944	SW	-	-	-
SA-326-05	2.75	Horizontal Lateral	347	NE	Unknown, New Drill	Permit Issued	EQT Production Company
SA-326-05	2.99	Oil and Gas Well	215	SE	-	-	-
SA-326-06	2.75	Horizontal Lateral	244	NE	Unknown, New Drill	Permit Issued	EQT Production Company
SA-326-06	2.75	Horizontal Lateral	627	SW	Unknown, New Drill	Permit Issued	EQT Production Company
SA-326-06	2.75	Oil and Gas Well	869	NE	-	-	-
SA-326-06	2.75	WVDEP Well	900	SE	Unknown, Vertical	Plugged	EQT Production Company
SA-326-06	2.75	WVDEP Well	900	SE	Unknown, Vertical	Plugged	EQT Production Company
SA-326-06	2.75	Horizontal Lateral	1,244	NE	Unknown, New Drill	Permit Issued	EQT Production Company

Table 6.3-1 (continued)

Facility, County, State	Nearest MP	Mineral Resource	Distance and Direction from Construction ROW (feet)		Description	Status	Comment
SA-326-06	2.99	Oil and Gas Well	978	SW	-	-	-
SA-326-07	2.75	Horizontal Lateral	294	NE	Unknown, New Drill	Permit Issued	EQT Production Company
SA-326-07	2.75	Horizontal Lateral	568	SW	Unknown, New Drill	Permit Issued	EQT Production Company
SA-326-07	2.75	Oil and Gas Well	925	NE	-	-	-
SA-326-07	2.75	WVDEP Well	1,008	SE	Unknown, Vertical	Plugged	EQT Production Company
SA-326-07	2.75	WVDEP Well	1,008	SE	Unknown, Vertical	Plugged	EQT Production Company
SA-326-07	2.75	Horizontal Lateral	1,293	NE	Unknown, New Drill	Permit Issued	EQT Production Company
SA-326-07	2.99	Oil and Gas Well	937	SW	-	-	-
H-329 Pipeline, Wetzel County, WV							
Access Road, PAR-329-01	0.00	WVDEP Well	483	SW	Unknown, Vertical	Abandoned Well	Diversified Production LLC
Pickenpaw Interconnect	0.00	WVDEP Well	483	SW	Unknown, Vertical	Abandoned Well	Diversified Production LLC
Pickenpaw Interconnect	0.02	Horizontal Lateral	1,315	NW	Gas Production, Horizontal 6A Well	Active Well	EQT Production Company
Pipeline ROW	0.00	WVDEP Well	397	SW	Unknown, Vertical	Abandoned Well	Diversified Production LLC
H-330 Pipeline, Wetzel County, WV							
Access Road, PAR-330-01	0.00	WVDEP Well	145	SE	Unknown, Vertical	Abandoned Well	Diversified Production LLC
Access Road, PAR-330-01	0.00	Oil and Gas Well	987	NW	-	-	-
Access Road, PAR-330-01	0.00	WVDEP Well	1,029	SW	Gas Production, Vertical	Abandoned Well	Diversified Production LLC
Access Road, PAR-330-01	0.00	WVDEP Well	1,029	SW	Gas Production, Vertical	Abandoned Well	Diversified Production LLC
Access Road, PAR-330-01	0.00	WVDEP Well	1,029	SW	Gas Production, Vertical	Abandoned Well	Diversified Production LLC
Access Road, PAR-330-01	0.00	WVDEP Well	1,029	SW	Gas Production, Vertical	Abandoned Well	Diversified Production LLC
Access Road, PAR-330-01	0.00	Horizontal Lateral	1,212	SW	Gas Production, Horizontal 6A Well	Active Well	EQT Production Company
Access Road, PAR-330-01	0.00	WVDEP Well	1,228	NW	Not Available, Vertical	Plugged	-
Access Road, PAR-330-01	0.00	WVDEP Well	1,228	NW	Not Available, Vertical	Plugged	-
Access Road, PAR-330-01	0.01	Oil and Gas Well	124	NW	-	-	-
Access Road, PAR-330-01	0.10	Oil and Gas Well	1,199	NW	-	-	-
Access Road, PAR-330-01	0.11	Oil and Gas Well	982	NW	-	-	-
Access Road, PAR-330-02	0.71	Oil and Gas Well	563	NE	-	-	-
Access Road, PAR-330-02	0.71	Oil and Gas Well	706	NE	-	-	-
Access Road, PAR-330-02	0.71	Oil and Gas Well	800	NW	-	-	-
Access Road, PAR-330-02	0.71	Oil and Gas Well	1,023	SW	-	-	-
Access Road, PAR-330-02	0.71	Oil and Gas Well	1,106	NW	-	-	-
Access Road, PAR-330-02	0.71	WVDEP Well	1,110	NW	Unknown, Vertical	Active Well	Meadow Ridge Development, LLC
Access Road, PAR-330-02	0.70	Oil and Gas Well	1,239	NW	-	-	-
Access Road, TAR-330-01	0.00	WVDEP Well	642	SW	Unknown, Vertical	Abandoned Well	Diversified Production LLC
Access Road, TAR-330-01	0.00	Oil and Gas	1,070	NW	-	-	-
Access Road, TAR-330-01	0.01	Oil and Gas Well	560	SW	-	-	-
Access Road, TAR-330-01	0.10	Oil and Gas Well	1,033	NW	-	-	-
Access Road, TAR-330-01	0.11	Oil and Gas Well	632	NW	-	-	-
Liberty Valve Yard	0.00	WVDEP Well	78	SE	Unknown, Vertical	Abandoned Well	Diversified Production LLC
Liberty Valve Yard	0.00	Horizontal Lateral	1,223	SW	Gas Production, Horizontal 6A Well	Active Well	EQT Production Company
Liberty Valve Yard	0.00	WVDEP Well	1,252	NW	Gas Production, Vertical	Abandoned Well	Diversified Production LLC
Liberty Valve Yard	0.00	WVDEP Well	1,252	NW	Gas Production, Vertical	Abandoned Well	Diversified Production LLC

Table 6.3-1 (continued)

Facility, County, State	Nearest MP	Mineral Resource	Distance and Direction from Construction ROW (feet)		Description	Status	Comment
Liberty Valve Yard	0.00	WVDEP Well	1,252	NW	Gas Production, Vertical	Abandoned Well	Diversified Production LLC
Liberty Valve Yard	0.00	WVDEP Well	1,252	NW	Gas Production, Vertical	Abandoned Well	Diversified Production LLC
Liberty Valve Yard	0.01	Oil and Gas Well	441	NW	-	-	-
Mobley Run Tap Site	0.71	Oil and Gas Well	427	NE	-	-	-
Mobley Run Tap Site	0.71	Oil and Gas Well	543	NE	-	-	-
Mobley Run Tap Site	0.71	Oil and Gas Well	639	NW	-	-	-
Mobley Run Tap Site	0.71	Oil and Gas Well	893	NW	-	-	-
Mobley Run Tap Site	0.71	Oil and Gas Well	917	SW	-	-	-
Mobley Run Tap Site	0.71	WVDEP Well	985	NW	Unknown, Vertical	Active Well	Meadow Ridge Development, LLC
Mobley Run Tap Site	0.71	Oil and Gas Well	1,102	NW	-	-	-
Mobley Run Tap Site	0.71	Oil and Gas Well	1,148	NW	-	-	-
OVC Interconnect	0.71	Oil and Gas Well	559	NE	-	-	-
OVC Interconnect	0.71	Oil and Gas Well	673	NW	-	-	-
OVC Interconnect	0.71	Oil and Gas Well	697	NE	-	-	-
OVC Interconnect	0.71	Oil and Gas Well	826	NW	-	-	-
OVC Interconnect	0.71	WVDEP Well	956	NW	Unknown, Vertical	Active Well	Meadow Ridge Development, LLC
OVC Interconnect	0.71	Oil and Gas Well	1,038	NW	-	-	-
OVC Interconnect	0.71	Oil and Gas Well	1,092	NW	-	-	-
Pipeline ROW	0.00	WVDEP Well	44	SE	Unknown, Vertical	Abandoned Well	Diversified Production LLC
Pipeline ROW	0.00	Horizontal Lateral	1,122	SW	Gas Production, Horizontal 6A Well	Active Well	EQT Production Company
Pipeline ROW	0.00	WVDEP Well	1,166	NW	Gas Production, Vertical	Abandoned Well	Diversified Production LLC
Pipeline ROW	0.00	WVDEP Well	1,166	NW	Gas Production, Vertical	Abandoned Well	Diversified Production LLC
Pipeline ROW	0.00	WVDEP Well	1,166	NW	Gas Production, Vertical	Abandoned Well	Diversified Production LLC
Pipeline ROW	0.00	WVDEP Well	1,166	NW	Gas Production, Vertical	Abandoned Well	Diversified Production LLC
Pipeline ROW	0.00	Oil and Gas Well	1,271	NW	-	-	-
Pipeline ROW	0.01	Oil and Gas Well	389	NW	-	-	-
Pipeline ROW	0.11	Oil and Gas Well	1,131	NW	-	-	-
Pipeline ROW	0.29	Oil and Gas Well	1,205	SE	-	-	-
Pipeline ROW	0.29	Oil and Gas Well	1,224	SE	-	-	-
Pipeline ROW	0.46	WVDEP Well	1,253	SE	Gas Production, Vertical	Abandoned Well	Diversified Production LLC
Pipeline ROW	0.46	Oil and Gas Well	1,272	SE	-	-	-
Pipeline ROW	0.71	Oil and Gas Well	405	NE	-	-	-
Pipeline ROW	0.71	Oil and Gas Well	525	NE	-	-	-
Pipeline ROW	0.71	Oil and Gas Well	678	NW	-	-	-
Pipeline ROW	0.71	Oil and Gas Well	916	NW	-	-	-
Pipeline ROW	0.71	Oil and Gas Well	922	NW	-	-	-
Pipeline ROW	0.71	WVDEP Well	1,025	NW	Unknown, Vertical	Active Well	Meadow Ridge Development, LLC
Pipeline ROW	0.71	Oil and Gas Well	1,142	NW	-	-	-
Pipeline ROW	0.71	Oil and Gas Well	1,150	NW	-	-	-
SA-330-01	0.00	WVDEP Well	494	SE	Unknown, Vertical	Abandoned Well	Diversified Production LLC
SA-330-01	0.00	Oil and Gas Well	901	NW	-	-	-
SA-330-01	0.00	WVDEP Well	1,004	SW	Gas Production, Vertical	Abandoned Well	Diversified Production LLC

Table 6.3-1 (continued)

Facility, County, State	Nearest MP	Mineral Resource	Distance and Direction from Construction ROW (feet)		Description	Status	Comment
SA-330-01	0.00	WVDEP Well	1,004	SW	Gas Production, Vertical	Abandoned Well	Diversified Production LLC
SA-330-01	0.00	WVDEP Well	1,004	SW	Gas Production, Vertical	Abandoned Well	Diversified Production LLC
SA-330-01	0.00	WVDEP Well	1,004	SW	Gas Production, Vertical	Abandoned Well	Diversified Production LLC
SA-330-01	0.00	WVDEP Well	1,166	NW	Not Available, Vertical	Plugged	-
SA-330-01	0.00	WVDEP Well	1,166	NW	Not Available, Vertical	Plugged	-
SA-330-01	0.00	Horizontal Lateral	1,289	SW	Gas Production, Horizontal 6A Well	Active Well	EQT Production Company
SA-330-01	0.01	Oil and Gas Well	111	SW	-	-	-
SA-330-01	0.10	Oil and Gas Well	1,126	NW	-	-	-
SA-330-01	0.11	Oil and Gas Well	921	NW	-	-	-
SA-330-02	0.00	WVDEP Well	595	SE	Unknown, Vertical	Abandoned Well	Diversified Production LLC
SA-330-02	0.00	Oil and Gas Well	915	NW	-	-	-
SA-330-02	0.00	WVDEP Well	1,084	SW	Gas Production, Vertical	Abandoned Well	Diversified Production LLC
SA-330-02	0.00	WVDEP Well	1,084	SW	Gas Production, Vertical	Abandoned Well	Diversified Production LLC
SA-330-02	0.00	WVDEP Well	1,084	SW	Gas Production, Vertical	Abandoned Well	Diversified Production LLC
SA-330-02	0.00	WVDEP Well	1,084	SW	Gas Production, Vertical	Abandoned Well	Diversified Production LLC
SA-330-02	0.00	WVDEP Well	1,217	NW	Not Available, Vertical	Plugged	-
SA-330-02	0.00	WVDEP Well	1,217	NW	Not Available, Vertical	Plugged	-
SA-330-02	0.01	Oil and Gas Well	220	SW	-	-	-
SA-330-02	0.10	Oil and Gas Well	1,096	NW	-	-	-
SA-330-02	0.11	Oil and Gas Well	847	NW	-	-	-
SA-330-02	0.10	Oil and Gas Well	1,096	NW	-	-	-
SA-330-02	0.11	Oil and Gas Well	847	NW	-	-	-
SA-330-03	0.00	WVDEP Well	851	SE	Unknown, Vertical	Abandoned Well	Diversified Production LLC
SA-330-03	0.00	Oil and Gas Well	1,014	NW	-	-	-
SA-330-03	0.01	Oil and Gas Well	563	SW	-	-	-
SA-330-03	0.10	Oil and Gas Well	992	NW	-	-	-
SA-330-03	0.11	Oil and Gas Well	599	NW	-	-	-
H-330 Spur, Wetzel County, WV							
Pipeline ROW	0.00	WVDEP Well	494	SE	Unknown, Vertical	Abandoned Well	Diversified Production LLC
Pipeline ROW	0.00	Oil and Gas Well	901	NW	-	-	-
Pipeline ROW	0.00	WVDEP Well	1,004	SW	Gas Production, Vertical	Abandoned Well	Diversified Production LLC
Pipeline ROW	0.00	WVDEP Well	1,004	SW	Gas Production, Vertical	Abandoned Well	Diversified Production LLC
Pipeline ROW	0.00	WVDEP Well	1,004	SW	Gas Production, Vertical	Abandoned Well	Diversified Production LLC
Pipeline ROW	0.00	WVDEP Well	1,004	SW	Gas Production, Vertical	Abandoned Well	Diversified Production LLC
Pipeline ROW	0.00	WVDEP Well	1,166	NW	Not Available, Vertical	Plugged	-
Pipeline ROW	0.00	WVDEP Well	1,166	NW	Not Available, Vertical	Plugged	-
Pipeline ROW	0.00	Horizontal Lateral	1,289	SW	Gas Production, Horizontal 6A Well	Active Well	EQT Production Company
Pipeline ROW	0.00	Oil and Gas Well	111	SW	-	-	-
Pipeline ROW	0.00	Oil and Gas Well	1,126	NW	-	-	-
Pipeline ROW	0.00	Oil and Gas Well	921	NW	-	-	-
Logansport Spur, Wetzel County, WV[4]							
Logansport Spur Facility Area	0.00	WVDEP Well	268	SW	Gas Production, Vertical	Abandoned Well	Diversified Production LLC
Logansport Spur Facility Area	0.00	WVDEP Well	268	SW	Gas Production, Vertical	Abandoned Well	Diversified Production LLC
Logansport Spur Facility Area	0.00	WVDEP Well	68	SW	Gas Production, Vertical	Abandoned Well	Diversified Production LLC

