Aquatic Resource Report for the Mountain Valley Pipeline Project

US National Forest Service (National Forest) Lands, Monroe County, West Virginia; Giles and Montgomery Counties, Virginia

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LIST OF ACRONYMS AND ABBREVIATIONS

ACRONYM	MEANING
1987 Manual	US Army Corps of Engineers Wetland Delineation Manual
FAC	Facultative
FACU	Facultative Upland
FACW	Facultative Wetland
GIS	Geographic Information Systems
GPS	Global Positioning System
HGM	Hydrogeomorphic
MVP	Mountain Valley Pipeline, LLC
NHD	National Hydrography Dataset
NRCS	Natural Resources Conservation Service
NWI	National Wetlands Inventory
OBL	Obligate
PEM	Palustrine Emergent
PFO	Palustrine Forested
Project	Mountain Valley Pipeline Project
PSS	Palustrine Scrub-Shrub
Regional Supplement	Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont Region
ROW	Right-of-Way
Tetra Tech	Tetra Tech, Inc.
Transco	Transcontinental Gas Pipeline Company, LLC
UNT	Unnamed Tributary
UPL	Upland
USACE	United States Army Corps of Engineers
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
VA	Virginia
WV	West Virginia

1.0 PROJECT INTRODUCTION

Mountain Valley Pipeline, LLC (MVP), a joint venture between EQT Midstream Partners, LP and affiliates of NextEra Energy, Inc., WGL Holdings, Inc., Consolidated Edison Gas Midstream, LLC., and RGC Midstream, LLC, is proposing to construct and operate the Mountain Valley Pipeline Project (Project) located within 11 counties in West Virginia (WV) and six counties in Virginia (VA). MVP plans to construct an approximately 303-mile, 42-inch-diameter natural gas pipeline to provide timely, cost-effective access to the growing demand for natural gas for use by local distribution companies, industrial users, and power generation in the Mid-Atlantic and southeastern markets, as well as potential markets in the Appalachian region.

The proposed pipeline will extend from the existing Equitrans, L.P. transmission system and other natural gas facilities in Wetzel County, WV to the Transcontinental Gas Pipe Line Company, LLC's (Transco) Zone 5 Compressor Station 165 in Pittsylvania County, VA. In addition to the pipeline, the Project will include approximately 171,600 horsepower of compression at three compressor stations currently planned along the route, as well as measurement, regulation, and other ancillary facilities required for the safe and reliable operation of the pipeline.

This Aquatic Resource Report for the proposed Project has been prepared by Tetra Tech, Inc. (Tetra Tech) on behalf of MVP. The proposed Project route on US Forest Service (National Forest) Lands in Monroe County, WV, Giles County, VA, and Montgomery County, VA is shown on United States Geological Survey (USGS) Project Location Maps (Figures 1-1 to 1-2). The content of this report presents the methodology, results, and conclusions of wetland delineation and stream identification activities completed for the proposed Project on US Forest Service (National Forest) Lands in Monroe, Giles, and Montgomery Counties.

2.0 METHODOLOGY

2.1 Wetland Delineation

United States Army Corps of Engineers (USACE) requires the use of the procedures enumerated in the *USACE Wetland Delineation Manual* (*1987 Manual*; Environmental Laboratory, 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont Region* (*USACE Regional Supplement*; Environmental Laboratory, 2012) for making jurisdictional determinations. According to the *1987 Manual* (Environmental Laboratory, 1987), an area is defined as a wetland if, under normal circumstances, it meets all three of the following criteria:

1. Predominance of hydrophytic vegetation (plants adapted for life in saturated soil conditions);
2. Hydric soils (soils formed under water, or in saturated conditions); and
3. Wetland hydrology (presence of inundated or saturated soils at some time during the growing season).

Wetlands identified in the field were classified in accordance with the U.S. Fish and Wildlife Service's (USFWS) *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin et al., 1979), *A Hydrogeomorphic (HGM) Classification for Wetlands (*Brinson, 1993) and USACE Waters Type (USACE, 2007). Cowardin wetland classifications (Cowardin et al., 1979) are as follows:

Palustrine emergent (PEM) – emergent, herbaceous (non-woody) plants are the tallest life form with at least 30 percent aerial coverage

Palustrine scrub-shrub (PSS) –woody plants less than six meters (20 feet) in height are the tallest life form with at least 30 percent aerial coverage, or, when trees or shrubs alone cover less than 30 percent of an area but in combination cover 30 percent or more. Trees are defined as woody plants at least six meters (20 feet) in height and shrubs are defined as woody plants less than six meters (20 feet) in height

Palustrine forested (PFO) - woody plants at least six meters (20 feet) in height are the tallest life form with at least 30 percent aerial coverage

Dominant vegetation was identified and classified according to *The National Wetland Plant List: 2016 wetland ratings* (Lichvar, 2016). Plant classifications are as follows:

Obligate (OBL) - essentially always found in wetlands; estimated probability >99%
Facultative Wetland (FACW) - usually found in wetlands; estimated probability 67%-99%
Facultative (FAC) - equally likely to occur in wetlands and non-wetlands; estimated probability 34%-66%
Facultative Upland (FACU) - sometimes occurs in wetlands; estimated probability 1%-33%
Upland (UPL) – rarely occurs in wetlands; estimated probability <1%

2.2 Stream Identification

Streams identified in the field were classified by Flow Regime, USACE Water Type (USACE, 2007), and Cowardin Classification (Cowardin et al., 1979).

Streams were designated in the field as ephemeral if they exhibited the following characteristics: ephemeral streams typically exhibit short duration flow derived from precipitation and precipitation driven run-off from the localized surrounding landscape. Ephemeral streams are located above the groundwater table and are not augmented by groundwater sources. Ephemeral streams are often dry. Therefore, no permanent fish species persistently reside in streams exhibiting this flow regime. Aquatic macroinvertebrates are also not common within this flow regime and the absence is often used to support the determination of a stream being ephemeral. As practical, the source of hydrology for a stream was identified. If the stream received no groundwater contributions then it was designated as ephemeral.

Streams were designated in the field as intermittent if they exhibited the following characteristics: intermittent streams exhibit periods of flowing water during the wet season (winter through spring), but normally flow does not persist year-round. Intermittent streams derive at least a portion of their hydrology

from ground water sources. Precipitation and precipitation driven run-off from the surrounding landscape serve as supplemental hydrologic contributors. Only pioneer fish species potentially occupy streams of this flow regime when conditions are optimal. Aquatic macroinvertebrate populations in intermittent streams differ from season to season depending on stream flow fluctuations. As practical, the source of hydrology for a stream was identified. If the stream received groundwater contributions then it was designated as either an intermittent or perennial.

Streams were designated in the field as perennial if they exhibited the following characteristics: perennial streams have continuous flow year-round during years of normal rainfall. Perennial streams, like intermittent streams, derive hydrology from ground water sources. Precipitation and precipitation driven run-off from the surrounding landscape serve as supplemental hydrologic contributors. Usually numerous ephemeral and intermittent streams are tributaries to perennial streams. These tributaries allow for a large enough drainage area and groundwater inflow to allow for continuous flow year-round. Various fish and macroinvertebrate species may be present if suitable water quality parameters are present.

2.3 Field Surveys

The field investigations for the proposed Project were performed on September 11 & 14, 2015; October 16 – 17, 2015; June 17 & 28, 2016; and May 10, 2017. The study area was at least 300-feet wide along the proposed pipeline right-of-way (ROW) and 100-feet wide along proposed access roads, in addition to specific areas identified for proposed workspaces. Study areas were investigated for the presence of potential wetlands and streams. The final study area is illustrated on Figures 1-1 to 1-2.

Preliminary site reconnaissance of the study area was conducted through a review of available Geographic Information Systems (GIS) resources. Existing information reviewed included the following:

- USGS topographic mapping (Figures 1-1 to 1-2; USGS, 2009)
- Natural Resources Conservation Service (NRCS) National Cooperative Soil Survey (Figures 2-1 to 2-2; NRCS, 2014)
- USFWS National Wetland Inventory (NWI) Mapping (Figures 3-1 to 3-2; USFWS, 2009)

Wetland delineation in the field involved the establishment of the wetland/upland margin with flagging hung at intervals that accurately depicted the outline of the boundary. The individual flags were then located using a Global Positioning System (GPS) receiver with sub-meter accuracy and later added to the Project area mapping. Wetland flagging was limited to the bounds of the investigated study area and wetlands are shown as closed or partially closed systems on the detail maps (Figures 4-1 to 4-21).

All wetlands and streams identified were given unique identification names (i.e. Wetland ID, Stream ID). For streams, the National Hydrography Dataset (NHD) mapped stream names (USGS, 2015) are also provided in the results. For identified streams without a NHD name, the identified stream was given the name, “Unnamed Tributary (UNT)”, of the first named receiving waterbody.

Data concerning soils, hydrology, and vegetation were collected and recorded on USACE Wetland Determination Data Forms at wetlands and at upland point locations associated with each wetland. USACE Wetland Determination Forms are provided in Appendix A. Photographs depicting wetland topography and vegetation are included in Appendix B. Stream data sheets detailing stream characteristics are provided in Appendix C. Appendix D contains photographs of streams identified within the study area. A matrix of Project field personnel, summarizing professional experience, qualifications, and education, is included in Appendix E.

The proposed Project pipeline ROW is approximately 3.4 miles long on US Forest Service (National Forest) Lands in Monroe, Giles, and Montgomery Counties, with approximately 6.8 miles of existing access roads proposed for Project use. As of December 2016 MVP has conducted field surveys for wetlands and waterbodies on all of the proposed pipeline ROW and access roads proposed for Project use on US Forest Service (National Forest) Lands in Monroe, Giles, and Montgomery Counties.

3.0 RESULTS

The field investigations identified 5 areas within the Project study area on US Forest Service (National Forest) Lands in Monroe, Giles, and Montgomery Counties that met the wetland criteria outlined in the *1987 Manual* (Environmental Laboratory, 1987), as amended by the *USACE Regional Supplement* (Environmental Laboratory, 2012). Additionally, 27 streams were identified within the Project study area on US Forest Service (National Forest) Lands in Monroe, Giles, and Montgomery Counties.

The detail maps provided as Figures 4-1 to 4-21 illustrates the wetland and stream locations in relation to the study area. Tables 1 and 2 summarize wetland and stream information for all wetlands and streams identified within the Project study area.

3.1 Wetland Identification and Delineation

A review of the NRCS Soil Survey and hydric soil list indicates that there is one soil mapped within the study area classified as hydric or containing hydric components (Table 3). Hydric soils and soils with hydric components are often associated with wetlands. The NRCS soil survey mapping units are shown on Figures 2-1 to 2-2. Confirmation of the soil mapping units was not performed during this site evaluation.

A review of the USFWS NWI database indicates that there are no NWI mapped wetlands identified in the Project study area (Figures 3-1 to 3-2).

Based on our review of available GIS mapping data, evidence collected during field surveys, and best professional judgment, 5 wetlands were identified and delineated within the study area. These areas demonstrated the presence of all three wetland parameters required by the *1987 Manual* (Environmental Laboratory, 1987) and the *USACE Regional Supplement* (Environmental Laboratory, 2012):

1. Predominance of hydrophytic vegetation (plants adapted for life in saturated soil conditions);
2. Hydric soils (soils formed under water, or in saturated conditions); and
3. Wetland hydrology (presence of inundated or saturated soils at some time during the growing season).

A summary of each wetland identified and delineated within the Project study area is provided in Table 1. Table 1 shows the location of each wetland, Cowardin classification, HGM classification, Waters Type classification, the identity of any associated (i.e. abutting or adjacent) waterbodies, wetland size within the study area (in acres and square feet), whether the wetland boundary is open or closed (open wetland boundaries indicate that delineated wetlands continue beyond the Project study area), and dominant vegetation identified within the wetland. Wetlands with multiple habitat types (e.g. PEM and PSS) are considered a single wetland system and are counted as one wetland. The wetland size provided in Table 1 represents the size of the wetland delineated within the Project study area. Open boundary wetlands continue beyond the survey area; therefore, the size of open boundary wetlands may be larger than the size provided in Table 1.

USACE wetland determination data forms detailing the existing vegetation, soil characteristics, and hydrology for each wetland and its associated upland point are provided in Appendix A. Photographs of each delineated wetland are provided in Appendix B.

3.2 Stream Identification and Evaluation

Based on our review of available GIS mapping data, evidence collected during field surveys, and best professional judgment, 27 streams were identified and evaluated within the study area. Streams with braided channels, streams that have different flow regimes (e.g. ephemeral and intermittent) within the surveyed reach, and named streams with different field identification names are counted as single streams. A summary of each stream identified and evaluated within the Project study area is provided in Table 2. Table 2 shows the stream field identification name (Stream ID), the NHD mapped stream name (NHD

Stream Name), stream location, Flow Regime classification, Water Type classification, and top of bank width.

Stream data sheets detailing the bank and channel measurements, substrate composition, aquatic habitat, and hydrology are provided for each stream in Appendix C. Photographs of each identified stream are provided in Appendix D.

4.0 CONCLUSION

During the field investigations of the Project study area on US Forest Service (National Forest) Lands in Monroe, Giles, and Montgomery Counties, 5 locations were identified and delineated as wetlands in accordance with the *1987 Manual* (Environmental Laboratory, 1987) and the *USACE Regional Supplement* (Environmental Laboratory, 2012). In addition, 27 streams were identified and evaluated within the Project study area on US Forest Service (National Forest) Lands in Monroe, Giles, and Montgomery Counties. A summary of wetland and stream data is provided in Tables 1 and 2 and locations of all identified wetlands and streams are shown on Figures 4-1 to 4-21.

5.0 REFERENCES

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Figures

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Figures 2-1 to 2-2	**NRCS Soils Maps**
Figures 3-1 to 3-2	**National Wetland Inventory Maps**
Figures 4-IND-1 to 4-IND-2	**Index Detail Maps**
Figures 4-1 to 4-21	**Detail Maps**

Legend

- Proposed Route
- Study Area
- Appalachian National Scenic Trail (ANST)
- U.S. Forest Service (National Forest) Lands
- Peters Mountain Wilderness

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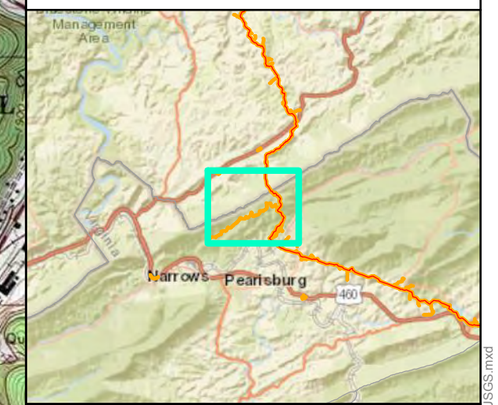

Mountain Valley Pipeline Project

Mountain Valley PIPELINE

USGS Project Location Map
U.S. National Forest Service (National Forest) Lands

Figure 1-1
Monroe County, WV/Giles County, VA

June, 2017

Data Sources: ESRI Streaming Data 2014. USDA Forest Service surface ownership, https://data.fs.usda.gov/geodata.

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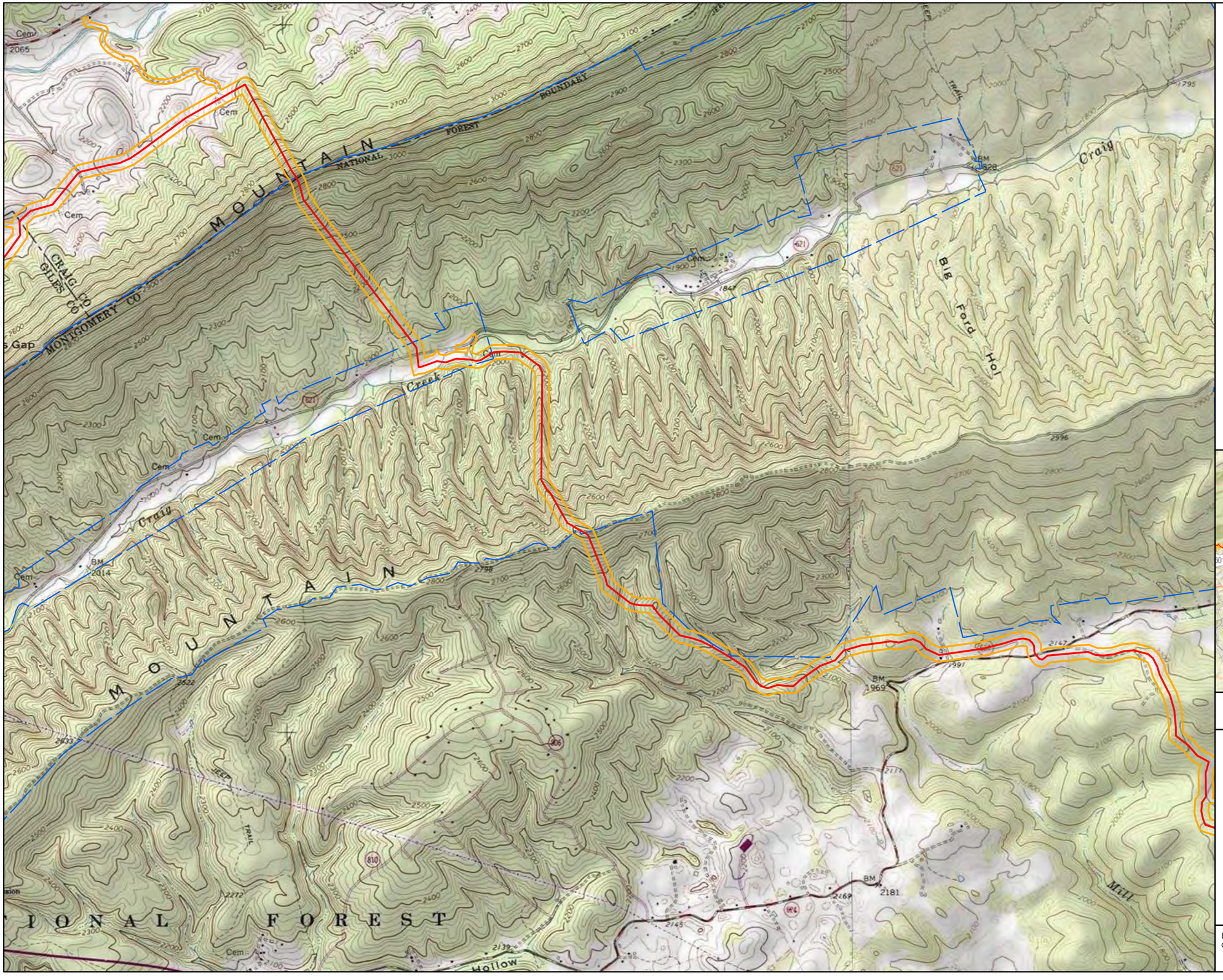

Legend

- Proposed Route
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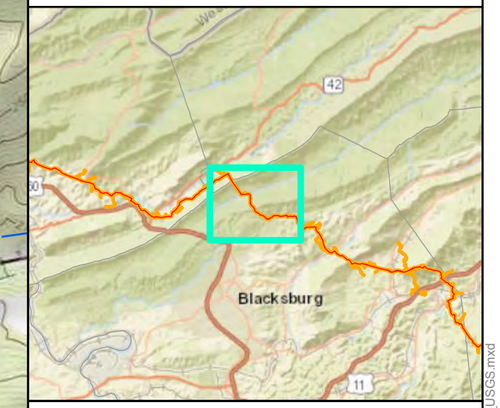

Mountain Valley Pipeline Project

Mountain Valley PIPELINE

USGS Project Location Map
U.S. National Forest Service (National Forest) Lands

Figure 1-2
Monroe County, WV/Giles County, VA

June, 2017

Data Sources: ESRI Streaming Data 2014. USDA Forest Service surface ownership, https://data.fs.usda.gov/geodata.

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Legend

- Porposed Route
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- Appalachian National Scenic Trail (ANST)
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- Peters Mountain Wilderness
- NRCS Soils and Codes

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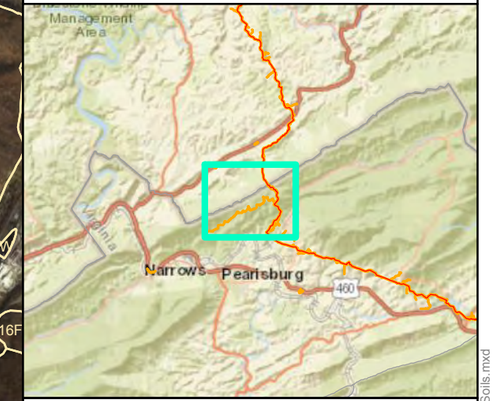

Mountain Valley Pipeline Project

Mountain Valley PIPELINE

NRCS Soils and Codes Map
U.S. National Forest Service (National Forest) Lands

Figure 2-1
Monroe County, WV/Giles County, VA

June, 2017

Data Sources: ESRI Streaming Data 2014, Gridded Soil Survey Geographic Database for West Virginia (2014), Geospatial Gateway. USDA Forest Service surface ownership, https://data.fs.usda.gov/geodata.

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Legend

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- GeP NRCS Soils and Codes

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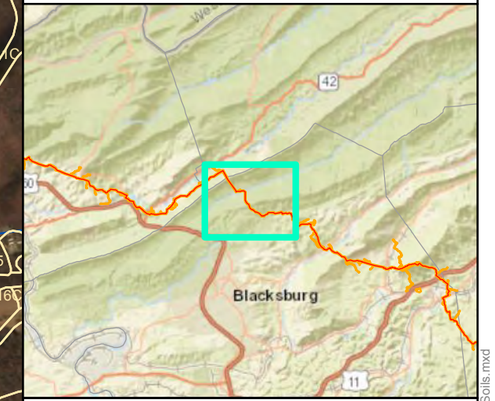

Mountain Valley Pipeline Project

Mountain Valley PIPELINE

NRCS Soils and Codes Map
U.S. National Forest Service (National Forest) Lands

Figure 2-2
Monroe County, WV/Giles County, VA

June, 2017

Data Sources: ESRI Streaming Data 2014, Gridded Soil Survey Geographic Database for West Virginia (2014), Geospatial Gateway. USDA Forest Service surface ownership, https://data.fs.usda.gov/geodata.

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Legend

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- Peters Mountain Wilderness
- NWI Wetlands and Codes

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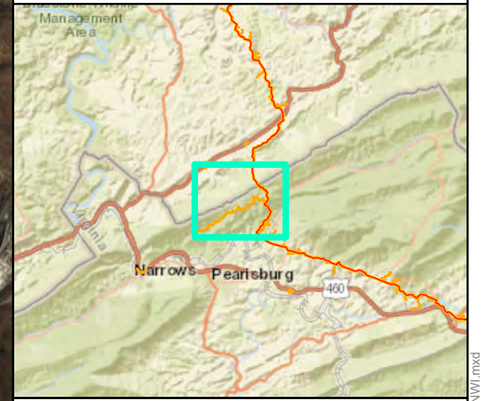

Mountain Valley Pipeline Project

Mountain Valley PIPELINE

NWI Wetlands and Codes Map
U.S. National Forest Service (National Forest) Lands

Figure 3-1
Giles County, Virginia

June, 2017

Data Sources: ESRI Streaming Data 2014. National Wetlands Inventory, National Hydrography Dataset for West Virginia (2014). Geospatial Gateway. USDA Forest Service surface ownership, https://data.fs.usda.gov/geodata.

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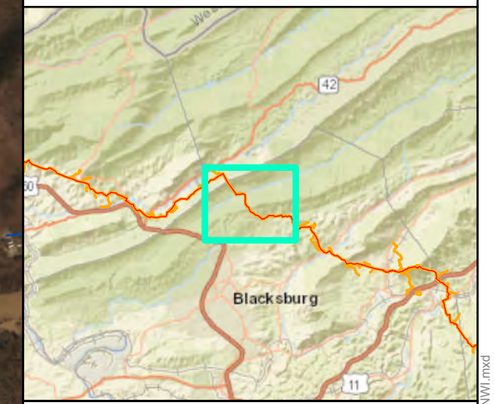

Mountain Valley Pipeline Project

Mountain Valley PIPELINE

NWI Wetlands and Codes Map
U.S. National Forest Service (National Forest) Lands

Figure 3-2
Montgomery County, Virginia

June, 2017

Data Sources: ESRI Streaming Data 2014. National Wetlands Inventory, National Hydrography Dataset for West Virginia (2014), Geospatial Gateway. USDA Forest Service surface ownership, https://data.fs.usda.gov/geodata.

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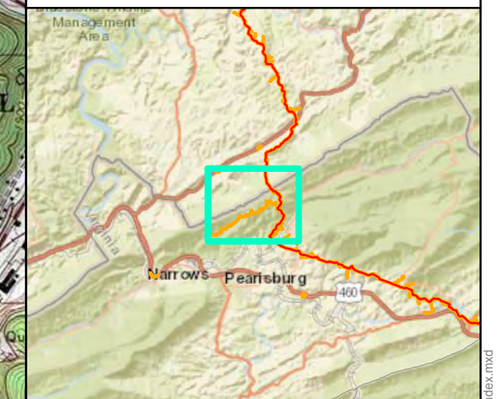

Mountain Valley Pipeline Project

Mountain Valley PIPELINE

USGS Project Location Map
U.S. National Forest Service (National Forest) Lands

Figure 4-INDEX-1
Giles County, Virginia

June, 2017

Data Sources: ESRI Streaming Data 2014. USDA Forest Service surface ownership. http://data.fs.usda.gov/geodata.

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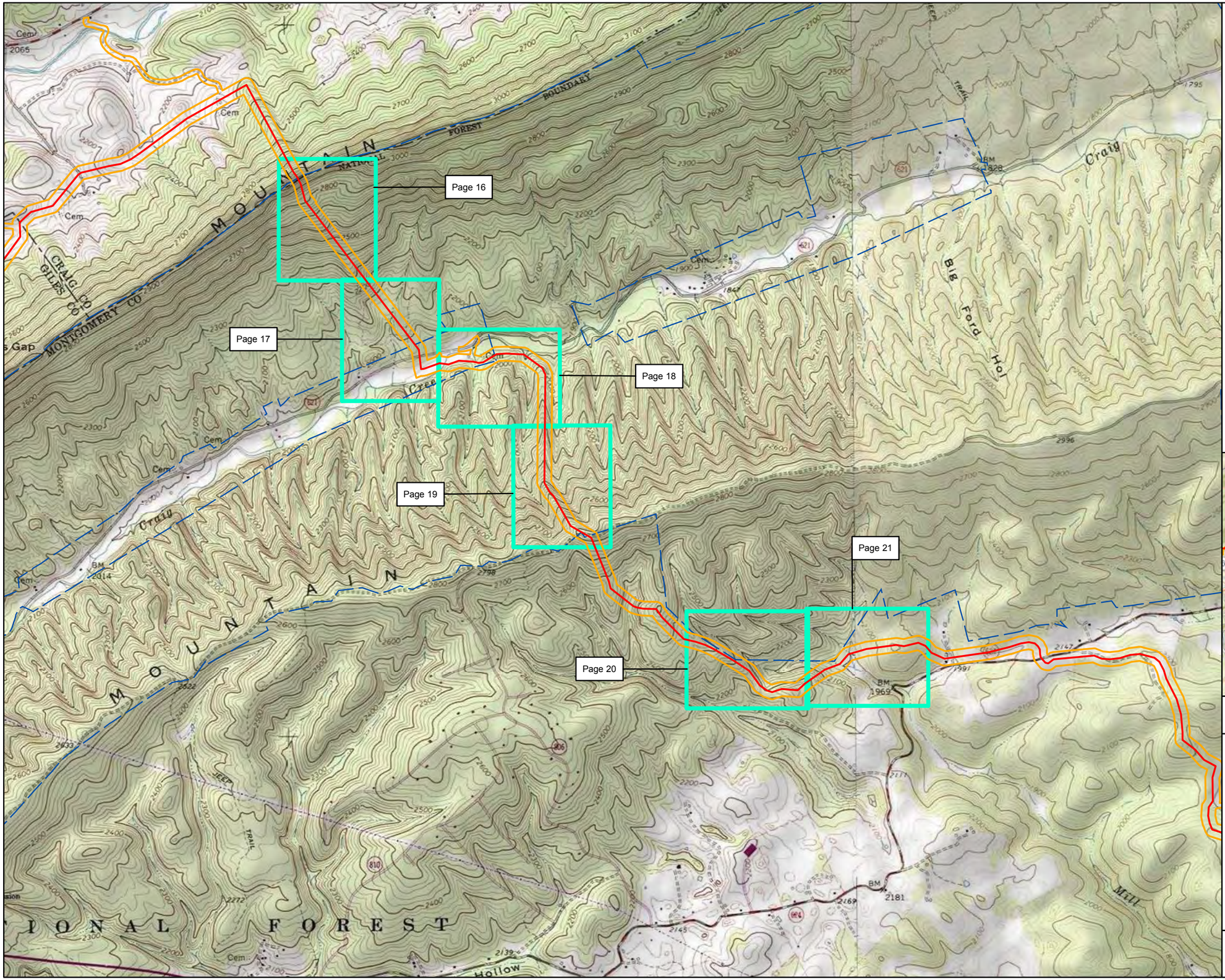

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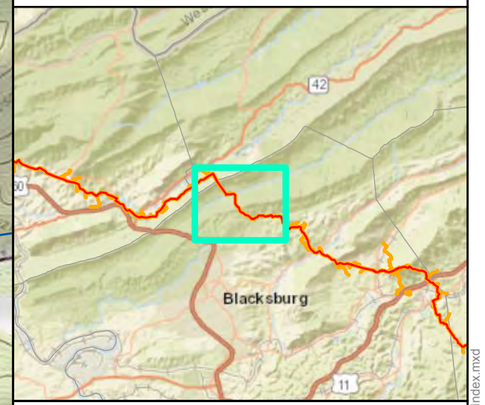

Mountain Valley Pipeline Project

Mountain Valley PIPELINE

USGS Project Location Map
U.S. National Forest Service (National Forest) Lands

Figure 4-INDEX-2
Montgomery County, Virginia

June, 2017

Data Sources: ESRI Streaming Data 2014. USDA Forest Service surface ownership. http://data.fs.usda.gov/geodata.

