# Aquatic Resource Report Addendum for the Pennsylvania Pipeline Project, Southcentral Region, Huntington County, Pennsylvania

Prepared By:

Tetra Tech, Inc.

For

Sunoco Pipeline, LP

525 Fritztown Road

Sinking Spring, PA

November 2016

# TABLE OF CONTENTS

# ACRONYMS

| | |
|---|---|
| 1987 Manual | Corps of Engineers Wetland Delineation Manual |
| Corps Regional Supplement | Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont Region |
| FAC | Facultative |
| FACU | Facultative Upland |
| FACW | Facultative Wetland |
| GIS | Geographic Information Systems |
| GPS | Global Positioning System |
| NRCS | Natural Resources Conservation Service |
| NWI | National Wetlands Inventory |
| OBL | Obligate |
| PA | Pennsylvania |
| PADEP | Pennsylvania Department of Environmental Protection |
| PEM | Palustrine Emergent |
| PFO | Palustrine Forested |
| Project | Southwest Region, Pennsylvania Pipeline Project |
| PSS | Palustrine Scrub Shrub |
| SF | Square Feet |
| SPLP | Sunoco Pipeline, LP |
| Tetra Tech | Tetra Tech, Inc. |
| UNT | Unnamed Tributary |
| UPL | Upland |
| USACE | United States Army Corps of Engineers |
| USFWS | United States Fish and Wildlife Service |
| USGS | United States Geological Survey |

# 1.0 INTRODUCTION

On behalf of Sunoco Pipeline, LP (SPLP), Tetra Tech, Inc. (Tetra Tech), has prepared this Aquatic Resource Addendum Report for Huntington County to support the Pennsylvania Pipeline Project (Project). Additional aquatic resource surveys were determined to be necessary to accommodate additional Project area changes. This addendum report will be the second addendum submitted since the original Aquatic Resource Report, prepared in July 2015. This addendum report reflects changes and additions to aquatic resources identified since the March 2016 Aquatic Resource Addendum Report was prepared for Huntingdon County, Pennsylvania (PA). The three reports provide a comprehensive delineation of aquatic resources to be, or likely to be, impacted by the proposed Project. Wetland areas were delineated onsite using methodology outlined within the United States Army Corps of Engineers (USACE) *Wetland Delineation Manual* (Environmental Laboratory, 1987; *1987 Manual*), as amended by the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont Region*, April 2012 (Environmental Laboratory, 2012; *Corps Regional Supplement*).

The content of this report presents the methodology, results, and conclusions of wetland delineation and stream identification activities completed for Addendum Study Areas. This report provides additional baseline information on existing aquatic resources so that appropriate avoidance and minimization measures can be implemented. This report does not reference a detailed project description, present impacts, or discuss Clean Water Act jurisdiction.

# 2.0 METHODOLOGY

USACE requires the use of the procedures enumerated in the *1987 Manual* (Environmental Laboratory, 1987) and the *Corps Regional Supplement* (Environmental Laboratory, 2012) for making jurisdictional determinations. According to the *1987 Manual*, 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 which are adapted for life in saturated soil conditions);
2. Hydric soils (soils which were formed under water, or in saturated conditions); and
3. Wetland hydrology (or the 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). Wetland classifications are as follows: palustrine emergent (PEM), palustrine scrub-shrub (PSS), and palustrine forested (PFO). Dominant vegetation was identified and classified according to The National Wetland Plant List: 2016 Update of Wetland Ratings (Lichvar et al., 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%

Streams identified in the field were categorized as one of the following flow regimes: ephemeral, intermittent, or perennial.

Streams identified in the field were designated 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 identified in the field were designated 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 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 identified in the field were designated 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 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.

The Project field investigations addressing modifications or verifications to previously collected data were performed during numerous field visits occurring between March 2016 and November 2016. The Addendum Study Area was limited to the modification areas illustrated on the Project mapping. 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:

- United States Geological Survey (USGS) topographic mapping (Figures 1-1 to 1-5; USGS, 2009)
- Natural Resources Conservation Service (NRCS) National Cooperative Soil Survey (Figures 2-1 to 2-5; NRCS, 2014 )
- USFWS National Wetland Inventory (NWI) Mapping (Figures 3-1 to 3-5; USFWS, 2009)

The delineation consisted of 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 and later added to the Project area mapping. Wetland and stream flagging was limited to the bounds of the investigated Addendum Study Area and wetlands are shown as closed or partially closed systems on the detail maps (Figures 4-1 to 4-20)

Data concerning soils, hydrology, and vegetation were collected and recorded on USACE Wetland Determination Data Forms at wetlands and upland point locations associated with wetlands, which 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 located within the study area. As a result of reevaluation per Pennsylvania Department of Environmental Protection (PADEP) comments, photographs reflecting modifications made to wetlands since the March 2016 Aquatic Resource Addendum Report have been provided in the Modified Wetland Photographs (Appendix E). Photographs reflecting modifications made to streams since the March 2016 Aquatic Resource Addendum Report have been provided in the Modified Stream Photographs (Appendix F). Appendix G contains photographs of verified features. Supplemental data requested by PADEP has been provided in Appendix H - Supplemental Data. Appendix I provides a list of hydric soils known to occur within Huntingdon County. Resumes of project personnel are included in Appendix J.

# 3.0 RESULTS

The field investigations identified three new wetlands within Huntington County, located within the Southcentral Region of the proposed Project Addendum Study Area, which met the wetland criteria outlined in the *1987 Manual*, as amended by the *Corps Regional Supplement*. Two new streams were identified within the Addendum Study Area. Additionally, six previously identified streams were modified within of the Addendum Study Area. A narrative summary of field data collected for these features is presented below. The detail maps, provided as Figures 4-1 to 4-20, illustrate the wetland and stream locations in relation to the Addendum Study Area

## 3.1 NEW FEATURES

### 3.1.1 Wetland Identification and Delineation

Hydric soils and soils with hydric components are often associated with wetlands. The NRCS Soil Survey hydric soil list for Huntingdon County, PA is included in Appendix I. The NRCS Soil Survey Maps are included as Figures 2-1 to 2-5. Confirmation of the soil mapping units was not performed during this site evaluation.

NWI mapped wetlands that fall within the Addendum Study Area are illustrated on the NWI Maps included as Figures 3.1 to 3.5.

Based on field evidence and best professional judgment, it was determined that three wetlands are present within the study area. These areas demonstrated the presence of all three wetland parameters required by the *1987 Manual* and the *Corps Regional Supplement*. The vegetative communities were dominated by hydrophytic plant species, the soils exhibited hydric characteristics, and the area contained wetland hydrology indicators.

USACE wetland determination data forms that detail the existing vegetation, soil characteristics, and hydrology were prepared for each wetland and its associated upland point (Appendix A).

**Wetland JH1**

Wetland JH1 (W-JH1) is a 539-square foot (SF) PFO wetland (Figure 4-5). Indicators of wetland hydrology include surface water, a high water table, saturation within the upper 12 inches of the soil profile, water-stained leaves, drainage patterns, geomorphic position, and a positive FAC neutral test. Dominant vegetation consists of red maple (*Acer rubrum*), sweet birch (*Betula lenta*), praire sphagnum (*Sphagnum palustre),* and cinnamon fern (*Osmundastrum cinnamomeum*). The soil between -2 and 0 inches exhibits a low-chroma matrix (7.5YR 2.5/2) with a mucky peat texture. The soil between 0 and 1 inches exhibits a low-chroma matrix (10YR 3/1) with a sand loam texture.

The soil between 1 and 2 inches exhibits a low-chroma matrix (N 3/0 with a sand loam texture. The soil between 2-3.25 inches exhibits a low-chroma matrix (10YR 5/1) with a sand loam texture. The soil from 3.25- 4.5 contains a low-chroma matrix (10YR 6/2) with a loam sand texture that contains redoximorphic features (10YR 4/4). The soil between 4.5 to 15 inches contains a low-chroma matrix (2.5Y 6/2) with a loam sand texture that contains redoximorphic features (10YR 4/4).

**Wetland JH2**

Wetland JH2 (W-JH2) is a 997-SF PEM wetland (Figure 4-7). Indicators of wetland hydrology include surface water, a high water table, saturation within the upper 12 inches of the soil profile, geomorphic position, and a positive FAC neutral test. Dominant vegetation consists of meadowsweet (*Spirea alba*), and rough bluegrass (*Poa trivialis*). The soil between 0 and 2.5 inches exhibits a low-chroma matrix (5YR 4/2) with a silt loam texture that contains redoximorphic features (5YR 4/4. The soil between 2.5 and 7 inches exhibits a low-chroma matrix (5YR 4/2) with a clay loam texture that contains redoximorphic features (5YR 4/4, 4/1). The soil between 7 and 14 inches exhibits a low-chroma matrix (5YR 4/2 with a Silt loam texture that contains redoximorphic features (5YR 4/4, 5YR 4/4).

**Wetland L24/ L25 PEM1**

Wetland L24/25 PEM1 (W-L24/L25) represents a 14,152-SF PEM portion of wetland complex W-L24/L25 (Figure 4-7). Indicators of wetland hydrology include a high water table, saturation within the upper 12 inches of the soil profile, geomorphic position, and a positive FAC-Neutral test. Dominant vegetation consists of spotted touch-me-not (*Impatiens capensis*) and cinnamon fern (*Osmundastrum cinnamomeum*). The soil between 0 and 12 inches exhibits a low-chroma matrix (2.5Y 4/1) with a silty loam texture that contains redoximorphic features (10YR 3/3).

**Wetland L24/ L25 PEM2**

Wetland L24/25 PEM2 (W-L24/25) represents a 14152-SF PEM portion of wetland complex W-L24/L25 (Figure 4-7). Indicators of wetland hydrology include a high water table, saturation within the upper 12 inches of the soil profile, geomorphic position, and positive FAC-Neutral test. Dominant vegetation consists of spotted touch-me-not (*Impatiens capensis*) and cinnamon fern (*Osmundastrum cinnamomeum*). The soil between 0 and 5 inches exhibits a low-chroma matrix (7.5YR 3/1) with a sandy loam texture. The soil between 5 and 10 inches exhibits a low-chroma matrix (7.5YR 4/1) with a sandy texture that contains redoximorphic features (5YR 4/6).

### 3.1.2 Stream Identification and Evaluation

Based on field evidence and best professional judgment, it was determined that two new streams were identified within the Addendum Study Area. A data sheet that details the bank and channel characteristics, substrate composition, aquatic habitat, and hydrology was prepared for each of the streams (Appendix C).

**Stream JH2 Ephemeral**

Stream S-JH2 (S-JH2) is an ephemeral unnamed tributary (UNT) to the Raystown Branch of the Juniata River (Figure 4-3, 4-4). The bank is approximately 4 feet in width and the left bank height of 18 inches and right bank height of 1 foot. The stream bed contains a cobble, gravel, sand, and silt substrate. The stream exhibited no flow at the time of the field investigation.

**Stream JH2 Intermittent**

Stream S-JH2 (S-JH2) is an intermittent UNT to the Raystown Branch of the Juniata River (Figure 4-3, 4-4). The bank is approximately 8 feet in width and 5 feet in height. The stream bed contains a cobble gravel, sand, and silt substrate. The stream exhibited a water depth of 0.5 inches at the time of the field investigation.

**Stream JH4**

Stream S-JH4 (S-JH4) is an intermittent UNT to Little Trough Creek (Figure 4-15). The bank is approximately 2 feet in width and 1 feet in height. The stream bed contains a sand substrate. The stream exhibited a water depth of 3 inches at the time of the field investigation.

## 3.2 MODIFIED FEATURES

### 3.2.2 Wetlands

Based on field evidence and best professional judgment, it was determined that one previously identified wetland were extended within of the Addendum Study Area. Appendix E includes photographs of modified streams.

**Wetland BB135**

W-BB135 is a previously identified wetland that was extended within the Addendum Study Area (Figure 4-5). No new data was collected for this wetland extension. Appendix E includes a photograph of this modified wetland.

### 3.2.2 Streams

Based on field evidence and best professional judgment, it was determined that seven previously identified streams were extended within of the Addendum Study Area. Appendix F includes photographs of modified streams.

**Stream Y18**

S-Y18 is a previously identified stream that was extended within the Addendum Study Area (Figure 4-3). No new data was collected for this stream extension.

**Stream Y20**

S-Y20 is a previously identified stream that was extended within the Addendum Study Area (Figure 4-4). No new data was collected for this stream extension.

**Stream BB104**

S-BB104 is a previously identified stream that was extended within the Addendum Study Area (Figure 4-5). No new data was collected for this stream extension.

**Stream BB108**

S-BB108 is a previously identified stream that was extended within the Addendum Study Area (Figure 4-5). No new data was collected for this stream extension.

**Stream L42**

S-L42 is a previously identified stream that was modified within the Addendum Study Area (Figure 4-7). No new data was collected for this stream. The stream was extended outside, then back into, the survey area and connected to previously identified stream S-L45A. Stream L42 was then edited to encompass the portion of stream L45A located above the previously delineated pond feature (Pond-I4). This stream was modified in response to a comment from the PADEP. A supplemental stream data form for stream S-L42 is provided in Appendix H – Requested Supplemental Data Forms.

**Stream M9**

S-M9 is a previously identified stream that was extended within the Addendum Study Area (Figure 4-11). No new data was collected for this stream extension.

**Stream L26**

S-L26 is a previously identified stream that was extended within the Addendum Study Area (Figure 4-14). No new data was collected for this stream extension.

### 3.3 VERIFIED FEATURES

In an effort to address comments from the PADEP certain features of concern were reexamined and photographed to verify they were accurately depicted and/or recorded. Features reexamined and verified required no modification, and therefore no new data was collected. Photographs depicting existing field verified conditions have been included for streams: S-Y21, S-KP3, S-M28, S-L37, S-L36, S-L34, S-M13, S-CC10, S-L25, S-L21, and S-K89. Photographs of verified features have been included in Appendix G – Verified Feature Photographs.

In regards to the comment from PADEP concerning the area east of stream S-L26 and around stream S-CC10 being outside of the survey area of the Aquatic Resource Report and its Addendums. Tetra Tech has investigated these areas for waters of the Commonwealth. The survey has been surveyed and a revised map is provided within the detail figures (Figure 4-1).

In an additional PADEP comment pertaining to stream S-L30, PADEP requested that an additional investigation be conducted south of existing stream S-L30 to examine whether a potential stream exists. This location was reexamined to verify the presence/absence of a potential watercourse. During the investigation an erosional feature [drainage feature] carrying stormwater run-off to the culvert (Figure 4-1).

A revised wetland delineation for the Aughwick Creek islands of concern was conducted by Tetra Tech personnel on September 28, 2016. The purpose of this field visit was to verify the absence of wetland characteristics at previously identified wetland W46b. Supplemental upland data forms (Upland 1, Upland 2) requested by the PADEP for the investigated islands of concern are provided in the Appendix H. Project mapping reflecting the revisions at this location is provided in the detail map included as (Figure 4-1).

### 3.4 SUPPLEMENTAL DATA

In an effort to supply additional information to the PADEP regarding certain previously identified watercourses, supplemental data forms pertaining to the requested watercourses is being provided

in this addendum report. The supplemental stream data forms requested by PADEP for streams S-Y1, S-Y24, S-JH2, S-JH4, S-K92, S-KP3, S-L17, S-L42, and S-M49 are provided in Appendix H.

# 4.0 CONCLUSIONS

During the field investigations in Huntington County, PA, located within the Southcentral Region of the proposed Pennsylvania Pipeline Project, three new wetlands were identified within the Addendum Study Area which exhibited all three criteria necessary to be classified as a jurisdictional wetland in accordance with the 1987 Manual and the Regional Supplement:

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

Two new streams were identified within the Addendum Study Area. One previously collected wetland and seven previously identified streams were modified within the Addendum Study Area.

Additionally, streams Y21, KP3, M28, L37, L36, L34, M13, CC10, L25, L21, and K89 were field verified to address PADEP comments. The supplemental stream data forms requested by PADEP for streams S-Y1, S-Y24, S-JH2, S-JH4, S-K92, S-KP3, S-L42, S-L17, and S-M49 are provided in Appendix H.

# REFERENCES

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe, 1979. Classification of Wetlands and Deepwater Habitats of the United States. United States Government Printing Office. Washington, D.C. GPO 024-010-00524-6. 103 pp.

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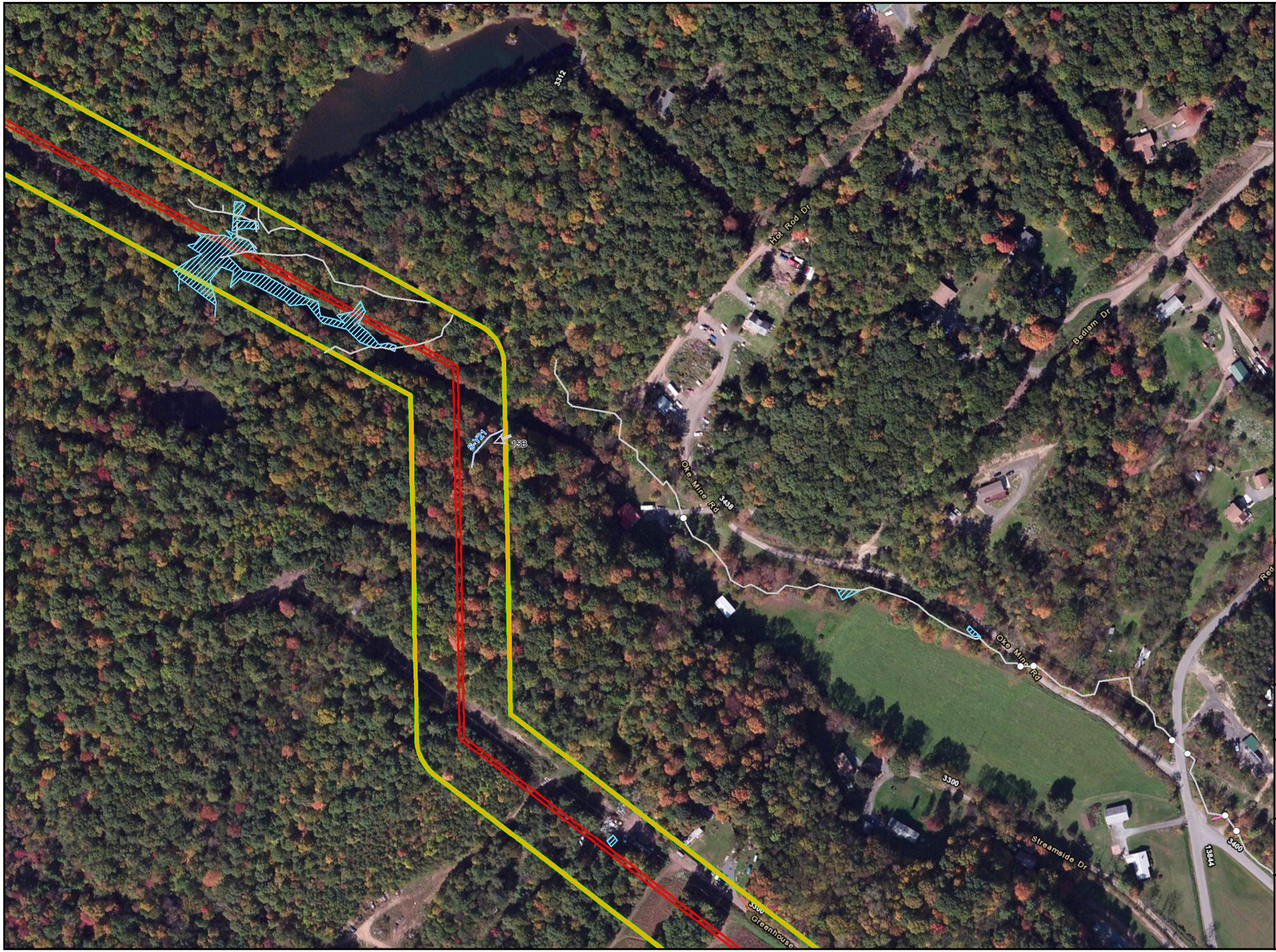
# FIGURES



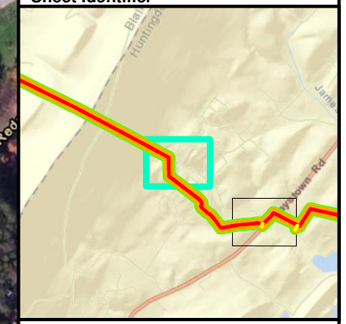

## Legend

- Photo Location

Stream
- VERIFIED
- Culvert
- Drainage Feature
- Previous Delineated Stream

Previous Delineated Wetland
- PEM
- Alignment Centerline
- Alignment Centerline (2/25/16)
- Study Area
- Study Area (2/25/16)
- Block Valve/Station

**Sheet Identifier**



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**ADDENDUM WETLANDS DETAIL MAP**
**FIGURE 4-1**
**PENNSYLVANIA PIPELINE PROJECT**
**NOVEMBER 12, 2016 ALIGNMENT**
**SUNOCO LOGISTICS, L.P.**
**HUNTINGDON COUNTY, PA**

TETRA TECH

Notes:
1) Aerial photograph provided by ESRI's ArcGIS Online World Imagery map service (© 2013 ESRI and its data suppliers).