Table 6.3-1 (continued)

Facility, County, State	Nearest MP	Mineral Resource	Distance and Direction from Construction ROW (feet)		Description	Status	Comment
Logansport Spur Facility Area	0.00	WVDEP Well	268	SW	Gas Production, Vertical	Abandoned Well	Diversified Production LLC
Logansport Spur Facility Area	0.00	Oil and Gas Well	405	NW	-	-	-
Logansport Spur Facility Area	0.00	WVDEP Well	551	NW	Not Available, Vertical	Plugged	-
Logansport Spur Facility Area	0.00	WVDEP Well	551	NW	Not Available, Vertical	Plugged	-
Logansport Spur Facility Area	0.00	Horizontal Lateral	691	SW	Gas Production, Horizontal 6A Well	Active Well	EQT Production Company
Logansport Spur Facility Area	0.00	WVDEP Well	749	SE	Unknown, Vertical	Abandoned Well	Diversified Production LLC
Logansport Spur Facility Area	0.01	Oil and Gas Well	166	SE	-	-	-
Logansport Spur Facility Area	0.07	Oil and Gas Well	1,113	NW	-	-	-
Logansport Spur Facility Area	0.10	Oil and Gas Well	808	NW	-	-	-
Logansport Spur Facility Area	0.11	Oil and Gas Well	785	NE	-	-	-
Plasma Compressor Station, Monroe County, OH							
Access Road, PAR-Plasma-01	N/A	Horizontal Drilling Unit	0	N/A	-	-	-
Access Road, PAR-Plasma-01	N/A	Known abandoned underground mine	0	N/A	BT-270	Abandoned	Coal
Access Road, PAR-Plasma-01	N/A	Line indicator of directional/horizontal well	0	N/A	-	PR	-
Access Road, PAR-Plasma-01	N/A	Oil and gas field	0	N/A	SWITZER	-	Gas
Access Road, PAR-Plasma-01	N/A	Oil and gas field	0	N/A	BEARWALLOW RUN	-	Gas
Access Road, PAR-Plasma-01	N/A	Unknown Extent of Abandoned Underground Mine	145	SE	BT-270	Abandoned	Mine API - 340138027002
Access Road, PAR-Plasma-01	N/A	Known abandoned underground mine	242	SW	ME-004	Abandoned	Coal
Access Road, PAR-Plasma-01	N/A	Unknown Extent of Abandoned Underground Mine	540	SE	ME-004	Abandoned	Mine API - 341118000402
Access Road, PAR-Plasma-01	N/A	Line indicator of directional/horizontal well	1,009	NE	-	PR	-
Access Road, PAR-Plasma-01	N/A	Oil and gas field	1,145	SW	STILLHOUSE	-	Oil
Access Road, PAR-Plasma-01	N/A	Line indicator of directional/horizontal well	1,200	SW	-	PR	-
Plasma Compressor Station	N/A	Horizontal Drilling Unit	0	N/A	-	-	-
Plasma Compressor Station	N/A	Known abandoned underground mine	0	N/A	BT-270	Abandoned	Coal
Plasma Compressor Station	N/A	Oil and gas field	0	N/A	SWITZER	-	Gas
Plasma Compressor Station	N/A	Oil and gas field	0	N/A	BEARWALLOW RUN	-	Gas
Plasma Compressor Station	N/A	Unknown Extent of Abandoned Underground Mine	0	N/A	BT-270	Abandoned	Mine API - 340138027002
Plasma Compressor Station	N/A	Unknown Extent of Abandoned Underground Mine	290	SW	ME-004	Abandoned	Mine API - 341118000402
Plasma Compressor Station	N/A	Line indicator of directional/horizontal well	348	SW	-	PR	-
Plasma Compressor Station	N/A	Known abandoned underground mine	436	SW	ME-004	Abandoned	Coal
Plasma Compressor Station	N/A	Line indicator of directional/horizontal well	600	NE	-	PR	-
PA Contractor Yards							
Access Road, TAR-CY-PA221-East	N/A	Mined Out Areas of Coal Seam	69	NE	Pittsburgh Coal Seam	Abandoned - Last Mined in 1993	Jand L Steel
Access Road, TAR-CY-PA221-East	N/A	Mined Out Areas of Coal Seam	69	NE	Pittsburgh Coal Seam	Abandoned - Last Mined in 1993	Gateway Coal Company
Access Road, TAR-CY-PA221-East	N/A	Longwall Mining Panel	870	SE	Gateway Mine	Completed - 1981	Gateway Coal Company
Access Road, TAR-CY-PA221-East	N/A	Longwall Mining Panel	942	NE	Gateway Mine	Completed - 1981	Gateway Coal Company

Table 6.3-1 (continued)

Facility, County, State	Nearest MP	Mineral Resource	Distance and Direction from Construction ROW (feet)		Description	Status	Comment
Access Road, TAR-CY-PA221-West-01	N/A	Mined Out Areas of Coal Seam	114	SE	Pittsburgh Coal Seam	Abandoned - Last Mined in 1993	Jand L Steel
Access Road, TAR-CY-PA221-West-01	N/A	Mined Out Areas of Coal Seam	114	SE	Pittsburgh Coal Seam	Abandoned - Last Mined in 1993	Gateway Coal Company
Access Road, TAR-CY-PA221-West-01	N/A	Oil and Gas Well - Unconventional	1,037	NW	MCNAY NORTH - GAS	Proposed But Never Materialized	Vantage Energy Appalachia II LLC
Access Road, TAR-CY-PA221-West-02	N/A	Mined Out Areas of Coal Seam	75	SW	Pittsburgh Coal Seam	Abandoned - Last Mined in 1993	Jand L Steel
Access Road, TAR-CY-PA221-West-02	N/A	Mined Out Areas of Coal Seam	75	SW	Pittsburgh Coal Seam	Abandoned - Last Mined in 1993	Gateway Coal Company
Access Road, TAR-CY-PA221-West-02	N/A	Oil and Gas Well - Unconventional	1,095	NW	MCNAY NORTH - GAS	Proposed But Never Materialized	Vantage Energy Appalachia II LLC
CY-PA18-North	N/A	Underground Permit Boundary of Active Bituminous Coal Mine	0	N/A	Cumberland - Longwall	Active	Cumberland Contura, LLC
CY-PA18-South	N/A	Underground Permit Boundary of Active Bituminous Coal Mine	0	N/A	Monongalia County Mine - Longwall	Active	Monongalia County Coal Company
CY-PA221-East	N/A	Mined Out Areas of Coal Seam	20	NE	Pittsburgh Coal Seam	Abandoned - Last Mined in 1993	Jand L Steel
CY-PA221-East	N/A	Mined Out Areas of Coal Seam	20	NE	Pittsburgh Coal Seam	Abandoned - Last Mined in 1993	Gateway Coal Company
CY-PA221-East	N/A	Longwall Mining Panel	728	SE	Gateway Mine	Completed - 1981	Gateway Coal Company
CY-PA221-East	N/A	Longwall Mining Panel	891	NE	Gateway Mine	Completed - 1981	Gateway Coal Company
CY-PA221-West	N/A	Mined Out Areas of Coal Seam	0	N/A	Pittsburgh Coal Seam	Abandoned - Last Mined in 1993	Jand L Steel
CY-PA221-West	N/A	Mined Out Areas of Coal Seam	0	N/A	Pittsburgh Coal Seam	Abandoned - Last Mined in 1993	Gateway Coal Company
CY-PA221-West	N/A	Oil and Gas Well - Unconventional	1,053	NW	MCNAY NORTH - GAS	Proposed But Never Materialized	Vantage Energy Appalachia II LLC
WV Contractor Yards							
Access Road, TAR-CY-WV-01	N/A	Oil and Gas Well	707	SE	-	-	-
Access Road, TAR-CY-WV-01	N/A	Oil and Gas Well	881	NE	-	-	-
CY-WV19	N/A	Oil and Gas Well	0	N/A	-	-	-
CY-WV19	N/A	WVDEP Well	18	SE	House Gas, Vertical	Abandoned Well	JCR Petroleum, Inc.
CY-WV19	N/A	Horizontal Lateral	182	NW	Unknown, New Drill	Future Use	EQT Production Company
CY-WV19	N/A	WVDEP Well	376	NE	House Gas, Vertical	Abandoned Well	JCR Petroleum, Inc.
CY-WV19	N/A	WVDEP Well	376	NE	House Gas, Vertical	Abandoned Well	JCR Petroleum, Inc.
CY-WV19	N/A	WVDEP Well	488	SE	Unknown, Vertical	Active Well	Diversified Production LLC

Table 6.3-1 (continued)

Facility, County, State	Nearest MP	Mineral Resource	Distance and Direction from Construction ROW (feet)		Description	Status	Comment
CY-WV19	N/A	WVDEP Well	704	NW	Unknown, Vertical	Plugged	PEMCO Gas, Inc.
CY-WV19	N/A	WVDEP Well	704	NW	Unknown, Vertical	Plugged	PEMCO Gas, Inc.
CY-WV19	N/A	Horizontal Lateral	793	NW	Gas Production, Plugging	Permit Issued	EQT Production Company
CY-WV19	N/A	Horizontal Lateral	793	NW	Gas Production, New Drill	Permit Issued	EQT Production Company
CY-WV19	N/A	Oil and Gas Well	811	SE	-	-	-
CY-WV19	N/A	Horizontal Lateral	896	SW	Gas Production, Horizontal 6A Well	Active Well	EQT Production Company
CY-WV19	N/A	Horizontal Lateral	908	SW	Gas Production, Horizontal 6A Well	Active Well	EQT Production Company
CY-WV19	N/A	WVDEP Well	908	SW	Gas Production, Horizontal 6A	Active Well	EQT Production Company
CY-WV19	N/A	WVDEP Well	928	SW	Gas Production, Horizontal 6A	Permit Issued	EQT Production Company
CY-WV19	N/A	WVDEP Well	928	SW	Gas Production, Horizontal 6A	Permit Issued	EQT Production Company
CY-WV19	N/A	Oil and Gas Well	929	SW	-	-	-
CY-WV19	N/A	WVDEP Well	933	SW	Unknown, Horizontal 6A	Future Use	EQT Production Company
CY-WV19	N/A	WVDEP Well	935	SW	Gas Production, Horizontal 6A	Active Well	EQT Production Company
CY-WV19	N/A	Oil and Gas Well	942	SE	-	-	-
CY-WV19	N/A	Horizontal Lateral	942	SW	Gas Production, New Drill	Active Well	EQT Production Company
CY-WV19	N/A	WVDEP Well	942	SW	Gas Production, Horizontal 6A	Active Well	EQT Production Company
CY-WV19	N/A	WVDEP Well	944	SW	Gas Production, Horizontal 6A	Active Well	EQT Production Company
CY-WV19	N/A	Horizontal Lateral	944	SW	Gas Production, Horizontal 6A Well	Active Well	EQT Production Company
CY-WV19	N/A	WVDEP Well	945	SW	Gas Production, Horizontal 6A	Never Issued	EQT Production Company
CY-WV19	N/A	Horizontal Lateral	951	SW	Gas Production, New Drill	Active Well	EQT Production Company
CY-WV19	N/A	WVDEP Well	945	SW	Gas Production, Horizontal 6A	Never Issued	EQT Production Company
CY-WV19	N/A	Horizontal Lateral	951	SW	Gas Production, New Drill	Active Well	EQT Production Company
CY-WV19	N/A	WVDEP Well	951	SW	Gas Production, Horizontal 6A	Active Well	EQT Production Company
CY-WV19	N/A	Horizontal Lateral	953	SW	Gas Production, Horizontal 6A Well	Active Well	EQT Production Company
CY-WV19	N/A	WVDEP Well	953	SW	Gas Production, Horizontal 6A	Active Well	EQT Production Company
CY-WV19	N/A	Horizontal Lateral	960	SW	Gas Production, Plugging	Permit Issued	EQT Production Company
CY-WV19	N/A	Horizontal Lateral	960	SW	Gas Production, New Drill	Permit Issued	EQT Production Company
CY-WV19	N/A	WVDEP Well	960	SW	Gas Production, Horizontal 6A	Permit Issued	EQT Production Company
CY-WV19	N/A	WVDEP Well	960	SW	Gas Production, Horizontal 6A	Permit Issued	EQT Production Company
CY-WV19	N/A	WVDEP Well	974	SW	Gas Production, Horizontal 6A	Never Issued	EQT Production Company
CY-WV19	N/A	WVDEP Well	1,049	SW	Gas Production, Horizontal 6A	Never Issued	EQT Production Company
CY-WV20	N/A	Oil and Gas Well	275	SE	-	-	-
CY-WV20	N/A	Oil and Gas Well	585	NE	-	-	-

Sources: (ODNR-DGS 2021; ODNR 2021; WVGES 2021a; WVGES 2021b; PSU 2021; and PADEP 2021c)

Notes:

[1] Resource locations noted in the following cardinal quadrants: NE – northeast, NW – northwest, SE – southeast, SW – southwest

[2] A hyphen (-) denotes not available/unknown. N/A = not applicable.