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Legend

- Milepost
- Stationing
- Proposed Route
- Limit of Disturbance
- Study Area
- U.S. Forest Service (National Forest) Lands
- Peters Mountain Wilderness
- Appalachian National Scenic Trail (ANST)
- County Boundary
- Culvert
- Drainage Feature

Stream
- Perennial
- Intermittent
- Ephemeral

- Sample Location
- Pond

Wetland
- PEM
- PSS
- PFO

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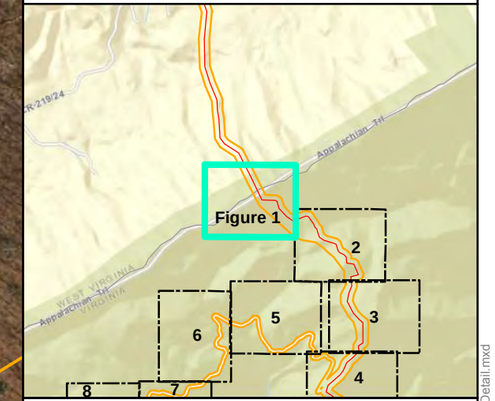


Mountain Valley Pipeline Project

Mountain Valley PIPELINE

Detail Map
U.S. National Forest Service (National Forest) Lands

Figure 4-1
Giles/Monroe County, Virginia

June, 2017

Data Sources: ESRI Streaming Data 2014. USDA Forest Service surface ownership, https://data.fs.usda.gov/geodata/edw.

Document Path: PGH Z:\EQT_MVP\Mapdocs\Wetlands\VA\USFS\MVP_USFS_Detail.mxd

196.7
196.8
196.9
197
197.1
197.2
S-MVP19
S-MVP18
S-SS2
Peters Mountain Wilderness
W-KL14-UP
W-KL14
W-KL14
161 SqFt
1 in = 50 ft

Legend

- Milepost
- Stationing
- Proposed Route
- Limit of Disturbance
- Study Area
- U.S. Forest Service (National Forest) Lands
- Peters Mountain Wilderness
- Appalachian National Scenic Trail (ANST)
- County Boundary
- Culvert
- Drainage Feature

Stream
- Perennial
- Intermittent
- Ephemeral

- Sample Location
- Pond

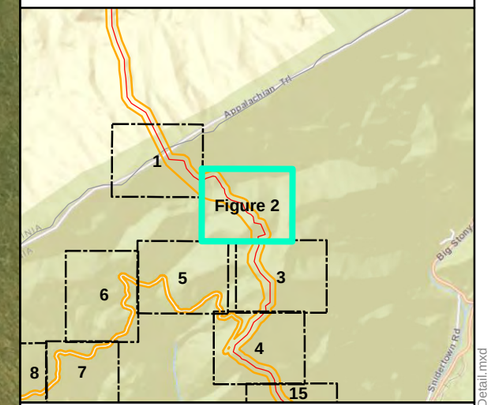
Wetland
- PEM
- PSS
- PFO

NAD 1983 UTM 17N

N
W E
S

1:2,400

0 520 Feet



Mountain Valley Pipeline Project

Mountain Valley PIPELINE

Detail Map
U.S. National Forest Service (National Forest) Lands

Figure 4-2
Giles County, Virginia

June, 2017

Data Sources: ESRI Streaming Data 2014. USDA Forest Service surface ownership, https://data.fs.usda.gov/geodata/edw.

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Legend

- Milepost
- Stationing
- Proposed Route
- Limit of Disturbance
- Study Area
- U.S. Forest Service (National Forest) Lands
- Peters Mountain Wilderness
- Appalachian National Scenic Trail (ANST)
- County Boundary
- Culvert
- Drainage Feature

Stream

- Perennial
- Intermittent
- Ephemeral

- Sample Location
- Pond

Wetland

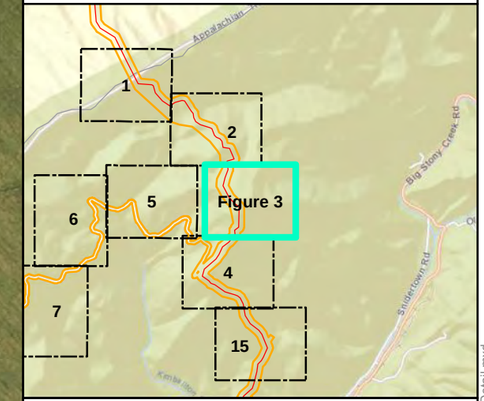
- PEM
- PSS
- PFO

NAD 1983 UTM 17N

1:2,400

N W E S

0 520 Feet



Mountain Valley Pipeline Project

Mountain Valley PIPELINE

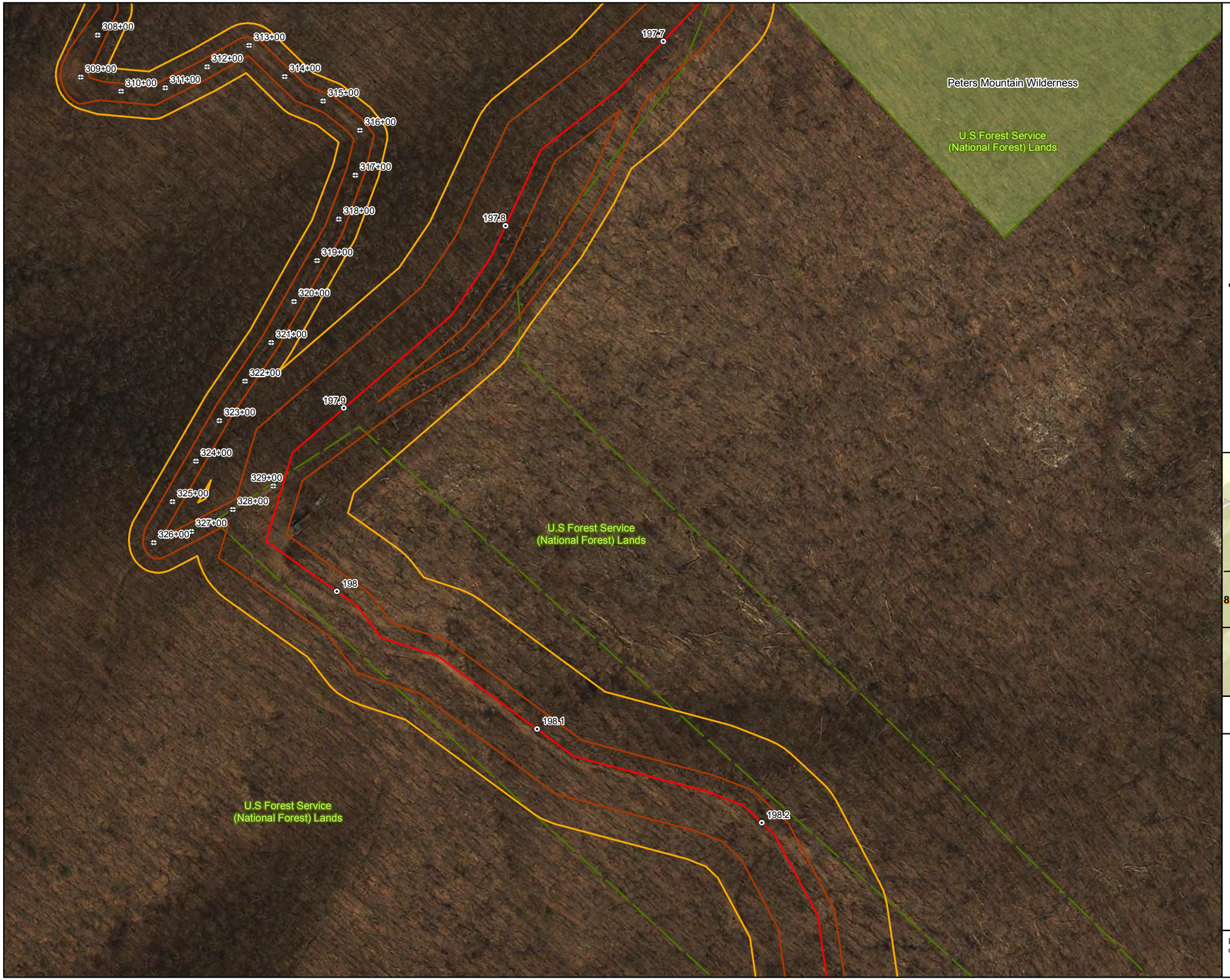
Detail Map
U.S. National Forest Service (National Forest) Lands

Figure 4-3
Giles County, Virginia

June, 2017

Data Sources: ESRI Streaming Data 2014. USDA Forest Service surface ownership, https://data.fs.usda.gov/geodata/edw.

Document Path: PGH Z:\EQT_MVP\Mapdocs\Wetlands\VA\USFS\MVP_USFS_Detail.mxd



Legend

- Milepost
- Stationing
- Proposed Route
- Limit of Disturbance
- Study Area
- U.S. Forest Service (National Forest) Lands
- Peters Mountain Wilderness
- Appalachian National Scenic Trail (ANST)
- County Boundary
- Culvert
- Drainage Feature

Stream
- Perennial
- Intermittent
- Ephemeral

- Sample Location
- Pond

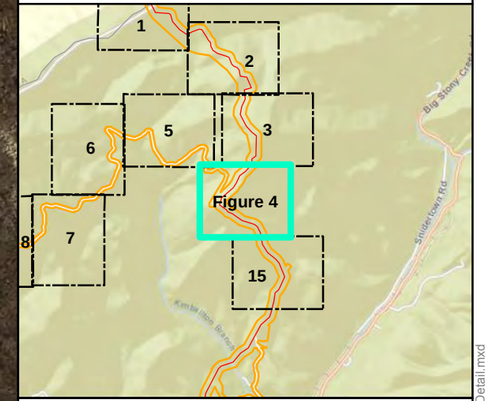
Wetland
- PEM
- PSS
- PFO

NAD 1983 UTM 17N

1:2,400

N
W E
S

0 520 Feet



Mountain Valley Pipeline Project

Mountain Valley PIPELINE

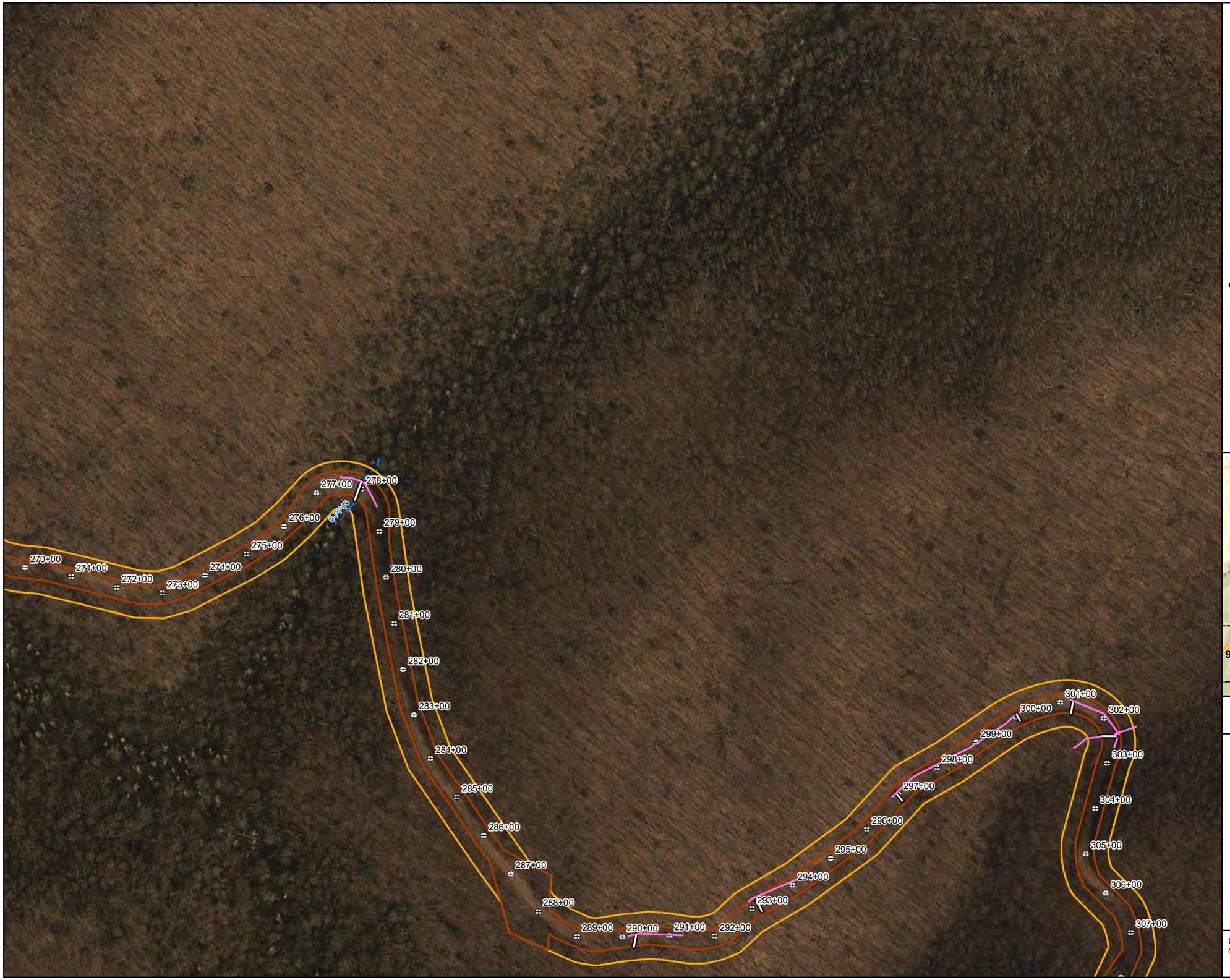
Detail Map
U.S. National Forest Service (National Forest) Lands

Figure 4-4
Giles County, Virginia

June, 2017

Data Sources: ESRI Streaming Data 2014. USDA Forest Service surface ownership, https://data.fs.usda.gov/geodata/edw.

Document Path: PGH Z:\EQT_MVP\Mapdocs\Wetlands\VA\USFS\MVP_USFS_Detail.mxd



Legend

- Milepost
- Stationing
- Proposed Route
- Limit of Disturbance
- Study Area
- U.S. Forest Service (National Forest) Lands
- Peters Mountain Wilderness
- Appalachian National Scenic Trail (ANST)
- County Boundary
- Culvert
- Drainage Feature

Stream
- Perennial
- Intermittent
- Ephemeral

- Sample Location
- Pond

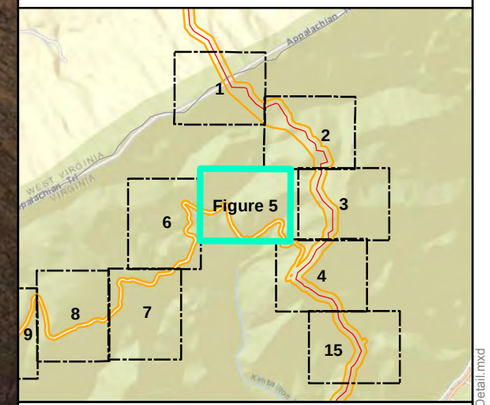
Wetland
- PEM
- PSS
- PFO

NAD 1983 UTM 17N

1:2,400

N W E S

0 520 Feet



Mountain Valley Pipeline Project

Mountain Valley PIPELINE

Detail Map
U.S. National Forest Service (National Forest) Lands

Figure 4-5
Giles County, Virginia

June, 2017

Data Sources: ESRI Streaming Data 2014. USDA Forest Service surface ownership, https://data.fs.usda.gov/geodata/edw.

Document Path: PGH Z:\EQT_MVP\Mapdocs\Wetlands\VA\USFS\MVP_USFS_Detail.mxd

Legend

- Milepost
- Stationing
- Proposed Route
- Limit of Disturbance
- Study Area
- U.S. Forest Service (National Forest) Lands
- Peters Mountain Wilderness
- Appalachian National Scenic Trail (ANST)
- County Boundary
- Culvert
- Drainage Feature

Stream
- Perennial
- Intermittent
- Ephemeral

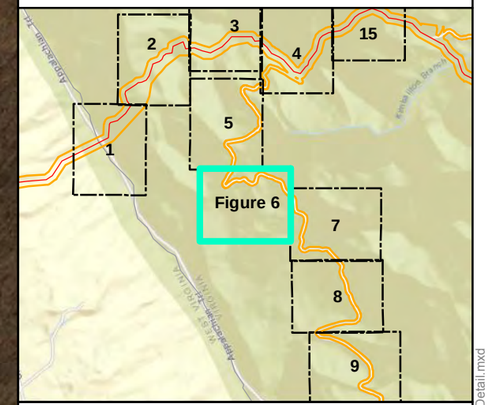
- Sample Location
- Pond

Wetland
- PEM
- PSS
- PFO

NAD 1983 UTM 17N

1:2,400

0 520 Feet



Mountain Valley Pipeline Project

Mountain Valley PIPELINE

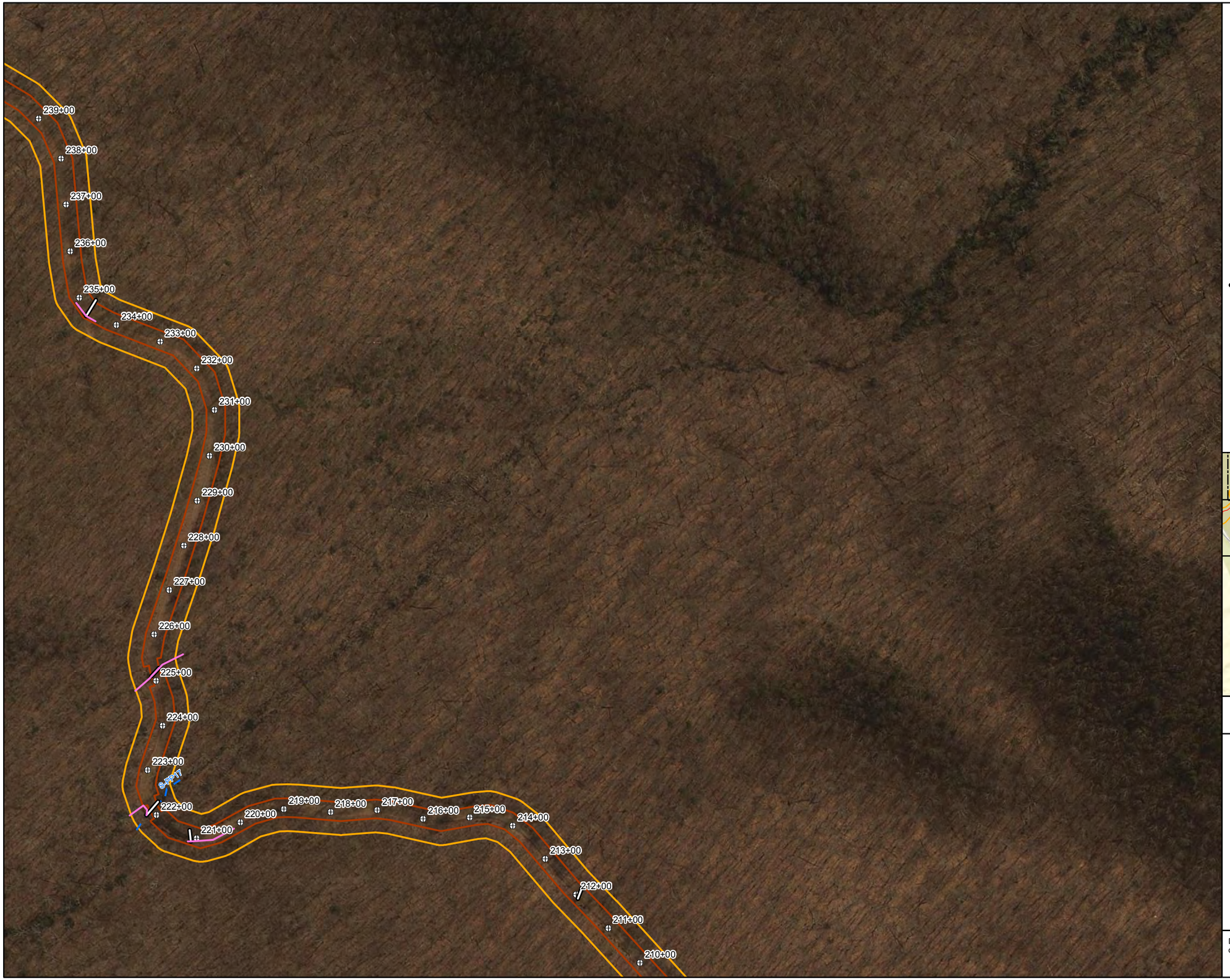
Detail Map
U.S. National Forest Service (National Forest) Lands

Figure 4-6
Giles County, Virginia

June, 2017

Data Sources: ESRI Streaming Data 2014. USDA Forest Service surface ownership, https://data.fs.usda.gov/geodata/edw.

Document Path: PGH Z:\EQT_MVP\Mapdocs\Wetlands\VA\USFS\MVP_USFS_Detail.mxd



Legend

- Milepost
- Stationing
- Proposed Route
- Limit of Disturbance
- Study Area
- U.S. Forest Service (National Forest) Lands
- Peters Mountain Wilderness
- Appalachian National Scenic Trail (ANST)
- County Boundary
- Culvert
- Drainage Feature

Stream
- Perennial
- Intermittent
- Ephemeral

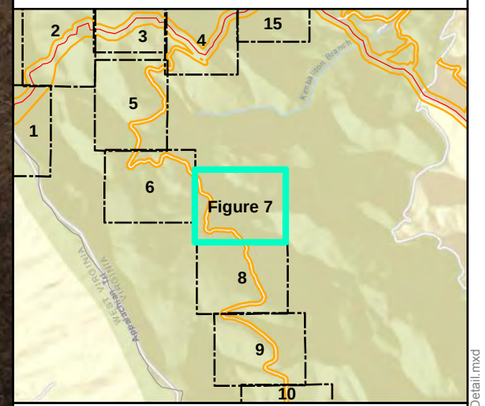
- Sample Location
- Pond

Wetland
- PEM
- PSS
- PFO

NAD 1983 UTM 17N

1:2,400

0 520 Feet



Mountain Valley Pipeline Project

Mountain Valley PIPELINE

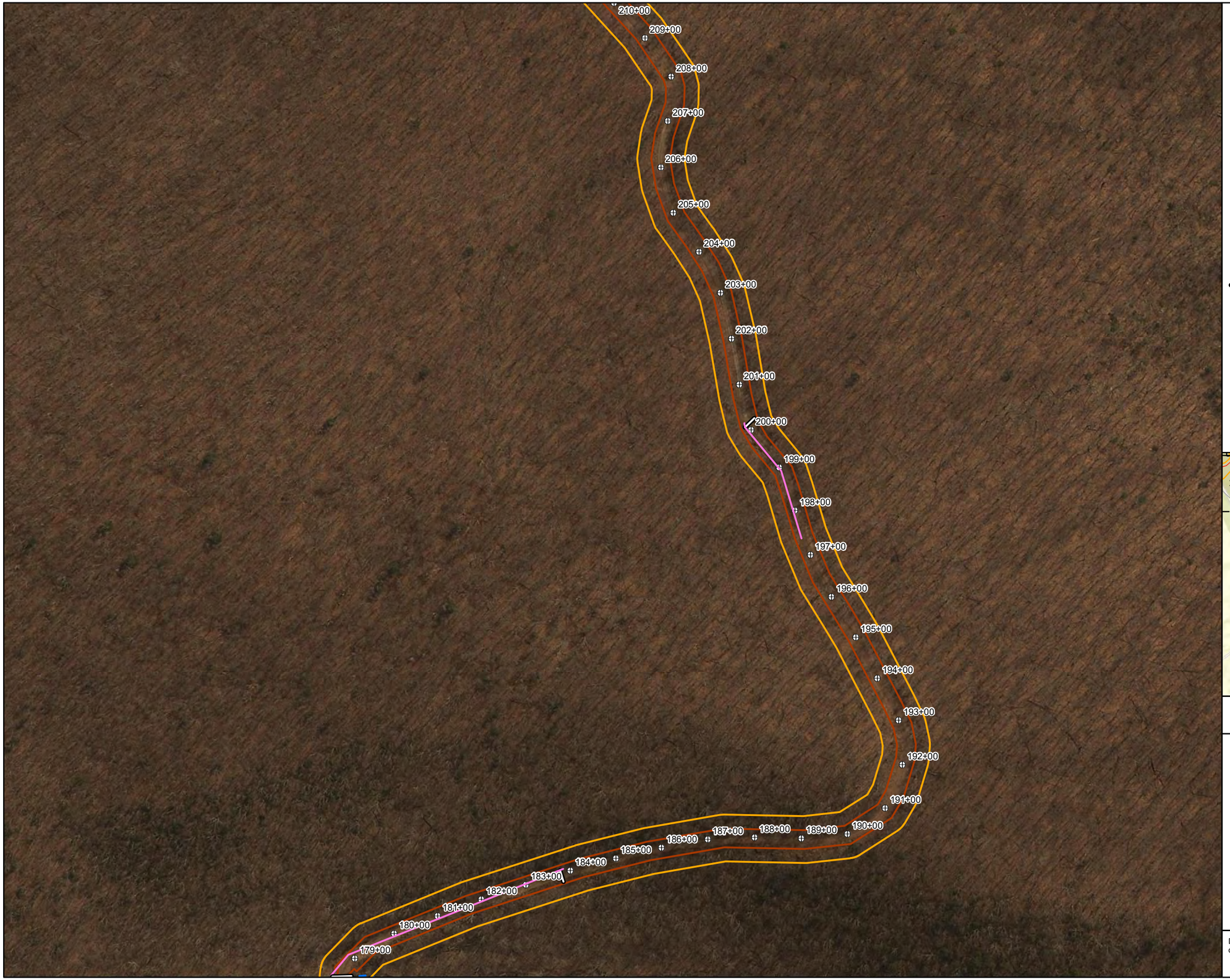
Detail Map
U.S. National Forest Service (National Forest) Lands

Figure 4-7
Giles County, Virginia

June, 2017

Data Sources: ESRI Streaming Data 2014. USDA Forest Service surface ownership, https://data.fs.usda.gov/geodata/edw.

Document Path: PGH Z:\EQT_MVP\Mapdocs\Wetlands\VA\USFS\MVP_USFS_Detail.mxd



Legend

- Milepost
- Stationing
- Proposed Route
- Limit of Disturbance
- Study Area
- U.S. Forest Service (National Forest) Lands
- Peters Mountain Wilderness
- Appalachian National Scenic Trail (ANST)
- County Boundary
- Culvert
- Drainage Feature

Stream
- Perennial
- Intermittent
- Ephemeral

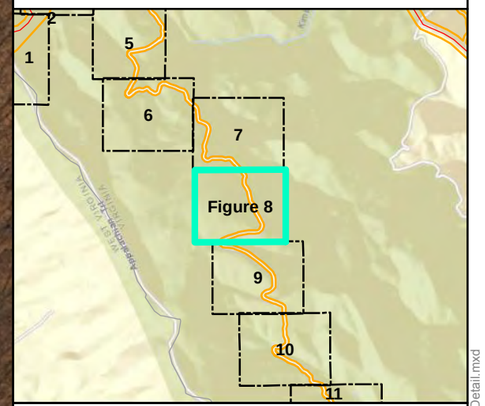
- Sample Location
- Pond

Wetland
- PEM
- PSS
- PFO

NAD 1983 UTM 17N

1:2,400

0 520 Feet



Mountain Valley Pipeline Project

Mountain Valley PIPELINE

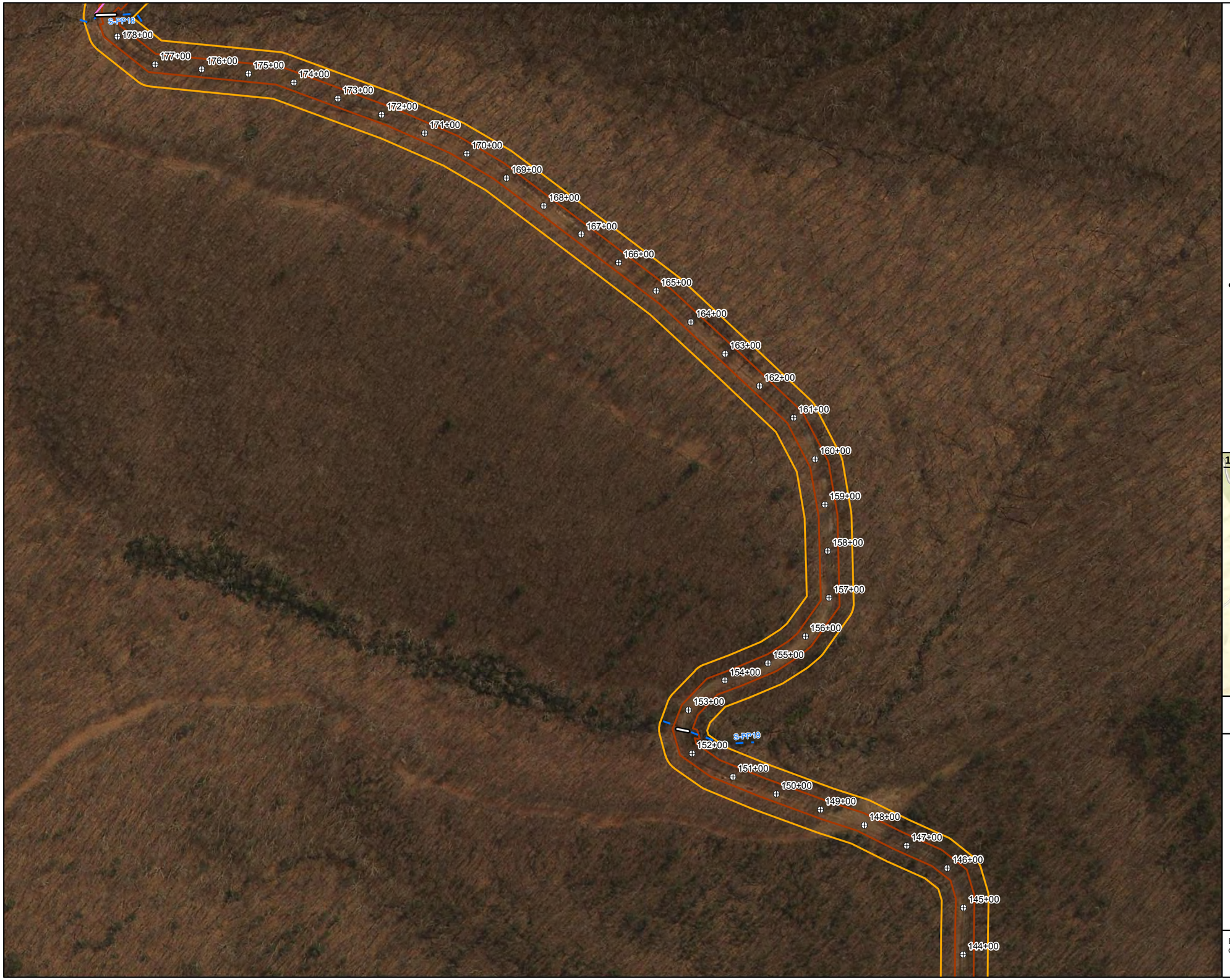
Detail Map
U.S. National Forest Service (National Forest) Lands

Figure 4-8
Giles County, Virginia

June, 2017

Data Sources: ESRI Streaming Data 2014. USDA Forest Service surface ownership, https://data.fs.usda.gov/geodata/edw.