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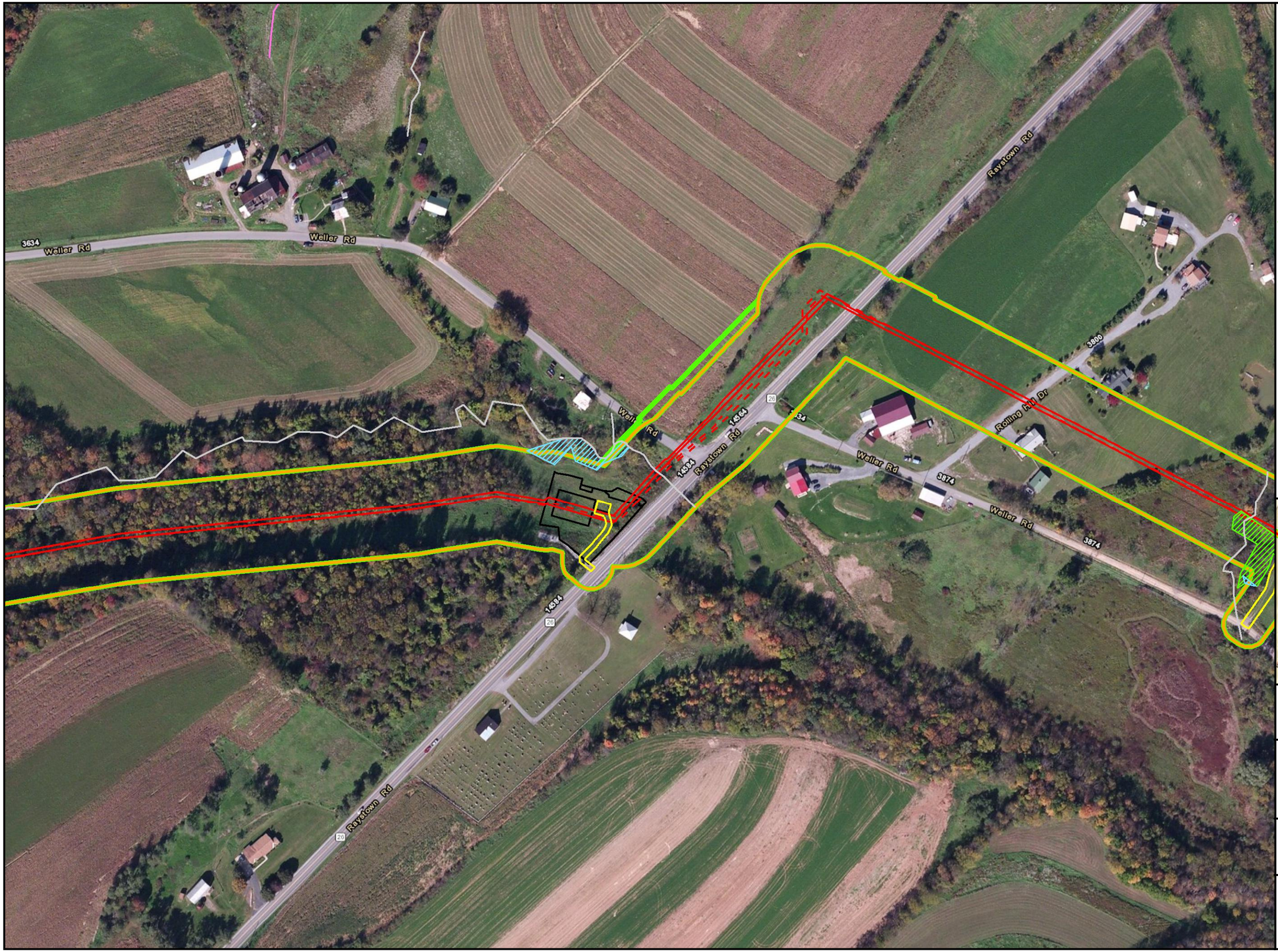


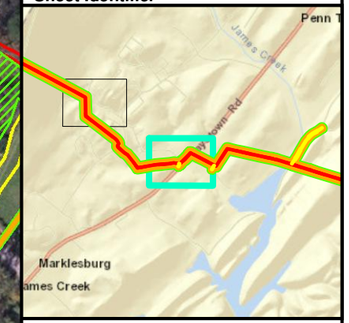

## Legend

- Photo Location
- Drainage Feature
- Previous Delineated Stream

Previous Delineated Wetland

- PEM
- PSS
- Access Road
- Access Road (2/25/16)
- Alignment Centerline
- Alignment Centerline (2/25/16)
- Study Area
- Study Area (2/25/16)
- Block Valve/Station

**Sheet Identifier**

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**ADDENDUM WETLANDS DETAIL MAP**
**FIGURE 4-2**
**PENNSYLVANIA PIPELINE PROJECT**
**NOVEMBER 12, 2016 ALIGNMENT**
**SUNOCO LOGISTICS, L.P.**
**HUNTINGDON COUNTY, PA**

TETRA TECH

Notes:
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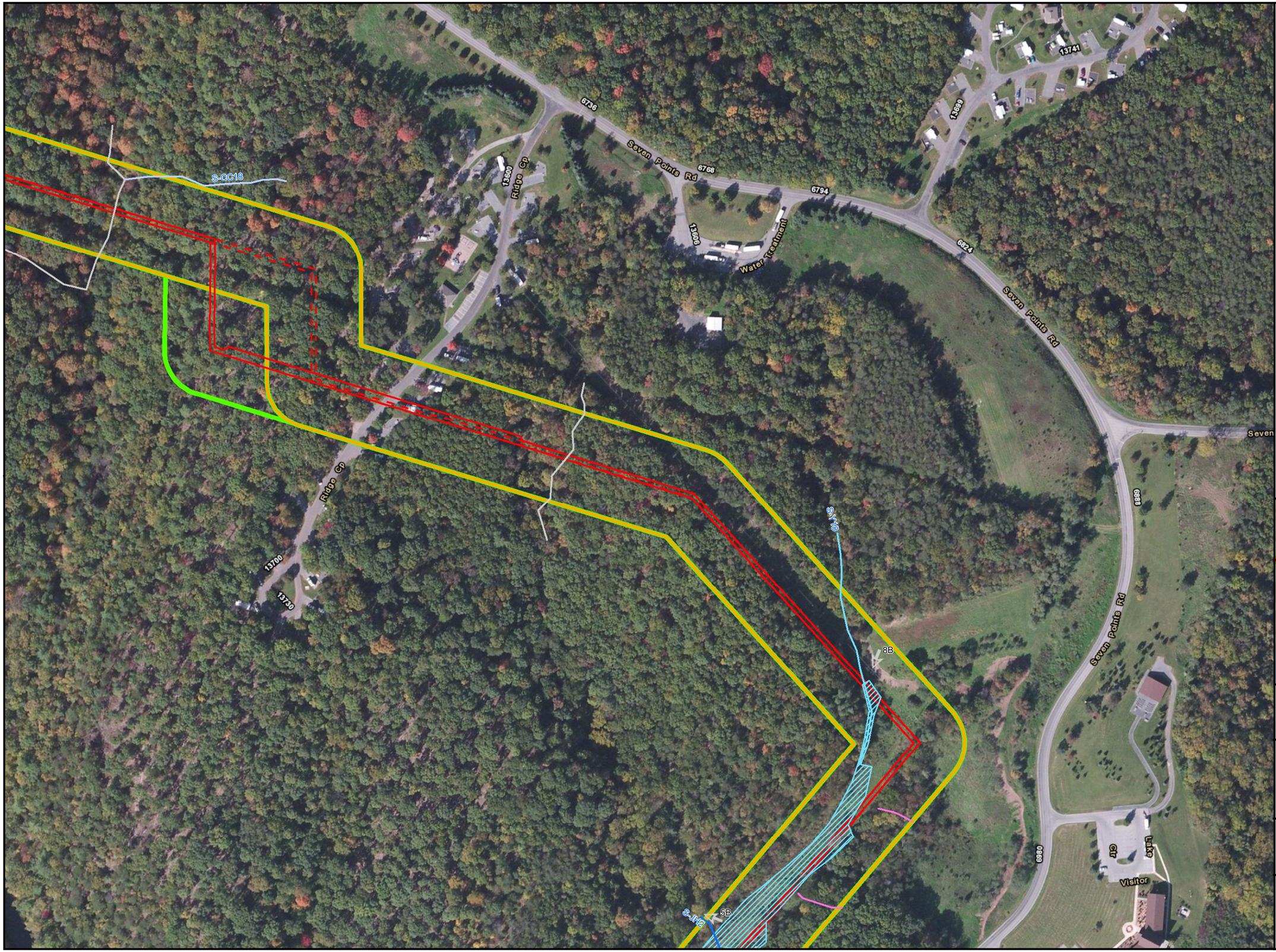


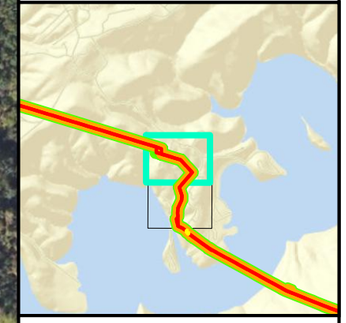

## Legend

- Photo Location

Stream
- NEW
- MOD
- VERIFIED
- Drainage Feature
- Previous Delineated Stream

Previous Delineated Wetland
- PEM
- Alignment Centerline
- Alignment Centerline (2/25/16)
- Study Area
- Study Area (2/25/16)
- Block Valve/Station

**Sheet Identifier**



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**ADDENDUM WETLANDS DETAIL MAP**
**FIGURE 4-3**
**PENNSYLVANIA PIPELINE PROJECT**
**NOVEMBER 12, 2016 ALIGNMENT**
**SUNOCO LOGISTICS, L.P.**
**HUNTINGDON COUNTY, PA**

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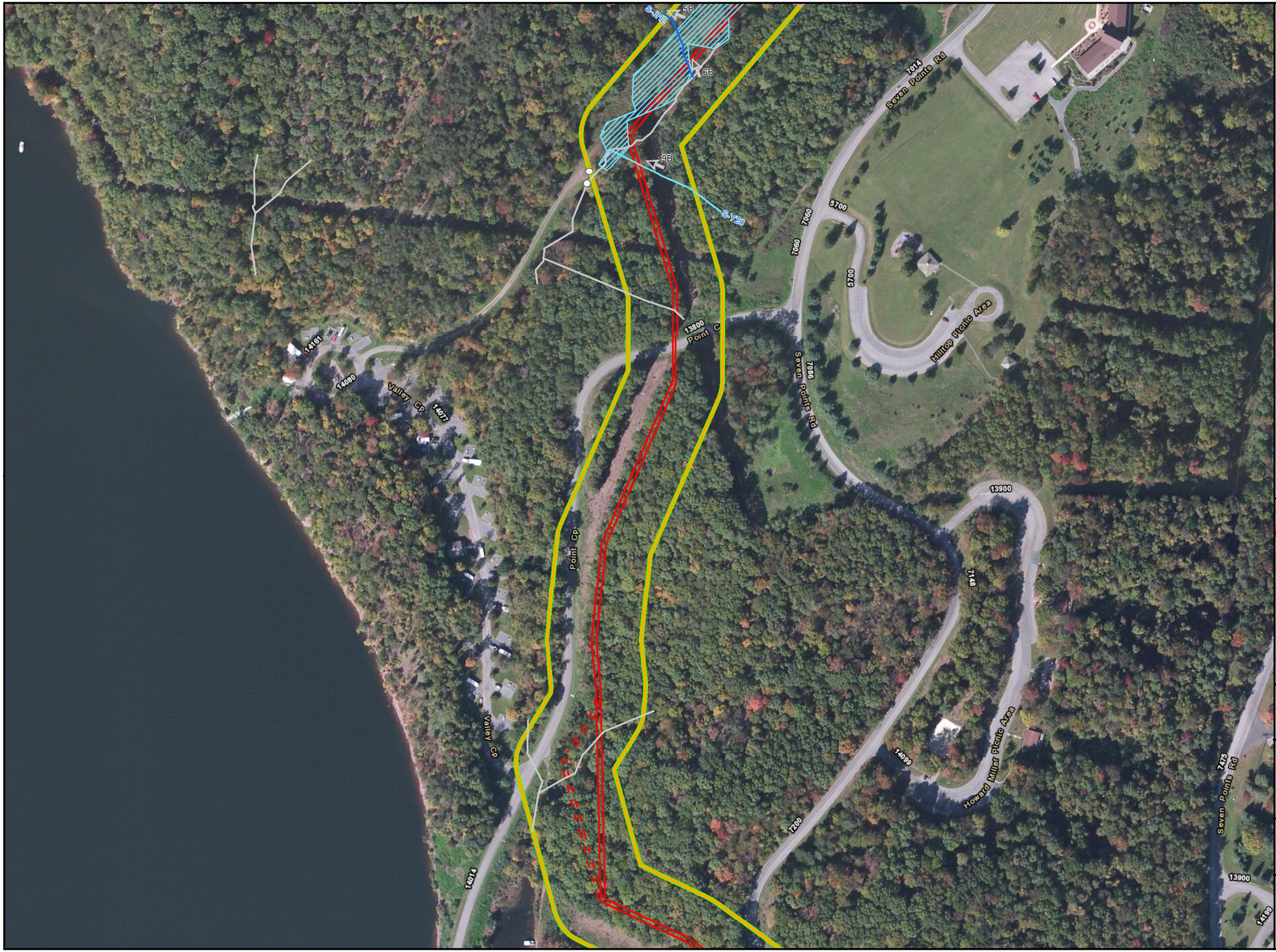


## Legend

- Photo Location

Stream
- NEW
- MOD
- Culvert
- Drainage Feature
- Previous Delineated Stream

Previous Delineated Wetland
- PEM
- Alignment Centerline
- Alignment Centerline (2/25/16)
- Study Area
- Study Area (2/25/16)
- Block Valve/Station

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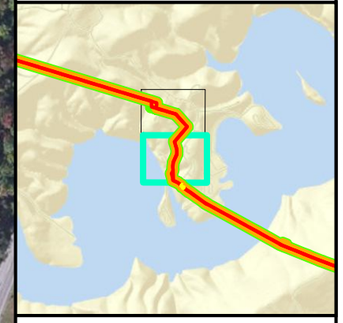

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Meters
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**ADDENDUM WETLANDS DETAIL MAP**
**FIGURE 4-4**
**PENNSYLVANIA PIPELINE PROJECT**
**NOVEMBER 12, 2016 ALIGNMENT**
**SUNOCO LOGISTICS, L.P.**
**HUNTINGDON COUNTY, PA**

TETRA TECH

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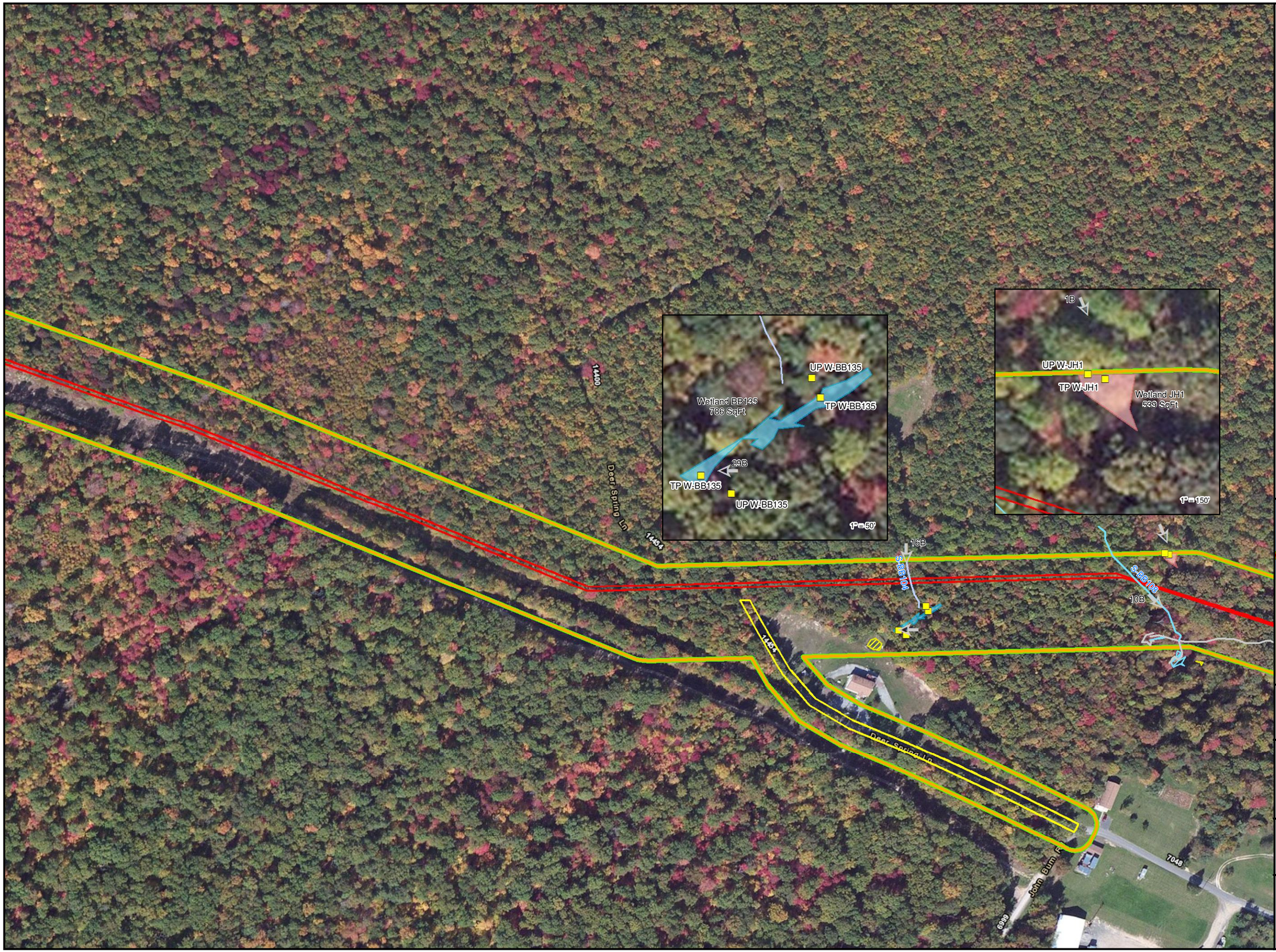