[3] H-327 and H-328 are parallel pipelines located within shared permanent pipeline ROW.

[4] Logansport Spur consists of 0.03-mile of pipeline located within existing fenced facility area

Table 6.4-2

Steep Slopes (>32%) Crossed by the Proposed Pipeline Route by Milepost[1, 2]

Approximate MP - Begin[3]	Approximate MP - End	Steep Slopes Total Miles
H-327 and H-328 Pipelines, Greene County, PA		
0.03	0.03	<0.01
0.03	0.04	0.01
0.05	0.05	<0.01
0.05	0.06	0.01
0.06	0.06	<0.01
0.08	0.08	<0.01
0.13	0.13	<0.01
0.19	0.19	<0.01
0.22	0.22	<0.01
0.22	0.22	<0.01
0.25	0.25	<0.01
0.27	0.27	<0.01
0.28	0.28	<0.01
0.28	0.28	<0.01
0.28	0.28	<0.01
0.29	0.29	<0.01
0.29	0.29	<0.01
0.30	0.30	<0.01
0.30	0.31	<0.01
0.32	0.32	<0.01
0.32	0.32	<0.01
0.32	0.33	<0.01
0.33	0.33	<0.01
0.34	0.36	0.01
0.39	0.39	<0.01
0.44	0.45	<0.01
H-327 and H-328 Pipelines Subtotal		***0.07***
H-326 Pipeline, Wetzel County, WV[4]		
0.02	0.02	<0.01
0.02	0.02	<0.01
0.02	0.02	<0.01
0.02	0.02	<0.01
0.02	0.04	0.02
0.04	0.05	<0.01
0.05	0.08	0.03
0.08	0.10	0.02
0.10	0.10	<0.01
0.13	0.13	<0.01
0.13	0.15	0.02
0.15	0.16	<0.01
0.16	0.16	<0.01
0.17	0.18	0.01
0.18	0.19	<0.01
0.18	0.19	<0.01
0.19	0.19	<0.01
0.19	0.20	<0.01
0.20	0.20	<0.01

Approximate MP - Begin[3]	Approximate MP - End	Steep Slopes Total Miles
H-326 Pipeline, Wetzel County, WV (cont.)		
0.20	0.20	<0.01
0.20	0.20	<0.01
0.20	0.20	<0.01
0.21	0.21	<0.01
0.21	0.21	<0.01
0.21	0.21	<0.01
0.33	0.33	<0.01
0.33	0.33	<0.01
0.34	0.35	0.02
0.35	0.36	<0.01
0.36	0.36	<0.01
0.36	0.36	<0.01
0.37	0.37	<0.01
0.39	0.39	<0.01
0.39	0.39	<0.01
0.40	0.40	<0.01
0.40	0.40	<0.01
0.47	0.47	<0.01
0.47	0.47	<0.01
0.47	0.48	<0.01
0.52	0.52	<0.01
0.52	0.53	<0.01
0.53	0.53	<0.01
0.55	0.55	<0.01
0.58	0.58	<0.01
0.58	0.58	<0.01
0.58	0.59	<0.01
0.59	0.59	<0.01
0.59	0.59	<0.01
0.59	0.59	<0.01
0.59	0.60	<0.01
0.60	0.60	<0.01
0.60	0.60	<0.01
0.62	0.62	<0.01
0.64	0.64	<0.01
0.64	0.64	<0.01
0.64	0.64	<0.01
0.65	0.65	<0.01
0.65	0.66	<0.01
0.66	0.66	<0.01
0.66	0.67	<0.01
0.67	0.70	<0.01
0.72	0.72	<0.01
0.72	0.73	<0.01
0.73	0.73	<0.01
0.73	0.76	<0.01
0.76	0.77	<0.01
0.77	0.77	<0.01

Table 6.4-2 (continued)

Approximate MP - Begin[1]	Approximate MP - End	Steep Slopes Total Miles
H-326 Pipeline, Wetzel County, WV (cont.)		
0.78	0.78	<0.01
0.78	0.78	<0.01
0.78	0.78	<0.01
0.78	0.78	<0.01
0.78	0.79	0.01
0.79	0.79	<0.01
0.80	0.80	<0.01
0.80	0.80	<0.01
0.80	0.80	<0.01
0.80	0.80	<0.01
0.80	0.80	<0.01
0.80	0.80	<0.01
0.83	0.83	<0.01
0.83	0.83	<0.01
0.83	0.83	<0.01
0.84	0.84	<0.01
0.84	0.84	<0.01
0.88	0.88	<0.01
0.90	0.91	<0.01
0.91	0.91	<0.01
0.91	0.91	<0.01
0.91	0.92	<0.01
0.92	0.92	<0.01
0.94	0.94	<0.01
0.94	0.94	<0.01
0.94	0.94	<0.01
0.99	0.99	<0.01
0.99	0.99	<0.01
0.99	1.00	<0.01
1.00	1.00	<0.01
1.00	1.01	0.01
1.01	1.01	<0.01
1.01	1.01	<0.01
1.01	1.01	<0.01
1.01	1.01	<0.01
1.02	1.02	<0.01
1.02	1.03	0.01
1.03	1.03	<0.01
1.03	1.03	<0.01
1.04	1.04	<0.01
1.04	1.04	<0.01
1.05	1.05	<0.01
1.05	1.05	<0.01
1.05	1.05	<0.01
1.05	1.05	<0.01
1.06	1.06	<0.01
1.06	1.06	<0.01
1.06	1.06	<0.01

Approximate MP - Begin[1]	Approximate MP - End	Steep Slopes Total Miles
H-326 Pipeline, Wetzel County, WV (cont.)		
1.06	1.06	<0.01
1.06	1.06	<0.01
1.06	1.06	<0.01
1.06	1.06	<0.01
1.06	1.06	<0.01
1.07	1.07	<0.01
1.07	1.07	<0.01
1.07	1.08	<0.01
1.08	1.08	<0.01
1.08	1.08	<0.01
1.08	1.08	<0.01
1.08	1.08	<0.01
1.09	1.09	<0.01
1.09	1.09	<0.01
1.09	1.15	0.05
1.22	1.22	<0.01
1.23	1.24	0.02
1.24	1.26	0.01
1.26	1.29	0.03
1.29	1.30	<0.01
1.30	1.30	<0.01
1.31	1.31	<0.01
1.31	1.31	<0.01
1.31	1.32	<0.01
1.32	1.32	<0.01
1.32	1.33	<0.01
1.33	1.33	<0.01
1.33	1.33	<0.01
1.35	1.35	<0.01
1.35	1.36	<0.01
1.36	1.36	<0.01
1.36	1.36	<0.01
1.36	1.37	<0.01
1.37	1.38	<0.01
1.38	1.38	<0.01
1.40	1.40	<0.01
1.40	1.40	<0.01
1.40	1.40	<0.01
1.40	1.40	<0.01
1.41	1.41	<0.01
1.41	1.41	<0.01
1.48	1.48	<0.01
1.48	1.48	<0.01
1.76	1.77	<0.01
1.77	1.77	<0.01
1.83	1.83	<0.01
1.83	1.83	<0.01
1.83	1.83	<0.01

Table 6.4-2 (continued)

Approximate MP - Begin[1]	Approximate MP - End	Steep Slopes Total Miles
H-326 Pipeline, Wetzel County, WV (cont.)		
1.84	1.84	<0.01
1.84	1.84	<0.01
1.85	1.85	<0.01
1.85	1.85	<0.01
1.85	1.86	<0.01
1.86	1.86	<0.01
1.86	1.87	<0.01
1.94	1.95	<0.01
1.95	1.95	<0.01
1.95	1.95	<0.01
1.96	1.96	<0.01
1.99	1.99	<0.01
1.99	2.00	0.01
2.00	2.01	<0.01
2.01	2.01	<0.01
2.01	2.01	<0.01
2.01	2.01	<0.01
2.02	2.03	<0.01
2.03	2.05	0.01
2.05	2.05	<0.01
2.06	2.06	<0.01
2.06	2.06	<0.01
2.06	2.07	<0.01
2.07	2.07	<0.01
2.07	2.08	<0.01
2.08	2.11	0.03
2.11	2.11	<0.01
2.11	2.14	0.02
2.14	2.16	0.02
2.16	2.16	<0.01
2.17	2.17	<0.01
2.21	2.22	<0.01
2.22	2.22	<0.01
2.22	2.24	0.02
2.24	2.25	<0.01
2.25	2.27	0.02
2.27	2.29	0.01
2.29	2.29	<0.01
2.31	2.31	<0.01
2.32	2.34	0.02
2.34	2.34	<0.01
2.34	2.35	<0.01
2.35	2.35	<0.01
2.35	2.35	<0.01
2.35	2.36	0.01
2.37	2.37	<0.01
2.37	2.37	<0.01
2.37	2.38	<0.01

Approximate MP - Begin[1]	Approximate MP - End	Steep Slopes Total Miles
H-326 Pipeline, Wetzel County, WV (cont.)		
2.38	2.38	<0.01
2.39	2.39	<0.01
2.39	2.40	0.02
2.41	2.41	<0.01
2.41	2.42	<0.01
2.42	2.42	<0.01
2.43	2.43	<0.01
2.43	2.43	<0.01
2.43	2.43	<0.01
2.43	2.43	<0.01
2.43	2.43	<0.01
2.43	2.44	<0.01
2.45	2.45	<0.01
2.46	2.46	<0.01
2.47	2.47	<0.01
2.48	2.48	<0.01
2.48	2.49	<0.01
2.49	2.50	<0.01
2.50	2.53	0.03
2.54	2.54	<0.01
2.56	2.56	<0.01
2.56	2.57	<0.01
2.57	2.57	<0.01
2.57	2.57	<0.01
2.57	2.57	<0.01
2.57	2.58	<0.01
2.58	2.61	0.02
2.61	2.61	<0.01
2.61	2.63	0.03
2.64	2.64	<0.01
2.64	2.64	<0.01
2.64	2.64	<0.01
2.64	2.64	<0.01
2.64	2.64	<0.01
2.64	2.64	<0.01
2.65	2.65	<0.01
2.65	2.66	<0.01
2.66	2.66	<0.01
2.66	2.67	<0.01
2.69	2.69	<0.01
2.69	2.69	<0.01
2.69	2.69	<0.01
2.69	2.69	<0.01
2.70	2.70	<0.01
2.70	2.70	<0.01
2.70	2.70	<0.01
2.70	2.71	<0.01
2.71	2.71	<0.01

Table 6.4-2 (continued)

Approximate MP - Begin[1]	Approximate MP - End	Steep Slopes Total Miles
2.72	2.73	0.01
2.74	2.74	<0.01
2.75	2.76	<0.01
2.76	2.76	<0.01
2.76	2.76	<0.01
2.76	2.78	0.01
2.78	2.78	<0.01
2.79	2.80	0.02
2.80	2.80	<0.01
2.80	2.80	<0.01
2.80	2.81	<0.01
2.82	2.83	0.01
2.83	2.83	<0.01
2.83	2.85	0.01
2.85	2.85	<0.01
2.85	2.86	<0.01
2.86	2.86	<0.01
2.87	2.88	<0.01
2.88	2.88	<0.01
2.88	2.88	<0.01
2.89	2.90	0.01
2.90	2.91	0.01
2.91	2.91	<0.01
2.92	2.92	<0.01
2.93	2.94	0.01
2.94	2.94	<0.01
2.94	2.94	<0.01
2.95	2.96	<0.01
2.96	2.96	<0.01
2.97	2.97	<0.01
2.98	2.98	<0.01
2.98	2.99	<0.01
3.00	3.00	<0.01
3.00	3.01	<0.01
3.01	3.01	<0.01
3.01	3.02	<0.01
3.02	3.02	<0.01
3.02	3.02	<0.01
3.04	3.04	<0.01
3.04	3.05	<0.01
3.05	3.05	<0.01
3.08	3.08	<0.01
3.08	3.08	<0.01
3.08	3.09	<0.01
3.09	3.09	<0.01
3.11	3.11	<0.01
3.11	3.14	<0.01
3.14	3.14	<0.01
3.17	3.17	<0.01
3.17	3.18	<0.01
3.18	3.19	0.01
3.19	3.19	<0.01
3.19	3.20	<0.01
3.20	3.20	<0.01
3.20	3.20	<0.01
3.21	3.21	<0.01
3.22	3.22	<0.01
3.22	3.22	<0.01
3.22	3.23	<0.01
3.24	3.24	<0.01
3.24	3.24	<0.01
3.41	3.41	<0.01
3.41	3.41	<0.01
3.41	3.41	<0.01
3.42	3.42	<0.01
3.42	3.42	<0.01
3.42	3.42	<0.01
3.42	3.43	<0.01
3.43	3.44	0.02
3.45	3.45	<0.01
3.46	3.46	<0.01
3.46	3.46	<0.01
3.46	3.46	<0.01
3.47	3.47	<0.01
3.47	3.47	<0.01
3.47	3.47	<0.01
3.48	3.48	<0.01
3.48	3.48	<0.01
3.48	3.49	<0.01
3.49	3.49	<0.01
H-326 Pipeline Subtotal		***1.34***
H-329 Pipeline, Wetzel County, WV		
0.00	0.00	<0.01
0.00	0.01	<0.01
0.01	0.01	<0.01
0.02	0.02	<0.01
0.02	0.02	<0.01
H-329 Pipeline Subtotal		***0.01***
H-330 Pipeline, Wetzel County, WV[4]		
0.01	0.01	<0.01
0.02	0.02	<0.01
0.02	0.04	0.02
0.04	0.05	0.01
0.05	0.05	<0.01