Document Path: PGH Z:\EQT_MVP\Mapdocs\Wetlands\VA\USFS\MVP_USFS_Detail.mxd



Legend

- Milepost
- Stationing
- Proposed Route
- Limit of Disturbance
- Study Area
- U.S. Forest Service (National Forest) Lands
- Peters Mountain Wilderness
- Appalachian National Scenic Trail (ANST)
- County Boundary
- Culvert
- Drainage Feature

Stream
- Perennial
- Intermittent
- Ephemeral

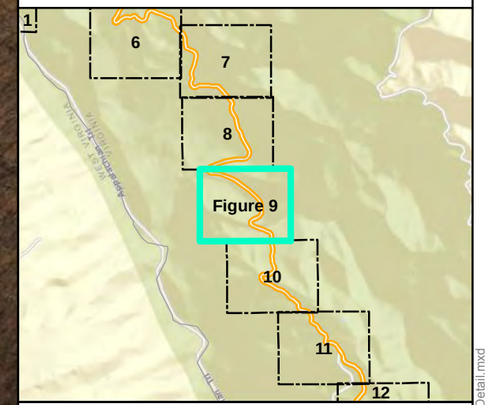
- Sample Location
- Pond

Wetland
- PEM
- PSS
- PFO

NAD 1983 UTM 17N

1:2,400

0 520 Feet



Mountain Valley Pipeline Project

Mountain Valley PIPELINE

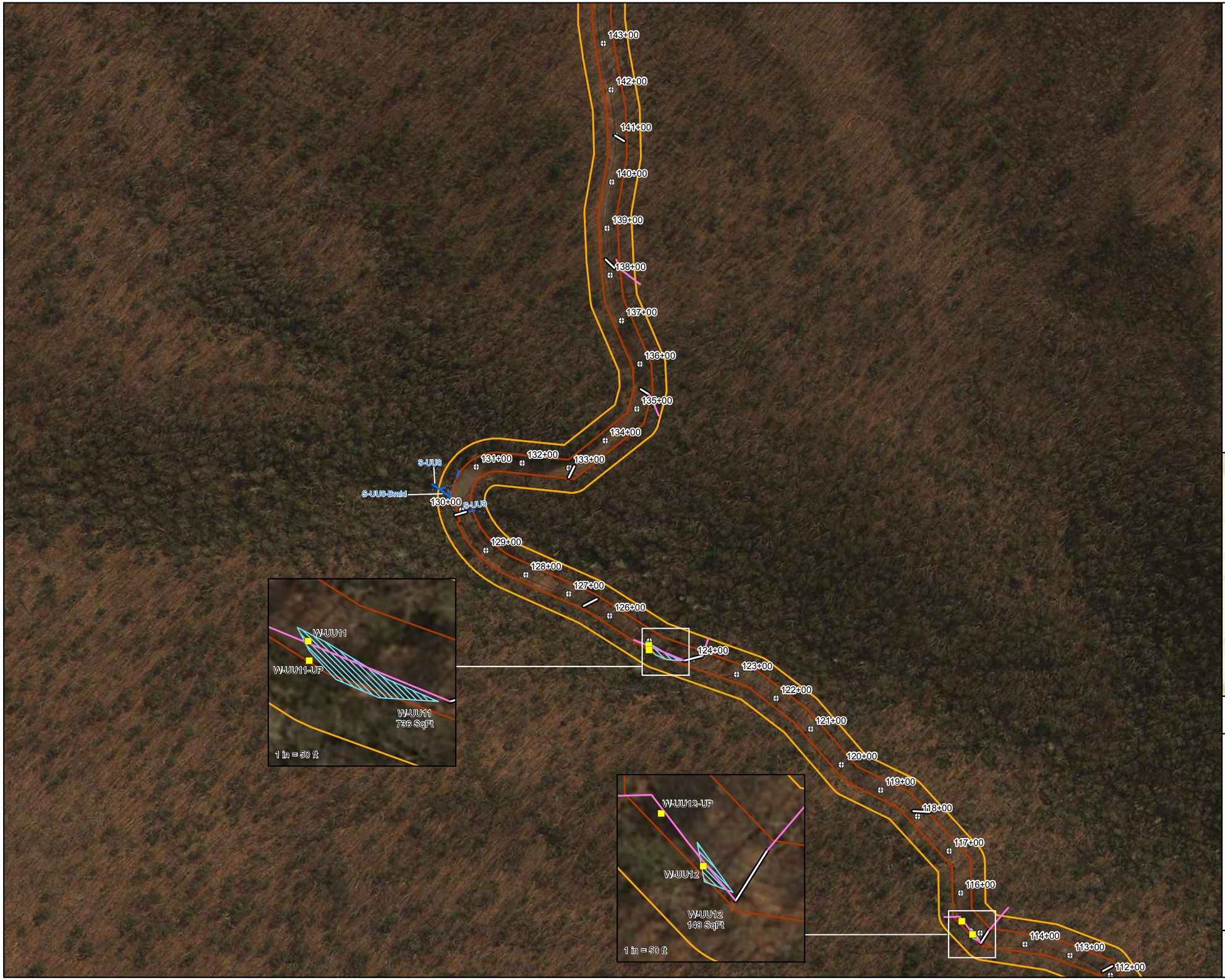
Detail Map
U.S. National Forest Service (National Forest) Lands

Figure 4-9
Giles County, Virginia

June, 2017

Data Sources: ESRI Streaming Data 2014. USDA Forest Service surface ownership, https://data.fs.usda.gov/geodata/edw.

Document Path: PGH Z:\EQT_MVP\Mapdocs\Wetlands\VA\USFS\MVP_USFS_Detail.mxd



Legend

- Milepost
- Stationing
- Proposed Route
- Limit of Disturbance
- Study Area
- U.S. Forest Service (National Forest) Lands
- Peters Mountain Wilderness
- Appalachian National Scenic Trail (ANST)
- County Boundary
- Culvert
- Drainage Feature

Stream
- Perennial
- Intermittent
- Ephemeral

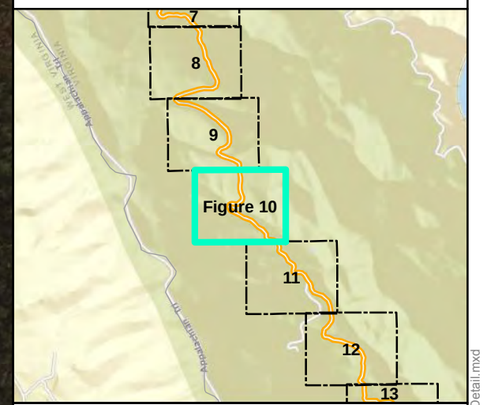
- Sample Location
- Pond

Wetland
- PEM
- PSS
- PFO

NAD 1983 UTM 17N

1:2,400

0 520 Feet



Mountain Valley Pipeline Project

Mountain Valley PIPELINE

Detail Map
U.S. National Forest Service (National Forest) Lands

Figure 4-10
Giles County, Virginia

June, 2017

Data Sources: ESRI Streaming Data 2014. USDA Forest Service surface ownership, https://data.fs.usda.gov/geodata/edw.

Document Path: PGH Z:\EQT_MVP\Mapdocs\Wetlands\VA\USFS\MVP_USFS_Detail.mxd

Legend

- Milepost
- Stationing
- Proposed Route
- Limit of Disturbance
- Study Area
- U.S. Forest Service (National Forest) Lands
- Peters Mountain Wilderness
- Appalachian National Scenic Trail (ANST)
- County Boundary
- Culvert
- Drainage Feature

Stream
- Perennial
- Intermittent
- Ephemeral
- Sample Location
- Pond

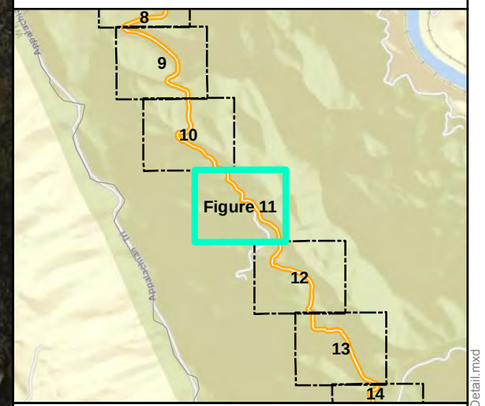
Wetland
- PEM
- PSS
- PFO

NAD 1983 UTM 17N

1:2,400

N E S W

0 520 Feet



Mountain Valley Pipeline Project

Mountain Valley PIPELINE

Detail Map
U.S. National Forest Service (National Forest) Lands

Figure 4-11
Giles County, Virginia

June, 2017

Data Sources: ESRI Streaming Data 2014. USDA Forest Service surface ownership, https://data.fs.usda.gov/geodata/edw.

Document Path: PGH Z:\EQT_MVP\Mapdocs\Wetlands\VA\USFS\MVP_USFS_Detail.mxd

Legend

- Milepost
- Stationing
- Proposed Route
- Limit of Disturbance
- Study Area
- U.S. Forest Service (National Forest) Lands
- Peters Mountain Wilderness
- Appalachian National Scenic Trail (ANST)
- County Boundary
- Culvert
- Drainage Feature

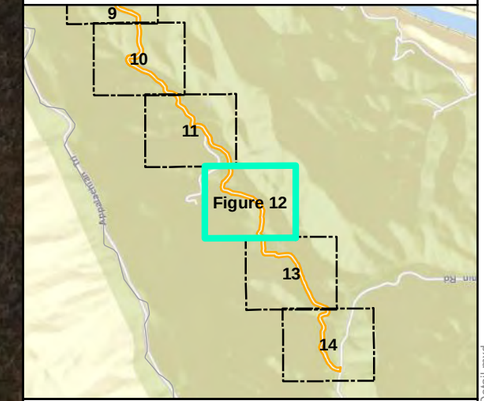
Stream
- Perennial
- Intermittent
- Ephemeral
- Sample Location
- Pond

Wetland
- PEM
- PSS
- PFO

NAD 1983 UTM 17N

1:2,400

0 520 Feet



Mountain Valley Pipeline Project

Mountain Valley PIPELINE

Detail Map
U.S. National Forest Service (National Forest) Lands

Figure 4-12
Giles County, Virginia

June, 2017

Data Sources: ESRI Streaming Data 2014. USDA Forest Service surface ownership, https://data.fs.usda.gov/geodata/edw.

Document Path: PGH Z:\EQT_MVP\Mapdocs\Wetlands\VA\USFS\MVP_USFS_Detail.mxd

Legend

- Milepost
- Stationing
- Proposed Route
- Limit of Disturbance
- Study Area
- U.S. Forest Service (National Forest) Lands
- Peters Mountain Wilderness
- Appalachian National Scenic Trail (ANST)
- County Boundary
- Culvert
- Drainage Feature

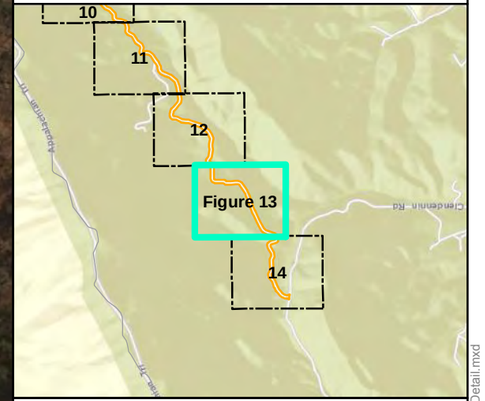
Stream
- Perennial
- Intermittent
- Ephemeral
- Sample Location
- Pond

Wetland
- PEM
- PSS
- PFO

NAD 1983 UTM 17N

1:2,400

0 520 Feet



Mountain Valley Pipeline Project

Mountain Valley PIPELINE

Detail Map
U.S. National Forest Service (National Forest) Lands

Figure 4-13
Giles County, Virginia

June, 2017

Data Sources: ESRI Streaming Data 2014. USDA Forest Service surface ownership, https://data.fs.usda.gov/geodata/edw.

Document Path: PGH Z:\EQT_MVP\Mapdocs\Wetlands\VA\USFS\MVP_USFS_Detail.mxd

Legend

- Milepost
- Stationing
- Proposed Route
- Limit of Disturbance
- Study Area
- U.S. Forest Service (National Forest) Lands
- Peters Mountain Wilderness
- Appalachian National Scenic Trail (ANST)
- County Boundary
- Culvert
- Drainage Feature

Stream
- Perennial
- Intermittent
- Ephemeral

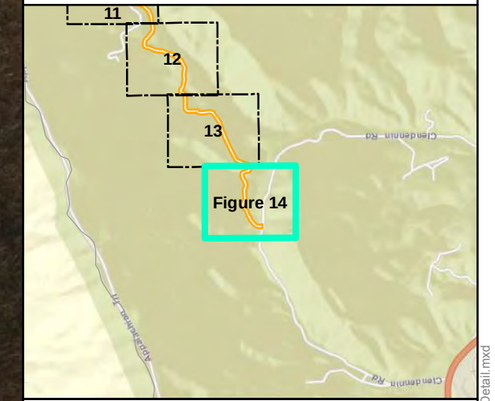
- Sample Location
- Pond

Wetland
- PEM
- PSS
- PFO

NAD 1983 UTM 17N

1:2,400

0 520 Feet



Mountain Valley Pipeline Project

Mountain Valley PIPELINE

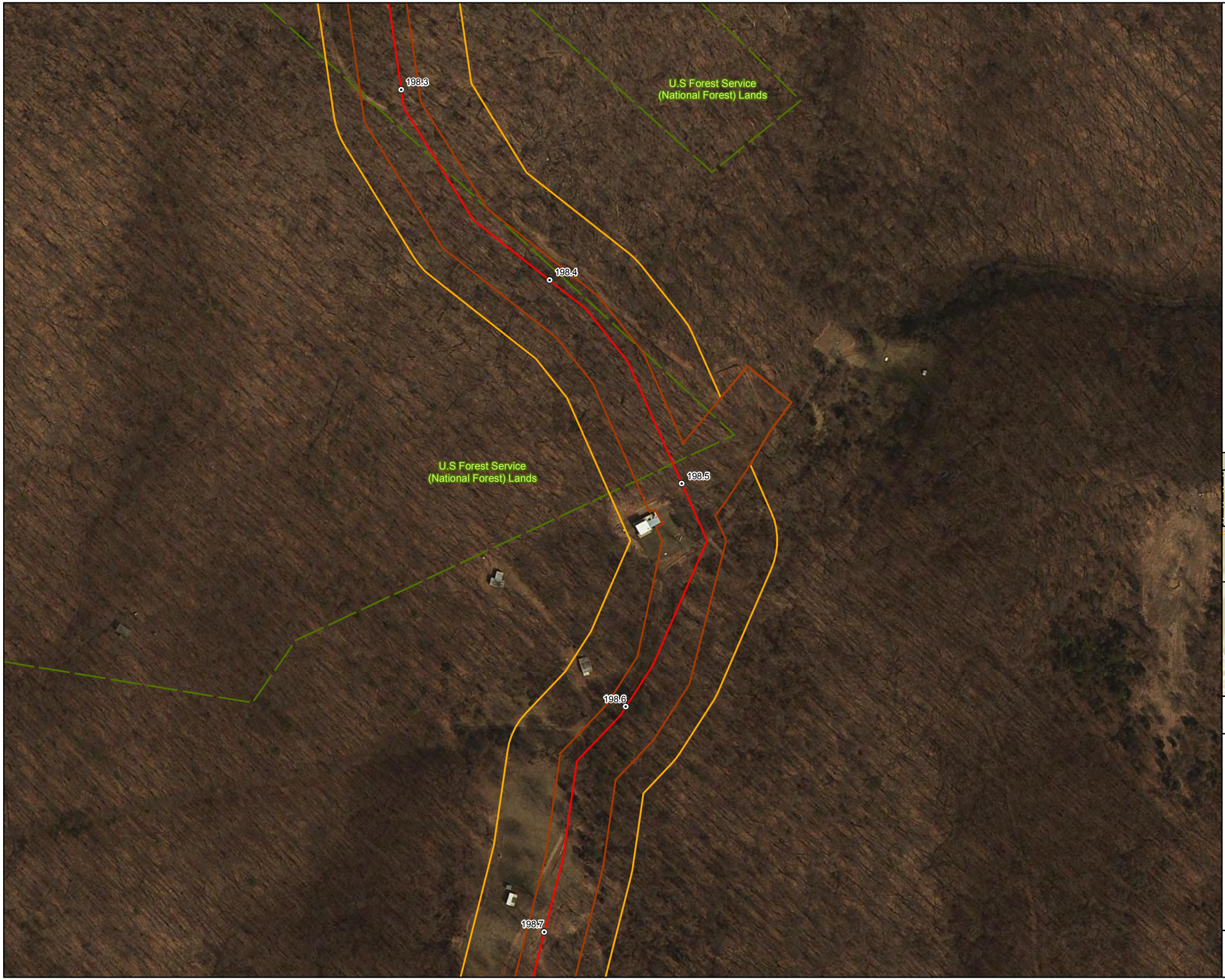
Detail Map
U.S. National Forest Service (National Forest) Lands

Figure 4-14
Giles County, Virginia

June, 2017

Data Sources: ESRI Streaming Data 2014. USDA Forest Service surface ownership, https://data.fs.usda.gov/geodata/edw.

Document Path: PGH Z:\EQT_MVP\Mapdocs\Wetlands\VA\USFS\MVP_USFS_Detail.mxd



Legend

- Milepost
- Stationing
- Proposed Route
- Limit of Disturbance
- Study Area
- U.S. Forest Service (National Forest) Lands
- Peters Mountain Wilderness
- Appalachian National Scenic Trail (ANST)
- County Boundary
- Culvert
- Drainage Feature

Stream
- Perennial
- Intermittent
- Ephemeral
- Sample Location
- Pond

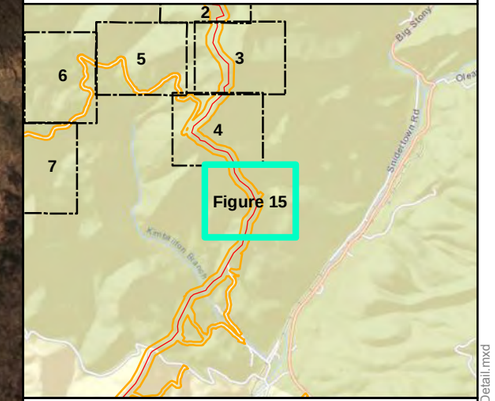
Wetland
- PEM
- PSS
- PFO

NAD 1983 UTM 17N

1:2,400

N W E S

0 520 Feet



Mountain Valley Pipeline Project

Mountain Valley PIPELINE

Detail Map
U.S. National Forest Service (National Forest) Lands

Figure 4-15
Giles County, Virginia

June, 2017

Data Sources: ESRI Streaming Data 2014. USDA Forest Service surface ownership, https://data.fs.usda.gov/geodata/edw.

Document Path: PGH Z:\EQT_MVP\Mapdocs\Wetlands\VA\USFS\MVP_USFS_Detail.mxd

Legend

- Milepost
- Stationing
- Proposed Route
- Limit of Disturbance
- Study Area
- U.S. Forest Service (National Forest) Lands
- Peters Mountain Wilderness
- Appalachian National Scenic Trail (ANST)
- County Boundary
- Culvert
- Drainage Feature

Stream
- Perennial
- Intermittent
- Ephemeral
- Sample Location
- Pond

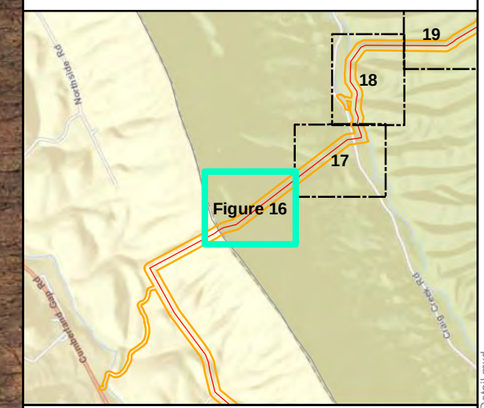
Wetland
- PEM
- PSS
- PFO

NAD 1983 UTM 17N

1:2,400

N E S W

0 520 Feet



Mountain Valley Pipeline Project

Mountain Valley PIPELINE

Detail Map
U.S. National Forest Service (National Forest) Lands

Figure 4-16
Montgomery County, Virginia

June, 2017

Data Sources: ESRI Streaming Data 2014. USDA Forest Service surface ownership, https://data.fs.usda.gov/geodata/edw.

Document Path: PGH Z:\EQT_MVP\Mapdocs\Wetlands\VA\USFS\MVP_USFS_Detail.mxd

Legend

- Milepost
- Stationing
- Proposed Route
- Limit of Disturbance
- Study Area
- U.S. Forest Service (National Forest) Lands
- Peters Mountain Wilderness
- Appalachian National Scenic Trail (ANST)
- County Boundary
- Culvert
- Drainage Feature

Stream
- Perennial
- Intermittent
- Ephemeral

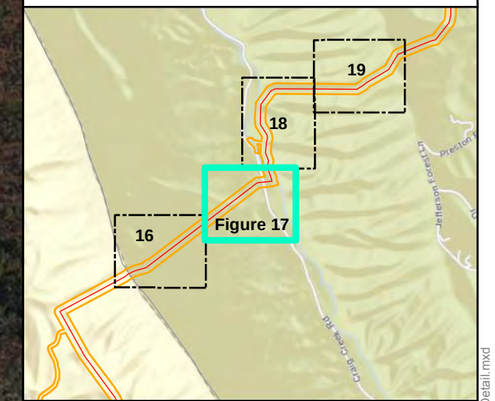
- Sample Location
- Pond

Wetland
- PEM
- PSS
- PFO

NAD 1983 UTM 17N

1:2,400

0 520 Feet



Mountain Valley Pipeline Project

Mountain Valley PIPELINE

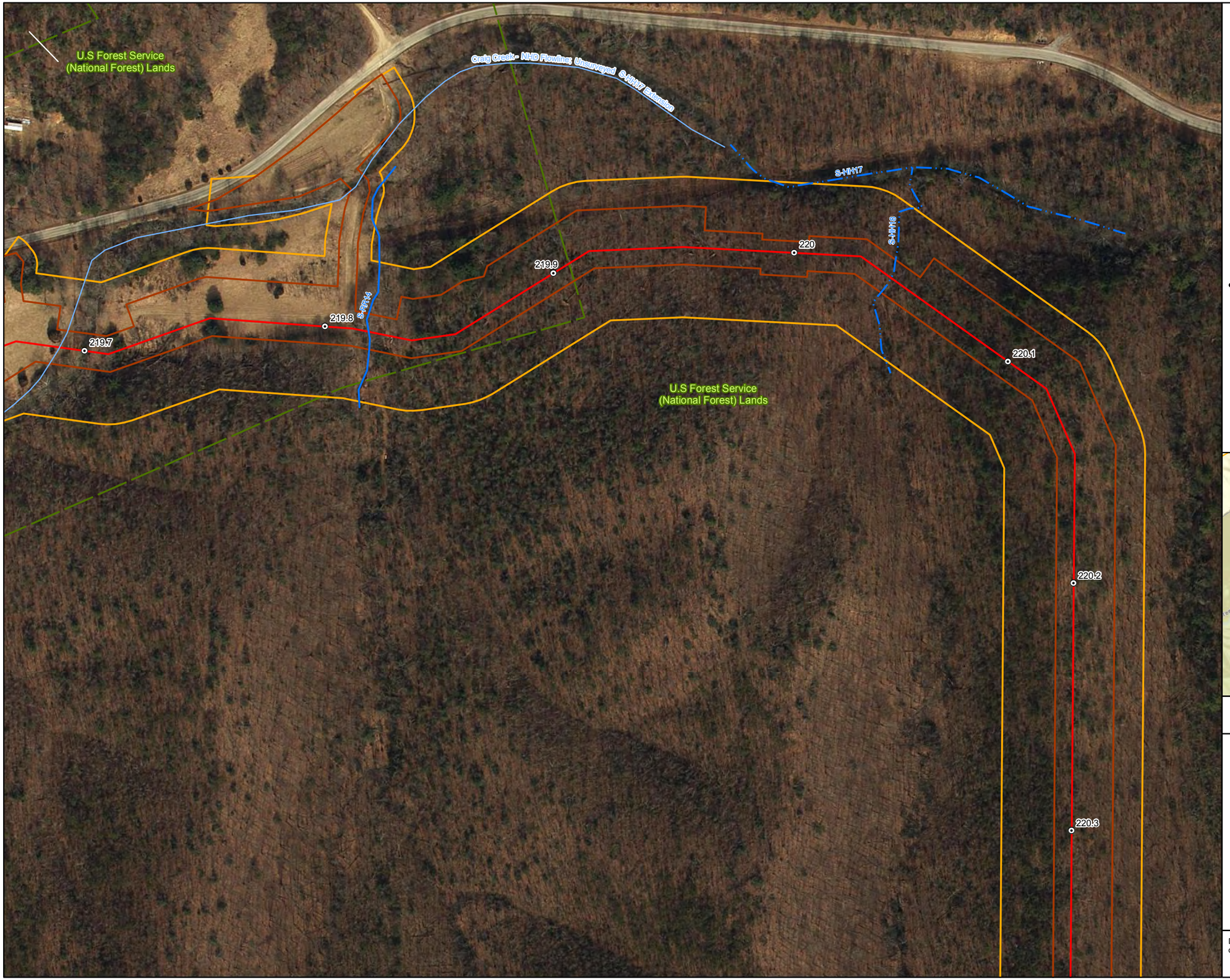
Detail Map
U.S. National Forest Service (National Forest) Lands

Figure 4-17
Montgomery County, Virginia

June, 2017

Data Sources: ESRI Streaming Data 2014. USDA Forest Service surface ownership, https://data.fs.usda.gov/geodata/edw.

Document Path: PGH Z:\EQT_MVP\Mapdocs\Wetlands\VA\USFS\MVP_USFS_Detail.mxd



Legend

- Milepost
- Stationing
- Proposed Route
- Limit of Disturbance
- Study Area
- U.S. Forest Service (National Forest) Lands
- Peters Mountain Wilderness
- Appalachian National Scenic Trail (ANST)
- County Boundary
- Culvert
- Drainage Feature

Stream
- Perennial
- Intermittent
- Ephemeral
- Sample Location
- Pond

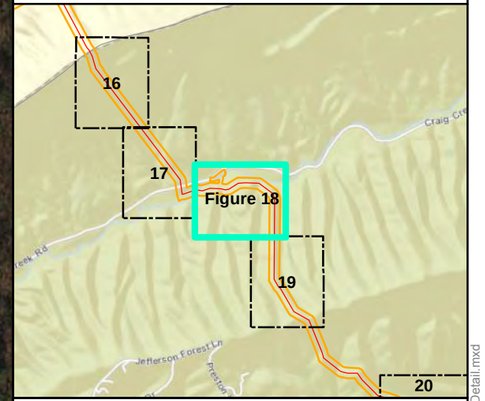
Wetland
- PEM
- PSS
- PFO

NAD 1983 UTM 17N

N
W E
S

1:2,400

0 520 Feet



Mountain Valley Pipeline Project

Mountain Valley PIPELINE

Detail Map
U.S. National Forest Service (National Forest) Lands

Figure 4-18
Montgomery County, Virginia

June, 2017

Data Sources: ESRI Streaming Data 2014. USDA Forest Service surface ownership, https://data.fs.usda.gov/geodata/edw.