## Legend

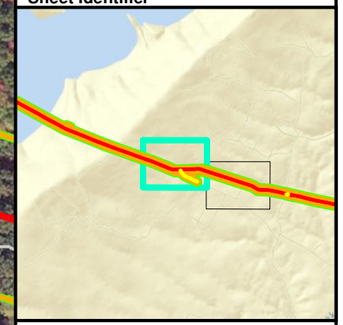
- Photo Location
- Sample Location

Stream
- MOD
- VERIFIED

New Wetland
- PEM
- PFO
- Previous Delineated Stream
- Previous Delineated Pond

Previous Delineated Wetland
- PEM
- Access Road
- Access Road (2/25/16)
- Alignment Centerline
- Alignment Centerline (2/25/16)
- Study Area
- Study Area (2/25/16)
- Block Valve/Station

**Sheet Identifier**



Feet
0 100 200
Meters
0 30.45 60.9

**ADDENDUM WETLANDS DETAIL MAP**
**FIGURE 4-5**
**PENNSYLVANIA PIPELINE PROJECT**
**NOVEMBER 12, 2016 ALIGNMENT**
**SUNOCO LOGISTICS, L.P.**
**HUNTINGDON COUNTY, PA**

TETRA TECH

Notes:
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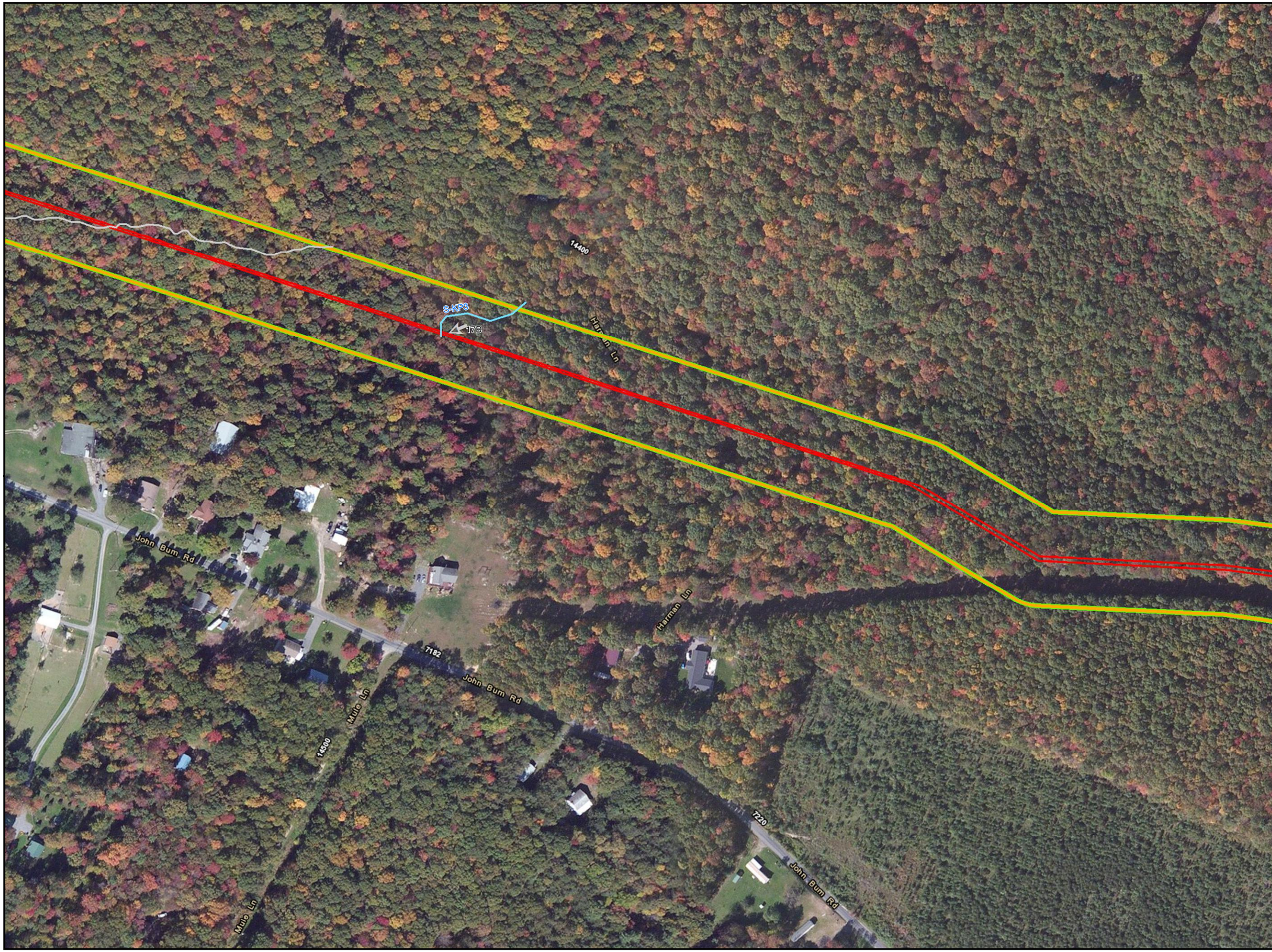
PGH P:\GIS\SUNOCO\MARINER EAST 2\MXD\PPP WETLANDS SC-1\PENNPIPELINE_HUNTINGDONCO_ADDENDUMDETAIL_REV.MXD 11/22/16 JN

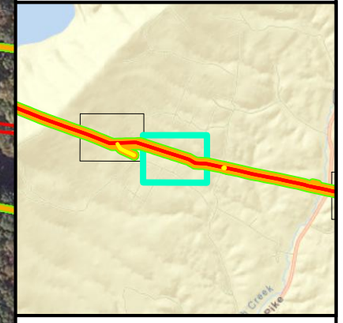



## Legend

- Photo Location

Stream
- MOD
- Previous Delineated Stream
- Alignment Centerline
- Alignment Centerline (2/25/16)
- Study Area
- Study Area (2/25/16)
- Block Valve/Station

**Sheet Identifier**



N

0 100 200 Feet

0 30.45 60.9 Meters

**ADDENDUM WETLANDS DETAIL MAP**
**FIGURE 4-6**
**PENNSYLVANIA PIPELINE PROJECT**
**NOVEMBER 12, 2016 ALIGNMENT**
**SUNOCO LOGISTICS, L.P.**
**HUNTINGDON COUNTY, PA**

TETRA TECH

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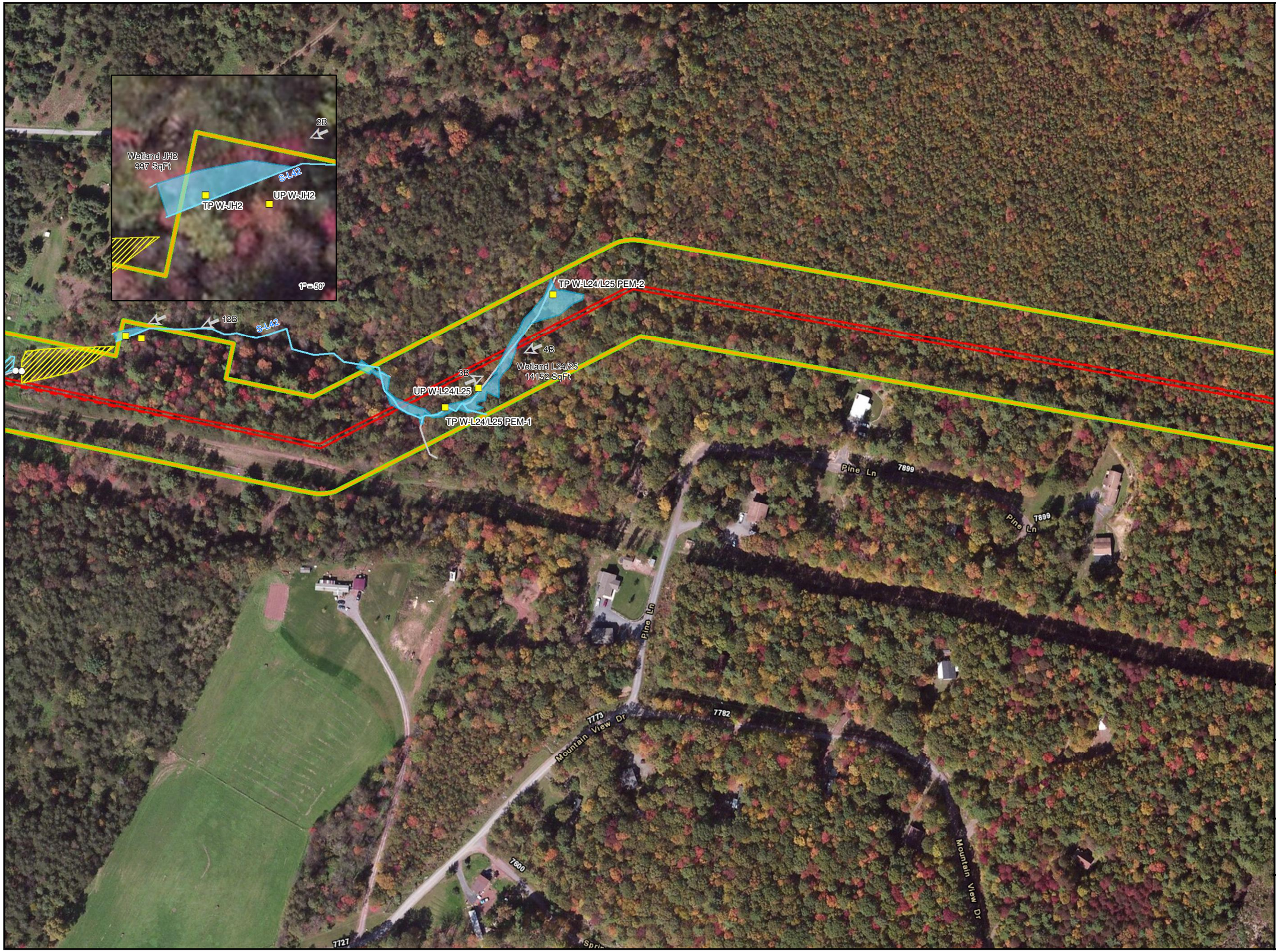



## Legend

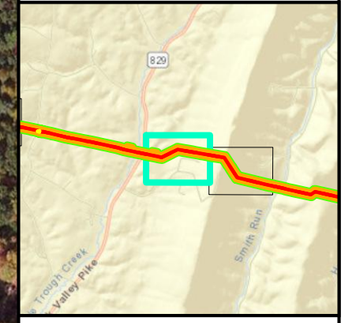
- Photo Location
- Sample Location

Stream
- MOD

New Wetland
- PEM
- Culvert
- Previous Delineated Stream
- Previous Delineated Pond

Previous Delineated Wetland
- PEM
- Alignment Centerline
- Alignment Centerline (2/25/16)
- Study Area
- Study Area (2/25/16)
- Block Valve/Station

**Sheet Identifier**




N

Feet
0 100 200

Meters
0 30.45 60.9

**ADDENDUM WETLANDS DETAIL MAP**
**FIGURE 4-7**
**PENNSYLVANIA PIPELINE PROJECT**
**NOVEMBER 12, 2016 ALIGNMENT**
**SUNOCO LOGISTICS, L.P.**
**HUNTINGDON COUNTY, PA**

TETRA TECH

Notes:
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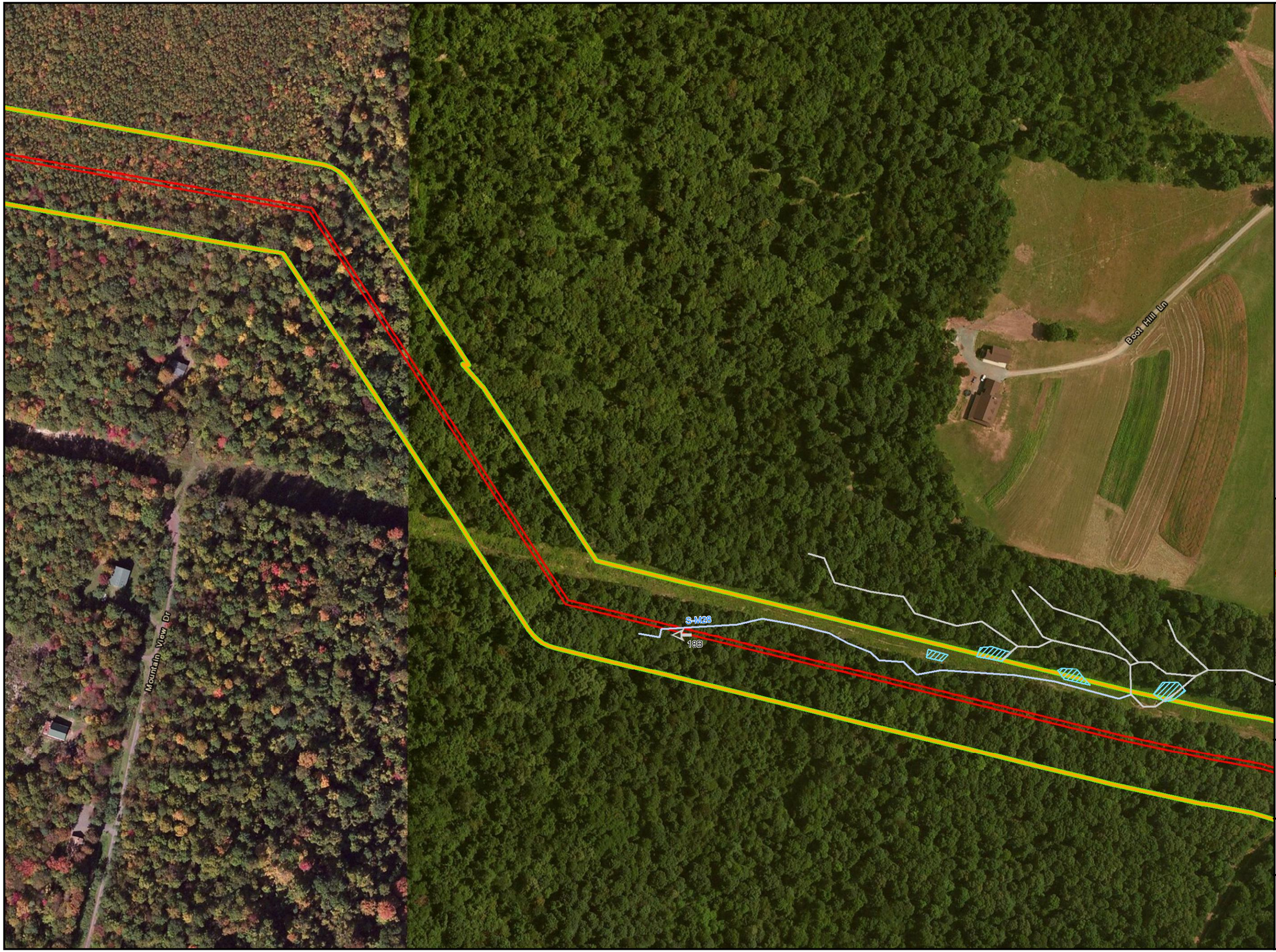


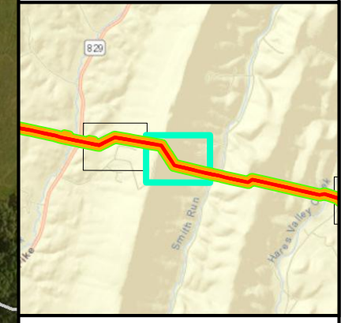

## Legend

- Photo Location

Stream
- VERIFIED
- Previous Delineated Stream

Previous Delineated Wetland
- PEM
- Alignment Centerline
- Alignment Centerline (2/25/16)
- Study Area
- Study Area (2/25/16)
- Block Valve/Station

**Sheet Identifier**




N

0 100 200 Feet

0 30.45 60.9 Meters

**ADDENDUM WETLANDS DETAIL MAP**
**FIGURE 4-8**
**PENNSYLVANIA PIPELINE PROJECT**
**NOVEMBER 12, 2016 ALIGNMENT**
**SUNOCO LOGISTICS, L.P.**
**HUNTINGDON COUNTY, PA**

TETRA TECH

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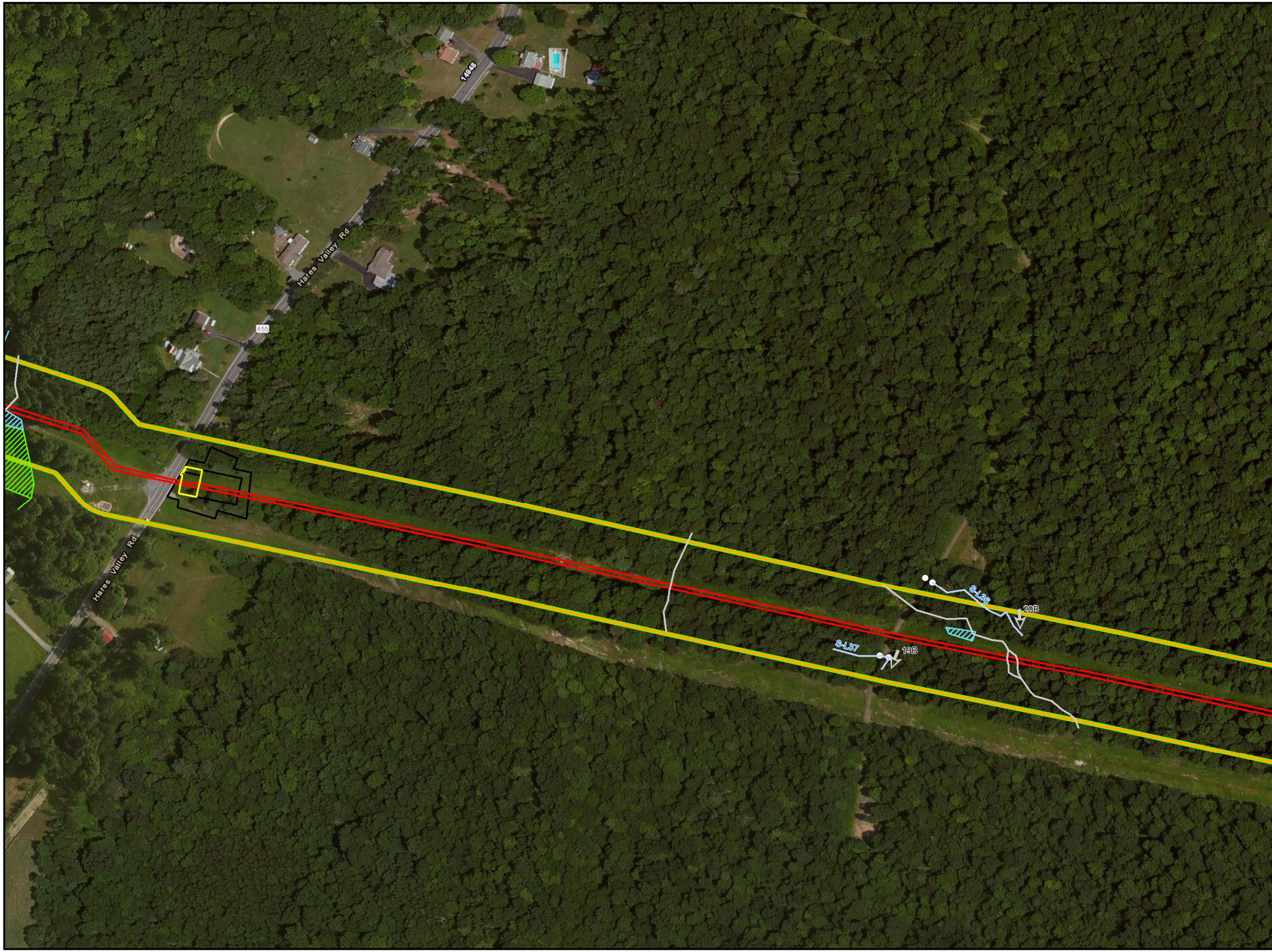