Table 6.4-2 (continued)

Approximate MP - Begin[1]	Approximate MP - End	Steep Slopes Total Miles
0.05	0.05	<0.01
0.06	0.07	0.02
0.08	0.09	<0.01
0.09	0.09	<0.01
0.09	0.10	<0.01
0.12	0.13	<0.01
0.15	0.15	<0.01
0.15	0.15	<0.01
0.15	0.16	<0.01
0.16	0.16	<0.01
0.16	0.16	<0.01
0.17	0.17	<0.01
0.17	0.17	<0.01
0.18	0.19	0.01
0.19	0.19	<0.01
0.20	0.20	<0.01
0.20	0.20	<0.01
0.21	0.21	<0.01
0.21	0.21	<0.01
0.21	0.22	<0.01
0.22	0.22	<0.01
0.22	0.22	<0.01
0.23	0.23	<0.01
0.23	0.23	<0.01
0.23	0.23	<0.01
0.24	0.24	<0.01
0.24	0.25	<0.01
0.25	0.25	<0.01
0.25	0.25	<0.01
0.25	0.27	0.02
0.27	0.27	<0.01
0.27	0.27	<0.01
0.27	0.27	<0.01
0.46	0.47	0.02
0.47	0.47	<0.01
0.48	0.49	<0.01
0.49	0.50	0.01
0.50	0.50	<0.01
0.51	0.51	<0.01
0.51	0.51	<0.01
0.51	0.52	0.01
0.53	0.54	0.02
0.55	0.56	0.02
0.56	0.56	<0.01
0.57	0.57	<0.01
0.57	0.57	<0.01
0.58	0.58	<0.01
0.58	0.59	<0.01
0.59	0.59	<0.01
0.59	0.60	<0.01
0.60	0.61	0.01
0.61	0.62	<0.01
0.62	0.63	<0.01
0.63	0.64	<0.01
0.66	0.67	<0.01
0.67	0.67	<0.01
H-330 Pipeline Subtotal		***0.30***
H-330 Spur, Wetzel County, WV		
0.00	0.00	<0.01
0.00	0.00	<0.01
H-330 Spur Subtotal		***<0.01***
Project Total		**1.72**

Table 6.4-2 (continued)

Notes:

1 Slope analysis based on DEM and Lidar data collected between 2006 and 2020. Numbers may not sum exactly due to rounding.

2 As detailed in Resource Report 1, Logansport Spur consists of modifications within the existing aboveground facility area (Logansport Station) to install approximately 160 feet of 12-inch-diamter pipeline and therefore is not included in this table.

3 H-327 and H-328 are parallel pipelines located within shared permanent pipeline ROW.

4 Portions of H-326 and H-330 that share ROW are accounted for under H-330.

APPENDIX 6-B
General Blasting Plan

General Blasting Plan

FERC Docket No. CP22-___-000

Equitrans, L.P.
Ohio Valley Connector Expansion Project
Greene County, Pennsylvania,
Weztel County, West Virginia,
and Monroe County, Ohio

January 2022

EQUITRANS℠

Public Information

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Acronyms and Abbreviations

CFR	Code of Federal Regulations
EI	Environmental Inspector
Equitrans	Equitrans, L.P.
FERC	Federal Energy Regulatory Commission
HP	Horsepower
LOD	limits of disturbance
MP	Milepost
NGA	Natural Gas Act
OAC	Ohio Administrative Code
ODNR	Ohio Department of Natural Resources
OH	Ohio
PA	Pennsylvania
PADEP	Pennsylvania Department of Environmental Protection
Plan	General Blasting Plan
Project	Ohio Valley Connector Expansion Project
ROW	right-of-way
USGS	United States Geological Survey
WV	West Virginia

1.0 Introduction

The Ohio Valley Connector Expansion Project (Project) General Blasting Plan (Plan) outlines the procedures and safety measures that the contractor(s) will adhere to while implementing blasting activities during the construction of the Project. This Plan addresses blasting for the construction of the proposed pipeline and associated Project facilities filed with the Federal Energy Regulatory Commission (FERC).

The Plan includes the overall physiogeographic setting and bedrock geology in the vicinity of the Project. Further information on shallow bedrock soils and bedrock outcroppings is included in Resource Report 6, Geological Resources. A detailed description and overview map of the Project is provided in Resource Report 1.

Information for blasting and rip characteristics of bedrock may be elevated, at least in a general sense, and applied toward an appropriate bedrock excavating method. The hard and intact nature of unweathered bedrock will likely be removed by ripping or mechanical means. However, if ripping or mechanical means are not successful, blasting of shallow bedrock within the trench may be necessary.

Other geological features may control the effects of blasting, rock fabric, or the arrangement of minerals determining intrinsic rock stressing and thus influence rock excavation. Joint spacing, bedding, and foliation influence rock excavation.

2.0 Geologic Setting

As detailed in Section 6.1 of Resource Report 6, the Project is within the Waynesburg Hills and Kanawha sections of the Appalachian Plateau Province. The Waynesburg Hill Section is a dissected plateau of horizontally bedded sedimentary rocks shaped by fluvial erosion and landslides to form a hilly landscape with steeply sloping narrow valleys and narrow hilltops. The Kanawha Section is on a dissected plateau underlain by horizontally bedded sedimentary rocks and characterized by steep side slopes, narrow, level valleys, and narrow, sloping ridgetops.

Along the pipeline route in Pennsylvania (PA), the topographic elevation ranges from approximately 1,140 to 1,540 feet with an average slope of 9.4 percent. The pipeline route in West Virginia (WV) follows an elevation range from approximately 875 feet to 1,650 feet with an average slope of 21.3 percent.

2.1 Regional Geology

The Project area overlays a thick sequence of sedimentary rocks that sandstone, shale, and limestone that produce oil, gas, and coal. The surficial geology consists of Holocene and late and middle Pleistocene age colluviums. Colluvium is produced by frost action that has broken the bedrock near the surface into loose slabs and blocks.

The geologic formations listed below are present in the area and are crossed by the Project.

Dunkard Group: Permian/Pennsylvanian age, containing non-marine cyclic sequences of sandstone, red and gray shale, limestone, and coal.

Greene Formation: Dunkard Group of Permian age, containing cyclic sequences of sandstone, shale, red-beds, limestone, and impure coal, with the base occurring at the top of the Upper Washington Limestone.

Table 6.1-1 (Appendix 6-A) of Resource Report 6 presents by milepost (MP) formations and their lithology crossed by the Project.

2.2 Active Faults

As discussed in Resource Report 6, the United States Geological Survey Quaternary Fold and Fault Database was searched to identify Quaternary faults crossed or encountered by the Project facilities. There were no active faults identified within the Project area.

2.3 Areas of Shallow Bedrock

The pipeline will be installed to allow a minimum cover of 36 inches, or a minimum of 24 inches in areas of consolidated bedrock. Therefore, the proposed Project area was evaluated for areas where bedrock might be encountered above a depth of 60 inches (Resource Report 7, Table 7.2-1, Appendix 7-A).

Blasting is not proposed for the Project. However, if shallow bedrock is encountered in some areas, Equitrans, L.P. (Equitrans) may need to resort to blasting methods. Equitrans plans to avoid or minimize blasting on the Project through the use of conventional rock-trenching methods where possible. Equitrans expects to use mechanical rippers or other mechanical means for trench construction, such as conventional excavation with a track-mounted excavator (trackhoe), trencher, or hammering with a trackhoe-attached device followed by excavation to remove bedrock encountered in the trench. In areas where blasting is required, Equitrans will implement the procedures described in this Plan.

2.4 Mineral Resources

Mineral resources, quarries, and other mineral extraction along and within the proposed route of the pipeline and its related facilities are discussed in Resource Report 6, Section 6.3.

The Project crosses active mining areas, inactive, reclaimed, and abandoned mine lands. Table 6.3-1 (Appendix 6-A) of Resource Report 6 includes mining operations within the Project area.

2.5 Oil and Natural Gas Wells

The locations of all known oil and gas wells, coal mines, and rock and mineral/mineral aggregate mines within 0.25-mile of the Project are shown by MP in Appendix 6-B, Table 6.3-1, of Resource Report 6. Active wells identified along and within the proposed route and are further discussed in Resource Report 6.

3.0 Blasting Specifications

Blasting is not proposed for the Project. However, blasting for pipeline facilities grade or trench excavation and interconnect site development will be considered after all other reasonable means of excavation have been evaluated and determined to be unlikely to achieve the required results. Equitrans does not anticipate blasting at sensitive locations (foreign line crossings and nearby structures); instead, consolidated rock will be removed by approved mechanical equipment as discussed in Section 2.3 above. Areas where blasting may be required will be surveyed for features, such as Karst terrain, structures, utilities, and wells (water, oil, and natural gas). Occupied buildings and their condition within 150 feet of the blasting area will be documented as to their pre-blast condition, as set forth in Appendix A – Pre-Blast Survey, and their condition after blasting, as set forth in Appendix D – Post-Blast Survey Report. Equitrans will provide verbal notification, followed by written documentation, to the buildings' occupant(s) of blasting activity during both pre-construction and post-construction within 150 feet of a blast location.

If blasting occurs within 150 feet of identified water wells or potable springs, water flow performance and water quality testing will be conducted before blasting. Post-construction water well testing will be offered. Landowners will be contacted by an Equitrans representative, and a qualified independent contractor will conduct the testing. Water wells within 150 feet of proposed Project work areas are tabulated in Resource Report 2 – Water Use and Quality.

Equitrans will evaluate landowner complaints regarding damage resulting from blasting to wells, homes, or outbuildings. If the damage is substantiated, Equitrans will negotiate a settlement with the landowner that may include repair or replacement.

Before blasting occurs, Equitrans' contractor will complete a Project/site-specific blasting plan (Section 8.0 of this General Blasting Plan) and provide it to Equitrans for review. No blasting shall be done without prior approval of Equitrans. In no event shall explosives be used where, in the opinion of Equitrans, such use will endanger existing facilities and/or structures. The contractor shall obtain Equitrans' approval and provide 48 hours' notice prior to the use of explosives. Equitrans will provide at least a 24-hour notice to occupants of nearby (within 150 feet of blasting area) buildings, stores, residences, businesses, farms, and other occupied areas prior to initiating blasting operations. These notices will be verbal, followed by written documentation of the 24-hour notice.

If blasting is conducted within 150 feet of an active or plugged oil or natural gas well, Equitrans will establish the owner and operator of that well and will contact both the owner and operator of the well to develop an acceptable blasting plan specific to that well that is approved by the well's owner, well's operator and Equitrans' approval. No blasting will occur without the approved well site-specific blasting plan by the above specified parties. All active wells crossed by the Project are owned by Equitrans (EQT Production). Equitrans will take the appropriate precautions to protect the integrity of the facilities.

Before blasting occurs in streams, wetlands, or environmentally sensitive areas, Equitrans will meet and obtain approval to conduct blasting from the governmental agency having jurisdiction over these areas. A site-specific blasting plan will be completed by Equitrans' contractor for review, approval, and submittal to the governmental agencies for their review, comment, and approval.

3.1 Specifications

Blasting shall adhere to the following federal, state, county, township, local, and Project standards and regulations. These standards and regulations are to be considered as the minimum requirements. Should there be a conflict between jurisdictions, standards, and regulations, the most stringent jurisdiction, standards, and regulations shall be followed.

These blasting requirements for the Project are as follows:

- 29 Code of Federal Regulations (CFR) 1926 Subpart U – Blasting and the Use of Explosives.
- 27 CFR 555 Subpart K, U. S. Bureau of Alcohol, Tobacco, and Firearms.
- 30 CFR 816.68 Mine Safety and Health Administration.
- 49 CFR Part 192 U.S. Department of Transportation.
- 27 CFR Part 55, Commerce in Explosives.
- 30 CFR 715.19.
- National Fire Protection Association 495.
- U. S. Bureau of Mines Report of Investigations 8507.
- WV 199 CFR 1 Title 199 Series 1.
- Ohio Administrave Code Rule 4123:1-3-15, Explosives and Blasting.
- PA Department of Environmental Protection 5600-PM-BMP0021 (Rev. 6/20/18).
- PA Administrative Code of 1929 (Section 1917-A) and 25 PA Code Chapter 211.