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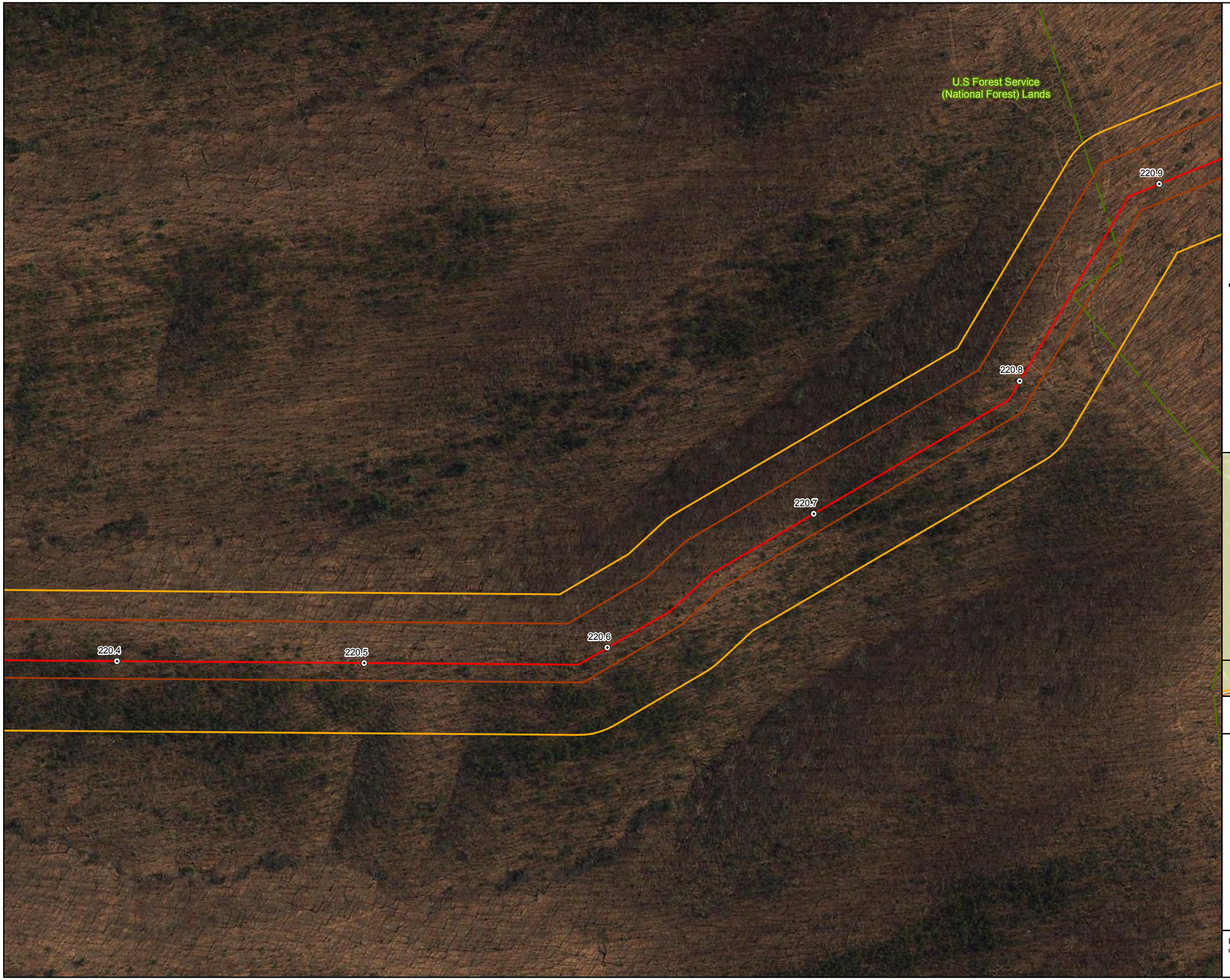

Legend

- Milepost
- Stationing
- Proposed Route
- Limit of Disturbance
- Study Area
- U.S. Forest Service (National Forest) Lands
- Peters Mountain Wilderness
- Appalachian National Scenic Trail (ANST)
- County Boundary
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- Drainage Feature

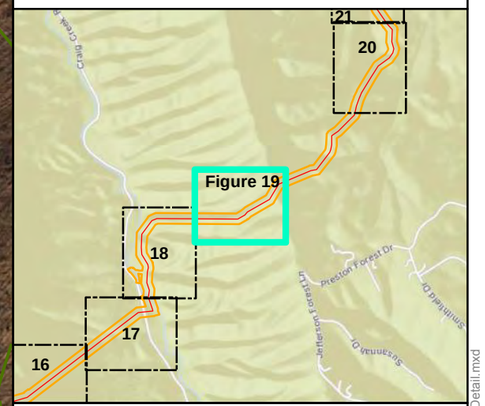
Stream
- Perennial
- Intermittent
- Ephemeral
- Sample Location
- Pond

Wetland
- PEM
- PSS
- PFO

NAD 1983 UTM 17N

1:2,400

0 520 Feet



Mountain Valley Pipeline Project

Mountain Valley PIPELINE

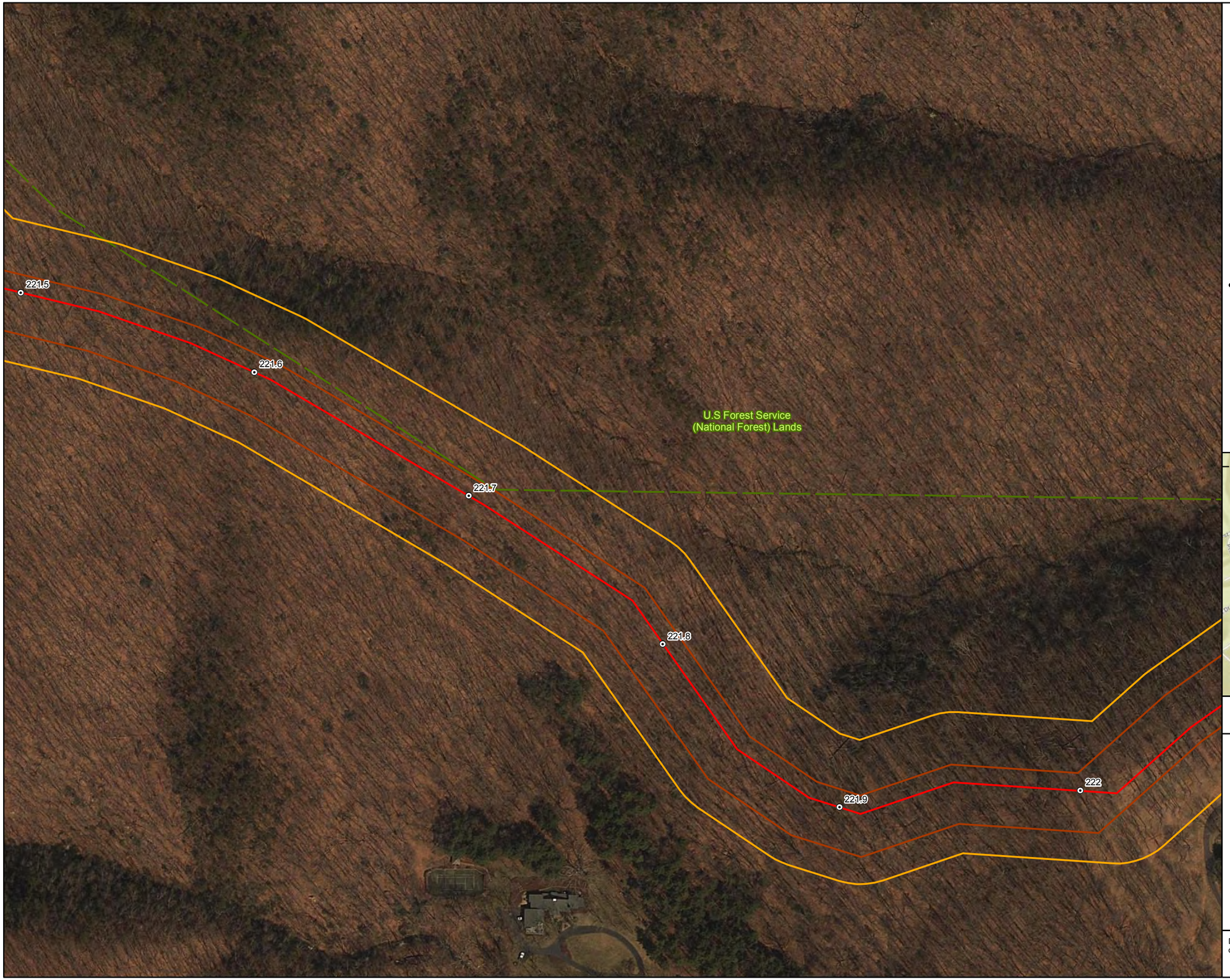
Detail Map
U.S. National Forest Service (National Forest) Lands

Figure 4-19
Montgomery County, Virginia

June, 2017

Data Sources: ESRI Streaming Data 2014. USDA Forest Service surface ownership, https://data.fs.usda.gov/geodata/edw.

Document Path: PGH Z:\EQT_MVP\Mapdocs\Wetlands\VA\USFS\MVP_USFS_Detail.mxd



Legend

- Milepost
- Stationing
- Proposed Route
- Limit of Disturbance
- Study Area
- U.S. Forest Service (National Forest) Lands
- Peters Mountain Wilderness
- Appalachian National Scenic Trail (ANST)
- County Boundary
- Culvert
- Drainage Feature

Stream
- Perennial
- Intermittent
- Ephemeral

- Sample Location
- Pond

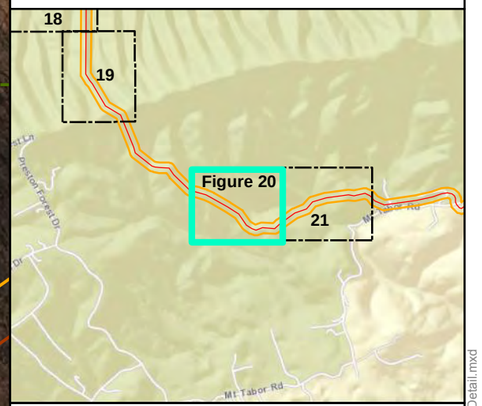
Wetland
- PEM
- PSS
- PFO

NAD 1983 UTM 17N

1:2,400

N W E S

0 520 Feet



Mountain Valley Pipeline Project

Mountain Valley PIPELINE

Detail Map
U.S. National Forest Service (National Forest) Lands

Figure 4-20
Montgomery County, Virginia

June, 2017

Data Sources: ESRI Streaming Data 2014. USDA Forest Service surface ownership, https://data.fs.usda.gov/geodata/edw.

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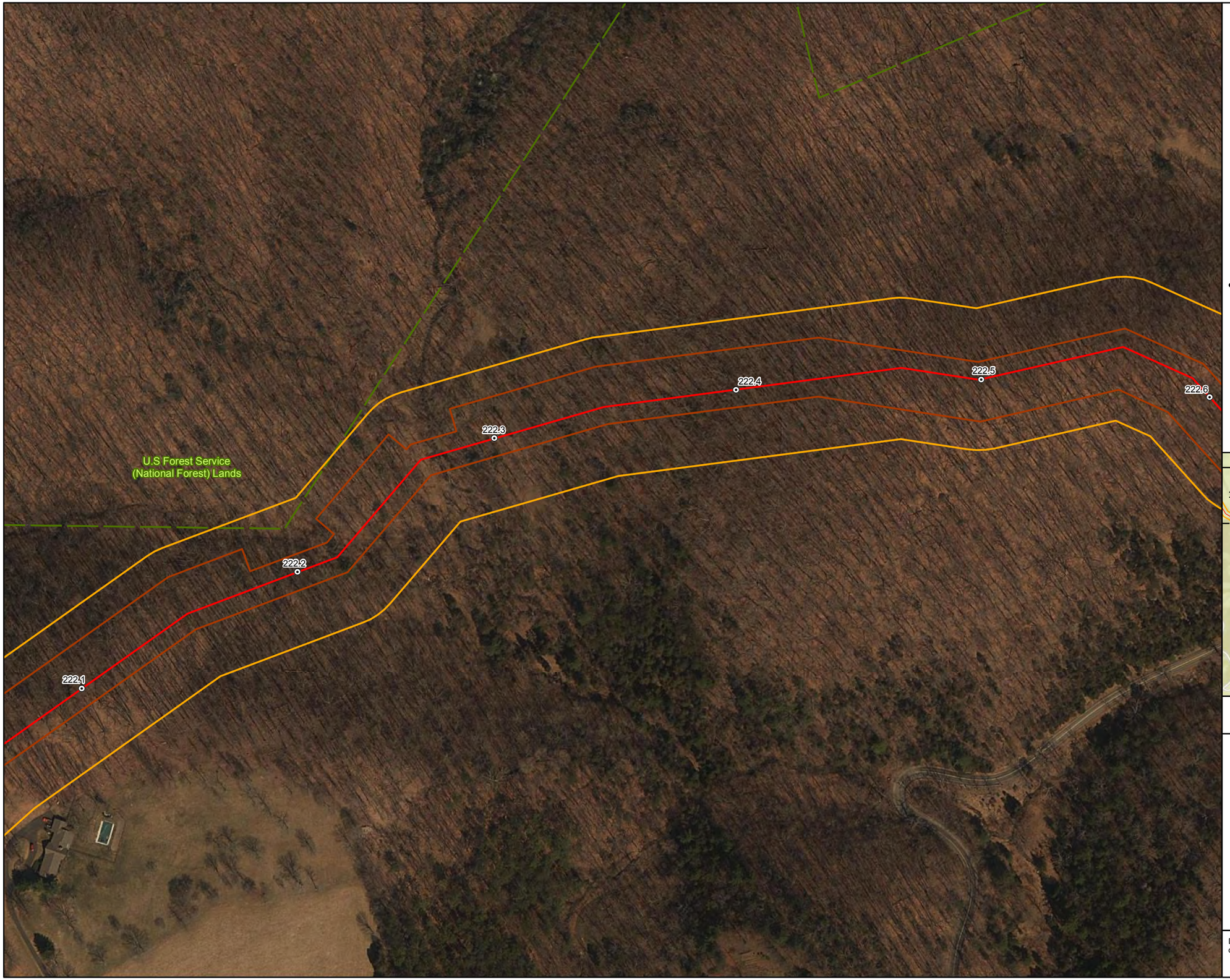


Legend

- Milepost
- Stationing
- Proposed Route
- Limit of Disturbance
- Study Area
- U.S. Forest Service (National Forest) Lands
- Peters Mountain Wilderness
- Appalachian National Scenic Trail (ANST)
- County Boundary
- Culvert
- Drainage Feature

Stream
- Perennial
- Intermittent
- Ephemeral

- Sample Location
- Pond

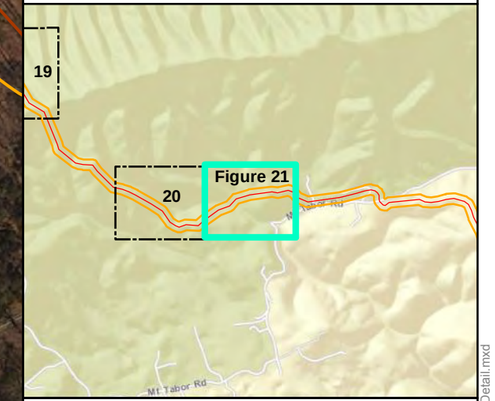
Wetland
- PEM
- PSS
- PFO

NAD 1983 UTM 17N

1:2,400

N W E S

0 520 Feet



Mountain Valley Pipeline Project

Mountain Valley PIPELINE

Detail Map
U.S. National Forest Service (National Forest) Lands

Figure 4-21
Montgomery County, Virginia

June, 2017

Data Sources: ESRI Streaming Data 2014. USDA Forest Service surface ownership, https://data.fs.usda.gov/geodata/edw.

Document Path: PGH Z:\EQT_MVP\Mapdocs\Wetlands\VA\USFS\MVP_USFS_Detail.mxd

Tables

Table 1 **Identified Wetlands**

Table 2 **Identified Streams**

Table 3 **Mapped Soils**

Wetland Impact Table
US National Forest Service Lands
Mountain Valley Pipeline Project

Wetland ID	County	Latitude[1]	Longitude[1]	Cowardin Class[2]	HGM[3]	Water Type[4]	Impact Type[5]	Mile Post / Access Road Station	Temporary Impacts (square feet)[6]	Permanent Impacts (square feet)[7]	Wetland Functions and Values[8]	Figure	Notes
W-KL14	Giles	37.395895	-80.680465	PSS	Depressional	ISOLATE	Pipeline LOD	MP 197.1	-	174	Sediment/Toxicant/Pathogen Retention; Wildlife habitat	4-2	Permanent conversion impact within LOD
W-UU11	Giles	37.380172	-80.720517	PEM	Slope	RPWWD	Permanent Access Road MVP-GI-232	124+50 - 125+00	-	-	Groundwater Recharge/Discharge; Sediment/Toxicant/Pathogen Retention; Uniqueness/Heritage	4-10	E&S BMP protection. No wetland impact.
W-UU12	Giles	37.378351	-80.722594	PEM	Depressional	ISOLATE	Permanent Access Road MVP-GI-232	115+00	-	-	Groundwater Recharge/Discharge; Sediment/Toxicant/Pathogen Retention; Uniqueness/Heritage	4-10	E&S BMP protection. No wetland impact.
W-HH15	Giles	37.371031	-80.736206	PEM	Depressional	ISOLATE	Permanent Access Road MVP-GI-232	56+50	64	-	Sediment/Toxicant/Pathogen Retention; Uniqueness/Heritage	4-12	Timber mat crossing during construction. Temporary impacts only.
W-HH14	Giles	37.370949	-80.737166	PEM	Slope	RPWWD	Permanent Access Road MVP-GI-232	53+00	-	-	Groundwater Recharge/Discharge; Sediment/Toxicant/Pathogen Retention; Uniqueness/Heritage	4-13	Outside of LOD; therefore, no impact

Notes:

1 - in decimal degrees

2 - Field classification based on Cowardin et al. 1979. See wetland delineation report for more details.

3 - Field classification based on Brinson, M.M. 1993.

4 - ISOLATE - Isolated
- RPWWD - Abutting Relatively Permanent Waters (RPW)

5 - LOD - Limit of Disturbance

6 - Temporary impacts to PEM wetlands in the temporary LOD

7 - Permanent impacts can include 1) permanent conversion impacts to PSS and PFO impacts in the temporary and permanent LOD, and 2) permanent fill impacts to wetlands within permanent access road LOD

8 - Wetland Functions and Values assessed according to the USACE Highway Method for all features with anticipated impacts (United States Army Corps of Engineers. 1999. The Highway Methodology Workbook Supplement. NAEEP-360-1-30a)

Stream Impact Table
US National Forest Service Lands
Mountain Valley Pipeline Project

Stream ID	NHD Stream Name[1]	County	Latitude[2]	Longitude[2]	Project Location[3]	Pipeline Mile Post / Access Road Station	Flow Regime	Water Type[4]	Cowardin Class[5]	Designation[6,7]	Water Quality[8,9]	Water Quantity[8,9]	Top of Bank Width (ft)	Temporary Linear Feet Impact (ft)	Permanent Linear Feet Impact (ft)	Figure	Notes
S-KL24	UNT to Kimballton Branch	Giles	37.400694	-80.687779	Pipeline LOD	MP 196.5	Ephemeral	NRPW	R6	-	N/A	N/A	3	-	-	4-1	Outside of LOD; therefore, no impact
S-MN19	UNT to Kimballton Branch	Giles	37.400399	-80.685935	Pipeline LOD	MP 196.7	Intermittent	RPW	R4SB5	-	N/A	N/A	1	38	-	4-2	Temporary impact within LOD
S-MN18	UNT to Kimballton Branch	Giles	37.400357	-80.685456	Pipeline LOD	MP 196.7	Intermittent	RPW	R4SB5	-	N/A	N/A	1	31	-	4-2	Temporary impact within LOD
S-SS3	UNT to Kimballton Branch	Giles	37.400120	-80.685438	Pipeline LOD	MP 196.7	Intermittent	RPW	R4SB5		3A	3A	2.5	-	-	4-2	Outside of LOD; therefore, no impact
S-KL23	UNT to Kimballton Branch	Giles	37.399935	-80.687796	Pipeline LOD	MP 196.6	Perennial	RPW	R3UB2	-	N/A	N/A	3	-	-	4-1	Outside of LOD; therefore, no impact
S-KL22	UNT to Kimballton Branch	Giles	37.399462	-80.686923	Pipeline LOD	MP 196.6	Perennial	RPW	R3UB2	-	N/A	N/A	3	-	-	4-1	Outside of LOD; therefore, no impact
S-KL21	UNT to Kimballton Branch	Giles	37.399162	-80.686559	Pipeline LOD	MP 196.6	Intermittent	RPW	R4SB4	-	N/A	N/A	3	-	-	4-1	Outside of LOD; therefore, no impact
S-PP14	Kimballton Branch	Giles	37.392796	-80.694250	Permanent Access Road MVP-GI-232	264+10	Perennial	RPW	R2RB1	-	3A	3A	14	50	-	4-6	Existing culvert, no replacement necessary. Timber mat crossing of unculverted stream segment during construction. No impact to culverted stream segment; temporary impact to unculverted stream segment.
S-PP15	UNT to Kimballton Branch	Giles	37.392628	-80.690067	Permanent Access Road MVP-GI-232	278+00	Perennial	RPW	R3RB1	-	3A	3A	6	15	-	4-5	Existing culvert, no replacement necessary. Timber mat crossing of unculverted stream segment during construction. No impact to culverted stream segment; temporary impact to unculverted stream segment.
S-PP17	UNT to New River	Giles	37.386744	-80.700408	Permanent Access Road MVP-GI-232	222+00	Intermittent	RPW	R4SB3	-	3A	3A	2	-	-	4-7	Existing culvert, no replacement necessary; therefore, no impact
S-PP18	Curve Branch	Giles	37.385534	-80.708752	Permanent Access Road MVP-GI-232	178+50	Intermittent	RPW	R4SB3	-	3B	3B	4	-	-	4-9	Existing culvert, no replacement necessary; therefore, no impact
S-PP19	UNT to Curve Branch	Giles	37.382172	-80.714021	Permanent Access Road MVP-GI-232	152+50	Intermittent	RPW	R4SB5	-	3A	3A	3	24	35	4-9	Culvert replacement and extension. Temporary impact at culvert replacement. Permanent impact at culvert extension.
S-UU8-Braid	Clendennin Creek	Giles	37.381470	-80.719305	Permanent Access Road MVP-GI-232	130+00	Perennial	RPW	R2UB1	-	3A	3A	3	-	-	4-10	Outside of LOD; therefore, no impact
S-UU8	Clendennin Creek	Giles	37.381467	-80.719287	Permanent Access Road MVP-GI-232	130+00	Perennial	RPW	R2UB1	-	3A	3A	3	-	-	4-10	Outside of LOD; therefore, no impact
S-UU9	Clendennin Creek	Giles	37.381343	-80.719468	Permanent Access Road MVP-GI-232	130+00	Perennial	RPW	R2UB1	-	3A	3A	5	-	-	4-10	Existing culvert, no replacement necessary; therefore, no impact
S-HH16	UNT to Clendennin Creek	Giles	37.376315	-80.725811	Permanent Access Road MVP-GI-232	101+25	Perennial	RPW	R3RB2	-	3A	3A	5	67	-	4-11	Existing ford crossing. Temporary crossing structure to be used during construction.
S-MN17	UNT to Clendennin Creek	Giles	37.373961	-80.732119	Permanent Access Road MVP-GI-232	76+00	Intermittent	RPW	R4SB3	-	3A	3A	3	42	-	4-12	Existing ford crossing. Temporary crossing structure to be used during construction.
S-MN20	UNT to Clendennin Creek	Giles	37.373901	-80.731631	Permanent Access Road MVP-GI-232	77+75	Intermittent	RPW	R4SB3	-	N/A	N/A	4	-	-	4-12	Existing culvert, no replacement necessary; therefore, no impact
S-MN17-Braid	UNT to Clendennin Creek	Giles	37.373838	-80.731963	Permanent Access Road MVP-GI-232	76+00	Intermittent	RPW	R4SB3	-	3A	3A	3	-	-	4-12	Outside of LOD; therefore, no impact
S-HH15	UNT to Clendennin Creek	Giles	37.370798	-80.737186	Permanent Access Road MVP-GI-232	53+10	Perennial	RPW	R3UB1	-	N/A	N/A	5	-	-	4-13	Existing culvert, no replacement necessary; therefore, no impact
S-HH14	UNT to Clendennin Creek	Giles	37.370790	-80.738127	Permanent Access Road MVP-GI-232	50+60	Ephemeral	NRPW	R6	-	N/A	N/A	3	-	-	4-13	Existing culvert, no replacement necessary; therefore, no impact
S-HH12	UNT to Clendennin Creek	Giles	37.366134	-80.746301	Permanent Access Road MVP-GI-232	13+50	Ephemeral	NRPW	R6	-	N/A	N/A	3	-	-	4-14	Existing culvert, no replacement necessary; therefore, no impact
S-HH11	UNT to Clendennin Creek	Giles	37.366087	-80.747473	Permanent Access Road MVP-GI-232	9+50	Ephemeral	NRPW	R6	-	N/A	N/A	4	10	-	4-14	Existing culvert, no replacement necessary. Timber mat crossing of unculverted stream segment during construction. No impact to culverted stream segment; temporary impact to unculverted stream segment.
S-PP22	UNT to Craig Creek	Montgomery	37.321090	-80.412831	Pipeline LOD	MP 218.8	Intermittent	RPW	R4SB5	-	N/A	N/A	2.5	83	-	4-16	Temporary impact within LOD
S-PP21	UNT to Craig Creek	Montgomery	37.317187	-80.409235	Pipeline LOD	MP 219.1	Ephemeral	NRPW	R6	-	N/A	N/A	4	97	-	4-17	Temporary impact within LOD
S-PP20	UNT to Craig Creek	Montgomery	37.316523	-80.408646	Pipeline LOD	MP 219.2	Intermittent	RPW	R4SB3	-	3A	3A	6	89	-	4-17	Temporary impact within LOD
S-HH17	Craig Creek	Montgomery	37.314554	-80.39842	Pipeline LOD	MP 219.9	Perennial	RPW[10]	R2UB1	-	2A (aquatic life, wildlife)	2A (aquatic life, wildlife)	18	-	-	4-18	Outside of LOD; therefore, no impact
S-HH18	UNT to Craig Creek	Montgomery	37.313910	-80.398683	Pipeline LOD	MP 219.9	Perennial	RPW	R3RB1	-	3A	3A	6	78	-	4-18	Temporary impact within LOD

Stream Impact Table
US National Forest Service Lands
Mountain Valley Pipeline Project

Stream ID	NHD Stream Name[1]	County	Latitude[2]	Longitude[2]	Project Location[3]	Pipeline Mile Post / Access Road Station	Flow Regime	Water Type[4]	Cowardin Class[5]	Designation[6,7]	Water Quality[8,9]	Water Quantity[8,9]	Top of Bank Width (ft)	Temporary Linear Feet Impact (ft)	Permanent Linear Feet Impact (ft)	Figure	Notes
S-RR14	UNT to Craig Creek	Montgomery	37.313615	-80.402521	Pipeline LOD[11]	MP 219.7	Ephemeral	NRPW	R6	-	3A	3A	7	78	-	4-18	Temporary impact within LOD. Impacted stream portion is located off of U.S. Forest Service (National Forest) Lands.

Notes:

1 - For identified streams without a NHD name, the identified stream was given the name, “Unidentified Tributary (UNT)”, of the first named receiving waterbody.