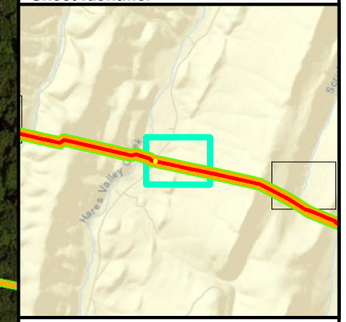

## Legend

- Photo Location

Stream
- VERIFIED
- Culvert
- Previous Delineated Stream

Previous Delineated Wetland
- PEM
- PSS
- Access Road
- Access Road (2/25/16)
- Alignment Centerline
- Alignment Centerline (2/25/16)
- Study Area
- Study Area (2/25/16)
- Block Valve/Station

**Sheet Identifier**



N

0 100 200 Feet

0 30.45 60.9 Meters

**ADDENDUM WETLANDS DETAIL MAP**
**FIGURE 4-9**
**PENNSYLVANIA PIPELINE PROJECT**
**NOVEMBER 12, 2016 ALIGNMENT**
**SUNOCO LOGISTICS, L.P.**
**HUNTINGDON COUNTY, PA**

TETRA TECH

Notes:
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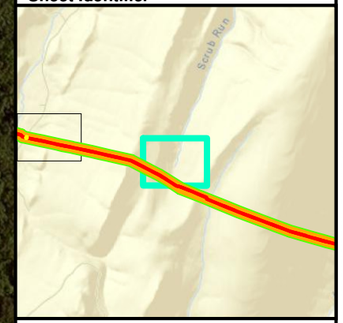
## Legend

- Photo Location

Stream
- VERIFIED
- Previous Delineated Stream

Previous Delineated Wetland
- PEM
- Alignment Centerline
- Alignment Centerline (2/25/16)
- Study Area
- Study Area (2/25/16)
- Block Valve/Station

**Sheet Identifier**




N

0 100 200 Feet

0 30.45 60.9 Meters

**ADDENDUM WETLANDS DETAIL MAP**
**FIGURE 4-10**
**PENNSYLVANIA PIPELINE PROJECT**
**NOVEMBER 12, 2016 ALIGNMENT**
**SUNOCO LOGISTICS, L.P.**
**HUNTINGDON COUNTY, PA**

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Nebo Rd
Nebo Rd
11525
Nebo Rd
22B
S-M13
15B
S-M9

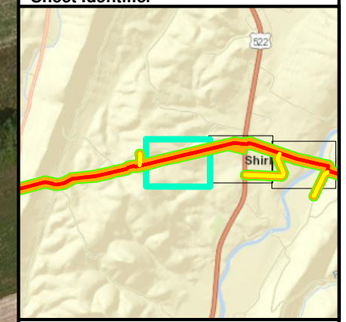
## Legend

Photo Location

Stream
- MOD
- VERIFIED
- Previous Delineated Stream

Previous Delineated Wetland
- PEM
- Alignment Centerline
- Alignment Centerline (2/25/16)
- Study Area
- Study Area (2/25/16)
- Block Valve/Station

**Sheet Identifier**




N

0 100 200 Feet

0 30.45 60.9 Meters

**ADDENDUM WETLANDS DETAIL MAP**
**FIGURE 4-11**
**PENNSYLVANIA PIPELINE PROJECT**
**NOVEMBER 12, 2016 ALIGNMENT**
**SUNOCO LOGISTICS, L.P.**
**HUNTINGDON COUNTY, PA**

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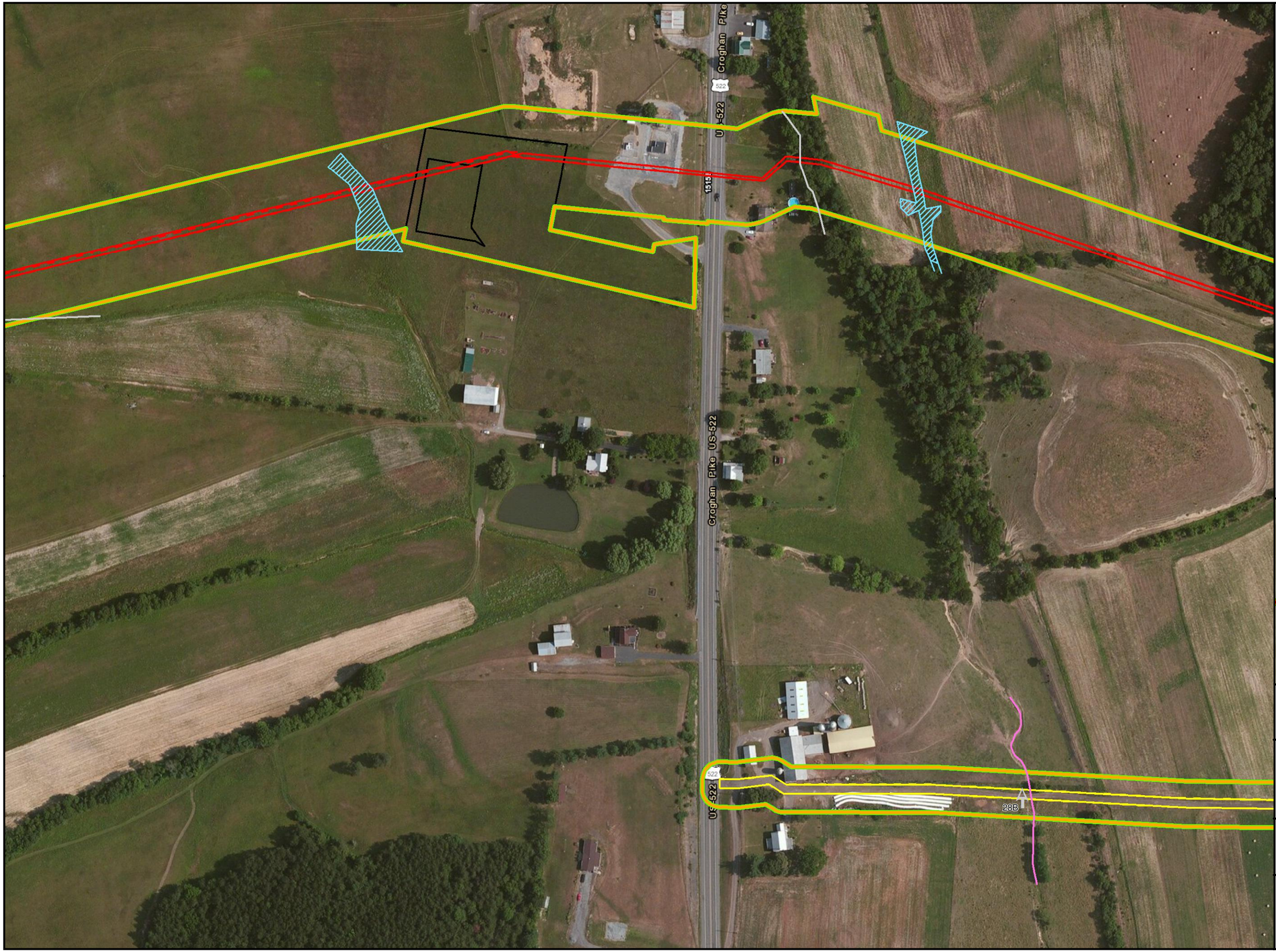


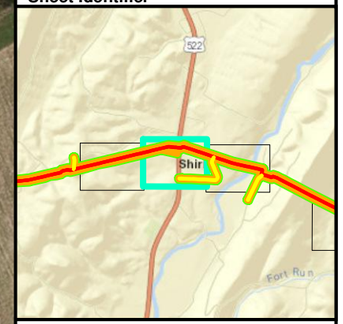

## Legend

- Photo Location
- Drainage Feature
- Previous Delineated Stream

Previous Delineated Wetland

- PEM
- Access Road
- Access Road (2/25/16)
- Alignment Centerline
- Alignment Centerline (2/25/16)
- Study Area
- Study Area (2/25/16)
- Block Valve/Station

**Sheet Identifier**




N

Feet
0 100 200

Meters
0 30.45 60.9

**ADDENDUM WETLANDS DETAIL MAP**
**FIGURE 4-12**
**PENNSYLVANIA PIPELINE PROJECT**
**NOVEMBER 12, 2016 ALIGNMENT**
**SUNOCO LOGISTICS, L.P.**
**HUNTINGDON COUNTY, PA**

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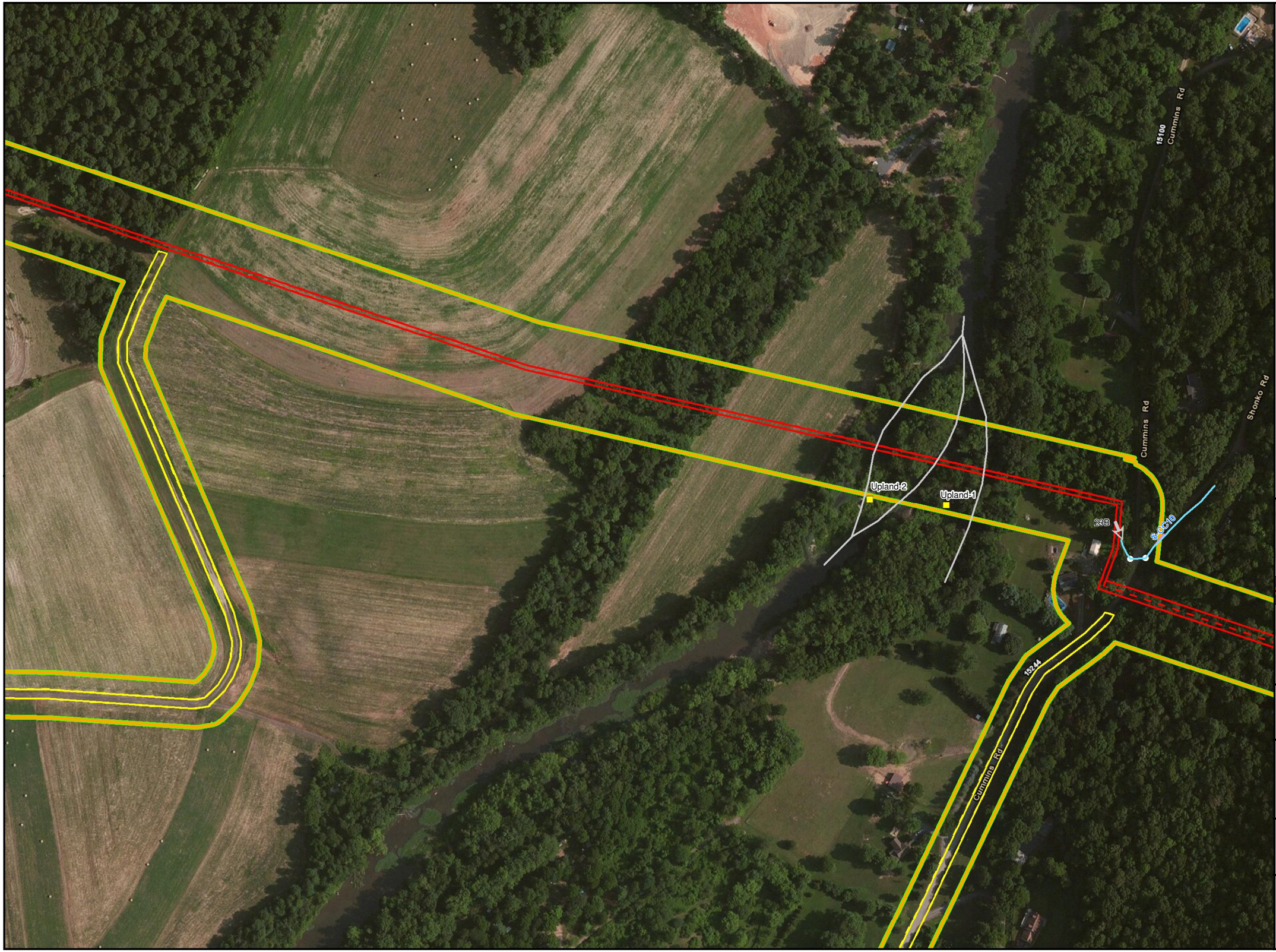


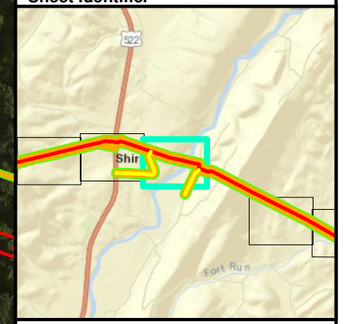

## Legend

- Photo Location
- Sample Location

Stream

- MOD
- Culvert
- Drainage Feature
- Previous Delineated Stream
- Access Road
- Access Road (2/25/16)
- Alignment Centerline
- Alignment Centerline (2/25/16)
- Study Area
- Study Area (2/25/16)
- Block Valve/Station

**Sheet Identifier**




N

0 100 200 Feet

0 30.45 60.9 Meters

**ADDENDUM WETLANDS DETAIL MAP**
**FIGURE 4-13**
**PENNSYLVANIA PIPELINE PROJECT**
**NOVEMBER 12, 2016 ALIGNMENT**
**SUNOCO LOGISTICS, L.P.**
**HUNTINGDON COUNTY, PA**

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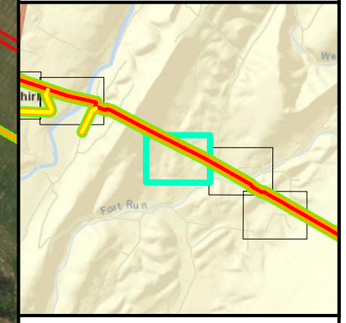
## Legend

Photo Location

Stream

- MOD
- Previous Delineated Stream
- Alignment Centerline
- Alignment Centerline (2/25/16)
- Study Area
- Study Area (2/25/16)
- Block Valve/Station

**Sheet Identifier**




Feet
0 100 200
Meters
0 30.45 60.9

**ADDENDUM WETLANDS DETAIL MAP**
**FIGURE 4-14**
**PENNSYLVANIA PIPELINE PROJECT**
**NOVEMBER 12, 2016 ALIGNMENT**
**SUNOCO LOGISTICS, L.P.**
**HUNTINGDON COUNTY, PA**

TETRA TECH

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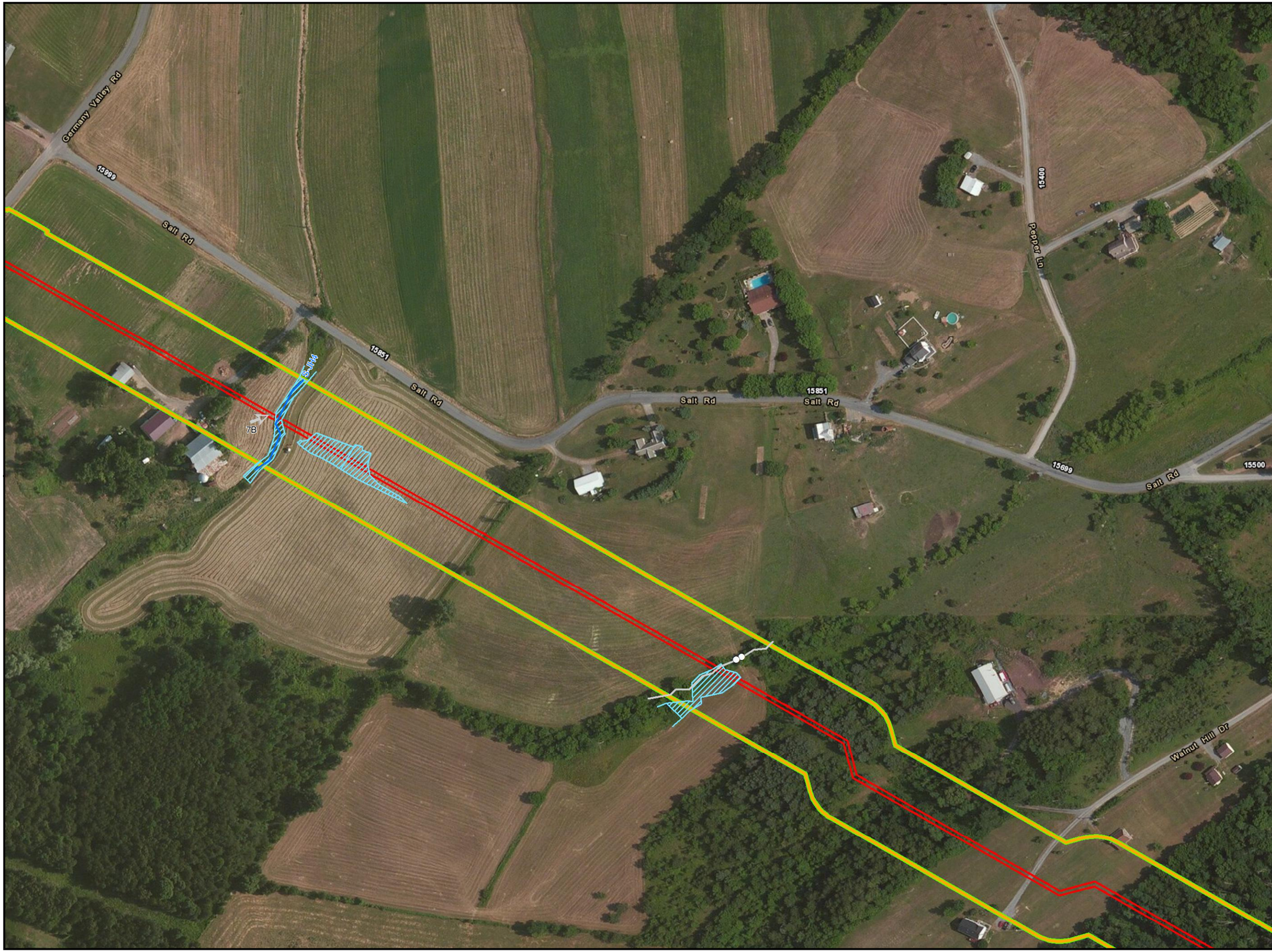


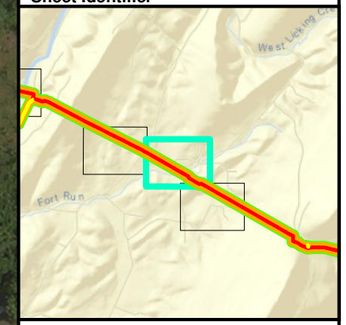

## Legend

- Photo Location

Stream
- NEW
- Culvert
- Previous Delineated Stream

Previous Delineated Wetland
- PEM
- Alignment Centerline
- Alignment Centerline (2/25/16)
- Study Area
- Study Area (2/25/16)
- Block Valve/Station

**Sheet Identifier**




N

Feet
0 100 200

Meters
0 30.45 60.9

**ADDENDUM WETLANDS DETAIL MAP**
**FIGURE 4-15**
**PENNSYLVANIA PIPELINE PROJECT**
**NOVEMBER 12, 2016 ALIGNMENT**
**SUNOCO LOGISTICS, L.P.**
**HUNTINGDON COUNTY, PA**