4.0 Pre-Blast Inspections

Equitrans shall conduct pre-blast surveys, with landowner permission, to assess the conditions of structures, wells, springs, and utilities within 150 feet of the proposed construction right-of-way (ROW).

Should local or state ordinances require inspections in excess of 150 feet from the work, the local or state ordinances shall prevail. The survey will include, at a minimum:

- Informal discussions to familiarize the adjacent property owners with blasting effects and planned precautions to be taken on this Project.
- Determination of the existence and location of site-specific structures, utilities, septic systems, and wells.
- Detailed examination, photographs, and/or video records of adjacent structures and utilities.
- Detailed mapping and measurement of large cracks, crack patterns, and other evidence of structural distress.

The results will be summarized in a Pre-Blast Condition Report that will include photographs and be completed prior to the commencement of blasting. The pre-blast conditions will be documented with the information outlined by “Pre-Blast Survey.” This Pre-Blast Survey Form is considered the minimum information needed. Appendix A presents the Pre-Blast Survey Form. The completion of the Pre-Blast Survey Form is in addition to all other local, county, township, state, or federal reporting/survey data collection and reports.

5.0 Monitoring of Blasting Activities

During blasting, Equitrans’ contractors will take precautions to minimize damage to adjacent areas and structures. Precautions include:

- Dissemination of blast warning signals in the area of blasting.
- Backfilling with subsoil (no topsoil to be used), crushed stone, blasting mats or other approved methods.
- Blast warning in congested areas, in shallow water bodies, or near structures that could be damaged by fly-rock.
- Use of matting or other suitable cover, as necessary, to prevent fly-rock from damaging adjacent protected natural resources.
- Posting warning signals, flags, and/or barricades.
- Following federal, state, local, and Project procedures and regulations for safe storage, handling, loading, firing, and disposal of explosive materials.
- Manning adjacent pipelines at valves for emergency response, as appropriate.
- Posting of portable signage, portable barricades, and visual survey of the blast area access ways to prevent unauthorized entrance into the blast zone by spectators and/or intruders.
- Maintaining communications between all persons involved for security of the blast zone during blasting/firing.

Excessive vibration will be controlled by limiting the size of charges and by using charge delays, which stagger each charge in a series of explosions.

If the contractor must blast near buildings, structures, or wells, a qualified independent contractor will inspect structures or wells within 150 feet, or farther if required by local or state regulations, of the Project’s limits of disturbance (LOD) prior to blasting, and with landowner permission. Post-blast inspections by Equitrans’ representative will be performed, as warranted. All blasting will be performed by registered blasters and monitored by experienced blasting inspectors. Recording seismographs will be installed by the contractor at selected monitoring stations (minimum of two seismographs required per blast) under the observation of Project personnel. During construction, the contractor will submit blast reports for each blast and keep detailed records as described in Section 6.10.

As appropriate, effects of each discharge will be monitored at the outer perimeter of the Project’s LOD and closest adjacent facilities by seismographs (minimum).

If a charge greater than eight pounds per delay is used, the distance of monitoring will be in accordance with the U. S. Bureau of Mines Report of Investigations 8507.

Equitrans will evaluate complaints of well or structural damage associated with construction activities, including blasting. As detailed in Resource Report 1, Section 1.7, the name and phone number (toll-free) of company representative(s) knowledgeable about the Project will be provided to landowners to use in reporting complaints or concerns.

In the event a private landowner well is damaged during construction, Equitrans will repair or replace the well. Equitrans plans to provide temporary accommodations or a temporary water supply to affected homeowners while their well is repaired or replaced if no other potable water source is readily available.

If well or structural damage is substantiated, Equitrans will compensate the owner for damages to the structure and well, or arrange for a new well to be drilled.

6.0 Blasting Requirements

Standard practices for blasting operations are outlined in Section 3.0 of this Plan. The potential for blasting to affect wetlands, municipal water supplies, waste disposal sites, well, septic systems, springs, oil/natural gas wells, or pipelines will be minimized by controlled blasting techniques and by using mechanical methods for rock excavation as much as possible. The following text presents details of procedures for powder blasting.

6.1 General Provisions

- The contractor will provide all personnel, labor, and equipment to perform necessary blasting operations related to the work. The contractor will provide a permitted blaster possessing all permits required by the local, county, township, states, and federal in which blasting is required during construction, and having a working knowledge of federal, state and local laws and regulations that pertain to explosives.
- Project blasting will be completed with 27 CFR Part 55, 30 CFR 715.19, National Fire Protection Association 495 – Explosive Materials Code; the above referenced Specification; and all other state and local laws, when required; and regulations applicable to obtaining, transporting, storing, handling, blast initiation, ground motion monitoring, and disposal of explosive materials and/or blasting agents.
- The contractor shall be responsible for supplying explosives and blasting materials that are perchlorate-free to eliminate the potential for perchlorate contamination of groundwater. Further, the use of ammonium nitrate is prohibited. However, the use of emulsion type explosives, including those having ammonium nitrate as a constituent, such as Dyna 1062 Bulk Emulsion, shall be permitted, as these types of explosives are considered industry standard for area blasting related to large scale earthwork construction. In addition, detonators containing small amounts of perchlorate, such as Dyno Nobel NONEL EZ Dets, are an industry standard and shall be permitted.
- Equitrans' contractor shall be responsible for securing and complying with all necessary permits required for the transportation, storage, and use of explosives. The contractor shall be responsible for all damages or liabilities occurring on or off the ROW resulting from the use of explosives. When the use of explosives is necessary to perform the work, the contractor shall use upmost care not to endanger life or adjacent property, and shall comply with all applicable laws, rules, and regulations governing the storage, handling, and use of such explosives. The contractor will conduct a pre- and post-surficial leak survey along the centerline of each adjacent live pipeline to the planned blast area. The surficial leak survey will be conducted by Equitrans employees and/or designated representative,

with the surficial leak survey extending a minimum of 150 feet (both directions) past the limits of the planned blast area.

- Blasting activities will adhere to all Project, local, state, and federal regulations and requirements applying to controlled blasting and blast vibration limits in regard to structures; underground gas pipelines; active, plugged, oil and gas wells; and underground utilities. In addition to following state and federal blasting guidelines, Equitrans will contact each governmental agency (if the Project is not undertaken within 12 months as of the date of this Plan) along the proposed route to determine local ordinances or guidelines for blasting (refer to Table 1).

Table 1

Contacts and Related Permitting Prior to Blasting

Jurisdiction	Contact	Agency	Permit/Regulations
PA	Staff – 717.787.5103	PADEP Bureau of Mining Programs	Permit/Notifcations
WV	Staff – 304.558.2191	WV Fire Marshall	Permit/Notifications
Ohio (OH)	Staff – 614.265.6633	ODNR Division of Mineral Resources	Permit/Notifications

Equitrans' contractor will be aware of all procedures and local requirements, and it will be the contractor's responsibility to notify officials and receive appropriate blasting permits and authorization.

Typically, local regulations require copies of the contractor's Certificate of Insurance and License. In some jurisdictions, a Certificate of Bond will be required, as well as a qualified person hired to oversee the blasting procedure.

Equitrans will assign a Project Inspector or designated representative and they shall have the opportunity to witness all rock excavations or other use of explosives. The contractor shall conduct all blasting operations in a safe manner which will not cause harm to the existing pipelines, oil/gas wells, water wells, and/or structures in the vicinity. If the Project Inspector determines that blasting operations have been conducted in an unsafe manner, the Project Inspector will notify the contractor of the unsafe activity. If further unsafe actions occur on the part of the blasting firm, the Project Inspector will request the contractor terminate the Contract of the blasting firm and hire another blasting company.

Failure to comply with the appropriate law and/or regulations is the sole liability of the contractor. The contractor and the contractor's permitted blaster shall be responsible for the conduct of blasting operations, which shall be subject to inspection requirements.

6.2 Storage of Materials

Explosives and related materials shall be stored in approved facilities required under the applicable provisions contained in 27 CFR Part 55, Commerce in Explosives. The handling of explosives may be performed by the person holding a permit to use explosives or by other employees under his or her direct supervision, provided employees are at least 21 years of age. While explosives are handled or used, smoking shall not be permitted, and no one near the explosives shall possess matches, open light, or other fire or flame within 50 feet of the explosives, in accordance with Occupational Safety and Health Administration requirements. Suitable devices or lighting safety fuses are exempt from this requirement. No person shall handle explosives while under the influence of intoxicating liquors or narcotics during construction of the Project. Original containers or Class II magazines shall be used for taking detonators and other explosives from storage magazines to the blasting area. Partial reels of detonating cord do not need to be in closed containers unless transported over public highways. Containers of explosives shall not be opened in magazines or within 50 feet of magazines. In opening kegs, or wooden cases, no sparking metal tools shall be used; wooden wedges and either wood, fiber or rubber mallets shall be used. Non-sparking metallic slitters may be used for opening fiberboard cases.

No explosive materials shall be located or stored where they may be exposed to flame, excessive heat, sparks, or impact.

Explosives or blasting equipment deteriorated or damaged shall not be used. Explosive materials shall be protected from unauthorized possession and shall not be abandoned.

No attempt shall be made to fight a fire if it is determined the fire cannot be contained or controlled before it reaches explosive materials. In such cases, personnel shall be immediately evacuated to a safe location and the area shall be guarded from entry by spectators or intruders.

No firearms shall be discharged into or in the vicinity of a vehicle containing explosive materials or into or in the vicinity of a location where explosive materials are handled, used, or stored.

Equitrans' contractor shall maintain a daily blast inventory record of explosive materials transported (to and from blast area), used, and returned to off-site storage when no storage is on the blast site.

6.3 Pre-Blast Operations

Equitrans' contractor is required to submit a planned schedule of blasting operations to the Project Inspector or designated representative for approval, prior to commencement of blasting or pre-blast operations, which indicates the maximum charge weight per delay, hole size, spacing, depth, and blast layout. If blasting is to be conducted adjacent to an existing pipeline or oil and gas wells, approval must be received from Equitrans. The contractor shall provide this schedule to the Project Inspector at least five working days prior to pre-blast operation for approval and use. Where residences or other structures are within 150 feet of the blasting operation, the Project Inspector may require notification in excess of five days. The blasting schedule is to include the blast geometry, drill hole dimensions, type and size of charges, stemming, and delay patterns and should include a location survey of dwellings or structures that may be affected by the proposed operation. Face material shall be carefully examined before drilling to determine the possible presence of unfired explosive material. Drilling shall not be started until all remaining butts of old holes are examined for unexploded charges, and if any are found, they shall be re-fired before work proceeds. No person shall be allowed to deepen the drill holes that have contained explosives.

Drill holes shall be large enough to permit free insertion of cartridges of explosive materials. Drill holes shall not be collared in bootlegs or in holes that have previously contained explosive materials. Holes shall not be drilled where there is a danger of intersecting another hole containing explosive material. Charge loading shall be spread throughout the depth of the drill hole or at the depths or rock concentration to obtain the optimum breakage of rock.

Loading and firing shall be performed or supervised by a person possessing an appropriate blasting permit and license. Drill holes shall be inspected and cleared of obstructions before loading. No holes shall be loaded, except those to be fired in the next round of blasting. After loading, remaining explosives shall be returned to an authorized magazine.

A maximum loading factor of 4.0 pounds of explosive per cubic yard of rock shall not be exceeded. However, should this loading fail to effectively break up the rock, a higher loading factor shall be allowed if the charge weight per delay is reduced by a proportional amount and approved by the Project Inspector. The minimum safe distance from the blasting area to a live buried pipeline is placed at 10 feet measured horizontally from the edge of the blasting area to the outer edge of the affected pipeline. The site-by-site minimum safe distance between blasting areas and adjacent live natural gas pipelines will be calculated each time blasting is to occur using PIPEBLAST computer modeling program or other recognized industrial standards and applying the measured site conditions. The minimum safe distance and supporting calculations and site measurements are to be submitted for approval to Equitrans' appointed Project Inspector at least five days before blasting is to occur.

The minimum safe distance from the blasting area to a live or plugged oil or natural gas well is placed at 150 feet measured horizontally from the edge of the blasting area to the outer edge of the affected well pad. The site-by-site minimum safe distance between blasting areas and adjacent active or plugged oil or natural gas wells will be calculated each time blasting is to occur using PIPEBLAST computer modeling program or other recognized industrial standards and applying the measured site conditions. The minimum safe distance and supporting calculations and site measurements are to be submitted for approval to Equitrans' appointed Project Inspector at least five days (minimum) before blasting is to occur.

All blasts will be monitored (Seismograph Monitoring-Transverse, Vertical, Longitudinal, and Acoustic) to ensure the peak particle velocity does not exceed the following specified maximum velocities:

- Four inches per second for underground, welded, steel pipeline.
- Two inches per second for underground, coupled, steel pipelines; above ground and underground structures; or water wells.
- Two inches per second for active and plugged oil and natural gas wells casings; above ground well structures; or other well support facilities/structures.

Equitrans may approve higher peak particle velocities in writing, given site-specific conditions.

The maximum amplitude of the elastic wave created by blasting shall not exceed 0.0636-inch.