2 - in decimal degrees

3 - LOD - Limit of Disturbance

4 - RPW = Relatively Permanent Waters
- NRPW = Non-Relatively Permanent Waters

5 - See Cowardin et al., 1979

6 - Trout Waters - Cold Water Streams Survey (CWSS) - trout streams as determined by Virginia Department of Game and Inland Fish available at https://www.dgif.virginia.gov/gis/data/download/;
Anadromous Fish Use Areas - as determined by Virginia Department of Game and Inland Fish available at https://www.dgif.virginia.gov/gis/data/download/;
Tier 3 - Exceptional State Waters (Tier III) list available at http://www.deq.virginia.gov/Programs/Water/WaterQualityInformationTMDLs/WaterQualityStandards/ExceptionalStateWaters(TierIII).aspx

7 - No Tier 3 streams are crossed on USFS property; Information regarding the location of VA DEQ designated Tier 1 and Tier 2 streams is not publically available information

8 - Water Quality/Quantity data are taken from existing sources including: EPA Storet (https://www.epa.gov/waterdata/storage-and-retrieval-and-water-quality-exchange) and
VA DEQ Final 2014 305(b)/303(d) Water Quality Assessment Integrated Report available at -
http://www.deq.virginia.gov/Programs/Water/WaterQualityInformationTMDLs/WaterQualityAssessments/2014305(b)303(d)IntegratedReport.aspx
- 3A - Category 3A (Indeterminate - Waters needing additional information, water was not previously listed as impaired) from VA DEQ Final 2014 305(b)/303(d) Water Quality Assessment Integrated Report
- 3B - Category 3B (Indeterminate - Waters needing additional information, waters will be prioritized for follow-up monitoring as resources allow) from VA DEQ Final 2014 305(b)/303(d) Water Quality Assessment Integrated Report
- 2A - Category 2A (Fully Supporting - Waters are supporting one or more designated uses) from VA DEQ Final 2014 305(b)/303(d) Water Quality Assessment Integrated Report

9 -N/A - Publically available water quality/quantity data was not available from the sources in Note 8

10 - Upstream of USACE-specified limit of Traditional Navigable Waterway (TNW)

Table 3.
Mapped Soils

County	Map Unit Symbol	Map Unit Name	Hydric Classification
Giles	138CS	Oriskany very cobbly sandy loam, 3 to 15 percent slopes, rubbly	-
Giles	138D	Oriskany very cobbly sandy loam, 15 to 35 percent slopes, very stony	-
Giles	138E	Oriskany very cobbly sandy loam, 35 to 60 percent slopes, very stony	-
Giles	138ES	Oriskany very cobbly sandy loam, 35 to 60 percent slopes, rubbly	-
Giles	23F	Lehew and Wallen soils, very stony, 35 to 65 percent slopes	-
Giles	26C	Jefferson loam, 3 to 15 percent slopes	-
Giles	26D	Jefferson loam, 15 to 35 percent slopes	-
Giles	27E	Lily-Bailegap complex, very stony, 15 to 35 percent slopes	-
Giles	27F	Lily-Bailegap complex, very stony, 35 to 65 percent slopes	-
Giles	30C	Nolichucky very stony sandy loam, 7 to 15 percent slopes	-
Giles	30D	Nolichucky very stony sandy loam, 15 to 30 percent slopes	-
Giles	30F	Nolichucky very stony sandy loam, 30 to 65 percent slopes	-
Giles	48C	Calvin very channery loam, 3 to 15 percent slopes, extremely stony	-
Giles	57E	Clymer sandy loam, 35 to 60 percent slopes	-
Giles	66D	Bailegap sandy loam, 15 to 35 percent slopes	-
Giles	66E	Bailegap sandy loam, 35 to 60 percent slopes	-
Giles	75D	Lily gravelly sandy loam, 15 to 35 percent slopes	-
Giles	75E	Lily gravelly sandy loam, 35 to 60 percent slopes	-
Montgomery	10	Craigsville soils	Hydric
Montgomery	10G	Calvin-Rough complex, 35 to 70 percent slopes, very stony	-
Montgomery	11F	Faywood silt loam, 30 to 65 percent slopes	-
Montgomery	13C	Frederick and Vertrees gravelly silt loams, 7 to 15 percent slopes	-
Montgomery	13D	Frederick and Vertrees gravelly silt loams, 15 to 25 percent slopes	-
Montgomery	16D	Groseclose and Poplimento soils, 15 to 25 percent slopes	-
Montgomery	16E	Groseclose and Poplimento soils, 25 to 60 percent slopes	-
Montgomery	1C	Berks-Clymer complex, 7 to 15 percent slopes	-
Montgomery	23C	Jefferson very stony soils, 7 to 15 percent slopes	-
Montgomery	24D	Jefferson extremely stony soils, 7 to 25 percent slopes	-
Montgomery	4E	Berks-Rock outcrop complex, 25 to 70 percent slopes	-
Montgomery	5D	Berks-Weikert complex, 15 to 25 percent slopes	-
Montgomery	6E	Berks and Weikert soils, 25 to 65 percent slopes	-
Montgomery	7D	Berks and Weikert very stony soils, 15 to 35 percent slopes	-

APPENDIX A
Wetland Determination Data Forms

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: MVP City/County: Giles Sampling Date: 06/28/2016

Applicant/Owner: MVP State: VA Sampling Point: W-KL14

Investigator(s): J. Cook, J. Potrikus, K. Pulver Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): -

Subregion (LRR or MLRA): LRR N Lat: 37.395903 Long: -80.680455 Datum: NAD 83

Soil Map Unit Name: 27F - Lily-Bailegap complex, very stony, 35 to 65 percent slopes NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil ✔, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ No ✔

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✔	No _____	**Is the Sampled Area within a Wetland?** **Yes ✔** **No _____**
Hydric Soil Present?	Yes ✔	No _____	
Wetland Hydrology Present?	Yes ✔	No _____	

Remarks: Cowardin Code: PSS HGM: Depressional Water Type: ISOLATE

Isolated wetland. Due to the characteristics of the soil, being largely gravel and weakly developed sand, we suspect this wetland was created from impact. The nature of the feature lends more closely to sparsely vegetated pub though the vegetation would allow for PSS classification.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ✔ Surface Water (A1)
- ✔ High Water Table (A2)
- ✔ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ✔ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ✔ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ✔	No _____	Depth (inches): 1
Water Table Present?	Yes ✔	No _____	Depth (inches): 0
Saturation Present? (includes capillary fringe)	Yes ✔	No _____	Depth (inches): 0

Wetland Hydrology Present? Yes ✔ No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Ponded depressional wetland formed by impacted soils.

VEGETATION (Four Strata) – Use scientific names of plants. Sampling Point: W-KL14

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Nyssa sylvatica	15	✔	FAC
2.			
3.			
4.			
5.			
6.			
7.			
	15 = Total Cover		
50% of total cover: 7.5	20% of total cover: 3		
Sapling/Shrub Stratum (Plot size: 15')			
1. Vaccinium corymbosum	20	✔	FACW
2. Acer rubrum	10	✔	FAC
3. Sassafras albidum	3		FACU
4.			
5.			
6.			
7.			
8.			
9.			
	33 = Total Cover		
50% of total cover: 16.5	20% of total cover: 6.6		
Herb Stratum (Plot size: 5')			
1. Viola blanda	5	✔	FACW
2. Vaccinum corymbosum	3	✔	FACW
3. Acer rubrum	1		FAC
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	9 = Total Cover		
50% of total cover: 4.5	20% of total cover: 1.8		
Woody Vine Stratum (Plot size: 15')			
1. Smilax rotundifolia	3		FAC
2.			
3.			
4.			
5.			
	3 = Total Cover		
50% of total cover: 1.5	20% of total cover: 0.6		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- ✔ 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ✔ No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL Sampling Point: W-KL14

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 3/1	100					SL	
6-16	7.5YR 6/8	60					SL	
	10YR 7/6	40						

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ✔ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ✔ **No** _____

Remarks:

6-16 inches is disturbed gravel fill and impacted. No restrictive layer found. Due to the vegetation present, as well as standing water, it is suspected that the soils have been impacted and compressed/modified. Without impact, soil would likely qualify for Dark Surface (S7).

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: MVP City/County: Giles Sampling Date: 06/28/2016

Applicant/Owner: MVP State: VA Sampling Point: W-KL14-UP

Investigator(s): J. Cook, J. Potrikus, K. Pulver Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Linear Slope (%): 2

Subregion (LRR or MLRA): LRR N Lat: 37.395941 Long: -80.680333 Datum: NAD 83

Soil Map Unit Name: 27F - Lily-Bailegap complex, very stony, 35 to 65 percent slopes NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✔	**Is the Sampled Area within a Wetland?** Yes _____ No ✔
Hydric Soil Present?	Yes _____	No ✔	
Wetland Hydrology Present?	Yes _____	No ✔	

Remarks: Cowardin Code: UPLAND HGM: Water Type:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes _____	No ✔	Depth (inches): _____
Water Table Present?	Yes _____	No ✔	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes _____	No ✔	Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✔

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
None

VEGETATION (Four Strata) – Use scientific names of plants. Sampling Point: W-KL14-UP

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Quercus rubra	20	✔	FACU
2. Sassafras albidum	10	✔	FACU
3. Nyssa sylvatica	7		FAC
4.			
5.			
6.			
7.			
	37 = Total Cover		
50% of total cover: 18.5	20% of total cover: 7.4		

Sapling/Shrub Stratum (Plot size: 15')			
1. Sassafras albidum	10	✔	FACU
2. Acer rubrum	20	✔	FAC
3. Acer pensylvanicum	5		FACU
4.			
5.			
6.			
7.			
8.			
9.			
	35 = Total Cover		
50% of total cover: 17.5	20% of total cover: 7		

Herb Stratum (Plot size: 5')			
1. Viola blanda	3	✔	FACW
2. Vaccinum corymbosum	3	✔	FACW
3. Sassafras albidum	5	✔	FACU
4. Quercus rubra	2		
5. Acer rubrum	1		
6.			
7.			
8.			
9.			
10.			
11.			
	14 = Total Cover		
50% of total cover: 7	20% of total cover: 2.8		

Woody Vine Stratum (Plot size: 15')			
1. Smilax rotundifolia	5	✔	FAC
2.			
3.			
4.			
5.			
	5 = Total Cover		
50% of total cover: 2.5	20% of total cover: 1		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 8 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ___ No ✔

Remarks: (Include photo numbers here or on a separate sheet.)

None

SOIL Sampling Point: W-KL14-UP

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-5	10YR 3/2	100					SIL	
5-10	10YR 5/4	100					SICL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: 10

Depth (inches): Refusal, compressed

Hydric Soil Present? **Yes** _____ **No** ✔

Remarks:

None

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: MVP City/County: Giles Sampling Date: 10/16/2015

Applicant/Owner: MVP State: VA Sampling Point: W-UU11

Investigator(s): S. Townsend, A. Hatfield Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Slope into drainage Slope (%): 6%

Subregion (LRR or MLRA): LRRN Lat: 37.380254 Long: -80.720485 Datum: NAD83

Soil Map Unit Name: 66D - Bailegap sandy loam, 15 to 35 percent slopes NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✔	No _____	**Is the Sampled Area within a Wetland?** Yes ✔ No _____
Hydric Soil Present?	Yes ✔	No _____	
Wetland Hydrology Present?	Yes ✔	No _____	

Remarks:
Cowardin Code: PEM
HGM: SLOPE
WT: RPWWD

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ✔ High Water Table (A2)
- ✔ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ✔ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes _____	No ✔	Depth (inches): _____
Water Table Present?	Yes ✔	No _____	Depth (inches): 12"
Saturation Present? (includes capillary fringe)	Yes ✔	No _____	Depth (inches): 0"

Wetland Hydrology Present? Yes ✔ No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Jefferson National Forest. This is a seep wetland with saturation to the surface along slopes, as well as a narrow drainage channel approx 6" wide with <1" of surface water. Less than 15% of wetland area is dominated by moss. This point was taken upslope from area with surface water.

VEGETATION (Four Strata) – Use scientific names of plants. Sampling Point: W-UU11

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		
Sapling/Shrub Stratum (Plot size: 15')			
1. Kalmia latifolia	15	✔	FACU
2. Rhododendron maximum	5	✔	FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
	20 = Total Cover		
50% of total cover: 10	20% of total cover: 4		
Herb Stratum (Plot size: 5')			
1. *Polytrichum commune	80	✔	FAC
2. Scirpus cyperinus	5	✔	FACW
3. Lindera benzoin	10	✔	FAC
4. Epilobium sp	5		
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	100 = Total Cover		
50% of total cover: 50	20% of total cover: 20		
Woody Vine Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 80% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ✔ No ___

Remarks: (Include photo numbers here or on a separate sheet.)

*Polytrichum mosses are not on USDA wetland indicator status list. However, P. commune is noted as FAC in Gillrich and Bowman's 2010 "The Use of Bryophytes as Indicators of Hydric Soils and Wetland Hydrology during Wetland Delineations in the US." This would increase the dominance to 4 species of FAC, FACW, OBL for 57%.

SOIL Sampling Point: W-UU11

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-6"	2.5YR 3/4	100						Moss, organic
6-12"	7.5YR 5/2	80	7.5YR 5/6	20	C	M	SL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ✔ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Rock

Depth (inches): 12"

Hydric Soil Present? **Yes** ✔ **No** ___

Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: MVP City/County: Giles Sampling Date: 10/16/2015

Applicant/Owner: MVP State: VA Sampling Point: W-UU11-UP

Investigator(s): S. Townsend, A. Hatfield Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Slope concave Slope (%): 2%

Subregion (LRR or MLRA): LRRN Lat: 37.380265 Long: -80.720450 Datum: NAD83

Soil Map Unit Name: 66D - Bailegap sandy loam, 15 to 35 percent slopes NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✔	**Is the Sampled Area within a Wetland?** Yes _____ No ✔
Hydric Soil Present?	Yes _____	No ✔	
Wetland Hydrology Present?	Yes _____	No ✔	

Remarks:
Upland

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes _____	No ✔	Depth (inches): _____
Water Table Present?	Yes _____	No ✔	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes _____	No ✔	Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✔

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
No hydrology

VEGETATION (Four Strata) – Use scientific names of plants. Sampling Point: W-UU11-UP

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		
Sapling/Shrub Stratum (Plot size: 15')			
1. Liriodendron tulipifera	5	✔	FACU
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
	5 = Total Cover		
50% of total cover: 2.5	20% of total cover: 1		
Herb Stratum (Plot size: 5')			
1. Agrostis sp.	30	✔	ND
2. Plantago lanceolata	5		UPL
3. Daucus carota	10	✔	UPL
4. Solidago canadensis	5		FACU
5. Glechoma hederacea	10	✔	FACU
6.			
7.			
8.			
9.			
10.			
11.			
	60 = Total Cover		
50% of total cover: 30	20% of total cover: 12		
Woody Vine Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

✔ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ___ No ✔

Remarks: (Include photo numbers here or on a separate sheet.)

Agrostis cannot be identified to species due to late season growth. Other identifiable species in area are UPL or FACU. It is unlikely that Agrostis is OBL, and if it were FACW, the prevalence worksheet would result in index of 3.3 at best.

ND - Not determined

*Not identified to species, not included in dominance test

SOIL Sampling Point: W-UU11-UP

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 5/6	98	10YR 6/8	2	C	M	SL	Road base, rocks 70%

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Gravel road base

Depth (inches): 12"

Hydric Soil Present? **Yes** _____ **No** ✔

Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: MVP City/County: Giles Sampling Date: 10/16/2015

Applicant/Owner: MVP State: VA Sampling Point: W-UU12

Investigator(s): S. Townsend, A. Hatfield Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 2%

Subregion (LRR or MLRA): LRRN Lat: 37.378364 Long: -80.722579 Datum: NAD83

Soil Map Unit Name: 26D - Jefferson loam, 15-35% slopes NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✔	No _____	**Is the Sampled Area within a Wetland?** **Yes** ✔ **No** _____
Hydric Soil Present?	Yes ✔	No _____	
Wetland Hydrology Present?	Yes ✔	No _____	

Remarks:

Cowardin Code: PEM
HGM: Depressional
WT: Isolate

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ✔ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ✔ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ✔ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes _____	No ✔	Depth (inches): _____
Water Table Present?	Yes _____	No ✔	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes ✔	No _____	Depth (inches): 0"

Wetland Hydrology Present? **Yes** ✔ **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants. Sampling Point: W-UU12

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		
Sapling/Shrub Stratum (Plot size: 15')			
1. Kalmia latifolia	20	✔	FACU
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
	20 = Total Cover		
50% of total cover: 10	20% of total cover: 4		
Herb Stratum (Plot size: 5')			
1. Scirpus cyperinus	35	✔	FACW
2. Solidago sp.	20		ND
3. Epilobium sp.	20		ND
4. Mentha arvensis	25	✔	FACW
5. Poa sp.	10		ND
6.			
7.			
8.			
9.			
10.			
11.			
	110 = Total Cover		
50% of total cover: 55	20% of total cover: 22		
Woody Vine Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 67% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- ✔ 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ✔ No ___

Remarks: (Include photo numbers here or on a separate sheet.)

ND - Not determined

*Not identified to species, not included in dominance test

SOIL Sampling Point: W-UU12

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-14"	7.5YR 4/2	85	2.5YR 4/4	5	C	M/PL	SIL	
			7.5YR 5/8	10	C	M/PL		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ✔ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Sandstone bedrock

Depth (inches): 14"

Hydric Soil Present? **Yes** ✔ **No** ___

Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: MVP City/County: Giles Sampling Date: 10/16/2015

Applicant/Owner: MVP State: VA Sampling Point: W-UU12-UP

Investigator(s): S. Townsend, A. Hatfield Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Access road terrace Slope (%): 2%

Subregion (LRR or MLRA): LRRN Lat: 37.378433 Long: -80.722484 Datum: NAV83

Soil Map Unit Name: 26D - Jefferson loam, 15-35% slopes NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✔	**Is the Sampled Area within a Wetland?** **Yes** _____ **No** ✔
Hydric Soil Present?	Yes _____	No ✔	
Wetland Hydrology Present?	Yes _____	No ✔	

Remarks:
Upland

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes _____	No ✔	Depth (inches): _____
Water Table Present?	Yes _____	No ✔	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes _____	No ✔	Depth (inches): _____

Wetland Hydrology Present? **Yes** _____ **No** ✔

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
No hydrology

VEGETATION (Four Strata) – Use scientific names of plants. Sampling Point: W-UU12-UP

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		
Sapling/Shrub Stratum (Plot size: 15')			
1. Liriodendron tulipifera	10	✔	FACU
2. Acer saccharum	10	✔	FACW
3.			
4.			
5.			
6.			
7.			
8.			
9.			
	20 = Total Cover		
50% of total cover: 10	20% of total cover: 4		
Herb Stratum (Plot size: 5')			
1. Symphyotrichum ericoides	20	✔	FACU
2. Trifolium repens	5		
3. Rubus sp.	10		
4. Solidago canadensis	15	✔	FACU
5. Smilax rotundifolia	10		
6. Ageratina altissima	5		
7.			
8.			
9.			
10.			
11.			
	65 = Total Cover		
50% of total cover: 32.5	20% of total cover: 13		
Woody Vine Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 25 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ___ No ✔

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL Sampling Point: W-UU12-UP

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-14	10YR 4/4	97	10YR 6/8	3			SL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Sandstone bedrock

Depth (inches): 14"

Hydric Soil Present? **Yes** _____ **No** ✔

Remarks:

Orange colors caused by sandstone lithics.

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: MVP City/County: Narrows/Giles Sampling Date: 10/16/2015

Applicant/Owner: MVP State: VA Sampling Point: W-HH15

Investigator(s): S Ryan, A Larson, M Whitten Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 3

Subregion (LRR or MLRA): LRRN Lat: 37.371087 Long: -80.736164 Datum: NAD83

Soil Map Unit Name: Oriskany very cobbly sandy loam, 3 to 15 percent slopes, rubbly NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✔	No _____	**Is the Sampled Area within a Wetland?** Yes ✔ No _____
Hydric Soil Present?	Yes ✔	No _____	
Wetland Hydrology Present?	Yes ✔	No _____	

Remarks:
Cowardin Code: PEM
HGM: Depressional
Water Type: Isolate

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ✔ High Water Table (A2)
- ✔ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ✔ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ✔ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes _____	No ✔	Depth (inches): _____
Water Table Present?	Yes ✔	No _____	Depth (inches): 8
Saturation Present? (includes capillary fringe)	Yes ✔	No _____	Depth (inches): 0

Wetland Hydrology Present? Yes ✔ No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Wetland enters north side of study area and goes underground just north of Access Road. From there a drainage feature (vegetated and lacking defined bed/bank) crosses road via culvert and continues to south edge of study area. Small seeps observed near southern survey boundary but all seeps lacked both stream and wetland characteristics.

VEGETATION (Four Strata) – Use scientific names of plants. Sampling Point: W-HH15

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		
Herb Stratum (Plot size: 5')			
1. Glyceria melicaria	40	✔	OBL
2. Impatiens capensis	30	✔	FACW
3. Viola sp.	5		ND
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	75 = Total Cover		
50% of total cover: 0	20% of total cover: 0		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- ✔ 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ✔ No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL Sampling Point: W-HH15

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-20	10YR 2/2	100					SL	High organic content

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ✔ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: None

Depth (inches): ___

Hydric Soil Present? **Yes** ✔ **No** ___

Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: MVP City/County: Giles Sampling Date: 10/16/2015

Applicant/Owner: MVP State: VA Sampling Point: W-HH15-UP

Investigator(s): S Ryan, A Larson, M Whitten Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 12

Subregion (LRR or MLRA): LRRN Lat: 37.371039 Long: -80.736149 Datum: NAD83

Soil Map Unit Name: Oriskany very cobbly sandy loam, 3 to 15 percent slopes, rubbly NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✔	**Is the Sampled Area within a Wetland?** Yes _____ No ✔
Hydric Soil Present?	Yes _____	No ✔	
Wetland Hydrology Present?	Yes _____	No ✔	

Remarks:
Upland

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes _____	No ✔	Depth (inches): _____
Water Table Present?	Yes _____	No ✔	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes _____	No ✔	Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✔

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants. Sampling Point: W-HH15-UP

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Liriodendron tulipifera	35	✔	FACU
2. Pinus strobus	30	✔	FACU
3. Oxydendrum arboreum	20	✔	UPL
4. Betula alleghaniensis	10		FAC
5.			
6.			
7.			
	95 = Total Cover		
50% of total cover: 47.5	20% of total cover: 19		
Sapling/Shrub Stratum (Plot size: 15')			
1. Liriodendron tulipifera	5		FACU
2. Sassafras albidum	5		FACU
3. Robinia psuedoacacia	15	✔	FACU
4. Oxydendrum arboreum	10	✔	UPL
5. Quercus montana	5		FACU
6.			
7.			
8.			
9.			
	40 = Total Cover		
50% of total cover: 20	20% of total cover: 8		
Herb Stratum (Plot size: 5')			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- ✔ 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ___ No ✔

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: W-HH15-UP

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	10R 3/2	100					SL	No Redox
4-10	10R 3/3	100					SL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Rock

Depth (inches): 10

Hydric Soil Present? **Yes** _____ **No** ✔

Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: MVP City/County: Giles Sampling Date: 10/16/2015

Applicant/Owner: MVP State: VA Sampling Point: W-HH14

Investigator(s): S Ryan, A Larson, M Whitten Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): Slope Local relief (concave, convex, none): Concave Slope (%): 3

Subregion (LRR or MLRA): LRRN Lat: 37.371001 Long: -80.737201 Datum: NAD83

Soil Map Unit Name: Oriskany very cobbly sandy loam, 3 to 15 percent slopes, rubbly NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✔	No _____	**Is the Sampled Area within a Wetland?** **Yes ✔** **No _____**
Hydric Soil Present?	Yes ✔	No _____	
Wetland Hydrology Present?	Yes ✔	No _____	

Remarks:
Cowardin Code: PEM
HGM: RPWWD
Water Type: Slope

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ✔ Surface Water (A1)
- ✔ High Water Table (A2)
- ✔ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ✔ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ✔ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ✔ Microtopographic Relief (D4)
- ✔ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ✔	No _____	Depth (inches): 1
Water Table Present?	Yes ✔	No _____	Depth (inches): 0
Saturation Present? (includes capillary fringe)	Yes ✔	No _____	Depth (inches): 0

Wetland Hydrology Present? Yes ✔ No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants. Sampling Point: W-HH14

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		
Herb Stratum (Plot size: 5')			
1. Scirpus polyphyllus	20	✔	OBL
2. Glyceria melicaria	15	✔	OBL
3. Impatiens capensis	5		FACW
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	40 = Total Cover		
50% of total cover: 20	20% of total cover: 8		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

✔ 1 - Rapid Test for Hydrophytic Vegetation

✔ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ✔ No ___

Remarks: (Include photo numbers here or on a separate sheet.)

Sparsely vegetated.

SOIL Sampling Point: W-HH14

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-7	10YR 3/2	95	10YR 5/8	5	C	M	CL	
7-16	10YR 4/4	100					CL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ✔ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: None

Depth (inches): ___

Hydric Soil Present? **Yes** ✔ **No** ___

Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: MVP City/County: Giles Sampling Date: 10/16/2015

Applicant/Owner: MVP State: VA Sampling Point: W-HH14-UP

Investigator(s): S Ryan, A Larson, M Whitten Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 0

Subregion (LRR or MLRA): LRRN Lat: 37.370940 Long: -80.737265 Datum: NAD83

Soil Map Unit Name: Oriskany very cobbly sandy loam, 3 to 15 percent slopes, rubbly NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✔	**Is the Sampled Area within a Wetland?** **Yes** _____ **No** ✔
Hydric Soil Present?	Yes _____	No ✔	
Wetland Hydrology Present?	Yes _____	No ✔	

Remarks:
Upland

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes _____	No ✔	Depth (inches): _____
Water Table Present?	Yes _____	No ✔	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes _____	No ✔	Depth (inches): _____

Wetland Hydrology Present? **Yes** _____ **No** ✔

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants. Sampling Point: W-HH14-UP

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Liriodendron tulipifera	50	✔	FACU
2. Acer saccharum	10		FACU
3. Carya sp.	10		ND
4.			
5.			
6.			
7.			
	70 = Total Cover		
50% of total cover: 0	20% of total cover: 0		
Sapling/Shrub Stratum (Plot size: 15')			
1. Liriodendron tulipifera	20	✔	FACU
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
	20 = Total Cover		
50% of total cover: 0	20% of total cover: 0		
Herb Stratum (Plot size: 5')			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ____ No ✔

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: W-HH14-UP

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 3/3	100					CL	No Redox
6-10	10YR 4/4	100					CL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Rock

Depth (inches): 10

Hydric Soil Present? **Yes** ____ **No** ✔

Remarks:

APPENDIX B
Wetland Photographs

Photograph Number: 1 **Feature Name:** W-KL14 **Cowardin Class:** PSS

Direction: W **Date:** 6/28/2016

Photograph Number: 2 **Feature Name:** W-UU11 **Cowardin Class:** PEM

Direction: SW **Date:** 10/16/2015

Photograph Number: 3 **Feature Name:** W-UU12 **Cowardin Class:** PEM

Direction: WSW **Date:** 10/16/2015

Photograph Number: 4 **Feature Name:** W-HH15 **Cowardin Class:** PEM

Direction: SSW **Date:** 10/16/2015

Photograph Number: 5 **Feature Name:** W-HH14 **Cowardin Class:** PEM

Direction: WSW **Date:** 10/16/2015

APPENDIX C
Stream Data Sheets

STREAM ID S-KL24		**STREAM NAME** UNT to Kimballton Branch	
CLIENT MVP		**PROJECT NAME** MVP	
LAT 37.400694	**LONG** -80.687779	**DATE** 06/28/2016	**COUNTY** Giles
INVESTIGATORS J. Cook, J. Potrikus, K. Pulver			
WATER TYPE TNW ☐ RPW ☐ NRPW ☑		**FLOW REGIME** Perennial ☐ Intermittent ☐ Ephemeral ☑	

CHANNEL FEATURES

Estimate Measurements
Top of Bank Width: 3.0 ft
Top of Bank Height:
LB 2.0 ft RB 1.5 ft
Water Depth: 0.00 in
Water Width: 0.0 ft
Ordinary High Water Mark (Width): 1.5 ft
Ordinary High Water Mark (Height): 3.0 in
Flow Direction: Southeast

Sinuosity ✔ Low ___ Medium ___ High

Gradient ___ Flat (0.5/100 ft) ✔ Moderate (2 ft/100 ft) ___ Severe (10 ft/100 ft)

Stream Erosion
✔ None ___ Moderate ___ Heavy

Artificial, Modified or Channelized
___ Yes ✔ No

Within Roadside Ditch
___ Yes ✔ No

Culvert Present ___ Yes ✔ No
Culvert Material:_____
Culvert Size: _____in

FLOW CHARACTERISTICS

Water Present
✔ No water, stream bed dry
___ Stream bed moist
___ Standing water
___ Flowing water

Velocity
___ Fast ___ Moderate
___ Slow

Proportion of Reach Represented by Stream Morphology Types (Only enter if water present)
Riffle % Run %
Pool %

Turbidity
___ Clear ___ Slightly turbid ___ Turbid
___ Other_____

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%) 100

Substrate Type	Diameter	% Composition in Sampling Reach
Bedrock		
Boulder	> 256 mm (10")	
Cobble	64-256 mm (2.5"-10")	30
Gravel	2-64 mm (0.1"-2.5")	
Sand	0.06-2mm (gritty)	30
Silt	0.004-0.06 mm	40
Clay	< 0.004 mm (slick)	

ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)

Substrate Type	Characteristic	% Composition in Sampling Area
Detritus	sticks, wood, coarse plant materials (CPOM)	50
Muck-Mud	black, very fine organic (FPOM)	
Marl	grey, shell fragments	

WATERSHED FEATURES

Predominant Surrounding Landuse
✔ Forest ___ Commercial
___ Field/Pasture ___ Industrial
___ Agricultural ___ Residential
___ ROW ___ Other:

Floodplain Width
___ Wide > 30ft ___ Moderate 15-30ft
✔ Narrow <15ft

Canopy Cover
___ Open ✔ Partly shaded
___ Shaded

MACROINVERTEBRATES/OTHER WILDLIFE OBSERVED OR OTHER NOTES AND OBSERVATIONS

STREAM ID S-MN19		**STREAM NAME** UNT to Kimballton Branch	
CLIENT MVP		**PROJECT NAME** MVP	
LAT 37.400399	**LONG** -80.685935	**DATE** 05/10/2017	**COUNTY** Giles
INVESTIGATORS S Ryan, K Pulver, H Phelan			
WATER TYPE TNW ☐ RPW ☑ NRPW ☐		**FLOW REGIME** Perennial ☐ Intermittent ☑ Ephemeral ☐	

CHANNEL FEATURES

Estimate Measurements
Top of Bank Width: 1.0 ft
Top of Bank Height:
LB 0.3 ft RB 0.3 ft
Water Depth: 1.00 in
Water Width: 1.0 ft
Ordinary High Water Mark (Width): 1.0 ft
Ordinary High Water Mark (Height): 1.0 in
Flow Direction: Southeast

Sinuosity ✔ Low ___ Medium ___ High

Gradient ___ Flat (0.5/100 ft) ___ Moderate (2 ft/100 ft) ✔ Severe (10 ft/100 ft)

Stream Erosion
✔ None ___ Moderate ___ Heavy

Artificial, Modified or Channelized
___ Yes ✔ No

Within Roadside Ditch
___ Yes ✔ No

Culvert Present ___ Yes ✔ No
Culvert Material:_____
Culvert Size: _____in

FLOW CHARACTERISTICS

Water Present
___ No water, stream bed dry
___ Stream bed moist
___ Standing water
✔ Flowing water

Velocity
___ Fast ✔ Moderate
___ Slow

Proportion of Reach Represented by Stream Morphology Types (Only enter if water present)
Riffle 30 % Run 50 %
Pool 20 %

Turbidity
✔ Clear ___ Slightly turbid ___ Turbid
___ Other_____

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%) 100

Substrate Type	Diameter	% Composition in Sampling Reach
Bedrock		
Boulder	> 256 mm (10")	
Cobble	64-256 mm (2.5"-10")	
Gravel	2-64 mm (0.1"-2.5")	10
Sand	0.06-2mm (gritty)	20
Silt	0.004-0.06 mm	70
Clay	< 0.004 mm (slick)	

ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)

Substrate Type	Characteristic	% Composition in Sampling Area
Detritus	sticks, wood, coarse plant materials (CPOM)	5
Muck-Mud	black, very fine organic (FPOM)	0
Marl	grey, shell fragments	0

WATERSHED FEATURES

Predominant Surrounding Landuse
✔ Forest ___ Commercial
___ Field/Pasture ___ Industrial
___ Agricultural ___ Residential
___ ROW ___ Other:

Floodplain Width
___ Wide > 30ft ___ Moderate 15-30ft
✔ Narrow <15ft

Canopy Cover
___ Open ___ Partly shaded
✔ Shaded

MACROINVERTEBRATES/OTHER WILDLIFE OBSERVED OR OTHER NOTES AND OBSERVATIONS

Seep fed. Seep has steady but minimal flow with marginal bed/bank. Feature goes subsurface approximately 40 feet from source.