TETRA TECH

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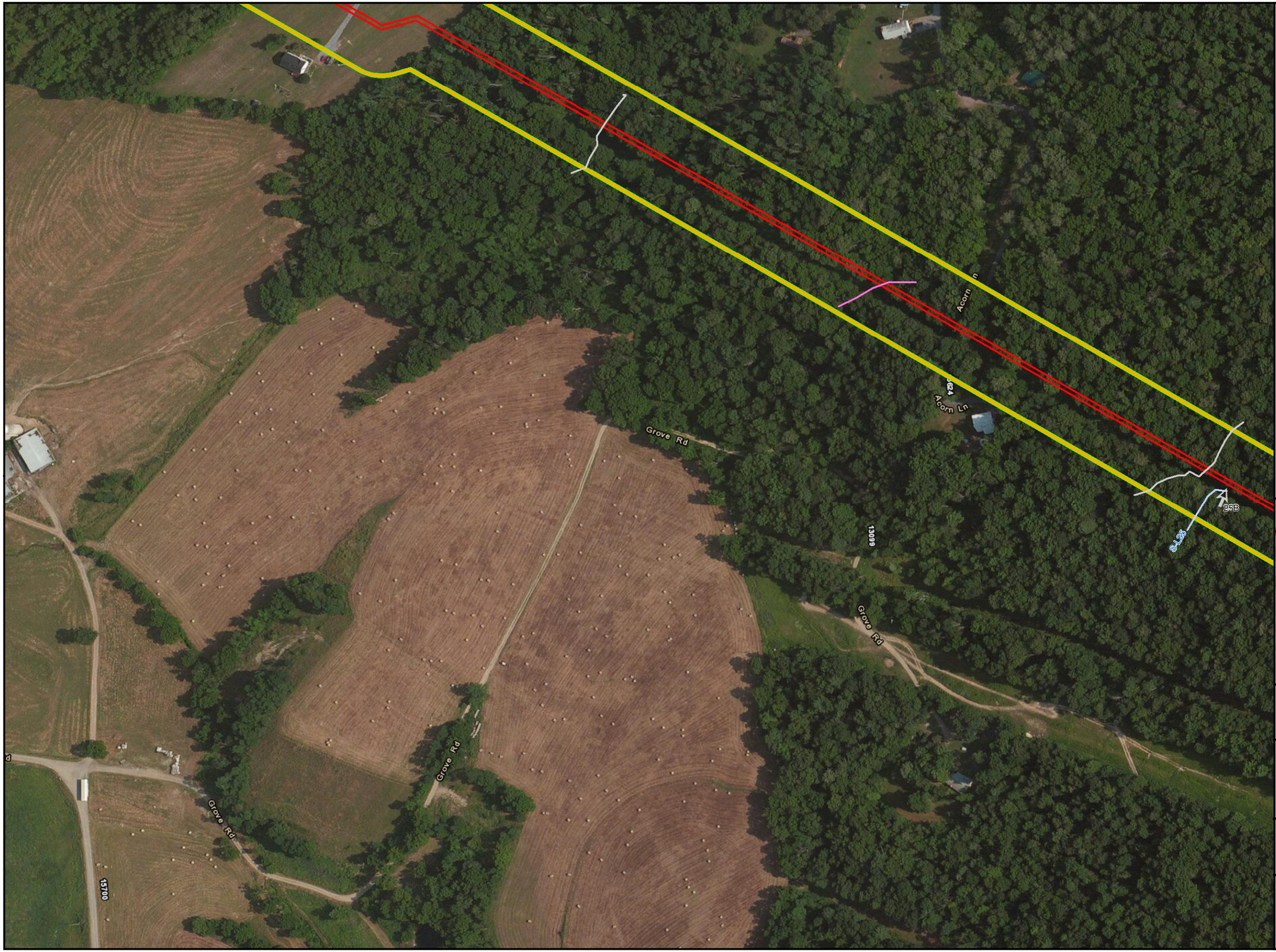


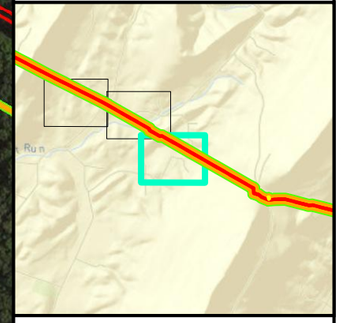

## Legend

- Photo Location

Stream

- VERIFIED
- Drainage Feature
- Previous Delineated Stream
- Alignment Centerline
- Alignment Centerline (2/25/16)
- Study Area
- Study Area (2/25/16)
- Block Valve/Station

**Sheet Identifier**



N

0 100 200 Feet

0 30.45 60.9 Meters

**ADDENDUM WETLANDS DETAIL MAP**
**FIGURE 4-16**
**PENNSYLVANIA PIPELINE PROJECT**
**NOVEMBER 12, 2016 ALIGNMENT**
**SUNOCO LOGISTICS, L.P.**
**HUNTINGDON COUNTY, PA**

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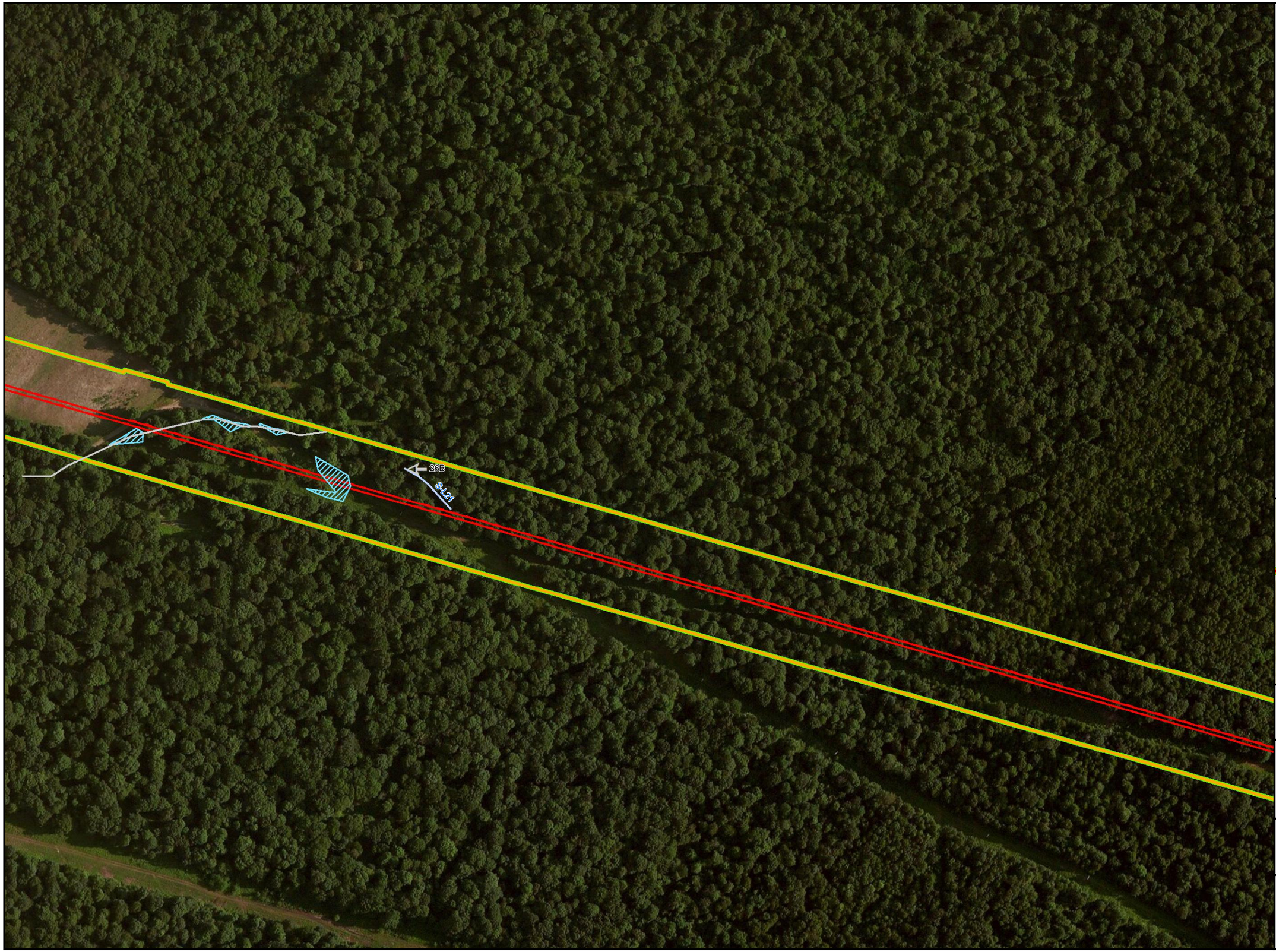


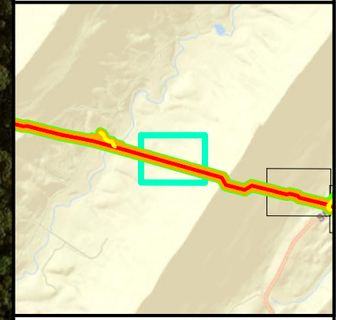

## Legend

- Photo Location

Stream
- VERIFIED
- Previous Delineated Stream

Previous Delineated Wetland
- PEM
- Alignment Centerline
- Alignment Centerline (2/25/16)
- Study Area
- Study Area (2/25/16)
- Block Valve/Station

**Sheet Identifier**



N

0 100 200 Feet

0 30.45 60.9 Meters

**ADDENDUM WETLANDS DETAIL MAP**
**FIGURE 4-17**
**PENNSYLVANIA PIPELINE PROJECT**
**NOVEMBER 12, 2016 ALIGNMENT**
**SUNOCO LOGISTICS, L.P.**
**HUNTINGDON COUNTY, PA**

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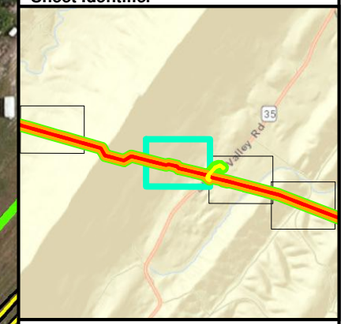
## Legend

- Photo Location
- Previous Delineated Stream
- Previous Delineated Pond
- Previous Delineated Wetland
- PEM
- Access Road
- Access Road (2/25/16)
- Alignment Centerline
- Alignment Centerline (2/25/16)
- Study Area
- Study Area (2/25/16)
- Block Valve/Station

**Sheet Identifier**




N

0 100 200 Feet

0 30.45 60.9 Meters

**ADDENDUM WETLANDS DETAIL MAP**
**FIGURE 4-18**
**PENNSYLVANIA PIPELINE PROJECT**
**NOVEMBER 12, 2016 ALIGNMENT**
**SUNOCO LOGISTICS, L.P.**
**HUNTINGDON COUNTY, PA**

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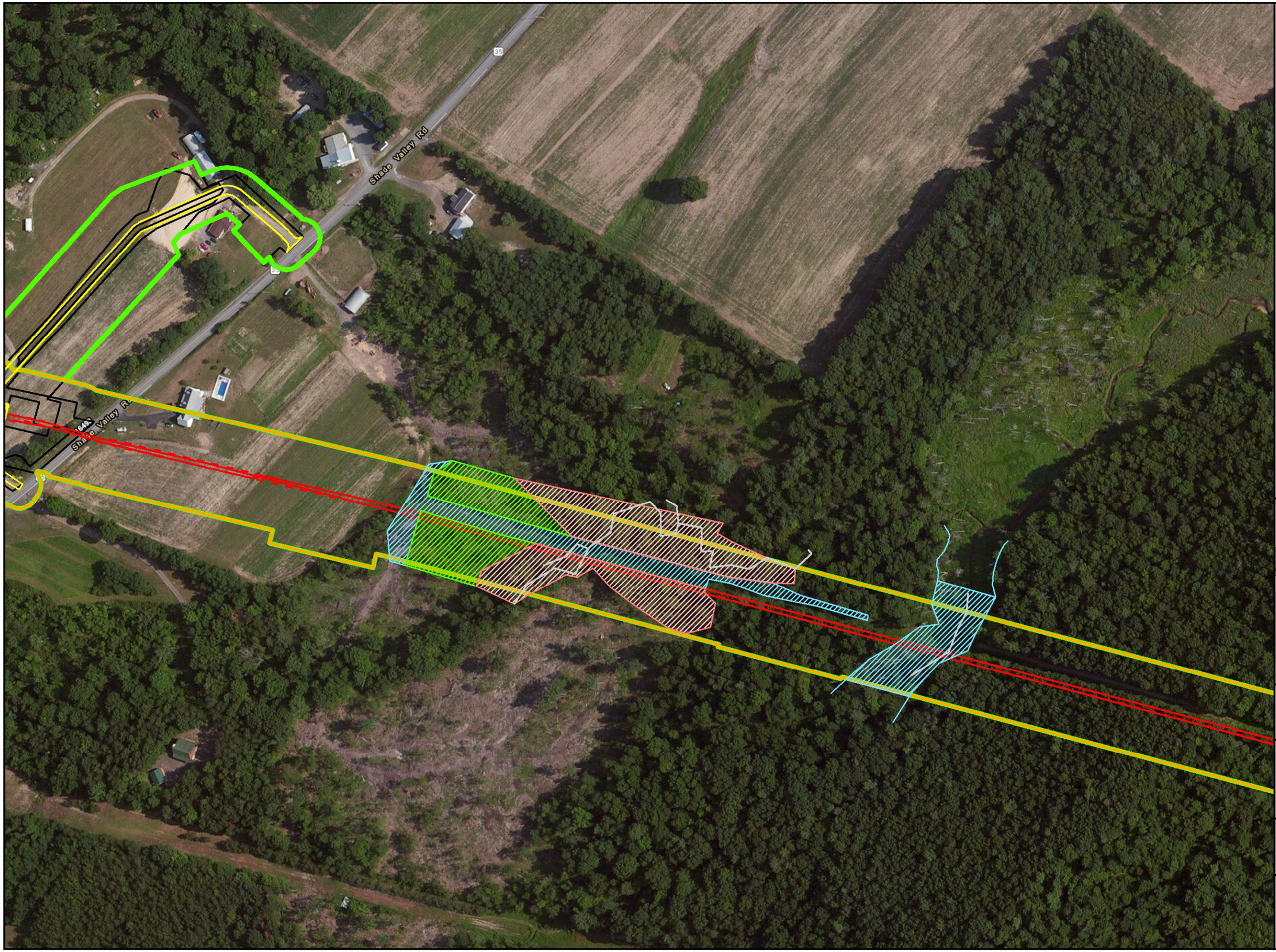


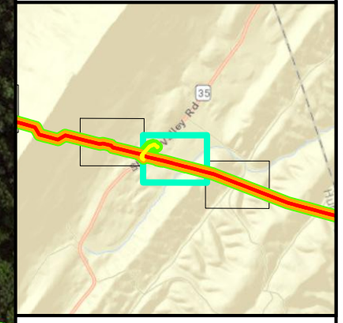

## Legend

- Photo Location
- Previous Delineated Stream

Previous Delineated Wetland

- PEM
- PFO
- PSS
- Access Road
- Access Road (2/25/16)
- Alignment Centerline
- Alignment Centerline (2/25/16)
- Study Area
- Study Area (2/25/16)
- Block Valve/Station

**Sheet Identifier**




N

Feet
0 100 200

Meters
0 30.45 60.9

**ADDENDUM WETLANDS DETAIL MAP**
**FIGURE 4-19**
**PENNSYLVANIA PIPELINE PROJECT**
**NOVEMBER 12, 2016 ALIGNMENT**
**SUNOCO LOGISTICS, L.P.**
**HUNTINGDON COUNTY, PA**

TETRA TECH

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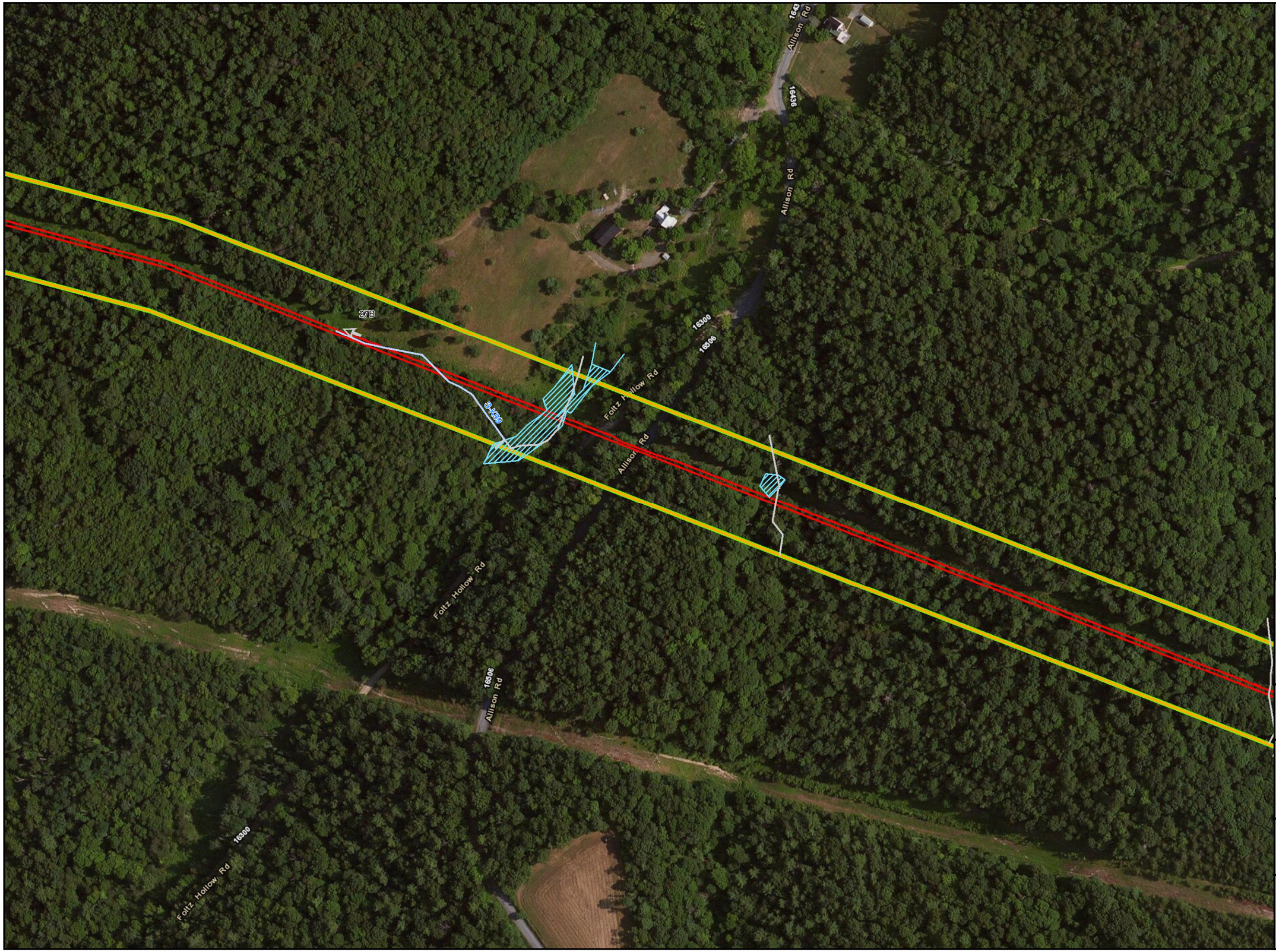


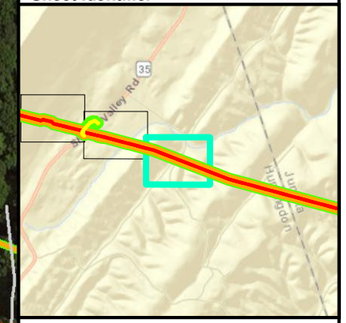

## Legend

- Photo Location

Stream
- VERIFIED
- Previous Delineated Stream

Previous Delineated Wetland
- PEM
- Alignment Centerline
- Alignment Centerline (2/25/16)
- Study Area
- Study Area (2/25/16)
- Block Valve/Station

**Sheet Identifier**




N

0 100 200 Feet

0 30.45 60.9 Meters

**ADDENDUM WETLANDS DETAIL MAP**
**FIGURE 4-20**
**PENNSYLVANIA PIPELINE PROJECT**
**NOVEMBER 12, 2016 ALIGNMENT**
**SUNOCO LOGISTICS, L.P.**
**HUNTINGDON COUNTY, PA**

TETRA TECH

Notes:
1) Aerial photograph provided by ESRI's ArcGIS Online World Imagery map service (© 2013 ESRI and its data suppliers).

PGH P:\GIS\SUNOCO\MARINER EAST 2\MXD\PPP WETLANDS SC-1\PENNPIPELINE_HUNTINGDONCO_ADDENDUMDETAIL_REV.MXD 11/22/16 JN

# APPENDIX A
# WETLAND DETERMINATION DATA FORMS

## WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: PPP City/County: Huntington Sampling Date: 04/26/2016

Applicant/Owner: Sunoco State: PA Sampling Point: W-JH1

Investigator(s): JMM, HBS Section, Township, Range: NA

Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): Concave Slope (%): 3-5

Subregion (LRR or MLRA): LRRN Lat: 40.363543 Long: -78.041151 Datum: NAD83

Soil Map Unit Name: Andover extremely stony loam, 0-8 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: PFO
HGM: Slope
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): 0.5 |
| Water Table Present? | Yes ✔ | No ____ | Depth (inches): 7 |
| Saturation Present? (includes capillary fringe) | Yes ✔ | No ____ | Depth (inches): 6 |

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

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

Remarks:
Vegetation within ROW recently hand cut and left lying in ROW.