The Contractor shall use industry-standard explosives and initiation systems and shall select the exact explosives and initiation systems on a site-specific basis. Examples of the types of explosives and initiation systems to be used are as follows:

6.3.1 Dyno Nobel Unimax™ (or equivalent)

An extra-gelatin dynamite with a specific gravity of 1.51 g/cc, a detonation rate of 17,400 f/s (unconfined) and a calculated energy of 1,055 c/g. The cartridge size will generally be two-inch by eight-inch (1.25 lbs/cartridge) or two-inch by 16-inch (2.50 lbs/cartridge).

6.3.2 Dyno Nobel Unigel™ (or equivalent)

A semi-gelatin dynamite with a specific gravity of 1.30 g/cc, a detonation rate of 14,200 f/s (unconfined) and a calculated energy of 955 c/g. The cartridge size will generally be two-inch by eight-inch (1.15 lbs/cartridge) or two-inch by 16-inch (2.30 lbs/cartridge).

6.3.3 Dyno Nobel Dynomax Pro™ (or equivalent)

A propagation-resistant dynamite, with a specific gravity of 1.45 g/cc, a detonation rate of 19,700 f/s (unconfined) and a calculated energy of 1,055 c/g. The cartridge size will generally be two-inch by eight-inch (1.225 lbs/cartridge) or two-inch by 16-inch (24.45 lbs/cartridge).

6.3.4 Dyno Nobel NONEL™ 17 or 25 Millisecond Delay Connectors or Dyno Nobel NONEL EZ Det™ (or equivalent)

A nonelectric delay detonator with a 25/350, 25/500, or 25/700 millisecond delay.

6.3.5 Dyno Nobel NONEL™ Nonelectric Shock Tube System Detonator (or equivalent)

The Shock Tube will initiate all shots. The Shock Tube will be attached at one point for initiation of the entire shot and will not be used for down hole priming.

6.3.6 Dyno Nobel 1062 Bulk Emulsion (or equivalent)

An emulsion/gel product commonly used for area blasting such as road alignments or large pads. It contains the following major components: ammonium nitrate (30 to 80 percent w/w, calcium nitrate, sodium nitrate, and No. 2 diesel fuel (one to eight percent w/w).

Each borehole shall be primed with NONEL EZ Det system. The total grains of the detonator system should be limited to prevent blowing stemming out of the drill hole. Boreholes shall be delayed with a minimum of 25 milliseconds. Slightly longer delays may be used over steep hills with prior approval of the Project Inspector. Primers shall not be assembled closer than 50 feet (15.25 m) from magazines. Primers shall be made up when and as required for immediate needs.

Blasting shall not be permitted if live pipelines lie within the perimeter of the crater zone, regardless of size of the blast/shot. Crater zone shall be defined as a circle created by turning a radius along the ground surface equal to the length of the depth below the surfaces where the shot is placed.

Tamping shall be done with wood rods without exposed metal parts; non- sparking metal connectors may be used for jointed poles. Plastic tamping poles may be used provided the authority having jurisdiction has approved them. Violent tamping shall be avoided.

Recommended stemming material shall consist of clean crushed stone with d50 – 3/8 inch, which will not bridge over like dirt and will completely fill voids in the hole.

When safety fuse is used, the burning rate shall be determined and in no case shall fuse lengths less than 120 seconds be used. The blasting cap shall be securely attached to the safety fuse with a standard ring type cap crimper.

Pneumatic loading of blasting agents in blast holes primed with electric blasting caps or other static-sensitive initiation systems shall comply with the following requirements:

- A positive grounding device shall be used for the equipment to prevent accumulation of static electricity.
- A semi-conductive discharge hose shall be used.
- A qualified person shall evaluate all systems to assure they will adequately dissipate static charges under field conditions.

No blasting caps or other detonators shall be inserted in the explosives without making a hole in the cartridge for the cap with a wooden punch of proper size or standard cap crimper.

After loading for a blast is completed, all excess blasting caps or electric blasting caps and other explosives shall be removed from the area and returned to their separate storage magazines.

6.4 Discharging Explosives

Persons authorized to prepare explosive charges or conduct blasting operations shall use precaution, including, but not limited to, warning signals, flags, barricades, or woven wire mats to ensure the safety of the general public and workmen.

The contractor shall obtain Equitrans' approval and provide at least 24-hour notice prior to the use of explosives. The contractor shall comply with local and state requirements for pre-blast notifications, such as the One-Calls of WV and PA, which require a 72-hour minimum notice, and the OHIO811, which requires a notice of at least 48 hours.

When blasting is conducted in the vicinity (within 150 feet) of gas, electric, water, fire alarm, telephone, telegraph, and other utilities, (above or below grade) the blaster shall notify the appropriate representatives of such utilities at least 24-hours, or as required by the utility, in advance of blasting. Verbal notice shall be confirmed with written notice. In an emergency, the local authority issuing the original permit may waive this time limit. Equitrans' Project Inspector is notified, both verbally and copied, with the written notice for notifications.

Blasting operations, except by special permission of the authority having jurisdiction and Equitrans, shall be conducted during daylight hours. No blasting shall occur on Sundays or legal holidays except by special permission of the authority having jurisdiction and Equitrans.

When blasting is conducted in congested areas or in proximity to a significant natural resource, structure, railway, highway, or other installation that may be damaged, the blast shall be backfilled before firing or covered with a mat, constructed so it is capable of preventing fragments from being thrown. In addition, all other possible precautions shall be taken to prevent damage to livestock and other property and inconvenience to the property owner or tenant during blasting operations. Rock scattered outside the ROW by blasting operations shall immediately be hauled off or returned to the ROW.

Precautions shall be taken to prevent accidental discharge of blasting caps from currents induced by lightning, adjacent power lines, dust and snow storms, or other sources of extraneous electricity. These precautions shall include:

- Suspension of all blasting operations and removal of all personnel from the blasting area during the approach and progress of an electrical storm.
- The use of lightning detectors is mandatory.

No blast shall be fired until the blaster in charge has made certain all surplus explosive materials are in a safe place, all persons and equipment are at a safe distance or under sufficient cover, and an adequate warning signal has been given.

No loaded holes shall be left unattended or unprotected. Explosive shall not be primed or fused until immediately before the blast. After each blasting sequence, the contractor shall inspect the site for cut-offs and misfires. All explosives or blasting agents shall be verified as discharged prior to starting/resuming excavation.

The person making connections between the cap and fuse system shall fire the shot. All connections should be made from the bore hole back to the source of ignition. If there are misfires while using cap and fuse, all persons shall remain away from the charge for at least 15 minutes. Misfires shall be handled under the direction of the person in charge of the blasting and the construction ROW shall be carefully searched for the unexploded charges.

Explosives shall not be extracted from a hole once charged or misfired unless it is impossible to detonate the unexploded charge by insertion of a fresh additional primer.

6.5 Waterbody Crossing Blasting Procedures

Blasting should not be conducted within or near a stream channel without prior consultation and approval from the appropriate federal, state, and local authorities having jurisdiction to determine what protective measures must be taken to minimize damage to the environment and aquatic life of the stream. At a minimum, a five-work day notice must be provided to the appropriate federal, state, and/or local authorities. In addition to the blasting permits, a separate permit and approvals are required for blasting within the waters of the states of WV and PA. No streams are crossed in OH.

Rock drill or test excavation will occur within the limits of a flowing stream only after the stream flow has been redirected and maintained via dam and pump or flume crossing, as presented in Resource Report 2, Water Use and Quality. For streams with no flow at the time of rock drill or test excavation activities, the rock testing will be conducted in the streambed and the streambed disturbance created by the rock testing will be restored within the same day of disturbance.

Rock drill or test excavation and resulting blasting will occur once the stream flow has been redirected and maintained via dam and pump or flume crossing method. For these crossings of flowing streams, work will commence after the initial disturbance and continue until the stream crossing is installed and the streambed restored. Stream crossing methods and crossing mitigation measures are presented in Resource Report 2 and Resource Report 2 – Appendix 2-A.

To facilitate planning for blasting activities for waterbody crossings, rock drilled, or test excavations may be used in waterbodies to test the ditch-line during mainline blasting operations to evaluate the presence of rock in the trench-line. The excavation of the test pit or rock drilling is not included in the time window requirements for completing the crossing. For testing and subsequent blasting operations, stream flow will be maintained through the site. When blasting is required, the FERC timeframes for completing in-stream construction begin when the removal of blast rock from the waterbody is started. If, after removing the blast rock, additional blasting is required, a new timing window will be determined in consultation with the Environmental Inspector (EI). If blasting impedes the flow of the waterbody, the contractor can use a backhoe to restore the stream flow without triggering the timing window. Waterbody crossing procedures and proposed crossing methods are further discussed in Resource Report 1 and Resource Report 2.

Equitrans will halt all construction activities if the loss of stream flow occurs after a blasting event. The construction contractor and EI will evaluate the loss of water and develop a Contingency Plan to restore stream flow. This Contingency Plan will be provided to the local, state, and federal agencies having jurisdiction over the stream impacted, for their review and approval. Congruent with the contractor's and the EI's evaluation, temporary emergency contingency measures will be employed to halt the loss of stream flow. Immediately upon the agencies' approval of the Contingency Plan, the contractor will implement the measures outlined in the agency-approved Contingency Plan.

6.6 Karst Terrain Blasting Procedures

As discussed in Resource Report 6, no known karst features exist within the Project; however, portions of the Project area is underlain by formations susceptible to karst formation. Blasting will be conducted to not compromise the structural integrity of the karst hydrology and the Project's EI will monitor construction for karst features (sinkholes, caves, sinking or losing streams, ponors, pinnacled bedrock and large springs). If rock is required to be blasted to achieve grade, then the following parameters will be adhered to:

- The excavation will be carefully inspected for voids, openings or other tell-tale signs of solution activity.
- If the rock removal intercepts an open void, channel, or cave, the work in that area will be stopped until a remedial assessment can be carried out.

- Use of explosives will be limited to low-force charges that are designed to transfer the explosive force only to the rock which is designated for removal (maximum charge of two inches per second ground acceleration).

6.7 Wetland Crossing Blasting Procedures

Blasting for trench excavation crossing a wetland will be considered after all other reasonable means of excavating have been evaluated and determined to be unlikely to achieve the required trench grade.

Blasting should not be conducted within or near a wetland without the EI's review and development of a Wetland Crossing Blasting Plan that includes protective measures to minimize damage to wetlands. At a minimum, the individual Wetland Crossing Blasting Plan will be provided to the appropriate federal, state and local authorities for review and approval five working days prior to conducting the blasting.

Blasting will be conducted to not compromise the structural integrity of the wetland hydrology of known wetlands. If rock is required to be blasted to achieve trench grade, then the following parameters will be adhered to:

- The excavation will be carefully inspected for voids, openings, fractures, or other signs of dewatering activity by the Project's EI.
- If the rock removal intercepts an open void, channel, or fracture, the work in that area will be stopped until a remedial assessment can be carried out by the Project's EI.
- Use of explosives will be limited to low-force charges that are designed to transfer the explosive force to the rock which is designated for removal (maximum charge of two inches per second ground acceleration).

6.8 Rock Disposal Due to Blasting

During the course of blasting for grade and trench excavation, excess rock fragments deemed as unacceptable for trench backfill may be incurred. This excess rock may be used in the restoration of the disturbed ROW limits, with the rock buried within the reclamation limits of the ROW. With the acceptance, approval and signed individual landowner agreements for the placement of this excess rock, the rock placement will be to a depth that will help stabilize the ROW restoration and will be below the root zones of the cover vegetation.

If the excess rock needs removed from the construction area, it must be hauled to an approved local- and state-permitted disposal site. This disposal facility will need to demonstrate it is permitted to accept and dispose of the excess rock from the blasting operations. Equitrans will obtain a copy of the disposal facility's permit, as issued by the local jurisdiction having authority over the disposal facility and the disposal site within.

6.9 Disposal of Explosive Materials

Explosive materials that are deteriorated or damaged shall not be used and shall be destroyed according to applicable local, state, and federal requirements.

Empty containers and packages and paper or fiberboard packing materials that have contained explosive materials shall not be reused for any purpose. Such packaging materials shall be destroyed by burning (outside of the construction ROW) at an approved outdoor location or by other approved method. All personnel shall remain at a safe distance from the disposal area.

All other explosive materials will be transported from the job site in approved magazines per local and/or state regulations.

6.10 Blasting Records

A record of each blast shall be made and submitted with seismograph reports, to Equitrans' Project Inspector. The record shall contain the following minimum data for each blast:

- Name of company or contractor.
- Location, date and time of blast.
- Name, signature and license number of contractor and blaster in charge.
- Blast location referenced to the pipeline station/milepost.
- Picture record of the blast area disturbance and of blasted trench.
- Type of material blasted.
- Number of holes, depth of burden and stemming, and spacing.
- Diameter and depth of holes.
- Volume of rock in shot.
- Types of explosives used, specific gravity, energy release, pounds of explosive per delay, and total pounds of explosive per shot.
- Delay type, interval, total number of delays and holes per delay.
- Maximum amount of explosives per delay period of 17 milliseconds or greater.
- Power factor.
- Method of firing and type of circuit.
- Direction and distance in feet to nearest structure and utility neither owned or leased by the person conducting the blasting.
- Weather conditions.
- Type and height or length of stemming.
- If mats or other protection were used.
- Type of detonators used and delay periods used.

Within 48 hours following a blast, a Blast Report must be provided to Equitrans' Project Inspector. The Blast Report shall provide the information outlined by the "Blast Report form." This Blast Report form is considered the minimum information needed. Appendix B and Appendix C present the Blast Report forms. In addition to the completed Blast Report, the blast design is attached and made part of the Blast Report. The Project's Blast Report is in addition to other local, county, township, state, or federal reporting requirements. Copies of these Blast Reports are to be provided to the Project Inspector.