STREAM ID S-MN18		**STREAM NAME** UNT to Kimballton Branch	
CLIENT MVP		**PROJECT NAME** MVP	
LAT 37.400357	**LONG** -80.685456	**DATE** 05/10/2017	**COUNTY** Giles
INVESTIGATORS S Ryan, K Pulver, H Phelan			
WATER TYPE TNW ☐ RPW ☑ NRPW ☐		**FLOW REGIME** Perennial ☐ Intermittent ☑ Ephemeral ☐	

CHANNEL FEATURES

Estimate Measurements
Top of Bank Width: 1.0 ft
Top of Bank Height:
LB 0.5 ft RB 0.5 ft
Water Depth: 1.00 in
Water Width: 1.0 ft
Ordinary High Water Mark (Width): 1.0 ft
Ordinary High Water Mark (Height): 1.0 in
Flow Direction: South

Sinuosity ___ Low ✔ Medium ___ High

Gradient ___ Flat (0.5/100 ft) ___ Moderate (2 ft/100 ft) ✔ Severe (10 ft/100 ft)

Stream Erosion
✔ None ___ Moderate ___ Heavy

Artificial, Modified or Channelized
___ Yes ✔ No

Within Roadside Ditch
___ Yes ✔ No

Culvert Present ___ Yes ✔ No
Culvert Material:_____
Culvert Size: _____in

FLOW CHARACTERISTICS

Water Present
___ No water, stream bed dry
___ Stream bed moist
___ Standing water
✔ Flowing water

Velocity
✔ Fast ___ Moderate
___ Slow

Proportion of Reach Represented by Stream Morphology Types (Only enter if water present)
Riffle 80 % Run 10 %
Pool 10 %

Turbidity
___ Clear ___ Slightly turbid ___ Turbid
___ Other_____

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%) 100

Substrate Type	Diameter	% Composition in Sampling Reach
Bedrock		
Boulder	> 256 mm (10")	
Cobble	64-256 mm (2.5"-10")	
Gravel	2-64 mm (0.1"-2.5")	10
Sand	0.06-2mm (gritty)	10
Silt	0.004-0.06 mm	80
Clay	< 0.004 mm (slick)	

ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)

Substrate Type	Characteristic	% Composition in Sampling Area
Detritus	sticks, wood, coarse plant materials (CPOM)	10
Muck-Mud	black, very fine organic (FPOM)	0
Marl	grey, shell fragments	0

WATERSHED FEATURES

Predominant Surrounding Landuse
✔ Forest ___ Commercial
___ Field/Pasture ___ Industrial
___ Agricultural ___ Residential
___ ROW ___ Other:

Canopy Cover
___ Open ___ Partly shaded
✔ Shaded

Floodplain Width
___ Wide > 30ft ___ Moderate 15-30ft
✔ Narrow <15ft

MACROINVERTEBRATES/OTHER WILDLIFE OBSERVED OR OTHER NOTES AND OBSERVATIONS

Seep-fed intermittent stream. Bed/bank becomes marginal in spots approximately 25' from source (seep), flowing through detritus before all flow disappears sub-surface (stream flag 4). Although flow goes subsurface, a defined channel continues and joins S-SS3 (this section of channel is dry during survey, suggesting that it only flows during flood event).

STREAM ID S-SS3		**STREAM NAME** UNT to Kimballton Branch	
CLIENT MVP		**PROJECT NAME** MVP	
LAT 37.400120	**LONG** -80.685438	**DATE** 05/10/2017	**COUNTY** Giles
INVESTIGATORS S Ryan, K Pulver, H Phelan			
WATER TYPE TNW ☐ RPW ☑ NRPW ☐		**FLOW REGIME** Perennial ☐ Intermittent ☑ Ephemeral ☐	

CHANNEL FEATURES

Estimate Measurements
Top of Bank Width: 2.5 ft
Top of Bank Height:
LB 0.5 ft RB 0.5 ft
Water Depth: 2.00 in
Water Width: 1.5 ft
Ordinary High Water Mark (Width): 2.5 ft
Ordinary High Water Mark (Height): 1.5 in
Flow Direction: South

Sinuosity ___ Low ✔ Medium ___ High

Gradient ___ Flat (0.5/100 ft) ___ Moderate (2 ft/100 ft) ✔ Severe (10 ft/100 ft)

Stream Erosion
✔ None ___ Moderate ___ Heavy

Artificial, Modified or Channelized
___ Yes ✔ No

Within Roadside Ditch
___ Yes ✔ No

Culvert Present ___ Yes ✔ No
Culvert Material:_____
Culvert Size: _____in

FLOW CHARACTERISTICS

Water Present
___ No water, stream bed dry
___ Stream bed moist
___ Standing water
✔ Flowing water

Velocity
___ Fast ✔ Moderate
___ Slow

Proportion of Reach Represented by Stream Morphology Types (Only enter if water present)
Riffle 50 % Run 20 %
Pool 30 %

Turbidity
✔ Clear ___ Slightly turbid ___ Turbid
___ Other_____

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%) 100

Substrate Type	Diameter	% Composition in Sampling Reach
Bedrock		
Boulder	> 256 mm (10")	
Cobble	64-256 mm (2.5"-10")	
Gravel	2-64 mm (0.1"-2.5")	15
Sand	0.06-2mm (gritty)	30
Silt	0.004-0.06 mm	55
Clay	< 0.004 mm (slick)	

ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)

Substrate Type	Characteristic	% Composition in Sampling Area
Detritus	sticks, wood, coarse plant materials (CPOM)	10
Muck-Mud	black, very fine organic (FPOM)	0
Marl	grey, shell fragments	0

WATERSHED FEATURES

Predominant Surrounding Landuse
✔ Forest ___ Commercial
___ Field/Pasture ___ Industrial
___ Agricultural ___ Residential
___ ROW ___ Other:

Floodplain Width
___ Wide > 30ft ✔ Moderate 15-30ft
___ Narrow <15ft

Canopy Cover
___ Open ___ Partly shaded
✔ Shaded

MACROINVERTEBRATES/OTHER WILDLIFE OBSERVED OR OTHER NOTES AND OBSERVATIONS

Seep-fed stream

STREAM ID S-KL23		**STREAM NAME** UNT to Kimballton Branch	
CLIENT MVP		**PROJECT NAME** MVP	
LAT 37.399935	**LONG** -80.687796	**DATE** 06/28/2016	**COUNTY** Giles
INVESTIGATORS J. Cook, K. Pulver, J. Potrikus			
WATER TYPE TNW ☐ RPW ☑ NRPW ☐		**FLOW REGIME** Perennial ☑ Intermittent ☐ Ephemeral ☐	

CHANNEL FEATURES

Estimate Measurements
Top of Bank Width: 3.0 ft
Top of Bank Height:
LB 1.0 ft RB 1.0 ft
Water Depth: 3.00 in
Water Width: 1.0 ft
Ordinary High Water Mark (Width): 1.0 ft
Ordinary High Water Mark (Height): 3.0 in
Flow Direction: Southeast

Sinuosity ___ Low ✔ Medium ___ High

Gradient ___ Flat (0.5/100 ft) ✔ Moderate (2 ft/100 ft) ___ Severe (10 ft/100 ft)

Stream Erosion
___ None ✔ Moderate ___ Heavy

Artificial, Modified or Channelized
___ Yes ✔ No

Within Roadside Ditch
___ Yes ✔ No

Culvert Present ___ Yes ✔ No
Culvert Material: _____
Culvert Size: _____ in

FLOW CHARACTERISTICS

Water Present
___ No water, stream bed dry
___ Stream bed moist
___ Standing water
✔ Flowing water

Velocity
✔ Fast ___ Moderate
___ Slow

Proportion of Reach Represented by Stream Morphology Types (Only enter if water present)
Riffle % Run 100 %
Pool %

Turbidity
✔ Clear ___ Slightly turbid ___ Turbid
___ Other _____

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%) 100

Substrate Type	Diameter	% Composition in Sampling Reach
Bedrock		
Boulder	> 256 mm (10")	
Cobble	64-256 mm (2.5"-10")	
Gravel	2-64 mm (0.1"-2.5")	20
Sand	0.06-2mm (gritty)	40
Silt	0.004-0.06 mm	40
Clay	< 0.004 mm (slick)	

ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)

Substrate Type	Characteristic	% Composition in Sampling Area
Detritus	sticks, wood, coarse plant materials (CPOM)	30
Muck-Mud	black, very fine organic (FPOM)	
Marl	grey, shell fragments	

WATERSHED FEATURES

Predominant Surrounding Landuse
✔ Forest ___ Commercial
___ Field/Pasture ___ Industrial
___ Agricultural ___ Residential
___ ROW ___ Other:

Floodplain Width
___ Wide > 30ft ___ Moderate 15-30ft
✔ Narrow <15ft

Canopy Cover
___ Open ___ Partly shaded
✔ Shaded

MACROINVERTEBRATES/OTHER WILDLIFE OBSERVED OR OTHER NOTES AND OBSERVATIONS

Perennial seep appearing from base of tree and flowing SE. Goes subsurface; may re-emerge as S-KL22.

STREAM ID S-KL22		**STREAM NAME** UNT to Kimballton Branch	
CLIENT MVP		**PROJECT NAME** MVP	
LAT 37.399462	**LONG** -80.686923	**DATE** 06/28/2016	**COUNTY** Giles
INVESTIGATORS J. Cook, K. Pulver, J. Potrikus			
WATER TYPE TNW ☐ RPW ☑ NRPW ☐		**FLOW REGIME** Perennial ☑ Intermittent ☐ Ephemeral ☐	

CHANNEL FEATURES

Estimate Measurements
Top of Bank Width: 3.0 ft
Top of Bank Height:
LB 3.0 ft RB 2.0 ft
Water Depth: 3.00 in
Water Width: 2.0 ft
Ordinary High Water Mark (Width): 2.0 ft
Ordinary High Water Mark (Height): 3.0 in
Flow Direction: South

Sinuosity ___ Low ___ Medium ✔ High

Gradient ___ Flat (0.5/100 ft) ✔ Moderate (2 ft/100 ft) ___ Severe (10 ft/100 ft)

Stream Erosion
___ None ✔ Moderate ___ Heavy

Artificial, Modified or Channelized
___ Yes ✔ No

Within Roadside Ditch
___ Yes ✔ No

Culvert Present ___ Yes ✔ No
Culvert Material:_____
Culvert Size: _____in

FLOW CHARACTERISTICS

Water Present
___ No water, stream bed dry
___ Stream bed moist
___ Standing water
✔ Flowing water

Velocity
✔ Fast ___ Moderate
___ Slow

Proportion of Reach Represented by Stream Morphology Types (Only enter if water present)
Riffle 30 % Run 70 %
Pool %

Turbidity
✔ Clear ___ Slightly turbid ___ Turbid
___ Other_____

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%) 100

Substrate Type	Diameter	% Composition in Sampling Reach
Bedrock		
Boulder	> 256 mm (10")	
Cobble	64-256 mm (2.5"-10")	30
Gravel	2-64 mm (0.1"-2.5")	30
Sand	0.06-2mm (gritty)	40
Silt	0.004-0.06 mm	
Clay	< 0.004 mm (slick)	

ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)

Substrate Type	Characteristic	% Composition in Sampling Area
Detritus	sticks, wood, coarse plant materials (CPOM)	
Muck-Mud	black, very fine organic (FPOM)	
Marl	grey, shell fragments	

WATERSHED FEATURES

Predominant Surrounding Landuse
✔ Forest ___ Commercial
___ Field/Pasture ___ Industrial
___ Agricultural ___ Residential
___ ROW ___ Other:

Floodplain Width
___ Wide > 30ft ___ Moderate 15-30ft
✔ Narrow <15ft

Canopy Cover
___ Open ___ Partly shaded
✔ Shaded

MACROINVERTEBRATES/OTHER WILDLIFE OBSERVED OR OTHER NOTES AND OBSERVATIONS

Perennial stream, connected to S-SS3 downstream.

STREAM ID S-KL21		**STREAM NAME** UNT to Kimballton Branch	
CLIENT MVP		**PROJECT NAME** MVP	
LAT 37.399162	**LONG** -80.686559	**DATE** 06/28/2016	**COUNTY** Giles
INVESTIGATORS J. Cook, K. Pulver, J. Potrikus			
WATER TYPE TNW ☐ RPW ☑ NRPW ☐		**FLOW REGIME** Perennial ☐ Intermittent ☑ Ephemeral ☐	

CHANNEL FEATURES

Estimate Measurements
Top of Bank Width: 3.0 ft
Top of Bank Height:
LB 0.3 ft RB 0.3 ft
Water Depth: 1.00 in
Water Width: 2.0 ft
Ordinary High Water Mark (Width): 2.0 ft
Ordinary High Water Mark (Height): 1.0 in
Flow Direction: South

Sinuosity ___ Low ✔ Medium ___ High

Gradient ___ Flat (0.5/100 ft) ✔ Moderate (2 ft/100 ft) ___ Severe (10 ft/100 ft)

Stream Erosion
___ None ✔ Moderate ___ Heavy

Artificial, Modified or Channelized
___ Yes ✔ No

Within Roadside Ditch
___ Yes ✔ No

Culvert Present ___ Yes ✔ No
Culvert Material: _____
Culvert Size: _____ in

FLOW CHARACTERISTICS

Water Present
___ No water, stream bed dry
___ Stream bed moist
___ Standing water
✔ Flowing water

Velocity
___ Fast ✔ Moderate
___ Slow

Proportion of Reach Represented by Stream Morphology Types (Only enter if water present)
Riffle 50 % Run 50 %
Pool %

Turbidity
✔ Clear ___ Slightly turbid ___ Turbid
___ Other _____

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%) 100

Substrate Type	Diameter	% Composition in Sampling Reach
Bedrock		
Boulder	> 256 mm (10")	
Cobble	64-256 mm (2.5"-10")	
Gravel	2-64 mm (0.1"-2.5")	
Sand	0.06-2mm (gritty)	100
Silt	0.004-0.06 mm	
Clay	< 0.004 mm (slick)	

ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)

Substrate Type	Characteristic	% Composition in Sampling Area
Detritus	sticks, wood, coarse plant materials (CPOM)	30
Muck-Mud	black, very fine organic (FPOM)	
Marl	grey, shell fragments	

WATERSHED FEATURES

Predominant Surrounding Landuse
✔ Forest ___ Commercial
___ Field/Pasture ___ Industrial
___ Agricultural ___ Residential
___ ROW ___ Other:

Floodplain Width
___ Wide > 30ft ___ Moderate 15-30ft
✔ Narrow <15ft

Canopy Cover
___ Open ✔ Partly shaded
___ Shaded

MACROINVERTEBRATES/OTHER WILDLIFE OBSERVED OR OTHER NOTES AND OBSERVATIONS

No macros. Stream emerges from an actively flowing seep.

STREAM ID S-PP14	**STREAM NAME** Kimballton Branch
LAT 37.392676 **LONG** -80.693871	**DATE** 10/16/2015
CLIENT MVP	**PROJECT NAME** MVP
INVESTIGATORS D. Hadersbeck, T. Woods, D. McCollough	
FLOW REGIME Perennial ✔ Intermittent ___ Ephemeral ___	**WATER TYPE** TNW ___ RPW ✔ NRPW ___

CHANNEL FEATURES

Estimate Measurements
Top of Bank Width: 14 ft
Top of Bank Height:
LB 1.0 ft RB 10.0 in
Water Depth: 8.00 in
Water Width: 5.0 ft
High Water Mark: 8.0 in
Flow Direction: Southeast

Stream Erosion
✔ None ___ Moderate ___ Heavy

Artificial, Modified or Channelized
✔ Yes ___ No

Dam Present ___ Yes ✔ No

Sinuosity ___ Low ✔ Medium ✔ High

Gradient
___ Flat (0.5/100 ft) ✔ Moderate (2 ft/100 ft) ___ Severe (10 ft/100 ft)

FLOW CHARACTERISTICS

Water Present
___ No water, stream bed dry
___ Stream bed moist
___ Standing water
✔ Flowing water

Velocity
___ Fast ✔ Moderate
___ Slow

Proportion of Reach Represented by Stream Morphology Types
Riffle 30 % Run 50 %
Pool 20 %

Turbidity
✔ Clear ___ Slightly turbid ___ Turbid
___ Opaque ___ Stained
___ Other_____

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)

Substrate Type	Diameter	% Composition in Sampling Reach
Bedrock		
Boulder	> 256 mm (10")	20
Cobble	64-256 mm (2.5"-10")	30
Gravel	2-64 mm (0.1"-2.5")	30
Sand	0.06-2mm (gritty)	20
Silt	0.004-0.06 mm	
Clay	< 0.004 mm (slick)	

ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)

Substrate Type	Characteristic	% Composition in Sampling Area
Detritus	sticks, wood, coarse plant materials (CPOM)	55
Muck-Mud	black, very fine organic (FPOM)	
Marl	grey, shell fragments	

WATERSHED FEATURES

Predominant Surrounding Landuse
✔ Forest ___ Commercial
___ Field/Pasture ___ Industrial
___ Agricultural ___ Residential
___ Other:

Canopy Cover
✔ Partly open ___ Partly shaded
___ Shaded ___ Open

Indicate the dominant type (Check one)
✔ Trees ___ Shrubs
___ Grasses ___ Herbaceous

Floodplain Width
___ Wide > 30ft ✔ Moderate 15-30ft
___ Narrow <16ft

Wetland Present ___ Yes ✔ No
Wetland ID

AQUATIC VEGETATION

Indicate the dominant type and record the dominant species present
___ Rooted emergent ___ Rooted submergent ___ Rooted floating ___ Free floating
___ Floating algae ✔ Attached algae

MACROINVERTEBRATES OR OTHER WILDLIFE OBSERVED/OTHER OBSERVATIONS AND NOTES

Stream traverses a culvert under the road.

STREAM ID S-PP15	**STREAM NAME** UNT to Kimballton Branch
LAT 37.392628 **LONG** -80.690067	**DATE** 10/16/2015
CLIENT MVP	**PROJECT NAME** MVP
INVESTIGATORS D. Hadersbeck, T. Woods, D. McCollough	
FLOW REGIME Perennial ✔ Intermittent ___ Ephemeral ___	**WATER TYPE** TNW ___ RPW ✔ NRPW ___

CHANNEL FEATURES

Estimate Measurements
Top of Bank Width: 6 ft
Top of Bank Height:
LB 6.0 in RB 6.0 in
Water Depth: 6.00 in
Water Width: 3.0 ft
High Water Mark: 8.0 in
Flow Direction: Southwest

Stream Erosion
✔ None ___ Moderate ___ Heavy

Artificial, Modified or Channelized
✔ Yes ___ No

Dam Present ___ Yes ✔ No

Sinuosity ___ Low ✔ Medium ✔ High

Gradient
___ Flat (0.5/100 ft) ✔ Moderate (2 ft/100 ft) ___ Severe (10 ft/100 ft)

FLOW CHARACTERISTICS

Water Present
___ No water, stream bed dry
___ Stream bed moist
___ Standing water
✔ Flowing water

Velocity
___ Fast ✔ Moderate
___ Slow

Proportion of Reach Represented by Stream Morphology Types
Riffle 30 % Run 50 %
Pool 20 %

Turbidity
✔ Clear ___ Slightly turbid ___ Turbid
___ Opaque ___ Stained
___ Other_____

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)

Substrate Type	Diameter	% Composition in Sampling Reach
Bedrock		
Boulder	> 256 mm (10")	20
Cobble	64-256 mm (2.5"-10")	30
Gravel	2-64 mm (0.1"-2.5")	30
Sand	0.06-2mm (gritty)	20
Silt	0.004-0.06 mm	
Clay	< 0.004 mm (slick)	

ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)

Substrate Type	Characteristic	% Composition in Sampling Area
Detritus	sticks, wood, coarse plant materials (CPOM)	65
Muck-Mud	black, very fine organic (FPOM)	
Marl	grey, shell fragments	

WATERSHED FEATURES

Predominant Surrounding Landuse
✔ Forest ___ Commercial
___ Field/Pasture ___ Industrial
___ Agricultural ___ Residential
___ Other:

Canopy Cover
✔ Partly open ___ Partly shaded
___ Shaded ___ Open

Indicate the dominant type (Check one)
✔ Trees ___ Shrubs
___ Grasses ___ Herbaceous

Floodplain Width
___ Wide > 30ft ✔ Moderate 15-30ft
___ Narrow <16ft

Wetland Present ___ Yes ✔ No
Wetland ID

AQUATIC VEGETATION

Indicate the dominant type and record the dominant species present
___ Rooted emergent ___ Rooted submergent ___ Rooted floating ___ Free floating
___ Floating algae ✔ Attached algae

MACROINVERTEBRATES OR OTHER WILDLIFE OBSERVED/OTHER OBSERVATIONS AND NOTES

Stream traverses a culvert under the road.

STREAM ID S-PP17	**STREAM NAME** UNT to New River
LAT 37.386744 **LONG** -80.700408	**DATE** 10/16/2015
CLIENT MVP	**PROJECT NAME** MVP
INVESTIGATORS D. Hadersbeck, T. Woods, D. McCollough	
FLOW REGIME Perennial ___ Intermittent ✔ Ephemeral ___	**WATER TYPE** TNW ___ RPW ✔ NRPW ___

CHANNEL FEATURES

Estimate Measurements
Top of Bank Width: 2 ft
Top of Bank Height:
LB 6.0 in RB 6.0 in
Water Depth: 3.00 in
Water Width: 1.0 ft
High Water Mark: 6.0 in
Flow Direction: South

Stream Erosion
✔ None ___ Moderate ___ Heavy

Artificial, Modified or Channelized
✔ Yes ___ No

Dam Present ___ Yes ✔ No

Sinuosity ___ Low ✔ Medium ✔ High

Gradient
___ Flat (0.5/100 ft) ✔ Moderate (2 ft/100 ft) ___ Severe (10 ft/100 ft)

FLOW CHARACTERISTICS

Water Present
___ No water, stream bed dry
___ Stream bed moist
___ Standing water
✔ Flowing water

Velocity
___ Fast ___ Moderate
✔ Slow

Proportion of Reach Represented by Stream Morphology Types
Riffle 20 % Run 60 %
Pool 20 %

Turbidity
___ Clear ✔ Slightly turbid ___ Turbid
___ Opaque ___ Stained
___ Other_____

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)

Substrate Type	Diameter	% Composition in Sampling Reach
Bedrock		20
Boulder	> 256 mm (10")	20
Cobble	64-256 mm (2.5"-10")	30
Gravel	2-64 mm (0.1"-2.5")	30
Sand	0.06-2mm (gritty)	
Silt	0.004-0.06 mm	
Clay	< 0.004 mm (slick)	

ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)

Substrate Type	Characteristic	% Composition in Sampling Area
Detritus	sticks, wood, coarse plant materials (CPOM)	80
Muck-Mud	black, very fine organic (FPOM)	
Marl	grey, shell fragments	

WATERSHED FEATURES

Predominant Surrounding Landuse
✔ Forest ___ Commercial
___ Field/Pasture ___ Industrial
___ Agricultural ___ Residential
___ Other:

Canopy Cover
✔ Partly open ___ Partly shaded
___ Shaded ___ Open

Indicate the dominant type (Check one)
✔ Trees ___ Shrubs
___ Grasses ___ Herbaceous

Floodplain Width
___ Wide > 30ft ✔ Moderate 15-30ft
___ Narrow <16ft

Wetland Present ___ Yes ✔ No
Wetland ID

AQUATIC VEGETATION

Indicate the dominant type and record the dominant species present
___ Rooted emergent ___ Rooted submergent ___ Rooted floating ___ Free floating
___ Floating algae ___ Attached algae

MACROINVERTEBRATES OR OTHER WILDLIFE OBSERVED/OTHER OBSERVATIONS AND NOTES

Stream emerges from high side of road from black plastic tubing then traverses a culvert under the road.

STREAM ID S-PP18	**STREAM NAME** Curve Branch
LAT 37.385499 **LONG** -80.708750	**DATE** 10/16/2015
CLIENT MVP	**PROJECT NAME** MVP
INVESTIGATORS D. Hadersbeck, T. Woods, D. McCollough	
FLOW REGIME Perennial ___ Intermittent ✔ Ephemeral ___	**WATER TYPE** TNW ___ RPW ✔ NRPW ___

CHANNEL FEATURES

Estimate Measurements
Top of Bank Width: 4 ft
Top of Bank Height:
LB 6.0 in RB 6.0 in
Water Depth: 3.00 in
Water Width: 1.0 ft
High Water Mark: 6.0 in
Flow Direction: Southwest

Stream Erosion
✔ None ___ Moderate ___ Heavy

Artificial, Modified or Channelized
✔ Yes ___ No

Dam Present ___ Yes ✔ No

Sinuosity ___ Low ✔ Medium ✔ High

Gradient
___ Flat (0.5/100 ft) ✔ Moderate (2 ft/100 ft) ___ Severe (10 ft/100 ft)

FLOW CHARACTERISTICS

Water Present
___ No water, stream bed dry
___ Stream bed moist
___ Standing water
✔ Flowing water

Velocity
___ Fast ___ Moderate
✔ Slow

Proportion of Reach Represented by Stream Morphology Types
Riffle 20 % Run 60 %
Pool 20 %

Turbidity
___ Clear ✔ Slightly turbid ___ Turbid
___ Opaque ___ Stained
___ Other_____

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)

Substrate Type	Diameter	% Composition in Sampling Reach
Bedrock		20
Boulder	> 256 mm (10")	20
Cobble	64-256 mm (2.5"-10")	30
Gravel	2-64 mm (0.1"-2.5")	30
Sand	0.06-2mm (gritty)	
Silt	0.004-0.06 mm	
Clay	< 0.004 mm (slick)	

ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)

Substrate Type	Characteristic	% Composition in Sampling Area
Detritus	sticks, wood, coarse plant materials (CPOM)	80
Muck-Mud	black, very fine organic (FPOM)	
Marl	grey, shell fragments	

WATERSHED FEATURES

Predominant Surrounding Landuse
✔ Forest ___ Commercial
___ Field/Pasture ___ Industrial
___ Agricultural ___ Residential
___ Other:

Canopy Cover
✔ Partly open ___ Partly shaded
___ Shaded ___ Open

Indicate the dominant type (Check one)
✔ Trees ___ Shrubs
___ Grasses ___ Herbaceous

Floodplain Width
___ Wide > 30ft ✔ Moderate 15-30ft
___ Narrow <16ft

Wetland Present ___ Yes ✔ No
Wetland ID

AQUATIC VEGETATION

Indicate the dominant type and record the dominant species present
___ Rooted emergent ___ Rooted submergent ___ Rooted floating ___ Free floating
___ Floating algae ___ Attached algae

MACROINVERTEBRATES OR OTHER WILDLIFE OBSERVED/OTHER OBSERVATIONS AND NOTES

Stream emerges from high side of road from black plastic tubing then traverses a culvert under the road.