**VEGETATION (Four Strata) – Use scientific names of plants.** Sampling Point: W-JH1

| Tree Stratum (Plot size: 30' ) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. Acer rubrum | 30 | ✔ | FAC |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| | 30 = Total Cover | | |
| 50% of total cover: 15 | 20% of total cover: 6 | | |
| **Sapling/Shrub Stratum** (Plot size: 15' ) | | | |
| 1. Betula lenta | 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. Sphagnum palustre | 60 | ✔ | OBL |
| 2. Osmundastrum cinnamomeum | 20 | ✔ | FACW |
| 3. Rubus hispidus | 2 | | FACW |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| 11. | | | |
| | 82 = Total Cover | | |
| 50% of total cover: 41 | 20% of total cover: 16.4 | | |
| **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: 3 (A)

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 75 (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.)

Betula lenta and Acer rubrum saplings and trees rooted on hummock inclusions within wetland. Vegetation in ROW cut. Tree stratum canopy cover estimated by comparing canopy cover of uncut red maples with similar basal diameter as cut stump diameter.

**SOIL** Sampling Point: W-JH1

**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 |
|---|---|---|---|---|---|---|---|---|
| -2-0 | 7.5YR 2.5/2 | 100 | | | | | MKPT | Oe |
| 0-1 | 10YR 3/1 | 100 | | | | | SL | Mucky mod sand |
| 1-2 | N 3/0 | 100 | | | | | SL | |
| 2-3.25 | 10YR 5/1 | 100 | | | | | SL | |
| 3.25-4.5 | 10YR 6/2 | 98 | 10YR 4/4 | 2 | C | PL | LS | |
| 4.5-15+ | 2.5Y 6/2 | 88 | 10YR 4/4 | 12 | C | M | LS | Refusal |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

[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: Rocks

Depth (inches): 15

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

Remarks:

## WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: PPP City/County: Huntingdon Sampling Date: 04/26/2016

Applicant/Owner: Sunoco State: PA Sampling Point: W-JH1-UP

Investigator(s): JMM, HBS Section, Township, Range: Union

Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): Concave Slope (%): 3-5

Subregion (LRR or MLRA): LRRN Lat: 40.363549 Long: -78.041185 Datum: NAD83

Soil Map Unit Name: AoB - Andover extremely stony loam, 0 - 8 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:
HGM:
WT:
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): 8 |
| Saturation Present? (includes capillary fringe) | Yes ✔ | No ____ | Depth (inches): 3 |

**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-JH1-UP

| Tree Stratum (Plot size: 30' ) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. Betula lenta | 60 | ✔ | FACU |
| 2. Acer rubrum | 15 | | FAC |
| 3. Liriodendron tulipifera | 15 | | FACU |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| | 90 = Total Cover | | |
| 50% of total cover: 45 | 20% of total cover: 18 | | |
| **Sapling/Shrub Stratum** (Plot size: 15' ) | | | |
| 1. Betula lenta | 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. Osmundastrum cinnamomeum | 10 | ✔ | FACW |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| 11. | | | |
| | 10 = Total Cover | | |
| 50% of total cover: 5 | 20% of total cover: 2 | | |
| **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: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 33 (A/B)

**Prevalence Index worksheet:**

| Total % Cover of: | | Multiply by: | |
|---|---|---|---|
| OBL species | 0 | x 1 = | 0 |
| FACW species | 10 | x 2 = | 20 |
| FAC species | 15 | x 3 = | 45 |
| FACU species | 95 | x 4 = | 380 |
| UPL species | 0 | x 5 = | 0 |
| Column Totals: | 120 (A) | | 445 (B) |

Prevalence Index = B/A = 3.7

**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.)

Sphagnum palustre located in herb stratum. Not a vascular plant therefore not included in dominance or prevalence tests. Prevalence test conducted because wetland hydrology indicators are present and the soil profile is extremely close to meeting the S5 hydric soil indicator.

**SOIL**

Sampling Point: W-JH1-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 |
|---|---|---|---|---|---|---|---|---|
| -2 - 0 | 5YR 2.5/2 | 100 | | | | | MkPt | Oe |
| 0 - 2 | 10YR 3/1 | 100 | | | | | SL | Readily visible |
| 2 - 5 | 10YR 4/1 | 100 | | | | | LS | unmasked sand grains |
| 5 - 6.5 | 10YR 5/1 | 99 | 10YR 4/4 | 1 | C | M | LS | |
| 6.5 - 12 | 10YR 5/2 | 92 | 10YR 5/6 | 8 | C | M | LS | Refusal due to rocks |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

[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:

Soil profile does not technically meet the criteria for any hydric soil indicators; however, it is extremely close to meeting the S5 Sandy Redox indicator. The depleted matrix with greater than or equal to 2% redox starts deeper than 6" and the layer 5 - 6.5" does not have enough redox to qualify (1%). Since hydrophytic vegetation is not present, the soil is presumed to be non-hydric.

## WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: PPP City/County: Huntington Sampling Date: 04/27/2016

Applicant/Owner: Sunoco State: PA Sampling Point: W-JH2

Investigator(s): JMM, HBS Section, Township, Range:

Landform (hillslope, terrace, etc.): toeslope Local relief (concave, convex, none): Concave Slope (%): 0-3

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

Soil Map Unit Name: 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: Riverine
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): 0.5 |
| Water Table Present? | Yes ✔ | No ____ | Depth (inches): 7 |
| 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:
Abuts S-L45A that flows into pond downslope.

**VEGETATION (Four Strata) – Use scientific names of plants.** Sampling Point: W-JH2

| 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. Spirea alba | 4 | | FACW |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| | 4 = Total Cover | | |
| 50% of total cover: 2 | 20% of total cover: 0.8 | | |
| **Herb Stratum** (Plot size: 5' ) | | | |
| 1. Poa trivialis | 40 | ✔ | FACW |
| 2. Impatiens capensis | 10 | | FACW |
| 3. Solidago rugosa | 5 | | FACW |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| 11. | | | |
| | 55 = Total Cover | | |
| 50% of total cover: 27.5 | 20% of total cover: 11 | | |
| **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: 1 (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-JH2

**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 |
|---|---|---|---|---|---|---|---|---|
| 0-2.5 | 5YR 4/2 | | 5YR 4/4 | 5 | C | PL | SiL | |
| 2.5-7 | 5YR 4/2 | | 5YR 4/4 | 15 | C | PL | CL | |
| | | | 5YR 4/1 | 3 | D | M | | |
| 7-14 | 5YR 4/2 | | 5YR 4/3 | 20 | C | M | SiL | |
| | | | 5YR 4/4 | 2 | C | 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: _____

Depth (inches): _____

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

Remarks:

## WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: PPP City/County: Huntington Sampling Date: 04/27/2016

Applicant/Owner: Sunoco State: PA Sampling Point: W-JH2-UP

Investigator(s): JMM, HBS Section, Township, Range:

Landform (hillslope, terrace, etc.): toeslope Local relief (concave, convex, none): Concave Slope (%): 3-5

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

Soil Map Unit Name: 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:
HGM:
WT:
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-JH2-UP

| Tree Stratum (Plot size: 30' ) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. Acer rubrum | 30 | ✔ | FAC |
| 2. Prunus serotina | 5 | | FACU |
| 3. Pinus sylvatica | 20 | ✔ | FACU |
| 4. Quercus rubra | 5 | | FACU |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| | 60 = Total Cover | | |
| 50% of total cover: 30 | 20% of total cover: 12 | | |
| **Sapling/Shrub Stratum** (Plot size: 15' ) | | | |
| 1. Cornus florida | 10 | ✔ | FACU |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| | 10 = Total Cover | | |
| 50% of total cover: 5 | 20% of total cover: 2 | | |
| **Herb Stratum** (Plot size: 5' ) | | | |
| 1. Podophyllum peltatum | 10 | ✔ | FACU |
| 2. Dendrolycopodium dendroidium | 5 | | FACU |
| 3. Solidago rugosa | 3 | | FACW |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| 11. | | | |
| | 18 = Total Cover | | |
| 50% of total cover: 9 | 20% of total cover: 3.6 | | |
| **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-JH2-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 |
|---|---|---|---|---|---|---|---|---|
| -0.5-0 | 5YR 2.5/2 | 100 | | | | | Mkpt | |
| 0-2 | 5YR 3/2 | 100 | | | | | L | |
| 2-15+ | 5YR 4/3 | 100 | | | | | L | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

[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:

## WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: PPP City/County: Huntingdon County Sampling Date: 06/24/2014

Applicant/Owner: Sunoco State: PA Sampling Point: W-L24/25 PEM1

Investigator(s): A. Grech, A. Stott Section, Township, Range:

Landform (hillslope, terrace, etc.): Valley bottom Local relief (concave, convex, none): concave Slope (%): 0-4%

Subregion (LRR or MLRA): LRRS Lat: 40.358046 Long: -78.006565 Datum: NAD 83

Soil Map Unit Name: Andover extremely stony loam, 0-8 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: Riverine
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): 4" |
| 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-L24/25 PEM1

| 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. Impatiens capensis | 40 | ✔ | FACW |
| 2. Osmundastrum cinnamomeum | 40 | ✔ | FACW |
| 3. Galium aparine | 10 | | FACU |
| 4. Onoclea sensibilis | 5 | | FACW |
| 5. Poa species | 5 | | ND |
| 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: 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.)

ND- species not determined

**SOIL** Sampling Point: W-L24/25 PEM1

**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" | 2.5Y 4/1 | 85 | 10YR 3/3 | 15 | C | M | SiL | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

[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: ND

Depth (inches): ___

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

Remarks:

## WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: PPP City/County: Huntingdon County Sampling Date: 06/24/2014

Applicant/Owner: Sunoco State: PA Sampling Point: W-L24/25 PEM2

Investigator(s): A. Grech, A. Stott Section, Township, Range:

Landform (hillslope, terrace, etc.): Valley bottom Local relief (concave, convex, none): concave Slope (%): 0-4%

Subregion (LRR or MLRA): LRRS Lat: 40.357519 Long: -78.007187 Datum: NAD 83

Soil Map Unit Name: Andover extremely stony loam, 0-8 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: Riverine
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): 4" |
| 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-L24/25 PEM2

| 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. Impatiens capensis | 40 | ✔ | FACW |
| 2. Osmundastrum cinnamomeum | 40 | ✔ | FACW |
| 3. Galium aparine | 10 | | FACU |
| 4. Onoclea sensibilis | 5 | | FACW |
| 5. Poa species | 5 | | ND |
| 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: 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.)

ND- species not determined

**SOIL** Sampling Point: W-L24/25 PEM2

**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 |
|---|---|---|---|---|---|---|---|---|
| 0-5" | 7.5YR 3/1 | 100 | | | | | SL | |
| 5-10" | 7.5YR 4/1 | 95 | 5YR 4/6 | 5 | C | M | S | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

[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: ND

Depth (inches): ___

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

Remarks:

## WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: PPP City/County: Huntingdon County Sampling Date: 06/24/2014

Applicant/Owner: Sunoco State: PA Sampling Point: W-L24,25 UP

Investigator(s): A. Grech, K. Keat Section, Township, Range:

Landform (hillslope, terrace, etc.): sideslope Local relief (concave, convex, none): Convex Slope (%): 5-10%

Subregion (LRR or MLRA): LRRS Lat: 40.357628 Long: -78.007025 Datum: NAD 83

Soil Map Unit Name: Andover extremely stony loam, 0-8 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:

**VEGETATION (Four Strata) – Use scientific names of plants.** Sampling Point: W-L24,25 UP

| Tree Stratum (Plot size: 30' ) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. Fagus grandifolia | 20 | ✔ | FACU |
| 2. Quercus rubra | 10 | ✔ | FACU |
| 3. Carya ovata | 10 | ✔ | FACU |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| | 40 = Total Cover | | |
| 50% of total cover: 20 | 20% of total cover: 8 | | |
| **Sapling/Shrub Stratum** (Plot size: 15' ) | | | |
| 1. Hamamelis virginiana | 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. Podophyllum peltatum | 10 | ✔ | FACU |
| 2. Parthenocissus quinquefolia | 10 | ✔ | FACU |
| 3. Quercus alba | 5 | ✔ | FACU |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| 11. | | | |
| | 25 = Total Cover | | |
| 50% of total cover: 12.5 | 20% of total cover: 5 | | |
| **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: 7 (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-L24,25 UP

**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 |
|---|---|---|---|---|---|---|---|---|
| 0-12" | 5YR 3/3 | 100 | | | | | SiL | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

[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:

# APPENDIX B
# WETLAND PHOTOGRAPHS

**Photograph Number:** 1B **Feature Name:** W-JH1 **Date:** 4/26/2016
**Direction:** SSE **Plant Community:** PFO **Remarks:** N/A

**Photograph Number:** 2B **Feature Name:** W-JH2 **Date:** 4/26/2016
**Direction:** WSW **Plant Community:** PEM **Remarks:** N/A


**Photograph Number:** 3B **Feature Name:** W-L24/L25 **Date:** 4/27/2016
**Direction:** ENE **Plant Community:** PEM 1 **Remarks:** N/A

**Photograph Number:** 4B **Feature Name:** W-L24/L25 **Date:** 4/27/2016
**Direction:** WSW **Plant Community:** PEM 2 **Remarks:** N/A

# APPENDIX C
# STREAM DATA SHEETS

| | |
|---|---|
| **STREAM ID** S-JH2-EPH | **STREAM NAME** |
| **LAT** 40.381235 **LONG** -78.07926 | **DATE** 04/26/2016 |
| **CLIENT** Sunoco Logistics, L.P. | **PROJECT NAME** PPP |
| **INVESTIGATORS** JMM, HBS | |
| **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 1.5 ft RB 1.0 ft
Water Depth: 0.00 in
Water Width: 0.0 ft
Ordinary High Water Mark (Width): 26.0 in
Ordinary High Water Mark (Height): 4.0 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 %
Pool %

**Turbidity**
☐ Clear ☐ Slightly turbid ☐ Turbid
☐ Opaque ☐ Stained
☐ 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") | 15 |
| Gravel | 2-64 mm (0.1"-2.5") | 10 |
| Sand | 0.06-2mm (gritty) | 30 |
| Silt | 0.004-0.06 mm | 45 |
| 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: ROW

**Canopy Cover**
☐ Open ☐ Partly shaded
☑ Shaded

**Indicate the dominant type**
☑ Trees ☐ Shrubs
☐ Grasses ☐ Herbaceous

**Floodplain Width**
☐ Wide > 30ft ☐ Moderate 15-30ft
☑ Narrow <16ft

**Wetland Present** ☑ Yes ☐ No
**Wetland ID** W-Y12

**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 in 6" wide plastic culvert.

| | |
|---|---|
| **STREAM ID** S-JH2-INT | **STREAM NAME** |
| **LAT** 40.381235 **LONG** -78.07926 | **DATE** 04/26/2016 |
| **CLIENT** Sunoco Logistics, L.P. | **PROJECT NAME** PPP |
| **INVESTIGATORS** JMM, HBS | |
| **WATER TYPE** TNW ☐ RPW ☑ NRPW ☐ | **FLOW REGIME** Perennial ☐ Intermittent ☑ Ephemeral ☐ |

**CHANNEL FEATURES**

**Estimate Measurements**
Top of Bank Width: 8.0 ft
Top of Bank Height:
LB 5.0 ft RB 5.0 ft
Water Depth: 0.50 in
Water Width: 1.5 ft
Ordinary High Water Mark (Width): 2.0 ft
Ordinary High Water Mark (Height): 3.0 ft
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 60 % Run 40 %
Pool %

**Turbidity**
✔ Clear ___ Slightly turbid ___ Turbid
___ Opaque ___ Stained
___ 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") | 20 |
| Gravel | 2-64 mm (0.1"-2.5") | 30 |
| 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) | 30 |
| Muck-Mud | black, very fine organic (FPOM) | |
| Marl | grey, shell fragments | |

**WATERSHED FEATURES**

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

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

**Indicate the dominant type**
___ Trees ✔ Shrubs
___ Grasses ✔ Herbaceous

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

**Wetland Present** ✔ Yes ___ No
**Wetland ID** W-Y12

**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-JH4 | **STREAM NAME** UNT to Little Trough Creek |
| **LAT** 40.334672 **LONG** -77.831048 | **DATE** 04/27/2016 |
| **CLIENT** Sunoco Logistics, L.P. | **PROJECT NAME** PPP |
| **INVESTIGATORS** JMM, HBS | |
| **WATER TYPE** TNW ☐ RPW ☑ NRPW ☐ | **FLOW REGIME** Perennial ☐ Intermittent ☑ Ephemeral ☐ |

**CHANNEL FEATURES**

**Estimate Measurements**
Top of Bank Width: 2.0 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): 1.5 in
Ordinary High Water Mark (Height): 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 80 %
Pool %

**Turbidity**
✔ Clear ___ Slightly turbid ___ Turbid
___ Opaque ___ Stained
___ 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) | |
| Silt | 0.004-0.06 mm | 100 |
| 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
___ Other:

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

**Indicate the dominant type**
___ Trees ___ Shrubs
✔ Grasses ___ Herbaceous

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

**Wetland Present** ✔ Yes ___ No
**Wetland ID** W-

**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:** 5B **Feature Name:** S-JH2 **Date:** 04/26/2016
**Direction:** W, Downstream **Flow Regime:** Ephemeral **Remarks:** N/A

**Photograph Number:** 6B **Feature Name:** S-JH2 **Date:** 04/26/2016
**Direction:** NW, Upstream **Flow Regime:** Intermittent **Remarks:** N/A

| | | | | | |
|---|---|---|---|---|---|
| **Photograph Number:** | 7B | **Feature Name:** | S-JH4 | **Date:** | 04/17/2016 |
| **Direction:** | NE, Upstream | **Flow Regime:** | Intermittent | **Remarks:** | N/A |

# APPENDIX E
# MODIFIED WETLAND PHOTOGRAPHS

| | | | | | |
|---|---|---|---|---|---|
| **Photograph Number:** | 29B | **Feature Name:** | W-BB135 | **Date:** | 04/15/2015 |
| **Direction:** | SW | **Plant Community:** | PEM | **Remarks:** | N/A |

# APPENDIX F
# MODIFIED STREAM PHOTOGRAPHS

**Photograph Number:** 8B **Feature Name:** S-Y18 **Date:** 04/26/2016
**Direction:** SSW, Upstream **Flow Regime:** Ephemeral **Remarks:** N/A

**Photograph Number:** 9B **Feature Name:** S-Y20 **Date:** 04/26/2016
**Direction:** WNW, Downstream **Flow Regime:** Ephemeral **Remarks:** N/A

**Photograph Number:** 10B **Feature Name:** S-BB108 **Date:** 04/15/2015
**Direction:** SE, Downstream **Flow Regime:** Perennial **Remarks:** N/A

**Photograph Number:** 12B **Feature Name:** S-L42 **Date:** 10/14/2016
**Direction:** WSW, Across **Flow Regime:** Intermittent **Remarks:** N/A

**Photograph Number:** 13B **Feature Name:** S-M9 **Date:** 06/19/2014
**Direction:** ESE, Downstream **Flow Regime:** Intermittent **Remarks:** N/A

**Photograph Number:** 14B **Feature Name:** S-L26 **Date:** 06/19/2014
**Direction:** NNE. Upstream **Flow Regime:** Ephemeral **Remarks:** N/A

**Photograph number:** 16B **Feature Name:** S-BB104 **Date:** 4/15/2015
**Location:** looking South **Flow Regime:** Intermittent