At the conclusion of each blasting event, the contractor is to conduct and inventory blasting/explosive materials with a written inventory report attached to the Blast Report. All blasting/explosive materials are to be accounted for. Discrepancies must be reported to the governing agencies and the Equitrans' Project Inspector.

The person taking the seismograph reading shall accurately indicate the exact location of the seismograph and show the distance of the seismograph from the blast.

Seismograph records should include:

- Name of person and firm operating and analyzing the seismograph record.
- Seismograph serial number.
- Seismograph reading.
- Maximum number of holes per delay period of 17 milliseconds or greater.

Within 72 hours following a blast, a Seismograph Report is to be provided to the Equitrans' Project Inspector. Appendix C presents the Seismograph Report Form for the Project. In addition to the completed Seismograph Report, the seismograph readings and written interpretations are attached to the report. This reporting is in addition to local, county, township, state, or federal reporting requirements. Copies of these Seismograph Reports are to be provided to the Project Inspector.

7.0 Post-Blasting Inspection

An approved independent contractor, with landowner permission, will examine the condition of structures within 150 feet, or as required by state or local ordinances, of the construction area after completion of blasting operations, to identify changes in the conditions of these properties or confirm damages noted by the landowner. The independent contractor, with landowner approval, will conduct a resampling of wells within 150 feet, or as required by state or local ordinances, of the construction area. Should damage or change occur during the blasting operations, an additional survey of the affected property may be made.

Upon receiving notice that a structure or other damages have occurred due to the blasting operations, the contractor shall conduct a post-blast conditions survey. The post-blast conditions survey shall be conducted within 48 hours after notification or at the landowner's schedule and permission. The post-blast conditions will be documented with the information outlined by "Post-Blast Survey form." This Post-Blast Survey form is considered the minimum information needed. Appendix D presents the Post-Blast Survey form.

8.0 Site-Specific Blasting Plans

For each area determined to require blasting, a site-specific Blasting Specification Plan will be prepared by the contractor. The site-specific Blasting Plans will include, at a minimum, the following information:

- Blaster's name, company, copy of license, and statement of qualifications.
- Seismograph company, names, equipment and sensor location.
- Site location (milepost and stationing), applicable alignment sheet numbers, and associated rock type and geological structure (solid, layered, or fractured).
- Copies of all required federal, state/commonwealth, and local permits.
- Methods and materials, including explosive type product name and size, weight per unit, and density. stemming material. tamping method. blasting sequence. use of non-electrical initiation systems for all blasting operations. and magazine type and locations for storage of explosives and detonating caps.
- Site dimensions, including explosive depth, distribution, and maximum charge and weight per delay. and hole depth, diameter, pattern, and number of holes per delay.
- Global Positioning System coordinates of blasting location(s), distance and orientation to nearest aboveground and underground structures, and dates and hours blasting will be conducted.
- Blasting procedures for:
    - Storing, handling, transporting, loading, and firing explosives.
    - Prevention of misfires, fly-rock, fire prevention, noise, and stray current accidental-detonation.
    - Signs, flagmen, and warning signals prior to each blast.
    - Locations where the pipeline route:
        - Parallels or crosses an electrical transmission corridor, cable, or pipeline.
        - Parallels or crosses a highway or road.

    - Approaches within 500 feet of a water well or within 150 feet of an oil and gas well.
    - Approaches within 1,000 feet of a residence, building, or occupied structure.
- Local notification.
- Inspections after each blast.
- Disposal of waste blasting material.
- Blasting considerations of steep slopes.
- Pipe dimensions and SMYS.
- Pipe grade, nonal size, wall thickness.
- Explosive type, Energy Efficiency Ratio.
- Maximum allowable operating pressure.
- Explosive grid.
- Equipment energy release ratio.
- Distance to nearest charge to pipeline, water well, oil and gas well.
- Angle between pipeline, water well, oil and gas and grid.
- Information as outlined by Section 6.3, Pre-Blast Operations, of this General Blasting Plan.

Equitrans' contractor shall submit the site-specific Blasting Plan(s) to the Equitrans' Project Inspector no less than 10 working days prior to conducting blasting for the Equitrans' Project Inspector and Engineering Department's review and approval.

APPENDIX A

Pre-Blast Survey

(Pipeline Facilities Grade, Trench Excavation, and Interconnect Sites)

Pre-Blast Survey

STRUCTURE INFORMATION

Owner Name:	
Mailing Address:	
Telephone No.:	
Street Address or Physical Address:	
Latitude:	Longitude:
County/Township:	State:
Nearest Pipeline Station/Milepost:	
Company Structure No.:	

OCCUPANT INFORMATION

Occupant Name:
Mailing Address:
Telephone No.:

SURVEYOR'S INFORMATION

Company Conducting Survey:
Mailing Address:
Telephone No.:
Contact Person to Discuss Survey:
Name of Approved Surveyor:
State of Approval:

STRUCTURE LOCATION MAP

Survey Map:	8 ½" x 11" copy of construction alignment sheet or site specific plan/drawing showing Ohio Valley Connector Expansion and structure surveyed. Attach map to survey.

SITE PLAN SKETCH

Site Plan:	8 " x 11" sketch showing all structures and relative locations, driveways, sidewalks, outbuildings, water wells, septic systems' components, and other man-made features as applicable. Use arrows to show site grade and slope. Include a North arrow and direction and distance to Ohio Valley Connector Expansion. The site plan sketch shall show the distance from the blast's end points to the adjacent natural gas pipeline(s) and/or/site developments.

Exterior Inspection
(Check all that apply)

Age of Structure
_____ years
☐ estimated
☐ provided by owner or occupant
☐ other (explain) _____

Use of Structure
☐ private dwelling
☐ commercial building
  ☐ retail
  ☐ factory
  ☐ office
  ☐ warehouse/storage
☐ multi-family dwelling
☐ single-family rental
☐ apartment building
☐ other (explain) _____

Type of Structure
☐ conventional dwelling
☐ mobile home
☐ mobile home with frame addition
☐ modular
☐ commercial (describe) _____
☐ other (explain) _____
☐ single story
☐ two story
☐ other (explain) _____

Frame Materials
☐ conventional wood frame
☐ timber frame
☐ steel
☐ masonry

Foundation Material
☐ poured concrete
☐ stone block
☐ cinder block
☐ concrete block
☐ other (explain) _____

Foundation Type
☐ crawl space
☐ full basement
☐ partial basement
☐ block on footing with center piers
☐ piers/posts/pillars with underpinning
☐ piers/posts/pillars without underpinning
☐ other (explain) _____
If dwelling is a mobile home are tie-downs in use ☐ yes ☐ no

Exterior Finish Materials
☐ brick
☐ concrete block
☐ cinder block
☐ stone
☐ stucco
☐ brick or stone laminate
☐ wood siding
☐ aluminum siding
☐ vinyl siding
☐ shingle (explain) _____
☐ other (explain) _____

Roofing Materials
☐ shingles
  ☐ asphalt
  ☐ cedar or other wood
  ☐ other (explain) _____
☐ slate
☐ tile
☐ tin or other metal
☐ tile
☐ tin or other metal
☐ tar & chip
☐ tarpaper
☐ other (explain) _____
☐ gutters installed? ☐ yes ☐ no
☐ downspouts installed? ☐ yes ☐ no
Routed away from foundation? ☐ yes ☐ no

Sidewalk/Walkway Material(s)
☐ concrete
☐ wood
☐ brick
☐ pavers/patio blocks

☐ flagstone
☐ other (explain) _____
☐ brick
☐ stone
☐ metal
☐ other (explain) _____

Roof Configuration
☐ sloped
☐ flat

☐ other (explain) _____
☐ block
☐ gravel
☐ tar & chip
☐ other (explain) _____

Driveway Material(s)
☐ concrete
☐ asphalt

Exterior Photos Labeled to Match Checklist Items.

Comments:

Well/Water Supply System
(Check all that apply)

Is there a treatment system:
☐ yes ☐ no

Type of treatment plant
_____

Is there a water sampling point
Prior to treatment:
☐ yes ☐ no

Sampling Information

May the well be unsealed to measure
depth to water and collect a water
sample ☐ yes ☐ no

May the well be pumped to measure
recharge character tics: ☐ yes ☐ no
Recharge rate: _____gmp
Date sampled: _____
Date measured: _____
Well sample #:_____
Well water latitude: _____
Well water longitude: _____
Spring water latitude: _____
Spring water longitude: _____

Septic/Sewage Treatment System
☐ public service system
☐ aeration system
☐ package
☐ septic tank
- ☐ concrete
- ☐ plastic
- ☐ metal
- ☐ other (explain)_____

☐ drain field
☐ other (explain)_____

Attach lab analysis of the pre-treatment water and available written well documentation. Provide source of documentation. Photos of water well(s), water supply, water treatment system, and septic/sewage treatment system and area.

STRUCTURE
(Check all that apply)

Interior Inspection

Provide written documentation of defects. Written documentation must be accompanied by photos or room sketches for each interior room.

Each interior room sketch must include type of construction materials and covering for each wall, the floor and the ceiling.

Each wall found to be defect free must be labeled "room completely surveyed" or "no defects observed."

Show areas hidden from view (hidden by furniture).

Interior photos of a room should be appropriately labeled to match written documentation to the photo (room and wall number).

Include a key to abbreviations used.

Include a floor plan sketch with rooms labeled and indicate direction of progression of the inspection.

Comments (include substandard construction):

Additional Buildings
(attach additional sheets for each additional building)

Type of Building
☐ barn
☐ garage
☐ well house
☐ storage
☐ other (explain) _____
Age: _____
☐ estimated
☐ owner provided
Exterior finish material: _____
Frame materials: _____
Roof materials: _____
Floor materials: _____
Foundation materials: _____

Is interior finished: ☐ yes ☐ no
Interior finish: _____

Provide written documentation and photos of exterior and interior with room sketches for each interior room of the additional buildings.

Comments

Owner/Resident:

Surveyor:

Structure
(Non-Residential)

Structure

☐ overhead utility
- ☐ electric
- ☐ telephone
- ☐ cable
- ☐ other

☐ buried utility
- ☐ electric
- ☐ telephone
- ☐ cable
- ☐ water
- ☐ sewage
- ☐ gas
- ☐ other

Structure Information

Owner:

Mailing address:

Contact name:

Contact telephone no.:

Location of structure: Latitude: Longitude:

County, Township, State:

Nearest pipeline station/mile post:

Structure description:

Structure ID number:

Company conducting survey:

Mailing address:

Telephone no.:

Contact person to discuss survey:

Name of approved surveyor:

State of approval:

Surveyor's Information

Structure Location Map

Survey Map: 8 ½" x 11" copy of construction alignment sheet or site specific plan/drawing showing Ohio Valley Connector Expansion or site and structure surveyed. Attach map of survey.

Site Plan Sketch

Site Plan: 8 ½" x 11" sketch showing structures and related facilities, as applicable. Use arrows to show site grade, slope, and ground clearances. Include a north arrow with direction and distance from structure to Ohio Valley Connector Expansion. The site plan sketch shall show the distance from the blast's end points to the pipeline trench and/or site developments. Provided photographs keyed to the site plan sketch showing the structure(s).

Type of Aerial Structure

☐ woods - poles
☐ metal poles
☐ metal towers
☐ other (describe) _____

Type of Buried Structure

☐ pipe
- ☐ PVC
- ☐ cast iron
- ☐ steel
- ☐ other

☐ cable
- ☐ direct burial
- ☐ conduit
- ☐ other

Surveyor's Comments:

(Attach additional pages and photos as needed)

APPENDIX B

Blast Report

(Pipeline Facilities Grade, Trench Excavation, and Interconnect Sites)

Blast Report

Blasting Company:

Address:

Company Blast Number:

Date and Time of Blast:

Environment

Weather:

Wind From:

Temperature:

Wind Velocity:

Blast Area

Blast Location _____ to _____ _____ _____
Pipeline Station/Mile Post Pipeline Station/Mile Post County State

Type of Material Blasted:
(Geologist Description)

Blast Layout

No. of Holes :	Burden:
No. of Volume Producing Holes :	Spacing:
No. of Rows:	Backfill Depth:
Hole Diameter:	Stem Type:
Hole Depth:	Water Depth:
Sub Drilling:	Stem Length:
Face Height:	Mats Used:
Drilling Angle:	Hole Diagram:
Total Drilling Footage:	Hole Layout and Numbering:

Blast Design

Initiation:	Rock Volume of Shot:
Firing Device:	Weight:
Max. Wt. of Exp. per Delay:	Provider Factor:
Max No. of Holes per Delay:	Rock Density:
Max Wt. of Explosive per Hole:	Specific Gravity:
Type of Circuit:	Energy Release:
Type of Delay and Interval:	Power Factor:

Blast Report

Products

Type of Construction Delays:

Nearest Structure
Structure Type:
Structure Name:
Structure Location: Latitude: Longitude:
Compass Point:
Bearing:
Distance:

Protection

Max Type (if used):
Max Weight (per mat):
Other than mat blast protection used (describe):

Safety Measures

Type of Safety Measures Implemented to Protect Blast Area from Unauthorized Personnel

_____
_____
_____

Location(s) of Safety Measures

Measure: Lat. _____ Long. _____ Measure: Lat. _____ Long.
Measure: Lat. _____ Long. _____ Measure: Lat. _____ Long.