STREAM ID S-PP19	**STREAM NAME** UNT to Curve Branch
LAT 37.382048 **LONG** -80.714071	**DATE** 10/16/2015
CLIENT MVP	**PROJECT NAME** MVP
INVESTIGATORS D. Hadersbeck, T. Woods, D. McCollough	
FLOW REGIME Perennial ___ Intermittent ✔ Ephemeral ___	**WATER TYPE** TNW ___ RPW ✔ NRPW ___

CHANNEL FEATURES

Estimate Measurements
Top of Bank Width: 3 ft
Top of Bank Height:
LB 1.0 ft RB 1.0 ft
Water Depth: 3.00 in
Water Width: 2.5 ft
High Water Mark: 1.0 ft
Flow Direction: South

Stream Erosion
✔ None ___ Moderate ___ Heavy

Artificial, Modified or Channelized
✔ Yes ___ No

Dam Present ___ Yes ✔ No

Sinuosity ___ Low ✔ Medium ✔ High

Gradient
___ Flat (0.5/100 ft) ✔ Moderate (2 ft/100 ft) ___ Severe (10 ft/100 ft)

FLOW CHARACTERISTICS

Water Present
___ No water, stream bed dry
___ Stream bed moist
___ Standing water
✔ Flowing water

Velocity
___ Fast ___ Moderate
✔ Slow

Proportion of Reach Represented by Stream Morphology Types
Riffle % Run 80 %
Pool 20 %

Turbidity
✔ Clear ___ Slightly turbid ___ Turbid
___ Opaque ___ Stained
___ Other_____

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)

Substrate Type	Diameter	% Composition in Sampling Reach
Bedrock		
Boulder	> 256 mm (10")	10
Cobble	64-256 mm (2.5"-10")	20
Gravel	2-64 mm (0.1"-2.5")	20
Sand	0.06-2mm (gritty)	10
Silt	0.004-0.06 mm	40
Clay	< 0.004 mm (slick)	

ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)

Substrate Type	Characteristic	% Composition in Sampling Area
Detritus	sticks, wood, coarse plant materials (CPOM)	70
Muck-Mud	black, very fine organic (FPOM)	
Marl	grey, shell fragments	

WATERSHED FEATURES

Predominant Surrounding Landuse
✔ Forest ___ Commercial
___ Field/Pasture ___ Industrial
___ Agricultural ___ Residential
___ Other:

Canopy Cover
✔ Partly open ___ Partly shaded
___ Shaded ___ Open

Indicate the dominant type (Check one)
✔ Trees ___ Shrubs
___ Grasses ___ Herbaceous

Floodplain Width
___ Wide > 30ft ✔ Moderate 15-30ft
___ Narrow <16ft

Wetland Present ___ Yes ✔ No
Wetland ID

AQUATIC VEGETATION

Indicate the dominant type and record the dominant species present
___ Rooted emergent ___ Rooted submergent ___ Rooted floating ___ Free floating
___ Floating algae ___ Attached algae

MACROINVERTEBRATES OR OTHER WILDLIFE OBSERVED/OTHER OBSERVATIONS AND NOTES

Stream traverses a culvert under the road.

STREAM ID S-UU8-Braid	**STREAM NAME** Clendennin Creek
LAT 37.381470 **LONG** -80.719305	**DATE** 10/16/2015
CLIENT MVP	**PROJECT NAME** MVP
INVESTIGATORS S. Townsend, A. Hatfield	
FLOW REGIME Perennial ✔ Intermittent ___ Ephemeral ___	**WATER TYPE** TNW ___ RPW ✔ NRPW ___

CHANNEL FEATURES

Estimate Measurements
Top of Bank Width: 3.0 ft
Top of Bank Height:
LB 1.0 ft RB 1.0 ft
Water Depth: 1.00 in
Water Width: 2.5 ft
High Water Mark: 1.0 ft
Flow Direction: South

Stream Erosion
✔ None ___ Moderate ___ Heavy

Artificial, Modified or Channelized
___ Yes ✔ No

Dam Present ___ Yes ✔ No

Sinuosity ✔ Low ___ Medium ___ High

Gradient
✔ Flat (0.5/100 ft) ✔ Moderate (2 ft/100 ft) ___ Severe (10 ft/100 ft)

FLOW CHARACTERISTICS

Water Present
___ No water, stream bed dry
___ Stream bed moist
___ Standing water
✔ Flowing water

Velocity
___ Fast ___ Moderate
✔ Slow

Proportion of Reach Represented by Stream Morphology Types
Riffle 100 % Run % Pool %

Turbidity
✔ Clear ___ Slightly turbid ___ Turbid
___ Opaque ___ Stained
___ Other_____

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)

Substrate Type	Diameter	% Composition in Sampling Reach
Bedrock		
Boulder	> 256 mm (10")	
Cobble	64-256 mm (2.5"-10")	35
Gravel	2-64 mm (0.1"-2.5")	30
Sand	0.06-2mm (gritty)	30
Silt	0.004-0.06 mm	5
Clay	< 0.004 mm (slick)	

ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)

Substrate Type	Characteristic	% Composition in Sampling Area
Detritus	sticks, wood, coarse plant materials (CPOM)	5
Muck-Mud	black, very fine organic (FPOM)	
Marl	grey, shell fragments	

WATERSHED FEATURES

Predominant Surrounding Landuse
✔ Forest ___ Commercial
___ Field/Pasture ___ Industrial
___ Agricultural ___ Residential
___ Other:

Canopy Cover
___ Partly open ___ Partly shaded
✔ Shaded ___ Open

Indicate the dominant type (Check one)
✔ Trees ___ Shrubs
___ Grasses ___ Herbaceous

Floodplain Width
✔ Wide > 30ft ___ Moderate 15-30ft
___ Narrow <16ft

Wetland Present ___ Yes ✔ No
Wetland ID

AQUATIC VEGETATION

Indicate the dominant type and record the dominant species present
___ Rooted emergent ___ Rooted submergent ___ Rooted floating ___ Free floating
___ Floating algae ___ Attached algae

MACROINVERTEBRATES OR OTHER WILDLIFE OBSERVED/OTHER OBSERVATIONS AND NOTES	Braid of S-UU8

STREAM ID S-UU8	**STREAM NAME** Clendennin Creek
LAT 37.381467 **LONG** -80.719287	**DATE** 10/16/2015
CLIENT MVP	**PROJECT NAME** MVP
INVESTIGATORS S. Townsend, A. Hatfield	
FLOW REGIME Perennial ✔ Intermittent ___ Ephemeral ___	**WATER TYPE** TNW ___ RPW ✔ NRPW ___

CHANNEL FEATURES

Estimate Measurements
Top of Bank Width: 3 ft
Top of Bank Height:
LB 1.0 ft RB 1.0 ft
Water Depth: 1.00 in
Water Width: 2.5 ft
High Water Mark: 1.0 ft
Flow Direction: South

Stream Erosion
✔ None ___ Moderate ___ Heavy

Artificial, Modified or Channelized
___ Yes ✔ No

Dam Present ___ Yes ✔ No

Sinuosity ✔ Low ___ Medium ✔ High

Gradient
✔ Flat (0.5/100 ft) ✔ Moderate (2 ft/100 ft) ___ Severe (10 ft/100 ft)

FLOW CHARACTERISTICS

Water Present
___ No water, stream bed dry
___ Stream bed moist
___ Standing water
✔ Flowing water

Velocity
___ Fast ___ Moderate
✔ Slow

Proportion of Reach Represented by Stream Morphology Types
Riffle 100 % Run % Pool %

Turbidity
✔ Clear ___ Slightly turbid ___ Turbid
___ Opaque ___ Stained
___ Other_____

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)

Substrate Type	Diameter	% Composition in Sampling Reach
Bedrock		
Boulder	> 256 mm (10")	
Cobble	64-256 mm (2.5"-10")	35
Gravel	2-64 mm (0.1"-2.5")	30
Sand	0.06-2mm (gritty)	30
Silt	0.004-0.06 mm	5
Clay	< 0.004 mm (slick)	

ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)

Substrate Type	Characteristic	% Composition in Sampling Area
Detritus	sticks, wood, coarse plant materials (CPOM)	5
Muck-Mud	black, very fine organic (FPOM)	
Marl	grey, shell fragments	

WATERSHED FEATURES

Predominant Surrounding Landuse
✔ Forest ___ Commercial
___ Field/Pasture ___ Industrial
___ Agricultural ___ Residential
___ Other:

Canopy Cover
___ Partly open ___ Partly shaded
✔ Shaded ___ Open

Indicate the dominant type (Check one)
✔ Trees ___ Shrubs
___ Grasses ___ Herbaceous

Floodplain Width
✔ Wide > 30ft ___ Moderate 15-30ft
___ Narrow <16ft

Wetland Present ___ Yes ✔ No
Wetland ID

AQUATIC VEGETATION

Indicate the dominant type and record the dominant species present
___ Rooted emergent ___ Rooted submergent ___ Rooted floating ___ Free floating
___ Floating algae ___ Attached algae

MACROINVERTEBRATES OR OTHER WILDLIFE OBSERVED/OTHER OBSERVATIONS AND NOTES

STREAM ID S-UU9	**STREAM NAME** Clendennin Creek
LAT 37.381405 **LONG** -80.719414	**DATE** 10/16/2015
CLIENT MVP	**PROJECT NAME** MVP
INVESTIGATORS S. Townsend, A. Hatfield	
FLOW REGIME Perennial ✔ Intermittent ___ Ephemeral ___	**WATER TYPE** TNW ___ RPW ✔ NRPW ___

CHANNEL FEATURES

Estimate Measurements
Top of Bank Width: 5 ft
Top of Bank Height:
LB 1.5 ft RB 3.0 ft
Water Depth: 2.00 in
Water Width: 3.5 ft
High Water Mark: 1.5 ft
Flow Direction: West

Stream Erosion
✔ None ___ Moderate ___ Heavy

Artificial, Modified or Channelized
✔ Yes ___ No

Dam Present ___ Yes ✔ No

Sinuosity ___ Low ✔ Medium ✔ High

Gradient
✔ Flat (0.5/100 ft) ✔ Moderate (2 ft/100 ft) ___ Severe (10 ft/100 ft)

FLOW CHARACTERISTICS

Water Present
___ No water, stream bed dry
___ Stream bed moist
___ Standing water
✔ Flowing water

Velocity
___ Fast ___ Moderate
✔ Slow

Proportion of Reach Represented by Stream Morphology Types
Riffle 100 % Run % Pool %

Turbidity
✔ Clear ___ Slightly turbid ___ Turbid
___ Opaque ___ Stained
___ Other_____

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)

Substrate Type	Diameter	% Composition in Sampling Reach
Bedrock		15
Boulder	> 256 mm (10")	5
Cobble	64-256 mm (2.5"-10")	45
Gravel	2-64 mm (0.1"-2.5")	15
Sand	0.06-2mm (gritty)	15
Silt	0.004-0.06 mm	5
Clay	< 0.004 mm (slick)	

ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)

Substrate Type	Characteristic	% Composition in Sampling Area
Detritus	sticks, wood, coarse plant materials (CPOM)	5
Muck-Mud	black, very fine organic (FPOM)	
Marl	grey, shell fragments	

WATERSHED FEATURES

Predominant Surrounding Landuse
✔ Forest ___ Commercial
___ Field/Pasture ___ Industrial
___ Agricultural ___ Residential
___ Other:

Canopy Cover
___ Partly open ✔ Partly shaded
___ Shaded ___ Open

Indicate the dominant type (Check one)
✔ Trees ___ Shrubs
___ Grasses ___ Herbaceous

Floodplain Width
___ Wide > 30ft ___ Moderate 15-30ft
✔ Narrow <16ft

Wetland Present ___ Yes ✔ No
Wetland ID

AQUATIC VEGETATION

Indicate the dominant type and record the dominant species present
___ Rooted emergent ___ Rooted submergent ___ Rooted floating ___ Free floating
___ Floating algae ___ Attached algae

MACROINVERTEBRATES OR OTHER WILDLIFE OBSERVED/OTHER OBSERVATIONS AND NOTES	

STREAM ID S-HH16	**STREAM NAME** UNT to Clendennin Creek
LAT 37.376291 **LONG** -80.725779	**DATE** 10/16/2015
CLIENT MVP	**PROJECT NAME** MVP
INVESTIGATORS S Ryan, A Larson, M Whitten	
FLOW REGIME Perennial ✔ Intermittent ___ Ephemeral ___	**WATER TYPE** TNW ___ RPW ✔ NRPW ___

CHANNEL FEATURES

Estimate Measurements
Top of Bank Width: 5 ft
Top of Bank Height:
LB 2.0 ft RB 2.0 ft
Water Depth: 2.00 in
Water Width: 1.0 ft
High Water Mark: 4.0 in
Flow Direction: Southeast

Stream Erosion
✔ None ___ Moderate ___ Heavy

Artificial, Modified or Channelized
___ Yes ✔ No

Dam Present ___ Yes ✔ No

Sinuosity ✔ Low ___ Medium ✔ High

Gradient
___ Flat (0.5/100 ft) ___ Moderate (2 ft/100 ft) ✔ Severe (10 ft/100 ft)

FLOW CHARACTERISTICS

Water Present
___ No water, stream bed dry
___ Stream bed moist
___ Standing water
✔ Flowing water

Velocity
___ Fast ___ Moderate
✔ Slow

Proportion of Reach Represented by Stream Morphology Types
Riffle % Run 40 %
Pool 60 %

Turbidity
✔ Clear ___ Slightly turbid ___ Turbid
___ Opaque ___ Stained
___ Other_____

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)

Substrate Type	Diameter	% Composition in Sampling Reach
Bedrock		
Boulder	> 256 mm (10")	60
Cobble	64-256 mm (2.5"-10")	30
Gravel	2-64 mm (0.1"-2.5")	
Sand	0.06-2mm (gritty)	10
Silt	0.004-0.06 mm	
Clay	< 0.004 mm (slick)	

ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)

Substrate Type	Characteristic	% Composition in Sampling Area
Detritus	sticks, wood, coarse plant materials (CPOM)	40
Muck-Mud	black, very fine organic (FPOM)	
Marl	grey, shell fragments	

WATERSHED FEATURES

Predominant Surrounding Landuse
✔ Forest ___ Commercial
___ Field/Pasture ___ Industrial
___ Agricultural ___ Residential
___ Other:

Canopy Cover
✔ Partly open ___ Partly shaded
___ Shaded ___ Open

Indicate the dominant type (Check one)
✔ Trees ___ Shrubs
___ Grasses ___ Herbaceous

Floodplain Width
___ Wide > 30ft ✔ Moderate 15-30ft
___ Narrow <16ft

Wetland Present ___ Yes ✔ No
Wetland ID

AQUATIC VEGETATION

Indicate the dominant type and record the dominant species present
___ Rooted emergent ___ Rooted submergent ___ Rooted floating ___ Free floating
___ Floating algae ___ Attached algae

MACROINVERTEBRATES OR OTHER WILDLIFE OBSERVED/OTHER OBSERVATIONS AND NOTES

Stream goes subsurface occassionally

STREAM ID S-MN17		**STREAM NAME** UNT to Clendennin Creek	
CLIENT MVP		**PROJECT NAME** MVP	
LAT 37.373961	**LONG** -80.732119	**DATE** 05/10/2017	**COUNTY** Giles
INVESTIGATORS S Ryan, K Pulver, H Phelan			
WATER TYPE TNW ☐ RPW ☑ NRPW ☐		**FLOW REGIME** Perennial ☐ Intermittent ☑ Ephemeral ☐	

CHANNEL FEATURES

Estimate Measurements
Top of Bank Width: 3.0 ft
Top of Bank Height:
LB 1.0 ft RB 1.0 ft
Water Depth: 4.00 in
Water Width: 3.0 ft
Ordinary High Water Mark (Width): 3.0 ft
Ordinary High Water Mark (Height): 4.0 in
Flow Direction: South

Sinuosity ___ Low ___ Medium ✔ High

Gradient ___ Flat (0.5/100 ft) ✔ Moderate (2 ft/100 ft) ___ Severe (10 ft/100 ft)

Stream Erosion
✔ None ___ Moderate ___ Heavy

Artificial, Modified or Channelized
___ Yes ✔ No

Within Roadside Ditch
___ Yes ✔ No

Culvert Present ___ Yes ✔ No
Culvert Material:_____
Culvert Size: _____in

FLOW CHARACTERISTICS

Water Present
___ No water, stream bed dry
___ Stream bed moist
___ Standing water
✔ Flowing water

Velocity
✔ Fast ___ Moderate
___ Slow

Proportion of Reach Represented by Stream Morphology Types (Only enter if water present)
Riffle 80 % Run % Pool 20 %

Turbidity
✔ Clear ___ Slightly turbid ___ Turbid
___ Other_____

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%) 100

Substrate Type	Diameter	% Composition in Sampling Reach
Bedrock		
Boulder	> 256 mm (10")	10
Cobble	64-256 mm (2.5"-10")	55
Gravel	2-64 mm (0.1"-2.5")	15
Sand	0.06-2mm (gritty)	15
Silt	0.004-0.06 mm	5
Clay	< 0.004 mm (slick)	

ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)

Substrate Type	Characteristic	% Composition in Sampling Area
Detritus	sticks, wood, coarse plant materials (CPOM)	15
Muck-Mud	black, very fine organic (FPOM)	0
Marl	grey, shell fragments	0

WATERSHED FEATURES

Predominant Surrounding Landuse
✔ Forest ___ Commercial
___ Field/Pasture ___ Industrial
___ Agricultural ___ Residential
___ ROW ___ Other:

Floodplain Width
___ Wide > 30ft ___ Moderate 15-30ft
✔ Narrow <15ft

Canopy Cover
___ Open ___ Partly shaded
✔ Shaded

MACROINVERTEBRATES/OTHER WILDLIFE OBSERVED OR OTHER NOTES AND OBSERVATIONS

Overnight heavy rains. Stream crosses over road (no culvert).

STREAM ID S-MN17-Braid		**STREAM NAME** UNT to Clendennin Creek	
CLIENT MVP		**PROJECT NAME** MVP	
LAT 37.373838	**LONG** -80.731963	**DATE** 05/10/2017	**COUNTY** Giles
INVESTIGATORS S Ryan, K Pulver, H Phelan			
WATER TYPE TNW ☐ RPW ☑ NRPW ☐		**FLOW REGIME** Perennial ☐ Intermittent ☑ Ephemeral ☐	

CHANNEL FEATURES

Estimate Measurements
Top of Bank Width: 3.0 ft
Top of Bank Height:
LB 1.0 ft RB 1.0 ft
Water Depth: 3.00 in
Water Width: 2.0 ft
Ordinary High Water Mark (Width): 2.0 ft
Ordinary High Water Mark (Height): 3.0 in
Flow Direction: South

Sinuosity ___ Low ___ Medium ✔ High

Gradient ___ Flat (0.5/100 ft) ✔ Moderate (2 ft/100 ft) ___ Severe (10 ft/100 ft)

Stream Erosion
✔ None ___ Moderate ___ Heavy

Artificial, Modified or Channelized
___ Yes ✔ No

Within Roadside Ditch
___ Yes ✔ No

Culvert Present ___ Yes ✔ No
Culvert Material:_____
Culvert Size: _____in

FLOW CHARACTERISTICS

Water Present
___ No water, stream bed dry
___ Stream bed moist
___ Standing water
✔ Flowing water

Velocity
✔ Fast ___ Moderate
___ Slow

Proportion of Reach Represented by Stream Morphology Types (Only enter if water present)
Riffle 80 % Run % Pool 20 %

Turbidity
✔ Clear ___ Slightly turbid ___ Turbid
___ Other_____

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%) 100

Substrate Type	Diameter	% Composition in Sampling Reach
Bedrock		
Boulder	> 256 mm (10")	10
Cobble	64-256 mm (2.5"-10")	55
Gravel	2-64 mm (0.1"-2.5")	15
Sand	0.06-2mm (gritty)	15
Silt	0.004-0.06 mm	5
Clay	< 0.004 mm (slick)	

ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)

Substrate Type	Characteristic	% Composition in Sampling Area
Detritus	sticks, wood, coarse plant materials (CPOM)	15
Muck-Mud	black, very fine organic (FPOM)	0
Marl	grey, shell fragments	0

WATERSHED FEATURES

Predominant Surrounding Landuse
✔ Forest ___ Commercial
___ Field/Pasture ___ Industrial
___ Agricultural ___ Residential
___ ROW ___ Other:

Canopy Cover
___ Open ___ Partly shaded
✔ Shaded

Floodplain Width
___ Wide > 30ft ___ Moderate 15-30ft
✔ Narrow <15ft

MACROINVERTEBRATES/OTHER WILDLIFE OBSERVED OR OTHER NOTES AND OBSERVATIONS

STREAM ID S-MN20		**STREAM NAME** UNT to Clendennin Creek	
CLIENT MVP		**PROJECT NAME** MVP	
LAT 37.373901	**LONG** -80.731631	**DATE** 05/10/2017	**COUNTY** Giles
INVESTIGATORS S Ryan, K Pulver, H Phelan			
WATER TYPE TNW ☐ RPW ☑ NRPW ☐		**FLOW REGIME** Perennial ☐ Intermittent ☑ Ephemeral ☐	

CHANNEL FEATURES

Estimate Measurements
Top of Bank Width: 4.0 ft
Top of Bank Height:
LB 1.0 ft RB 1.0 ft
Water Depth: 3.00 in
Water Width: 2.0 ft
Ordinary High Water Mark (Width): 2.0 ft
Ordinary High Water Mark (Height): 3.0 in
Flow Direction: South

Sinuosity ___ Low ___ Medium ✔ High

Gradient ___ Flat (0.5/100 ft) ✔ Moderate (2 ft/100 ft) ___ Severe (10 ft/100 ft)

Stream Erosion
✔ None ___ Moderate ___ Heavy

Artificial, Modified or Channelized
___ Yes ✔ No

Within Roadside Ditch
___ Yes ✔ No

Culvert Present ✔ Yes ___ No
Culvert Material: Corrugated Metal
Culvert Size: 16 in

FLOW CHARACTERISTICS

Water Present
___ No water, stream bed dry
___ Stream bed moist
___ Standing water
✔ Flowing water

Velocity
✔ Fast ___ Moderate
___ Slow

Proportion of Reach Represented by Stream Morphology Types (Only enter if water present)
Riffle 80 % Run % Pool 20 %

Turbidity
✔ Clear ___ Slightly turbid ___ Turbid
___ Other_____

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%) 100

Substrate Type	Diameter	% Composition in Sampling Reach
Bedrock		
Boulder	> 256 mm (10")	25
Cobble	64-256 mm (2.5"-10")	40
Gravel	2-64 mm (0.1"-2.5")	20
Sand	0.06-2mm (gritty)	10
Silt	0.004-0.06 mm	5
Clay	< 0.004 mm (slick)	

ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)

Substrate Type	Characteristic	% Composition in Sampling Area
Detritus	sticks, wood, coarse plant materials (CPOM)	15
Muck-Mud	black, very fine organic (FPOM)	0
Marl	grey, shell fragments	0

WATERSHED FEATURES

Predominant Surrounding Landuse
✔ Forest ___ Commercial
___ Field/Pasture ___ Industrial
___ Agricultural ___ Residential
___ ROW ___ Other:

Floodplain Width
___ Wide > 30ft ___ Moderate 15-30ft
✔ Narrow <15ft

Canopy Cover
___ Open ___ Partly shaded
✔ Shaded

MACROINVERTEBRATES/OTHER WILDLIFE OBSERVED OR OTHER NOTES AND OBSERVATIONS

Flows through culvert and joins S-MN17 outside of survey area. Heavy overnight rains.

STREAM ID S-HH15	**STREAM NAME** UNT to Clendennin Creek
LAT 37.370798 **LONG** -80.737186	**DATE** 10/16/2015
CLIENT MVP	**PROJECT NAME** MVP
INVESTIGATORS S Ryan, A Larson, M Whitten	
FLOW REGIME Perennial ✔ Intermittent ___ Ephemeral ___	**WATER TYPE** TNW ___ RPW ✔ NRPW ___

CHANNEL FEATURES

Estimate Measurements
Top of Bank Width: 5 ft
Top of Bank Height:
LB 1.5 ft RB 1.5 ft
Water Depth: 1.00 in
Water Width: 2.0 ft
High Water Mark: 4.0 in
Flow Direction: South

Stream Erosion
✔ None ___ Moderate ___ Heavy

Artificial, Modified or Channelized
___ Yes ✔ No

Dam Present ___ Yes ✔ No

Sinuosity ___ Low ✔ Medium ✔ High

Gradient
___ Flat (0.5/100 ft) ✔ Moderate (2 ft/100 ft) ___ Severe (10 ft/100 ft)

FLOW CHARACTERISTICS

Water Present
___ No water, stream bed dry
___ Stream bed moist
___ Standing water
✔ Flowing water

Velocity
___ Fast ✔ Moderate
___ Slow

Proportion of Reach Represented by Stream Morphology Types
Riffle 70 % Run % Pool 30 %

Turbidity
✔ Clear ___ Slightly turbid ___ Turbid
___ Opaque ___ Stained
___ Other_____

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)

Substrate Type	Diameter	% Composition in Sampling Reach
Bedrock		
Boulder	> 256 mm (10")	
Cobble	64-256 mm (2.5"-10")	30
Gravel	2-64 mm (0.1"-2.5")	10
Sand	0.06-2mm (gritty)	40
Silt	0.004-0.06 mm	20
Clay	< 0.004 mm (slick)	

ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)

Substrate Type	Characteristic	% Composition in Sampling Area
Detritus	sticks, wood, coarse plant materials (CPOM)	75
Muck-Mud	black, very fine organic (FPOM)	
Marl	grey, shell fragments	

WATERSHED FEATURES

Predominant Surrounding Landuse
✔ Forest ___ Commercial
___ Field/Pasture ___ Industrial
___ Agricultural ___ Residential
___ Other:

Canopy Cover
___ Partly open ___ Partly shaded
✔ Shaded ___ Open

Indicate the dominant type (Check one)
✔ Trees ___ Shrubs
___ Grasses ___ Herbaceous

Floodplain Width
___ Wide > 30ft ___ Moderate 15-30ft
✔ Narrow <16ft

Wetland Present ✔ Yes ___ No
Wetland ID W-HH14

AQUATIC VEGETATION

Indicate the dominant type and record the dominant species present
___ Rooted emergent ___ Rooted submergent ___ Rooted floating ___ Free floating
___ Floating algae ___ Attached algae

MACROINVERTEBRATES OR OTHER WILDLIFE OBSERVED/OTHER OBSERVATIONS AND NOTES

Stream enters survey area and crosses AR via culvert and flows south out of survey area. W-HH14 drains into stream north of AR.

STREAM ID S-HH14	**STREAM NAME** UNT to Clendennin Creek
LAT 37.370790 **LONG** -80.738127	**DATE** 10/16/2015
CLIENT MVP	**PROJECT NAME** MVP
INVESTIGATORS S Ryan, A Larson, M Whitten	
FLOW REGIME Perennial ___ Intermittent___ Ephemeral ✔	**WATER TYPE** TNW ___ RPW ___ NRPW ✔

CHANNEL FEATURES

Estimate Measurements
Top of Bank Width: 3 ft
Top of Bank Height:
LB 1.5 ft RB 1.5 ft
Water Depth: 0.00 ft
Water Width: 0.0 ft
High Water Mark: 3.0 in
Flow Direction: Southwest

Stream Erosion
✔ None ___ Moderate ___ Heavy

Artificial, Modified or Channelized
___ Yes ✔ No

Dam Present ___ Yes ✔ No

Sinuosity ___ Low ✔ Medium ✔ High

Gradient
___ Flat (0.5/100 ft) ✔ Moderate (2 ft/100 ft) ___ Severe (10 ft/100 ft)

FLOW CHARACTERISTICS

Water Present
___ No water, stream bed dry
✔ Stream bed moist
___ Standing water
___ Flowing water

Velocity
___ Fast ___ Moderate
___ Slow

Proportion of Reach Represented by Stream Morphology Types
Riffle % Run %
Pool %

Turbidity
___ Clear ___ Slightly turbid ___ Turbid
___ Opaque ___ Stained
___ Other_____

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)

Substrate Type	Diameter	% Composition in Sampling Reach
Bedrock		
Boulder	> 256 mm (10")	
Cobble	64-256 mm (2.5"-10")	
Gravel	2-64 mm (0.1"-2.5")	10
Sand	0.06-2mm (gritty)	10
Silt	0.004-0.06 mm	80
Clay	< 0.004 mm (slick)	

ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)

Substrate Type	Characteristic	% Composition in Sampling Area
Detritus	sticks, wood, coarse plant materials (CPOM)	90
Muck-Mud	black, very fine organic (FPOM)	
Marl	grey, shell fragments	

WATERSHED FEATURES

Predominant Surrounding Landuse
✔ Forest ___ Commercial
___ Field/Pasture ___ Industrial
___ Agricultural ___ Residential
___ Other:

Canopy Cover
___ Partly open ___ Partly shaded
✔ Shaded ___ Open

Indicate the dominant type (Check one)
✔ Trees ___ Shrubs
___ Grasses ___ Herbaceous

Floodplain Width
___ Wide > 30ft ___ Moderate 15-30ft
✔ Narrow <16ft

Wetland Present ___ Yes ✔ No
Wetland ID

AQUATIC VEGETATION

Indicate the dominant type and record the dominant species present
___ Rooted emergent ___ Rooted submergent ___ Rooted floating ___ Free floating
___ Floating algae ___ Attached algae

MACROINVERTEBRATES OR OTHER WILDLIFE OBSERVED/OTHER OBSERVATIONS AND NOTES	Stream begins in survey area then parallels AR before crossing AR via culvert then exits survey area flowing SW.