# APPENDIX G
# VERIFIED FEATURE PHOTOGRAPHS

**Photograph number:** 15B **Feature Name:** S-Y21 **Date:** 10/03/2016
**Location:** looking upslope from head of stream **Flow Regime:** Ephemeral

**Photograph number:** 17B **Feature Name:** S-KP3 **Date:** 03/10/2016
**Location:** looking upslope from head of stream **Flow Regime:** Perennial

**Photograph number:** 18B **Feature Name:** S-M28 **Date:** 06/24/2014
**Location:** looking West upslope **Flow Regime:** Ephemeral

**Photograph number:** 19B **Feature Name:** S-L37 **Date:** 10/03/2016
**Location:** looking upslope from head of stream **Flow Regime:** Ephemeral

**Photograph number:** 20B **Feature Name:** S-L36 **Date:** 10/03/2016
**Location:** looking at the start of stream **Flow Regime:** Ephemeral

**Photograph number: 2**1B **Feature Name:** S-L34 **Date:** 10/03/2016
**Location:** looking at end of wetland start of stream **Flow Regime:** Intermittent

**Photograph number:** 22B **Feature Name:** S-M13 **Date:** 10/03/2016
**Location:** looking upslope from head of stream **Flow Regime:** Ephemeral

**Photograph number:** 23B **Feature Name:** S-CC10 **Date:** 10/03/2016
**Location:** looking upslope from head of stream **Flow Regime:** Ephemeral

**Photograph number:** 25B **Feature Name:** S-L25 **Date:** 10/03/2016
**Location:** looking upslope from head of stream **Flow Regime:** Intermittent

**Photograph number: 2**6B **Feature Name:** S-L21 **Date:** 10/03/2016
**Location:** looking down slope from end of stream **Flow Regime:** Intermittent

**Photograph number:** 27B **Feature Name:** S-K89 **Date:** 10/03/2016
**Location:** looking upslope from head of stream **Flow Regime:** Ephemeral

**Photograph number:** 28B **Feature Name:** Drainage feature **Date:** 10/03/2016
**Location:** looking upslope from culvert **Flow Regime:** Drainage feature

# APPENDIX H
# REQUESTED SUPPLEMENTAL DATA FORMS

# Tetra Tech Stream Data Sheet

Surveyors: D. Bonomo, K.Keat Date: 09/03/2014 Resource ID Number: S-Y1
Project: PPP State: PA County: Huntingdon
Photo Number (s): _____ Canopy Cover: 80 % Location: 40.396757, -78.132607

**Flow Direction:** S **Bank Width:** 20 Feet **Water Width:** 17 Feet
**High Water Depth:** 30 Inches **Water Depth:** 18.00 Inches **Turbidity:** Low
**Flow Stage:** Low
**Flow Regime:** [✔] Perennial [ ] Intermittent [ ] Ephemeral [ ] Flowing Ditch [ ] Dry/Stagnant Ditch

**Sinuosity:**
[ ] Low
[✔] Medium
[ ] High

**Features:**
[ ] Riffles [ ] Sand/Mud Bar [ ] Run/Glide
[✔] Pools [ ] Gravel Bar [ ] Braided
[ ] Rapids [ ] Aquatic Vegetation [ ] Other _____

**Substrate:**
[ ] Bedrock ___%
[ ] Boulder ___%
[✔] Cobble/Gravel 80 %
[ ] Sand ___%
[✔] Silt/Clay 20 %
[ ] Organic ___%

**Bank Substrate:**
*Height*: Left 2.5' Right 2.5'

| | Left | Right |
|---|---|---|
| Bedrock | [ ] | [ ] |
| Boulder | [ ] | [ ] |
| Gravel | [ ] | [ ] |
| Sand | [ ] | [ ] |
| Silt/Clay | [✔] | [✔] |
| Organic | [ ] | [ ] |

**Floodplain Width:**

| | Left | Right |
|---|---|---|
| <10 feet | [ ] | [ ] |
| <25 feet | [ ] | [ ] |
| <50 feet | [✔] | [✔] |
| <100 feet | [ ] | [ ] |
| >100 feet | [ ] | [ ] |

**Dominant Vegetation:**
[✔] Forested
Species: Salix nigra, Carya ovata, Ulmus rubra, Carpinis virginiana
[✔] Shrub
Species: Alnus serrulata
[ ] Herbaceous
Species: _____

**Wildlife Observed/Notes:**

**Sketch:**
See Attached Figure.

# Tetra Tech Stream Data Sheet

Surveyors: D. Bonomo, K.Keat Date: 09/15/2014 Resource ID Number: S-Y24
Project: PPP State: PA County: Huntingdon
Photo Number (s): _____ Canopy Cover: 60 % Location: 40.39717, -78.149742

**Flow Direction:** S **Bank Width:** 8 Feet **Water Width:** 0 Feet
**High Water Depth:** 2 Feet **Water Depth:** 0.00 Inches **Turbidity:** Low
**Flow Stage:** Low

**Flow Regime:** [ ] Perennial [ ] Intermittent [✔] Ephemeral [ ] Flowing Ditch [ ] Dry/Stagnant Ditch

**Sinuosity:**
[✔] Low
[ ] Medium
[ ] High

**Features:**
[ ] Riffles [ ] Sand/Mud Bar [✔] Run/Glide
[ ] Pools [ ] Gravel Bar [ ] Braided
[ ] Rapids [ ] Aquatic Vegetation [ ] Other _____

**Substrate:**
[ ] Bedrock ___%
[ ] Boulder ___%
[✔] Cobble/Gravel 30 %
[ ] Sand ___%
[✔] Silt/Clay 70 %
[ ] Organic ___%

**Bank Substrate:**
*Height*: Left 2' Right 2'

| | Left | Right |
|---|---|---|
| Bedrock | [ ] | [ ] |
| Boulder | [ ] | [ ] |
| Gravel | [ ] | [ ] |
| Sand | [ ] | [ ] |
| Silt/Clay | [✔] | [✔] |
| Organic | [ ] | [ ] |

**Floodplain Width:**

| | Left | Right |
|---|---|---|
| <10 feet | [ ] | [ ] |
| <25 feet | [✔] | [✔] |
| <50 feet | [ ] | [ ] |
| <100 feet | [ ] | [ ] |
| >100 feet | [ ] | [ ] |

**Dominant Vegetation:**
[✔] Forested
Species: Juglans nigra
[ ] Shrub
Species: _____
[ ] Herbaceous
Species: _____

**Wildlife Observed/Notes:**

**Sketch:**
See Attached Figure.

| | |
|---|---|
| **STREAM ID** S-JH2-EPH | **STREAM NAME** |
| **LAT** 40.381235 **LONG** -78.07926 | **DATE** 04/26/2016 |
| **CLIENT** Sunoco Logistics, L.P. | **PROJECT NAME** PPP |
| **INVESTIGATORS** JMM, HBS | |
| **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 1.5 ft RB 1.0 ft
Water Depth: 0.00 in
Water Width: 0.0 ft
Ordinary High Water Mark (Width): 26.0 in
Ordinary High Water Mark (Height): 4.0 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 %
Pool %

**Turbidity**
☐ Clear ☐ Slightly turbid ☐ Turbid
☐ Opaque ☐ Stained
☐ 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") | 15 |
| Gravel | 2-64 mm (0.1"-2.5") | 10 |
| Sand | 0.06-2mm (gritty) | 30 |
| Silt | 0.004-0.06 mm | 45 |
| 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: ROW

**Canopy Cover**
☐ Open ☐ Partly shaded
☑ Shaded

**Indicate the dominant type**
☑ Trees ☐ Shrubs
☐ Grasses ☐ Herbaceous

**Floodplain Width**
☐ Wide > 30ft ☐ Moderate 15-30ft
☑ Narrow <16ft

**Wetland Present** ☑ Yes ☐ No
**Wetland ID** W-Y12

**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 in 6" wide plastic culvert.

| | |
|---|---|
| **STREAM ID** S-JH2-INT | **STREAM NAME** |
| **LAT** 40.381235 **LONG** -78.07926 | **DATE** 04/26/2016 |
| **CLIENT** Sunoco Logistics, L.P. | **PROJECT NAME** PPP |
| **INVESTIGATORS** JMM, HBS | |
| **WATER TYPE** TNW ☐ RPW ☑ NRPW ☐ | **FLOW REGIME** Perennial ☐ Intermittent ☑ Ephemeral ☐ |

**CHANNEL FEATURES**

**Estimate Measurements**
Top of Bank Width: 8.0 ft
Top of Bank Height:
LB 5.0 ft RB 5.0 ft
Water Depth: 0.50 in
Water Width: 1.5 ft
Ordinary High Water Mark (Width): 2.0 ft
Ordinary High Water Mark (Height): 3.0 ft
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 60 % Run 40 %
Pool %

**Turbidity**
✔ Clear ___ Slightly turbid ___ Turbid
___ Opaque ___ Stained
___ 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") | 20 |
| Gravel | 2-64 mm (0.1"-2.5") | 30 |
| 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) | 30 |
| Muck-Mud | black, very fine organic (FPOM) | |
| Marl | grey, shell fragments | |

**WATERSHED FEATURES**

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

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

**Indicate the dominant type**
___ Trees ✔ Shrubs
___ Grasses ✔ Herbaceous

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

**Wetland Present** ✔ Yes ___ No
**Wetland ID** W-Y12

**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-JH4 | **STREAM NAME** UNT to Little Trough Creek |
| **LAT** 40.334672 **LONG** -77.831048 | **DATE** 04/27/2016 |
| **CLIENT** Sunoco Logistics, L.P. | **PROJECT NAME** PPP |
| **INVESTIGATORS** JMM, HBS | |
| **WATER TYPE** TNW ☐ RPW ☐ NRPW ☑ | **FLOW REGIME** Perennial ☐ Intermittent ☐ Ephemeral ☑ |

**CHANNEL FEATURES**

**Estimate Measurements**
Top of Bank Width: 2.0 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): 1.5 in
Ordinary High Water Mark (Height): 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 80 %
Pool %

**Turbidity**
☐ Clear ☐ Slightly turbid ☐ Turbid
☐ Opaque ☐ Stained
☐ 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) | |
| Silt | 0.004-0.06 mm | 100 |
| 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
☑ Other:

**Canopy Cover**
☐ Open ☐ Partly shaded
☑ Shaded

**Indicate the dominant type**
☑ Trees ☐ Shrubs
☐ Grasses ☐ Herbaceous

**Floodplain Width**
☐ Wide > 30ft ☐ Moderate 15-30ft
☑ Narrow <16ft

**Wetland Present** ☑ Yes ☐ No
**Wetland ID** W-

**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**

# Tetra Tech Stream Data Sheet

Surveyors: J. Mcguirk, D. Quinn  Date: 06/17/2014  Resource ID Number: S-K92
Project: PPP  State: PA  County: Huntingdon
Photo Number (s): _____  Canopy Cover: 90 %  Location: 40.313354, -77.747815

**Flow Direction:** S?  **Bank Width:** 4 Feet  **Water Width:** 3 Feet
**High Water Depth:** ? Feet  **Water Depth:** 2.00 Inches  **Turbidity:** Low
**Flow Stage:** Low

**Flow Regime:** [ ] Perennial [✔] Intermittent [ ] Ephemeral [ ] Flowing Ditch [ ] Dry/Stagnant Ditch

**Sinuosity:**
- [✔] Low
- [ ] Medium
- [ ] High

**Features:**
- [ ] Riffles
- [✔] Pools
- [ ] Rapids
- [ ] Sand/Mud Bar
- [ ] Gravel Bar
- [ ] Aquatic Vegetation
- [ ] Run/Glide
- [ ] Braided
- [ ] Other _____

**Substrate:**
- [ ] Bedrock ___%
- [ ] Boulder ___%
- [ ] Cobble/Gravel ___%
- [ ] Sand ___%
- [✔] Silt/Clay 80 %
- [✔] Organic 20 %

**Bank Substrate:**
*Height*: Left 1' Right 1'

| | Left | Right |
|---|---|---|
| Bedrock | [ ] | [ ] |
| Boulder | [ ] | [ ] |
| Gravel | [ ] | [ ] |
| Sand | [ ] | [ ] |
| Silt/Clay | [✔] | [✔] |
| Organic | [✔] | [✔] |

**Floodplain Width:**

| | Left | Right |
|---|---|---|
| <10 feet | [ ] | [ ] |
| <25 feet | [ ] | [ ] |
| <50 feet | [ ] | [ ] |
| <100 feet | [ ] | [ ] |
| >100 feet | [ ] | [ ] |

**Dominant Vegetation:**
- [✔] Forested
  Species: Fagus grandifolia, Carya laciniosa, Carpinus caroliniana
- [✔] Shrub
  Species: Ulmus rubra, Carpinus caroliniana, Fagus grandifolia
- [✔] Herbaceous
  Species: Symplocarpus foetidus

**Wildlife Observed/Notes:**

**Sketch:**
See Attached Figure.

| | |
|---|---|
| **STREAM ID** S-KP3 | **STREAM NAME** UNT to Little Trough Creek |
| **LAT** 40.362384° **LONG** -78.037038° | **DATE** 03/10/2016 |
| **CLIENT** Sunoco Logistics, L.P. | **PROJECT NAME** PPP |
| **INVESTIGATORS** J. McGuirk, K. Pulver | |
| **WATER TYPE** TNW ☐ RPW ☑ NRPW ☐ | **FLOW REGIME** Perennial ☐ Intermittent ☑ Ephemeral ☐ |

**CHANNEL FEATURES**

**Estimate Measurements**
Top of Bank Width: 6.0 ft
Top of Bank Height:
LB 1.0 ft RB 1.0 ft
Water Depth: 3.00 in
Water Width: 3.0 ft
Ordinary High Water Mark (Width): 4.0 in
Ordinary High Water Mark (Height): 6.0 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 60 % Run % Pool 40 %

**Turbidity**
☑ Clear ☐ Slightly turbid ☐ Turbid
☐ Opaque ☐ Stained
☐ Other_____

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

| Substrate Type | Diameter | % Composition in Sampling Reach |
|---|---|---|
| Bedrock | | |
| Boulder | > 256 mm (10") | 15 |
| Cobble | 64-256 mm (2.5"-10") | 10 |
| Gravel | 2-64 mm (0.1"-2.5") | 10 |
| Sand | 0.06-2mm (gritty) | 50 |
| Silt | 0.004-0.06 mm | 10 |
| Clay | < 0.004 mm (slick) | 5 |

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

| Substrate Type | Characteristic | % Composition in Sampling Area |
|---|---|---|
| Detritus | sticks, wood, coarse plant materials (CPOM) | 45 |
| 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**
☐ Open ☐ Partly shaded
☑ Shaded

**Indicate the dominant type**
☑ 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**

# Tetra Tech Stream Data Sheet

Surveyors: A. Grech, A. Stott  Date: 06/17/2014  Resource ID Number: S-L17
Project: PPP  State: PA  County: Huntingdon
Photo Number (s): _____  Canopy Cover: 80 %  Location: 40.314734, -77.758249

**Flow Direction:** S  **Bank Width:** 6 Feet  **Water Width:** 5 Feet
**High Water Depth:** 5 Inches  **Water Depth:** 2.00 Inches  **Turbidity:** Low
**Flow Stage:** Low

**Flow Regime:** [ ] Perennial [✔] Intermittent [ ] Ephemeral [ ] Flowing Ditch [ ] Dry/Stagnant Ditch

**Sinuosity:**
- [✔] Low
- [ ] Medium
- [ ] High

**Features:**
- [✔] Riffles
- [✔] Pools
- [ ] Rapids
- [ ] Sand/Mud Bar
- [ ] Gravel Bar
- [ ] Aquatic Vegetation
- [✔] Run/Glide
- [ ] Braided
- [ ] Other _____

**Substrate:**
- [ ] Bedrock ___%
- [✔] Boulder 60 %
- [✔] Cobble/Gravel 20 %
- [✔] Sand 20 %
- [ ] Silt/Clay ___%
- [ ] Organic ___%

**Bank Substrate:**
*Height*: Left 4" Right 4"

| | Left | Right |
|---|---|---|
| Bedrock | [ ] | [ ] |
| Boulder | [✔] | [✔] |
| Gravel | [✔] | [✔] |
| Sand | [✔] | [✔] |
| Silt/Clay | [ ] | [ ] |
| Organic | [✔] | [✔] |

**Floodplain Width:**

| | Left | Right |
|---|---|---|
| <10 feet | [✔] | [✔] |
| <25 feet | [ ] | [ ] |
| <50 feet | [ ] | [ ] |
| <100 feet | [ ] | [ ] |
| >100 feet | [ ] | [ ] |

**Dominant Vegetation:**
- [✔] Forested
  Species: Quercus rubra, Fagus grandifolia
- [✔] Shrub
  Species: Acer pensylvanicum
- [✔] Herbaceous
  Species: Osmunda spectabilis

**Wildlife Observed/Notes:**

**Sketch:**
See Attached Figure.

# Tetra Tech Stream Data Sheet

Surveyors: A. Grech, A. Stott  Date: 06/24/2014  Resource ID Number: S-L42
Project: PPP  State: PA  County: Huntingdon
Photo Number (s): _____  Canopy Cover: 90 %  Location: 40.357459, -78.007445

**Flow Direction:** SW  **Bank Width:** 2 Feet  **Water Width:** 18 Inches
**High Water Depth:** 6 Inches  **Water Depth:** 2.00 Inches  **Turbidity:** Low
**Flow Stage:** Low

**Flow Regime:** [ ] Perennial [✔] Intermittent [ ] Ephemeral [ ] Flowing Ditch [ ] Dry/Stagnant Ditch

**Sinuosity:**
[✔] Low
[ ] Medium
[ ] High

**Features:**
[✔] Riffles [✔] Sand/Mud Bar [✔] Run/Glide
[✔] Pools [ ] Gravel Bar [ ] Braided
[ ] Rapids [ ] Aquatic Vegetation [ ] Other _____

**Substrate:**
[ ] Bedrock ___%
[✔] Boulder 20 %
[✔] Cobble/Gravel 20 %
[✔] Sand 60 %
[ ] Silt/Clay ___%
[ ] Organic ___%

**Bank Substrate:**
*Height*: Left 5" Right 5"

| | Left | Right |
|---|---|---|
| [ ] | Bedrock | [ ] |
| [ ] | Boulder | [ ] |
| [ ] | Gravel | [ ] |
| [✔] | Sand | [✔] |
| [✔] | Silt/Clay | [✔] |
| [✔] | Organic | [✔] |

**Floodplain Width:**

| Left | | Right |
|---|---|---|
| [✔] | <10 feet | [✔] |
| [ ] | <25 feet | [ ] |
| [ ] | <50 feet | [ ] |
| [ ] | <100 feet | [ ] |
| [ ] | >100 feet | [ ] |

**Dominant Vegetation:**
[✔] Forested
Species: Quercus rubra, Acer rubrum, Fagus grandifolia
[✔] Shrub
Species: Fagus grandifolia
[✔] Herbaceous
Species: Dryopteris sp. , Osmundastrum cinnamomeum, Impatiens capensis

**Wildlife Observed/Notes:**

**Sketch:**
See Attached Figure.

# Tetra Tech Stream Data Sheet

Surveyors: J. McGuirk, D. Quinn  Date: 07/02/2014  Resource ID Number: S-M49
Project: PPP  State: PA  County: Huntingdon
Photo Number (s): _____  Canopy Cover: 60 %  Location: 40.379961, -78.080172

**Flow Direction:** SE  **Bank Width:** 5 Feet  **Water Width:** 1 Feet
**High Water Depth:** 6 Inches  **Water Depth:** 2.00 Inches  **Turbidity:** low
**Flow Stage:** moderate

**Flow Regime:** [ ] Perennial [✔] Intermittent [ ] Ephemeral [ ] Flowing Ditch [ ] Dry/Stagnant Ditch

**Sinuosity:**
- [ ] Low
- [✔] Medium
- [ ] High

**Features:**
- [✔] Riffles
- [✔] Pools
- [ ] Rapids
- [ ] Sand/Mud Bar
- [ ] Gravel Bar
- [ ] Aquatic Vegetation
- [ ] Run/Glide
- [ ] Braided
- [ ] Other _____

**Substrate:**
- [ ] Bedrock ___%
- [✔] Boulder 10 %
- [✔] Cobble/Gravel 75 %
- [✔] Sand 10 %
- [ ] Silt/Clay ___%
- [✔] Organic 5 %

**Bank Substrate:**
*Height*: Left 2'  Right 2'

| | Left | Right |
|---|---|---|
| Bedrock | [ ] | [ ] |
| Boulder | [ ] | [ ] |
| Gravel | [✔] | [✔] |
| Sand | [ ] | [ ] |
| Silt/Clay | [ ] | [ ] |
| Organic | [✔] | |

**Floodplain Width:**

| Left | | Right |
|---|---|---|
| [✔] | <10 feet | [✔] |
| [ ] | <25 feet | [ ] |
| [ ] | <50 feet | [ ] |
| [ ] | <100 feet | [ ] |
| [ ] | >100 feet | [ ] |

**Dominant Vegetation:**
- [ ] Forested
  Species: _____
- [ ] Shrub
  Species: _____
- [✔] Herbaceous
  Species: Impatiens sp., Dichanthelium clandestinum, Eutrochium purpureum

**Wildlife Observed/Notes:**

**Sketch:**
See Attached Figure.

## WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: PPP City/County: Huntington Sampling Date: 09/28/2016

Applicant/Owner: Sunoco State: PA Sampling Point: Upland 1

Investigator(s): Jason McGuirk Cody Stoliker Section, Township, Range: N/A

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

Subregion (LRR or MLRA): LRR N Lat: 40.342630° Long: -77.852285° Datum: NAD 83

Soil Map Unit Name: Atkins silt loam 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:

well drained area within floodplain however not sandy enough for floodplain soils indicator. Non hydric soils present. Vegetation is FAC dominated within maintained ROW only. forested portion of island even less FAC or wetter. previous review with PADEP proved lack of hydrologic conditions within the forested section.