Dates Safety Measures Placed

Date: _____ Measure _____ Date: _____ Measure
Date: _____ Measure _____ Date: _____ Measure

Dates Safety Measures Removed

Date: _____ Measure _____ Date: _____ Measure
Date: _____ Measure _____ Date: _____ Measure

Blast Report

Communication System

Type System used to Maintain Safe Blast Area:

Location of System(s):

Notices of Blast

Company/Person Providing Notice:
Verbal Date and Time of Notice:
Written Notice Date:
Written Notice Provided By:

Seismograph

Type Seismograph
Model and Serial Number
Calibration Date
Calibration Certificate Provided
Date and Time Seismograph Set
Date and Time Seismograph Removed
Seismograph Location Lat. _____ Long. _____
Seismograph Distance from Blast
Seismograph Compass Direction from Blast
Printed Copy of Read Out to be Provided
Reader and Firm
Analyst and Firm
Installer and Firm
Trigger Level _____ in/s
dB
Calibration ☐ Yes ☐ No
Geophone Min. Freq. _____ Hz
Traverse _____ in/s
Hz
Vertical _____ in/s
Hz
Longitudinal _____ in/s
Hz
Peak Partial Velocity _____ in/s
Hz
Acoustic _____ dB
Hz
Vector Sum _____ in/s - - -

(Detailed Seismograph Report Provided By Appendix D.)

Blast Report

Pictures

Picture(s) of blast area disturbance before blasting
Picture(s) date and time

Picture(s) of blasted trench after blast
Picture(s) date and time

Comments/Explanation of Blaster:

_____

_____

_____

Blaster

Signature of Blaster in Charge:_____ Date: _____

Printed Name of Blaster in Charge:

Blaster in Charge License Number:

Blaster in Charge License Expiration Date:

Blasting Company License Number:

Blasting Company License Expiration Date:

Signature of Blasting Company Person in Charge:

Printed Name of Blasting Company Person in Charge:

Date Report Submitted to Ohio Valley Connector Expansion:

Date: _____

APPENDIX C
Seismograph Report

Seismograph Company:

Address:

Blast Location (Pipeline Grade or Trench Excavation)

_____ to _____
Pipeline Station/Mile Post Pipeline Station/Mile Post County/Township
State

Blast Location (Compressor Station or Site Development)

Latitude Longitude County/Township State

Seismograph

_____
Type ModelSerial Number

_____ ☐ Yes ☐ No
Calibration Date Calibration Certificate Attached

Blast Monitoring

Blasting Company's Blasé Number
Blast Date and Time Date _____ Time
(Military Time)
Seismograph Location Latitude _____ Longitude
Seismograph Location Description

Seismograph Distance from Blast in Feet and Compass Direction

Seismograph Distance from Structure in Fee and Compass Direction

Trigger Level _____in/s _____ dB Traverse _____ in/s
Hz
Calibration Signal _____ Yes _____ No Vertical _____ in/s
Hz
Geophone Min. Freq. _____ Hz Longitudinal _____ in/s
Hz
Mic. Min. Freq. _____ Hz Peak Partial Velocity ____ in/s
Hz
Acoustic _____ dB
Vector Sum _____in/s

Blast Monitoring (Continued)

Reader and Firm
Analyst and Firm
Installer and Firm

Seismic Analysis

Velocity Waveform Analysis □ Attached
Zero Crossing Halfwave Frequency Analysis □ Attached

Blast Data

Number of Holes per Delay
Max. Number per Delay Period

Delay Period _____ Milliseconds

No Seismograph Trigger

Event Time Begin Date _____ Time
End Date _____ Time

Events Over Trigger
Record Time _____ Seconds
Seismic Trigger _____ in/s
Sound Trigger _____ dB
Battery Level

Shake Table Calibrated Date _____ By

Dynamic Calibration Graph Cal Test Results

Longitudinal	_____ Pass	_____ Fail
Transverse	_____ Pass	_____ Fail
Vertical	_____ Pass	_____ Fail
Sound	_____ Pass	_____ Fail

Person Analyzing Readings

Signature of Seismograph Reader Date

Printed Name of Seismograph Reader

Name of Company/Firm Analyzing Readings

The Seismograph Report, copy of seismograph readings, location sketch of seismograph placement, and Description documenting the location of each seismograph are to be attached to the Blast Report. A Seismograph Report must be completed for each seismograph. When no “trigger” event is encountered, a Seismograph Report must be submitted with the No Seismograph Trigger Section of the report completed.

APPENDIX D
Post-Blast Survey Report

Post Blast Survey

STRUCTURE INFORMATION

Owner Name:	
Mailing Address:	
Telephone No.:	
Street Address or Physical Address:	
Latitude:	Longitude:
County/Township:	State:
Nearest Pipeline Station/Milepost:	
Company Structure No.:	

OCCUPANT INFORMATION

Occupant Name:
Mailing Address:
Telephone No.:

SURVEYOR'S INFORMATION

Company Conducting Survey:
Mailing Address:
Telephone No.:
Contact Person to Discuss Survey:
Name of Approved Surveyor:
State of Approval:

REQUEST FOR POST-BLAST SURVEY

Name of Company/Person Requesting Post-Blasting Survey:
Mailing Address:
Telephone No.:
Physical Address:
Statement of Damage:

STRUCTURE LOCATION MAP

Survey Map:	8 ½" x 11" copy of construction alignment sheet or site specific plan/drawing showing Ohio Valley Connector Expansion and structure surveyed. Attach map to survey.

SITE PLAN SKETCH

Site Plan:	8 ½" x 11" sketch showing all structures and relative locations, driveways, sidewalks, outbuildings, water wells, septic systems' components, and other man-made features as applicable. Use arrows to show site grade and slope. Include a North arrow and direction and distance to Ohio Valley Connector Expansion. The site plan sketch shall show the distance from the blast's end points to the adjacent natural gas pipeline(s).

Exterior Inspection

Age of Structure

_____years

❑estimated
- ❑ provided by owner or occupant
- ❑ other (explain) _____

Use of Structure

- ❑ private dwelling
- ❑ commercial building
  - ❑ retail
  - ❑ factory
  - ❑ office
  - ❑ warehouse/storage
- ❑ multi-family dwelling
- ❑ single-family rental
- ❑ apartment building
- ❑ other (explain) _____

Type of Structure

- ❑ conventional dwelling
- ❑ mobile home
- ❑ mobile home with frame addition
- ❑ modular
- ❑ commercial (describe) _____
- ❑ other (explain) _____
- ❑ single story
- ❑ two story
  - ❑ other (describe) _____

Frame Materials

- ❑ conventional wood frame
- ❑ timber frame
- ❑ steel
- ❑ masonry

Foundation Material

- ❑ poured concrete
- ❑ stone block
- ❑ cinder block
- ❑ concrete block
- ❑ other (explain)

Foundation Type

- ❑ crawl space
- ❑ full basement
- ❑ partial basement
- ❑ block on footing with center piers
- ❑ piers/posts/pillars with underpinning
- ❑ piers/posts/pillars w/out underpinning

other (describe)
_____

If dwelling is a mobile home, are tie-downs in use? ☐yes ☐ no

Exterior Finish Materials

- ❑ brick
- ❑ concrete block
- ❑ cinder block
- ❑ stone
- ❑ stucco
- ❑ brick or stone laminate
- ❑ wood siding
- ❑ aluminum siding
- ❑ vinyl siding
- ❑ shingle (describe type)

- ❑ other (explain)

Roofing Material(s)

- ❑ shingles
  - ❑ asphalt
  - ❑ cedar or other wood
  - ❑ other (explain)_____
- ❑ slate
- ❑ tile
- ❑ tin or other metal
- ❑ tar & chip
- ❑ tarpaper
- ❑ other (explain)_____

❑ gutters installed? ☐ yes ☐ no

❑ downspouts installed? ☐ yes ☐ no

❑Routed away from foundation? ☐ yes ☐ no

Roof Configuration

- ☐ sloped
- ☐ flat

Chimney Material

- ☐ block
- ☐ brick
- ☐ stone
- ☐ metal
- ☐ other (explain)

Sidewalk/Walkway Material(s)

- ❑ concrete
- ❑ wood
- ❑ brick
- ❑ pavers/patio blocks
- ❑ flagstone

Driveway Material(s)

- ☐ concrete
- ☐ asphalt
- ☐ gravel
- ☐ tar & chip

Exterior Photos Labeled to Match Checklist Items.

Comments (including a description of any substandard construction):

Well/Water Supply System
(*check all that apply*)
Page 4

❑ Public Service Water Supply (*if not checked, complete the remainder of this page, and include a water analysis of untreated water).*

Water Use

❑ domestic
❑ irrigation domestic garden
❑ irrigation commercial crops
❑ livestock
❑ combined domestic and agricultural
❑ commercial (explain)

_____

❑ no water source at the site (explain)

_____

❑ cistern
Size_____gallons

Age_____years
Supplied by:

❑ rainwater
❑ spring
❑ runoff/stream

Location:

❑ aboveground
❑ buried

Material:

❑ concrete
❑ plastic
❑ metal
❑ other (explain) _____

❑ spring
❑ stream
❑ other (explain)_____

❑ dug well
depth_____ft. age_____
❑ brick lining
❑ stone lining
❑ other (explain)_____
❑ Pump type & size_____

_____

☐drilled well
☐steel casing
☐plastic casing
☐other (explain) _____
Casing depth_____ft.
Casing diameter_____in.
Well screen/liner diameter_____in.

Depth ft. to_____ft.
Well screen type _____

Vent type/size _____
Well driller _____

Pump type & size _____

Water Quantity

Has well ever gone dry ☐yes ☐ no
Has well capacity ever been measured

☐yes ☐ no If yes, list
data (recharge rate):_____gpm
How many people use this water

supply? _____

Water Quality

Does the water cause staining?

☐yes ☐ no
Stain color: _____
Items stained: _____

Are there particulates (solids) in the water? ☐yes ☐ no
If yes describe the particles (color, texture): _____

Does the water have an odor?
☐yes ☐ no If yes describe the odor

_____

Water Well/Septic-Sewage System

Well/Water Supply (continued)

Is there a treatment system?

☐yes ☐ no☐aeration system
Type of treatment:_____
the water sampling point prior to
treatment? ☐yes ☐ no

Sampling Information

May the well be unsealed to measure

depth to and of water? ☐yes ☐ no
Depth of water:_____ft.

Ground level to water:_____ft.
May the well be pumped to measure

recharge characteristics? ☐yes ☐no
Recharge rate_____gpm
Date measured: _____
Date sampled: _____
Well sample no.: _____

Septic/Sewage Treatment System

☐public service system

☐package plant Is
☐septic tank
☐concrete

- ❑ plastic
- ☐ metal
- ❑ other (explain) _____

☐drain field

☐other (explain) _____

Location Information

- ❑ water well
  - ❑ latitude ❑ longitude
- ❑ springs
  - ❑ latitude ❑ longitude
- ❑ septic/sewage
  - ❑ latitude ❑ longitude

Attach lab analysis of the pre-treatment water and available written well documentation. Provide source of documentation. Photos of water well(s), water supply, water treatment system, and septic/sewage treatment system and area.

Interior Inspection

Provide written documentation of defects. Written documentation must be accompanied by photos or room sketches for each interior room.

Each interior room sketch must include type of construction materials and covering for each wall, the floor and the ceiling.

Each wall found to be defect free must be labeled "room completely surveyed" or "no defects observed".

Show areas hidden from view (hidden by furniture).

Interior photos of a room should be labeled to match written documentation to the photo (room and wall number).

Include a key to abbreviations used.

Include a floor plan sketch with rooms labeled and indicate direction of progression of the inspection.

Comments (include substandard construction): _____

_____

_____

Additional Buildings

Additional Building (attach additional sheets for each additional building). Type of building

- ❑ barn
- ❑ garage
- ❑ well house
- ❑ storage
- ❑ other (explain) _ Age _____
  - ❑ estimated
  - ❑ owner provided

Exterior finish material _____
Frame materials _____
Roof materials _____
Floor materials _____
Foundation materials _____
Is interior finished □yes □no

Interior finish _____

Provide written documentation and photos of exterior and interior with room sketches for each interior room of the additional building.

Comments

Owner/resident: _____

_____

_____

_____

Surveyor: _____

_____

_____

_____

DAMAGE SUMMARY

Damaged Facility: _____
List Facility Damaged

Type of Damage: _____
(Attach sketch of damaged facility, facility location, and photograph)

Date of Blast and Time: _____ _____
Date Military Time
(Attach copy of blast design and blast report)

Pipeline Trench Location: _____ to _____ _____ _____
Pipeline Station/Milepost Pipeline Station/Milepost County/Township State

Pipeline Trench to Damage Location: _____
Distance from Blasting Site (in Feet) and Location Compass Direction

Seismograph Report: _____
(Attach Seismograph Report)

Pipeline Trench Fracture Zone: _____ _____
Length in Feet Width in Feet

Changes Implemented Blast Design: _____
Weight of Change

_____
Distribution of Change in Blast Hole

_____
Weight of Explosive per Delay

_____
Shot Hole Pattern

_____
Supplier/Manufacturer of Explosive

_____
Explosive Grade

Ground Geology: _____
List Changes Before Blast and After Blast

DAMAGE SUMMARY

Provide Written Comments of:Equitrans Chief Blasting Inspector:

Blaster:

Post-Blast Surveyor Seismologist:

Facility Owner:

Provide written comments of suggested changes to future blast designs for Ohio Valley Connector Expansion.

Provide written comments as to actions to be taken to correct the damages.