STREAM ID S-HH12	**STREAM NAME** UNT to Clendennin Creek
LAT 37.366134 **LONG** -80.746301	**DATE** 10/16/2015
CLIENT MVP	**PROJECT NAME** MVP
INVESTIGATORS S Ryan, A Larson, M Whitten	
FLOW REGIME Perennial ___ Intermittent___ Ephemeral ✔	**WATER TYPE** TNW ___ RPW ___ NRPW ✔

CHANNEL FEATURES

Estimate Measurements
Top of Bank Width: 3 ft
Top of Bank Height:
LB 1.0 ft RB 1.0 ft
Water Depth: 0.00 ft
Water Width: 0.0 ft
High Water Mark: 3.0 in
Flow Direction: South

Stream Erosion
✔ None ___ Moderate ___ Heavy

Artificial, Modified or Channelized
___ Yes ✔ No

Dam Present ___ Yes ✔ No

Sinuosity ___ Low ✔ Medium ✔ High

Gradient
___ Flat (0.5/100 ft) ✔ Moderate (2 ft/100 ft) ___ Severe (10 ft/100 ft)

FLOW CHARACTERISTICS

Water Present
___ No water, stream bed dry
✔ Stream bed moist
___ Standing water
___ Flowing water

Velocity
___ Fast ___ Moderate
___ Slow

Proportion of Reach Represented by Stream Morphology Types
Riffle % Run %
Pool %

Turbidity
___ Clear ___ Slightly turbid ___ Turbid
___ Opaque ___ Stained
___ Other_____

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)			**ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)**		
Substrate Type	Diameter	% Composition in Sampling Reach	Substrate Type	Characteristic	% Composition in Sampling Area
Bedrock			Detritus	sticks, wood, coarse plant materials (CPOM)	100
Boulder	> 256 mm (10")				
Cobble	64-256 mm (2.5"-10")	10	Muck-Mud	black, very fine organic (FPOM)	
Gravel	2-64 mm (0.1"-2.5")	20			
Sand	0.06-2mm (gritty)	35	Marl	grey, shell fragments	
Silt	0.004-0.06 mm	35			
Clay	< 0.004 mm (slick)				

WATERSHED FEATURES

Predominant Surrounding Landuse
✔ Forest ___ Commercial
___ Field/Pasture ___ Industrial
___ Agricultural ___ Residential
___ Other:

Canopy Cover
___ Partly open ✔ Partly shaded
___ Shaded ___ Open

Indicate the dominant type (Check one)
✔ Trees ___ Shrubs
___ Grasses ___ Herbaceous

Floodplain Width
___ Wide > 30ft ___ Moderate 15-30ft
✔ Narrow <16ft

Wetland Present ___ Yes ✔ No
Wetland ID

AQUATIC VEGETATION

Indicate the dominant type and record the dominant species present
___ Rooted emergent ___ Rooted submergent ___ Rooted floating ___ Free floating
___ Floating algae ___ Attached algae

MACROINVERTEBRATES OR OTHER WILDLIFE OBSERVED/OTHER OBSERVATIONS AND NOTES	Crosses AR via culvert then exits survey area to the S. Marginal bed/bank characteristics within majority of survey area, with better defined bed/bank near southern survey boundary and outside survey area to south.

STREAM ID S-HH11	**STREAM NAME** UNT to Clendennin Creek
LAT 37.366087 **LONG** -80.747473	**DATE** 10/16/2015
CLIENT MVP	**PROJECT NAME** MVP
INVESTIGATORS S Ryan, A Larson, M Whitten	
FLOW REGIME Perennial ___ Intermittent___ Ephemeral ✔	**WATER TYPE** TNW ___ RPW ___ NRPW ✔

CHANNEL FEATURES

Estimate Measurements
Top of Bank Width: 4 ft
Top of Bank Height:
LB 1.5 ft RB 1.5 ft
Water Depth: 0.00 ft
Water Width: 0.0 ft
High Water Mark: 3.0 in
Flow Direction: Southeast

Stream Erosion
✔ None ___ Moderate ___ Heavy

Artificial, Modified or Channelized
___ Yes ✔ No

Dam Present ___ Yes ✔ No

Sinuosity ___ Low ✔ Medium ✔ High

Gradient
___ Flat (0.5/100 ft) ✔ Moderate (2 ft/100 ft) ___ Severe (10 ft/100 ft)

FLOW CHARACTERISTICS

Water Present
___ No water, stream bed dry
✔ Stream bed moist
___ Standing water
___ Flowing water

Velocity
___ Fast ___ Moderate
___ Slow

Proportion of Reach Represented by Stream Morphology Types
Riffle % Run %
Pool %

Turbidity
___ Clear ___ Slightly turbid ___ Turbid
___ Opaque ___ Stained
___ Other_____

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)

Substrate Type	Diameter	% Composition in Sampling Reach
Bedrock		
Boulder	> 256 mm (10")	
Cobble	64-256 mm (2.5"-10")	20
Gravel	2-64 mm (0.1"-2.5")	20
Sand	0.06-2mm (gritty)	35
Silt	0.004-0.06 mm	25
Clay	< 0.004 mm (slick)	

ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)

Substrate Type	Characteristic	% Composition in Sampling Area
Detritus	sticks, wood, coarse plant materials (CPOM)	80
Muck-Mud	black, very fine organic (FPOM)	
Marl	grey, shell fragments	

WATERSHED FEATURES

Predominant Surrounding Landuse
✔ Forest ___ Commercial
___ Field/Pasture ___ Industrial
___ Agricultural ___ Residential
___ Other:

Canopy Cover
___ Partly open ✔ Partly shaded
___ Shaded ___ Open

Indicate the dominant type (Check one)
✔ Trees ___ Shrubs
___ Grasses ___ Herbaceous

Floodplain Width
___ Wide > 30ft ___ Moderate 15-30ft
✔ Narrow <16ft

Wetland Present ___ Yes ✔ No
Wetland ID

AQUATIC VEGETATION

Indicate the dominant type and record the dominant species present
___ Rooted emergent ___ Rooted submergent ___ Rooted floating ___ Free floating
___ Floating algae ___ Attached algae

MACROINVERTEBRATES OR OTHER WILDLIFE OBSERVED/OTHER OBSERVATIONS AND NOTES

Crosses AR via culvert then exits survey area to the SE.

STREAM ID S-PP22	**STREAM NAME** UNT to Craig Creek
LAT 37.321203 **LONG** -80.412889	**DATE** 10/17/2015
CLIENT MVP	**PROJECT NAME** MVP
INVESTIGATORS D. Hadersbeck, T. Woods, D. McCollough	
FLOW REGIME Perennial ___ Intermittent ✔ Ephemeral ___	**WATER TYPE** TNW ___ RPW ✔ NRPW ___

CHANNEL FEATURES

Estimate Measurements
Top of Bank Width: 2.5 ft
Top of Bank Height:
LB 0.5 ft RB 0.5 ft
Water Depth: 1.00 in
Water Width: 1.0 ft
High Water Mark: 6.0 in
Flow Direction: South

Stream Erosion
___ None ✔ Moderate ___ Heavy

Artificial, Modified or Channelized
___ Yes ✔ No

Dam Present ___ Yes ✔ No

Sinuosity ✔ Low ___ Medium ✔ High

Gradient
___ Flat (0.5/100 ft) ___ Moderate (2 ft/100 ft) ✔ Severe (10 ft/100 ft)

FLOW CHARACTERISTICS

Water Present
___ No water, stream bed dry
___ Stream bed moist
___ Standing water
✔ Flowing water

Velocity
___ Fast ___ Moderate
✔ Slow

Proportion of Reach Represented by Stream Morphology Types
Riffle 10 % Run 90 %
Pool %

Turbidity
✔ Clear ___ Slightly turbid ___ Turbid
___ Opaque ___ Stained
___ Other_____

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)

Substrate Type	Diameter	% Composition in Sampling Reach
Bedrock		
Boulder	> 256 mm (10")	10
Cobble	64-256 mm (2.5"-10")	10
Gravel	2-64 mm (0.1"-2.5")	20
Sand	0.06-2mm (gritty)	20
Silt	0.004-0.06 mm	40
Clay	< 0.004 mm (slick)	

ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)

Substrate Type	Characteristic	% Composition in Sampling Area
Detritus	sticks, wood, coarse plant materials (CPOM)	70
Muck-Mud	black, very fine organic (FPOM)	
Marl	grey, shell fragments	

WATERSHED FEATURES

Predominant Surrounding Landuse
✔ Forest ___ Commercial
___ Field/Pasture ___ Industrial
___ Agricultural ___ Residential
___ Other:

Canopy Cover
___ Partly open ___ Partly shaded
✔ Shaded ___ Open

Indicate the dominant type (Check one)
✔ Trees ___ Shrubs
___ Grasses ___ Herbaceous

Floodplain Width
___ Wide > 30ft ✔ Moderate 15-30ft
___ Narrow <16ft

Wetland Present ___ Yes ✔ No
Wetland ID

AQUATIC VEGETATION

Indicate the dominant type and record the dominant species present
___ Rooted emergent ___ Rooted submergent ___ Rooted floating ___ Free floating
___ Floating algae ___ Attached algae

MACROINVERTEBRATES OR OTHER WILDLIFE OBSERVED/OTHER OBSERVATIONS AND NOTES

Stream sources from spring or seep then returns underground at the end point

STREAM ID S-PP21	**STREAM NAME** UNT to Craig Creek
LAT 37.317297 **LONG** -80.409219	**DATE** 10/17/2015
CLIENT MVP	**PROJECT NAME** MVP
INVESTIGATORS D. Hadersbeck, T. Woods, D. McCollough	
FLOW REGIME Perennial ___ Intermittent___ Ephemeral ✔	**WATER TYPE** TNW ___ RPW ___ NRPW ✔

CHANNEL FEATURES

Estimate Measurements
Top of Bank Width: 4 ft
Top of Bank Height:
LB 0.5 ft RB 0.5 ft
Water Depth: 3.00 in
Water Width: 2.5 ft
High Water Mark: 10.0 in
Flow Direction: Southwest

Stream Erosion
___None ✔ Moderate ___Heavy

Artificial, Modified or Channelized
___ Yes ✔ No

Dam Present ___Yes ✔ No

Sinuosity ___ Low ✔ Medium ✔ High

Gradient
___ Flat (0.5/100 ft) ✔ Moderate (2 ft/100 ft) ___Severe (10 ft/100 ft)

FLOW CHARACTERISTICS

Water Present
___ No water, stream bed dry
___ Stream bed moist
___ Standing water
✔ Flowing water

Velocity
___ Fast ___ Moderate
✔ Slow

Proportion of Reach Represented by Stream Morphology Types
Riffle 10 % Run 70 %
Pool 20 %

Turbidity
✔ Clear ___Slightly turbid ___Turbid
___ Opaque ___Stained
___Other_____

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)

Substrate Type	Diameter	% Composition in Sampling Reach
Bedrock		
Boulder	> 256 mm (10")	10
Cobble	64-256 mm (2.5"-10")	20
Gravel	2-64 mm (0.1"-2.5")	30
Sand	0.06-2mm (gritty)	20
Silt	0.004-0.06 mm	20
Clay	< 0.004 mm (slick)	

ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)

Substrate Type	Characteristic	% Composition in Sampling Area
Detritus	sticks, wood, coarse plant materials (CPOM)	70
Muck-Mud	black, very fine organic (FPOM)	
Marl	grey, shell fragments	

WATERSHED FEATURES

Predominant Surrounding Landuse
✔ Forest ___ Commercial
___ Field/Pasture ___Industrial
___ Agricultural ___ Residential
___ Other:

Canopy Cover
✔ Partly open ___Partly shaded
___ Shaded ___ Open

Indicate the dominant type (Check one)
✔ Trees ___ Shrubs
___ Grasses ___Herbaceous

Floodplain Width
___ Wide > 30ft ✔ Moderate 15-30ft
___ Narrow <16ft

Wetland Present ___Yes ✔ No
Wetland ID

AQUATIC VEGETATION

Indicate the dominant type and record the dominant species present
___ Rooted emergent ___Rooted submergent ___Rooted floating ___Free floating
___ Floating algae ___Attached algae

MACROINVERTEBRATES OR OTHER WILDLIFE OBSERVED/OTHER OBSERVATIONS AND NOTES

STREAM ID S-PP20	**STREAM NAME** UNT to Craig Creek
LAT 37.316550 **LONG** -80.408634	**DATE** 10/17/2015
CLIENT MVP	**PROJECT NAME** MVP
INVESTIGATORS D. Hadersbeck, T. Woods, D. McCollough	
FLOW REGIME Perennial ___ Intermittent ✔ Ephemeral ___	**WATER TYPE** TNW ___ RPW ✔ NRPW ___

CHANNEL FEATURES

Estimate Measurements
Top of Bank Width: 6 ft
Top of Bank Height:
LB 1.0 ft RB 1.0 ft
Water Depth: 4.00 in
Water Width: 3.0 ft
High Water Mark: 10.0 in
Flow Direction: Southwest

Stream Erosion
✔ None ___ Moderate ___ Heavy

Artificial, Modified or Channelized
___ Yes ✔ No

Dam Present ___ Yes ✔ No

Sinuosity ___ Low ✔ Medium ✔ High

Gradient
___ Flat (0.5/100 ft) ✔ Moderate (2 ft/100 ft) ___ Severe (10 ft/100 ft)

FLOW CHARACTERISTICS

Water Present
___ No water, stream bed dry
___ Stream bed moist
___ Standing water
✔ Flowing water

Velocity
___ Fast ___ Moderate
✔ Slow

Proportion of Reach Represented by Stream Morphology Types
Riffle 10 % Run 70 %
Pool 20 %

Turbidity
✔ Clear ___ Slightly turbid ___ Turbid
___ Opaque ___ Stained
___ Other_____

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)

Substrate Type	Diameter	% Composition in Sampling Reach
Bedrock		
Boulder	> 256 mm (10")	10
Cobble	64-256 mm (2.5"-10")	20
Gravel	2-64 mm (0.1"-2.5")	30
Sand	0.06-2mm (gritty)	20
Silt	0.004-0.06 mm	20
Clay	< 0.004 mm (slick)	

ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)

Substrate Type	Characteristic	% Composition in Sampling Area
Detritus	sticks, wood, coarse plant materials (CPOM)	70
Muck-Mud	black, very fine organic (FPOM)	
Marl	grey, shell fragments	

WATERSHED FEATURES

Predominant Surrounding Landuse
✔ Forest ___ Commercial
___ Field/Pasture ___ Industrial
___ Agricultural ___ Residential
___ Other:

Canopy Cover
✔ Partly open ___ Partly shaded
___ Shaded ___ Open

Indicate the dominant type (Check one)
✔ Trees ___ Shrubs
___ Grasses ___ Herbaceous

Floodplain Width
___ Wide > 30ft ✔ Moderate 15-30ft
___ Narrow <16ft

Wetland Present ___ Yes ✔ No
Wetland ID

AQUATIC VEGETATION

Indicate the dominant type and record the dominant species present
___ Rooted emergent ___ Rooted submergent ___ Rooted floating ___ Free floating
___ Floating algae ___ Attached algae

MACROINVERTEBRATES OR OTHER WILDLIFE OBSERVED/OTHER OBSERVATIONS AND NOTES

STREAM ID S-HH17	**STREAM NAME** Craig Creek
LAT 37.314554 **LONG** -80.398420	**DATE** 10/17/2015
CLIENT MVP	**PROJECT NAME** MVP
INVESTIGATORS S Ryan, A Larson, M Whitten, A Carrano	
FLOW REGIME Perennial ✔ Intermittent ___ Ephemeral ___	**WATER TYPE** TNW ___ RPW ✔ NRPW ___

CHANNEL FEATURES

Estimate Measurements
Top of Bank Width: 18 ft
Top of Bank Height:
LB 4.0 ft RB 4.0 ft
Water Depth: 12.00 in
Water Width: 10.0 ft
High Water Mark: 12.0 in
Flow Direction: East

Stream Erosion
✔ None ___ Moderate ___ Heavy

Artificial, Modified or Channelized
___ Yes ✔ No

Dam Present ___ Yes ✔ No

Sinuosity ___ Low ✔ Medium ___ High

Gradient
✔ Flat (0.5/100 ft) ___ Moderate (2 ft/100 ft) ___ Severe (10 ft/100 ft)

FLOW CHARACTERISTICS

Water Present
___ No water, stream bed dry
___ Stream bed moist
___ Standing water
✔ Flowing water

Velocity
___ Fast ___ Moderate
✔ Slow

Proportion of Reach Represented by Stream Morphology Types
Riffle % Run 60 %
Pool 40 %

Turbidity
✔ Clear ___ Slightly turbid ___ Turbid
___ Opaque ___ Stained
___ Other_____

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)

Substrate Type	Diameter	% Composition in Sampling Reach
Bedrock		
Boulder	> 256 mm (10")	10
Cobble	64-256 mm (2.5"-10")	40
Gravel	2-64 mm (0.1"-2.5")	30
Sand	0.06-2mm (gritty)	
Silt	0.004-0.06 mm	20
Clay	< 0.004 mm (slick)	

ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)

Substrate Type	Characteristic	% Composition in Sampling Area
Detritus	sticks, wood, coarse plant materials (CPOM)	15
Muck-Mud	black, very fine organic (FPOM)	
Marl	grey, shell fragments	

WATERSHED FEATURES

Predominant Surrounding Landuse
✔ Forest ___ Commercial
___ Field/Pasture ___ Industrial
___ Agricultural ___ Residential
___ Other:

Canopy Cover
___ Partly open ___ Partly shaded
✔ Shaded ___ Open

Indicate the dominant type (Check one)
✔ Trees ___ Shrubs
___ Grasses ___ Herbaceous

Floodplain Width
___ Wide > 30ft ___ Moderate 15-30ft
✔ Narrow <16ft

Wetland Present ___ Yes ✔ No
Wetland ID

AQUATIC VEGETATION

Indicate the dominant type and record the dominant species present
___ Rooted emergent ___ Rooted submergent ___ Rooted floating ___ Free floating
___ Floating algae ___ Attached algae

MACROINVERTEBRATES OR OTHER WILDLIFE OBSERVED/OTHER OBSERVATIONS AND NOTES	

STREAM ID S-HH18	**STREAM NAME** UNT to Craig Creek
LAT 37.314001 **LONG** -80.398651	**DATE** 10/17/2015
CLIENT MVP	**PROJECT NAME** MVP
INVESTIGATORS S Ryan, A Larson, M Whitten, A Carrano	
FLOW REGIME Perennial ✔ Intermittent ___ Ephemeral ___	**WATER TYPE** TNW ___ RPW ✔ NRPW ___

CHANNEL FEATURES

Estimate Measurements
Top of Bank Width: 6 ft
Top of Bank Height:
LB 3.0 ft RB 2.0 ft
Water Depth: 2.00 in
Water Width: 2.0 ft
High Water Mark: 2.0 in
Flow Direction: Northeast

Stream Erosion
✔ None ___ Moderate ___ Heavy

Artificial, Modified or Channelized
___ Yes ✔ No

Dam Present ___ Yes ✔ No

Sinuosity ___ Low ✔ Medium ✔ High

Gradient
___ Flat (0.5/100 ft) ✔ Moderate (2 ft/100 ft) ___ Severe (10 ft/100 ft)

FLOW CHARACTERISTICS

Water Present
___ No water, stream bed dry
___ Stream bed moist
___ Standing water
✔ Flowing water

Velocity
___ Fast ___ Moderate
✔ Slow

Proportion of Reach Represented by Stream Morphology Types
Riffle 10 % Run 60 %
Pool 30 %

Turbidity
✔ Clear ___ Slightly turbid ___ Turbid
___ Opaque ___ Stained
___ Other_____

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)

Substrate Type	Diameter	% Composition in Sampling Reach
Bedrock		60
Boulder	> 256 mm (10")	5
Cobble	64-256 mm (2.5"-10")	20
Gravel	2-64 mm (0.1"-2.5")	15
Sand	0.06-2mm (gritty)	
Silt	0.004-0.06 mm	
Clay	< 0.004 mm (slick)	

ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)

Substrate Type	Characteristic	% Composition in Sampling Area
Detritus	sticks, wood, coarse plant materials (CPOM)	10
Muck-Mud	black, very fine organic (FPOM)	
Marl	grey, shell fragments	

WATERSHED FEATURES

Predominant Surrounding Landuse
✔ Forest ___ Commercial
___ Field/Pasture ___ Industrial
___ Agricultural ___ Residential
___ Other:

Canopy Cover
___ Partly open ___ Partly shaded
✔ Shaded ___ Open

Indicate the dominant type (Check one)
✔ Trees ___ Shrubs
___ Grasses ___ Herbaceous

Floodplain Width
___ Wide > 30ft ___ Moderate 15-30ft
✔ Narrow <16ft

Wetland Present ___ Yes ✔ No
Wetland ID

AQUATIC VEGETATION

Indicate the dominant type and record the dominant species present
___ Rooted emergent ___ Rooted submergent ___ Rooted floating ___ Free floating
___ Floating algae ___ Attached algae

MACROINVERTEBRATES OR OTHER WILDLIFE OBSERVED/OTHER OBSERVATIONS AND NOTES

Stream joins S-HH17.

STREAM ID S-RR14	**STREAM NAME** UNT to Craig Creek
LAT 37.313894 **LONG** -80.402445	**DATE** 09/14/2015
CLIENT MVP	**PROJECT NAME** MVP
INVESTIGATORS J. Cook, R. Keyser, D. McCullough	
FLOW REGIME Perennial ___ Intermittent___ Ephemeral ✔	**WATER TYPE** TNW ___ RPW ___ NRPW ✔

CHANNEL FEATURES

Estimate Measurements
Top of Bank Width: 7 ft
Top of Bank Height:
LB 2.0 ft RB 18.0 in
Water Depth: 0.00 in
Water Width: 0.0 ft
High Water Mark: 3.0 in
Flow Direction: North

Stream Erosion
___None ✔ Moderate ___Heavy

Artificial, Modified or Channelized
___ Yes ✔ No

Dam Present ___Yes ✔ No

Sinuosity ✔ Low ___ Medium ✔ High

Gradient
✔ Flat (0.5/100 ft) ___Moderate (2 ft/100 ft) ___Severe (10 ft/100 ft)

FLOW CHARACTERISTICS

Water Present
✔ No water, stream bed dry
___ Stream bed moist
___ Standing water
___ Flowing water

Velocity
___ Fast ___ Moderate
___ Slow

Proportion of Reach Represented by Stream Morphology Types
Riffle % Run %
Pool %

Turbidity
___ Clear ___Slightly turbid ___Turbid
___ Opaque ___Stained
___Other_____

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)

Substrate Type	Diameter	% Composition in Sampling Reach
Bedrock		
Boulder	> 256 mm (10")	10
Cobble	64-256 mm (2.5"-10")	30
Gravel	2-64 mm (0.1"-2.5")	35
Sand	0.06-2mm (gritty)	25
Silt	0.004-0.06 mm	
Clay	< 0.004 mm (slick)	

ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)

Substrate Type	Characteristic	% Composition in Sampling Area
Detritus	sticks, wood, coarse plant materials (CPOM)	10
Muck-Mud	black, very fine organic (FPOM)	
Marl	grey, shell fragments	

WATERSHED FEATURES

Predominant Surrounding Landuse
✔ Forest ___ Commercial
___ Field/Pasture ___Industrial
___ Agricultural ___ Residential
___ Other:

Canopy Cover
___Partly open ___Partly shaded
✔ Shaded ___ Open

Indicate the dominant type (Check one)
✔ Trees ___ Shrubs
___ Grasses ___Herbaceous

Floodplain Width
___ Wide > 30ft ___ Moderate 15-30ft
✔ Narrow <16ft

Wetland Present ___Yes ✔ No
Wetland ID

AQUATIC VEGETATION

Indicate the dominant type and record the dominant species present
___Rooted emergent ___Rooted submergent ___Rooted floating ___Free floating
___Floating algae ___Attached algae

MACROINVERTEBRATES OR OTHER WILDLIFE OBSERVED/OTHER OBSERVATIONS AND NOTES

APPENDIX D
Stream Photographs

Photograph Number: 1 **Feature Name:** S-KL24 **Flow Regime:** Ephemeral

Direction: E **Date:** 6/28/2016

Photograph Number: 2 **Feature Name:** S-MN19 **Flow Regime:** Intermittent

Direction: NW **Date:** 5/10/2017

Photograph Number: 3 **Feature Name:** S-MN18 **Flow Regime:** Intermittent

Direction: NW **Date:** 5/10/2017

Photograph Number: 4 **Feature Name:** S-SS3 **Flow Regime:** Intermittent

Direction: SE **Date:** 5/10/2017

Photograph Number: 5 **Feature Name:** S-KL23 **Flow Regime:** Perennial

Direction: SE **Date:** 6/28/2016

Photograph Number: 6 **Feature Name:** S-KL22 **Flow Regime:** Perennial

Direction: S **Date:** 6/28/2016

Photograph Number: 7 **Feature Name:** S-KL21 **Flow Regime:** Intermittent

Direction: S **Date:** 6/28/2016

Photograph Number: 8 **Feature Name:** S-PP14 **Flow Regime:** Perennial

Direction: NW **Date:** 10/16/2015

Photograph Number: 9 **Feature Name:** S-PP15 **Flow Regime:** Perennial

Direction: NNE **Date:** 10/16/2015

Photograph Number: 10 **Feature Name:** S-PP17 **Flow Regime:** Intermittent

Direction: SE **Date:** 10/16/2015

Photograph Number: 11 **Feature Name:** S-PP18 **Flow Regime:** Intermittent

Direction: W **Date:** 10/16/2015

Photograph Number: 12 **Feature Name:** S-PP19 **Flow Regime:** Intermittent

Direction: S **Date:** 10/16/2015

Photograph Number: 13 **Feature Name:** S-UU8-Braid **Flow Regime:** Perennial

Direction: SSW **Date:** 10/16/2015

Photograph Number: 14 **Feature Name:** S-UU8 **Flow Regime:** Perennial

Direction: N **Date:** 10/16/2015

Photograph Number: 15 **Feature Name:** S-UU9 **Flow Regime:** Perennial

Direction: SSW **Date:** 10/16/2015

Photograph Number: 16 **Feature Name:** S-HH16 **Flow Regime:** Perennial

Direction: NW **Date:** 10/16/2015

Photograph Number: 17 **Feature Name:** S-MN17 **Flow Regime:** Intermittent

Direction: W **Date:** 5/10/2017

Photograph Number: 18 **Feature Name:** S-MN17-Braid **Flow Regime:** Intermittent

Direction: NW **Date:** 5/10/2017

Photograph Number: 19 **Feature Name:** S-MMN20 **Flow Regime:** Intermittent

Direction: NE **Date:** 5/10/2017

Photograph Number: 20 **Feature Name:** S-HH15 **Flow Regime:** Perennial

Direction: S **Date:** 10/16/2015

Photograph Number: 21 **Feature Name:** S-HH14 **Flow Regime:** Ephemeral

Direction: S **Date:** 10/16/2015

Photograph Number: 22 **Feature Name:** S-HH12 **Flow Regime:** Ephemeral

Direction: S **Date:** 10/16/2015

Photograph Number: 23 **Feature Name:** S-HH11 **Flow Regime:** Ephemeral

Direction: SE **Date:** 10/16/2015

Photograph Number: 24 **Feature Name:** S-PP22 **Flow Regime:** Intermittent

Direction: NE **Date:** 10/17/2015

Photograph Number: 25 **Feature Name:** S-PP21 **Flow Regime:** Ephemeral

Direction: NE **Date:** 10/17/2015

Photograph Number: 26 **Feature Name:** S-PP20 **Flow Regime:** Intermittent

Direction: SSW **Date:** 10/17/2015

Photograph Number: 27 **Feature Name:** S-HH17 **Flow Regime:** Perennial

Direction: W **Date:** 10/17/2015

Photograph Number: 28 **Feature Name:** S-HH18 **Flow Regime:** Perennial

Direction: N **Date:** 10/17/2015

Photograph Number: 29 **Feature Name:** S-RR14 **Flow Regime:** Ephemeral

Direction: N **Date:** 9/14/2015

APPENDIX E
Project Field Personnel

Project Field Personnel

Name	Job Title	Degree	Years of Experience	Summary
Whitten, Mike	Environmental Scientist	B.S. Mathematics, M.S. Environmental Sciences	26	26 years performing wildlife and endangered species surveys, habitat evaluations, and ecological risk assessments; one year experience conducting stream and wetland delineations. Training includes USACE Wetland Delineation Training Program, and 40-Hour OSHA Compliance Course and annual refreshers.
Townsend, Sara	Ecologist	B.S. Watershed Science, M.S. Wildlife Ecology Conservation	20	Fifteen years conducting jurisdictional wetland delineations, USACE Wetland Delineation Training, U.S. Forest Service stream assessment protocol training.
Hadersbeck, David	Wildlife Biologist II	B.S. Wildlife Ecology	13+	Extensive experience with avian research, botanical surveys, and wetland delineations ranging across the United States.
Ryan, Stephen	Biologist IV	B.S. Wildlife & Fisheries Science	6	Seven years employed in environmental sciences with an additional four years in construction management. Responsibilities have included wetland/stream delineation and mapping, reproduction and dispersal studies of migrant waterfowl, Phase I bog turtle assessments, Phase I northern log-eared bat assessments, environmental site assessments, endangered shorebird surveys, vernal pool surveys, critical issues analysis assessments, preparation of general and individual permits for development within regulated areas (freshwater wetlands, flood hazard areas, and coastal zones), and technical review/writing.
Larson, Andy	Environmental Scientist II	B.S. Environmental Science: Freshwater Ecology	4+	Going into 5th year with the company as part time employee focusing on fisheries projects and general biological surveys. Minored in Geography: Soils Science and Chemistry, with a focus of wetland studies with B.S.
Cook, James	Environmental Scientist II	BS in Biology, M.S. Environmental Science	3+	Over three years of wetland delineation/mapping experience throughout East Coast and Alaska. Training includes a Masters degree with a focus on wetland science, membership in the Society for Wetland Science, and certification for Wetland Professional in Training.
Foster, Emily	Biologist II	B.S. Biology, M.S. Environmental Science	3+	Over three years experience conducting wetland delineations and assessments in multiple regions. Member of the Society for Wetland Scientists (SWS), and Wetland Professional in Training (WPIT) certification through the SWS.
Pulver, Kevin	Environmental Scientist II	B.S. Environmental Science/Studies/Watershed Management	2+	Two years experience conducting stream and wetland delineations. USACE Wetland Delineation Training Program certificate from Swamp School Institute.
Potrikus, Jennifer	Biologist I	B.A Biology, M.S Conservation Biology	<1	6 months in the consulting field as a field biologist focused on wetland and stream delineations. Other areas include invasive species and threatened/endangered species assessments.