**VEGETATION (Four Strata) – Use scientific names of plants.** Sampling Point: Upland 1

| Tree Stratum (Plot size: 30' ) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. Liriodendron tulipifera | 20 | ✔ | FACU |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| | 20 = Total Cover | | |
| 50% of total cover: 10 | 20% of total cover: 4 | | |
| **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. Verbesina alternifolia | 35 | ✔ | FAC |
| 2. Microstegium verminium | 65 | ✔ | FAC |
| 3. Impatiens capensis | 5 | | FACW |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| 11. | | | |
| | 105 = Total Cover | | |
| 50% of total cover: 52.5 | 20% of total cover: 21 | | |
| **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: 66 (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.)

Maintained right of way only place with FAC or wetter species in dominance numbers. Forested section even less FAC or wetter vegetation present.

**SOIL** Sampling Point: Upland 1

**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 |
|---|---|---|---|---|---|---|---|---|
| 0-16 | 10YR 4/3 | 100 | | | | | SIL | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

[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:

## WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: PPP City/County: Huntington Sampling Date: 09/28/2016

Applicant/Owner: Sunoco State: PA Sampling Point: Upland 2

Investigator(s): Jason McGuirk Cody Stoliker Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): Linear Slope (%): 0-1

Subregion (LRR or MLRA): LRR N Lat: 40.342667° Long: -77.852894° Datum: NAD 83

Soil Map Unit Name: Water 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:

No soil. Within the ordinary high water mark of the creek. Island

### 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: Upland 2

| 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. Platanus occidentalis | 50 | ✔ | FACW |
| 2. Salix nigra | 10 | | OBL |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| | 60 = Total Cover | | |
| 50% of total cover: 30 | 20% of total cover: 12 | | |
| **Herb Stratum** (Plot size: 5' ) | | | |
| 1. Microstegium verminium | 30 | ✔ | FAC |
| 2. Polygonum pensylvanicum | 10 | | FACW |
| 3. Lysimachia ciliata | 25 | ✔ | FACW |
| 4. Impatiens capensis | 10 | | FACW |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| 11. | | | |
| | 75 = Total Cover | | |
| 50% of total cover: 37.5 | 20% of total cover: 15 | | |
| **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: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (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: Upland 2

**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 | 10YR 4/3 | 100 | | | | | GRSL | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

[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: Course fragments

Depth (inches): 4+

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

Remarks:

Stream bed for substrate. part of the stream channel.

# APPENDIX I
# HYDRIC SOILS LIST

# Hydric Soils List
# Huntingdon County, Pennsylvania

| Map Unit Symbol | Map Unit Name | Component Name and Phase | Component Percent | Landforms |
|---|---|---|---|---|
| AbB | Albrights silt loam, 3 to 8 percent slopes | Brinkerton | 5 | hills |
| AbC | Albrights silt loam, 8 to 15 percent slopes | Brinkerton | 5 | hills |
| AcB | Albrights very stony silt loam, 0 to 8 percent slopes | Atkins | 5 | flood plains |
| AcD | Albrights very stony silt loam, 8 to 25 percent percent slopes | Brinkerton | 10 | hills |
| AnB | Andover cobbly loam, 0 to 8 percent slopes | Andover | 85 | mountain slopes |
| AnB | Andover cobbly loam, 0 to 8 percent slopes | Brinkerton, poorly drained areas | 5 | hills |
| AoB | Andover extremely stony loam, 0 to 8 percent slopes | Andover | 85 | depressions |
| AoB | Andover extremely stony loam, 0 to 8 percent slopes | Brinkerton, poorly drained areas | 5 | hills |
| At | Atkins silt loam | Atkins | 85 | flood plains |
| At | Atkins silt loam | Muck | 2 | depressions |
| Ba | Barbour soils | Atkins | 2 | flood plains |
| Bb | Barbour soils, high bottom | Atkins | 5 | flood plains |
| Bc | Basher silt loam, neutral variant | Newark | 5 | flood plains |

| | | | | |
|---|---|---|---|---|
| BoB | Blairton silt loam, 2 to 8 percent slopes | Brinkerton | 5 | hills |
| BoC | Blairton silt loam, 8 to 15 percent slopes | Brinkerton | 5 | hills |
| BrA | Brinkerton silt loam, 0 to 3 percent slopes | Brinkerton | 80 | depressions |
| BrA | Brinkerton silt loam, 0 to 3 percent slopes | Atkins | 6 | flood plains |
| BrB | Brinkerton silt loam, 3 to 8 percent slopes | Brinkerton | 75 | depressions |
| BrB | Brinkerton silt loam, 3 to 8 percent slopes | Atkins | 3 | flood plains |
| BuB | Buchanan gravelly loam, 3 to 8 percent slopes | Andover | 10 | depressions |
| BuC | Buchanan gravelly loam, 8 to 15 percent slopes | Shelmadine | 5 | drainageways |
| BuD | Buchanan gravelly loam, 15 to 25 percent slopes | Andover | 3 | depressions |
| BxB | Buchanan extremely stony loam, 3 to 8 percent slopes | Andover, extremely stony | 7 | depressions |
| BxD | Buchanan extremely stony loam, 8 to 25 percent slopes | Andover, extremely stony | 3 | depressions |
| CbB | Clarksburg silt loam, 2 to 8 percent slopes | Thorndale | 5 | depressions |
| ErB | Ernest silt loam, 3 to 8 percent slopes | Brinkerton | 5 | depressions |
| ErB | Ernest silt loam, 3 to 8 percent slopes | Atkins | 2 | flood plains |
| ErC | Ernest silt loam, 8 to 15 percent slopes | Brinkerton | 5 | depressions |
| KlC | Klinesville shaly silt loam, 8 to 15 percent slopes | Brinkerton | 2 | hills |
| LcD | Laidig extremely stony loam, 8 to 30 percent slopes | Andover | 1 | mountain slopes |

| | | | | |
|---|---|---|---|---|
| MuB | Murrill gravelly loam, 3 to 8 percent slopes | Thorndale | 2 | depressions |
| MuC | Murrill gravelly loam, 8 to 15 percent slopes | Thorndale | 2 | depressions |
| Ne | Newark silt loam | Melvin | 15 | depressions |
| Ph | Philo and Basher silt loams | Atkins | 10 | depressions |
| Po | Philo and Basher silt loams, high bottom | Atkins | 10 | depressions |
| Pu | Purdy silt loam | Purdy | 85 | terraces |
| SM | Strip mines | Brinkerton | 3 | depressions |
| Ty | Tyler silt loam | Purdy | 5 | depressions |
| Modified from Hydric Soils of the United States (NRCS 2014) | | | | |

# APPENDIX J
# RESUMES

## EXPERIENCE SUMMARY

Mr. Preston Smith is a Biologist with 14+ total years of professional experience. Mr. Smith currently manages the Wetlands and Ecological Services Department for the Appalachian Basin Oil and Gas Services Group. His current responsibilities include project management, staff management, workload delegation including scheduling personnel for field work and report writing, QA/QC of work products and deliverables, and proposal/budget preparation. Mr. Smith has been involved in wetland delineations, habitat studies, plant surveys, permitting, and related report generation for commercial Oil and Gas clients in Pennsylvania, Ohio, and West Virginia for natural gas pipelines, water lines, well pads, impoundments, and water withdrawal locations. Since starting at Tetra Tech, Mr. Smith has also been involved in NEPA Categorical Exclusion, Environmental Assessment, and Environmental Impact Statement projects in several capacities serving as Project Manager, Deputy Project Manager, Water Resources Specialist, and Ecologist for various clients including the US Coast Guard, Department of Energy, Federal Energy Regulatory Commission, Nuclear Regulatory Commission, and Tennessee Department of Transportation.

Additionally, Mr. Smith has served as an Ecological Risk Assessor for various DoD sites for the Navy and Air Force, and non-DoD sites for USEPA and commercial clients. His aquatic ecology and sediment toxicology experience has been utilized in several capacities for, a wetland remediation benthic monitoring program, sediment contamination delineation, and field sampling activities. Mr. Smith also served as a Project Manager for a USCG CERCLA sediment evaluation and the related sediment dredging and removal action and has been a Task Manager for several CERCLA sites at MCRD Parris Island. Additionally, he has served as the Project Manager for a Phase I and Phase II environmental site assessment. Before joining Tetra Tech, he was a Lab Manager and Research Assistant in an Aquatic Toxicology Lab where he managed the laboratory operations and several grant funded research projects. He has experience with *in situ* toxicity testing using caged organisms and benthic macroinvertebrate sampling and identification. He also has extensive experience with sediment collection, spiking and toxicity testing, as well as watershed assessments. He also has experience performing herpetological and small mammal surveys in Western Pennsylvania.

## EDUCATION

B.S. Biology (Environmental Science); University of Pittsburgh; Dec. 2000
M.S. Biological Sciences; Wright State University; March 2010

## ADDITIONAL TRAINING AND CERTIFICATION

OSHA 1910.120 40-Hour HAZWOPER Training; June 22, 2007
OSHA 1910.120(e)(4) 8-Hour HAZWOPER Supervisory; October 17, 2008
ACOE-based 40-hour Wetland Delineation Certification; June 26, 2009

## REPRESENTATIVE PROJECTS

### Oil and Gas

**Natural Resources Permitting Lead; Confidential Client; West Virginia and Virginia, 2014-present.** As the Natural Resources Permitting Lead, Mr. Smith is responsible for preparing 404/Nationwide Permit applications for USACE Pittsburgh District and USACE Huntington District and WV DEP Individual 401 Water Quality Certification application for a 301 mile natural gas pipeline project. He is also responsible for the preparation of wetland delineation/stream identification reports, project impact calculations, and compensatory mitigation plans. He also participates in regulatory agency meetings.

**Manager, Wetlands and Ecological Services Department; Various Midstream and Exploration and Production Oil and Gas Clients, Ohio, Pennsylvania, and West Virginia, 2011-present.** As the Wetlands and Ecological Services Department Manager, Mr. Smith has managed Wetland Delineation and Stream Identification field activities and report generation for 300+ miles of pipeline, 40+ well pads, 30+ water withdrawal locations.

**Natural Resources Lead; Confidential Client; Ohio and Pennsylvania, 2014-2015.** As the Natural Resources Lead, Mr. Smith is responsible for scheduling and managing Wetland and Stream Surveys and reporting and Threatened and Endangered Species coordination for a FERC regulated gas pipeline repair project.

**Natural Resources Lead; Confidential Client; Ohio, West Virginia, and Pennsylvania, 2013-present.** As the Natural Resources Lead, Mr. Smith is responsible for scheduling and managing Wetland and Stream Surveys and Rare, Threatened, and Endangered Species Surveys for an approximately 350-mile Non-FERC, Natural Gas Liquid Pipeline. He is also responsible for Agency coordination and report submittal. As part of this Project, Mr. Smith managed one of the largest bog turtle (*Glyptemys muhlenbergii*), a federally listed species, surveys ever conducted in PA. Additionally, he managed large surveys for other federally listed species including the Indiana bat (*Myotis sodalis*) and the northeastern bulrush (*Scirpus ancistrochaetus*). Other species surveys managed included numerous PA listed plant species, Allegheny woodrat (*Neotoma magister*), small-footed bat (*Myotis leibii*), and timber rattlesnake (*Crotalus horridus*).

**Task Manager/Biologist; Confidential Client, Washington, Allegheny, and Westmoreland County, PA, 2013.** As a Task Manager/Biologist, Mr. Smith scheduled field crews and participated in Rare, Threatened and Endangered Plant surveys for large natural gas pipeline project. A final report was also prepared under Mr. Smith's direction and approval was received form the PA DCNR.

**Task Manager/Biologist; Confidential Client, Beaver and Butler County, PA, 2013-2014.** As a Task Manager/Biologist, Mr. Smith scheduled field crews and participated in Rare, Threatened and Endangered Plant surveys for a large natural gas pipeline project. A final report was also prepared under Mr. Smith's direction and approval was received form the PA DCNR.

**Natural Resource Permit Manager; Confidential Client; West Virginia; 2013-2015.** As the Natural Resource Permitting Manager, Mr. Smith prepared Preconstruction Notifications for U.S. Army Corps of Engineers Nationwide Permit 12 for several natural gas and water pipeline projects. He also prepared a Stream Activity Application Reports for submittal to the WV Department of Natural Resources (WV DNR) Office of Lands and Streams as part of these projects. Mr. Smith coordinated with US Fish and Wildlife Service and WV DNR Natural Heritage Program to evaluate the potential for threatened and endangered species within the project areas.

**Natural Resource Permit Manager; Multiple Clients; Ohio; 2012-2015.** As the Natural Resource Permitting Manager, Mr. Smith prepared Preconstruction Notifications for U.S. Army Corps of Engineers Nationwide Permit 12 for several natural gas pipeline projects. Mr. Smith coordinated with US Fish and Wildlife Service and the Ohio Department of Natural Resources Division of Wildlife to evaluate the potential for threatened and endangered species within the project areas.

**Project Manager; Wetland Restoration Plan, Construction, and Monitoring; Confidential Client; Eastern Ohio; 2012-present.** As a Project Manager, Mr. Smith is managing and contributed to a Wetland Restoration Plan for a large unauthorized wetland disturbance. The Restoration Plan was submitted and approved by the USACE. The construction, grading, and vegetation planting is complete and the wetland is currently recovering. Annual monitoring and progress reports are being completed and submitted to the USACE.

**Project Manager; Stream Restoration Plan; Confidential Client; Eastern Ohio; 2013.** As a Project Manager, Mr. Smith managed and contributed to Stream Restoration and Mitigation Plan for an Ohio EPA Director's Authorization to open cut a Class III Cold-water habitat stream. The Stream Restoration and Mitigation Plan was approved by Ohio EPA and led to the successful approval of the Director's Authorization.

**Task Manager; Confidential Client; Fayette County, PA, September 2012.** As a Task Manager/Biologist, Mr. Smith scheduled field crews for a Rare, Threatened and Endangered Plant survey for a natural gas pipeline project. A final report was also prepared under Mr. Smith's direction and approval was received form the PA DCNR.

**Task Manager; Confidential Client; Armstrong County, PA, July 2012.** As a Task Manager/Biologist, Mr. Smith scheduled field crews for a Rare, Threatened and Endangered Plant survey for a natural gas

pipeline project. A final report was also prepared under Mr. Smith's direction and approval was received form the PA DCNR.

**Project Biologist; Confidential Client; Fayette County, PA; 2010.** As a Project Biologist, Mr. Smith completed a field survey for presence/absence and potential habitat survey for the Allegheny woodrat, *Neotoma magister*, and submitted the report to the PA Game Commission for expedited review for Marcellus Shale-related activities. The survey was approved by the PA Game Commission.

**Biologist/Wetland Delineator; Confidential Clients; Western PA/Northern West Virginia/Eastern Ohio; 2009-present.** As a Biologist/Wetland Delineator, Mr. Smith has conducted and assisted with wetland investigations based on the 1987 US Army Corps of Engineers Wetland Delineation Manual and Regional Supplements. The investigations involved identifying wetland vegetation, soils, and hydrology along linear pipelines, water withdrawal sites, and well pad sites and preparing Wetland Reports for Marcellus/Utica Shale-related activities.

**Biologist; Confidential Client; Eastern OH; 2012.** As a Biologist, Mr. Smith assisted with a habitat survey for Indiana Bat roost tree suitability. The investigations involved identifying suitable habitat for the Indiana bat (*Myotis sodalis*) and preparing a report for submittal with a Nationwide Permit 12 to the Army Corps of Engineers.

**Natural Resource Permit Manager; Confidential Client; West Virginia; 2011.** As the Project Permitting Manager, Mr. Smith coordinated with USFWS and WV Department of Natural Resources (WV DNR) to secure the permitting for Nationwide Permit 12 for a natural gas pipeline project. Mr. Smith also prepared a Stream Activity Application Report for submittal to the WV DNR as part of this project.

**NEPA**

**NEPA Analyst/Environmental Scientist; FERC-regulated Environmental Assessment for a Natural Gas Pipeline; Pennsylvania; 2014-2015.** As a NEPA analyst, Mr. Smith is reviewing the Fish, Wildlife, and Vegetation Resource Report and will be drafting these sections of a FERC-regulated EA for a commercial Oil and Gas client for Marcellus Shale-related activities.

**Project Manager; Environmental Assessment for the New Station Lake Charles; U.S. Coast Guard; Lake Charles, LA. 2010-2011.** As a project manager, Mr. Smith managed all aspects of the EA and Finding of No Significant Impact for construction and operation of a new USCG facility in Lake Charles, LA from kickoff to completion. His duties included client management, budget monitoring, workload delegation, agency coordination, contributing to various sections of the document, site visit to characterize habitat, and publishing and submittal of all documents.

**Deputy Project Manager; Environmental Impact Statement for a Coal Gasification Plant; U.S. Department of Energy; Beaumont, TX. 2009-2010.** As a Deputy Project Manager, Mr. Smith assisted the Project Manager with client relations, attended the Public Scoping Meeting, coordinated and attended meetings with federal and local agencies, drafted and attended project meetings, and authored several ecological sections of a pre-Draft Environmental Impact Statement for the DoE for the TX Energy Industrial Gasification Plant. Mr. Smith also coordinated and participated in Biological surveys including fish and benthic sampling on the Neches River and a site habitat characterization in for the project, which is currently on hold.

**NEPA Project Manager; Categorical Exclusion for the Memphis Medical Center Streetscape; City of Memphis; Memphis, TN. 2011-2013.** As a NEPA project manager, Mr. Smith is managing all aspects of the CE for street improvements along a 2.81-mile segment of Elvis Presley Boulevard. His duties include client management, budget monitoring, workload delegation, agency coordination, contributing to the document, and publishing and submittal of all documents.

**NEPA Analyst/Environmental Scientist; FERC-regulated Environmental Assessment for an Interstate Natural Gas Pipeline; West Virginia and Pennsylvania; 2010-2011.** As a NEPA analyst, Mr.

Smith drafted the Aquatic Resource section of a FERC-regulated EA for a commercial Oil and Gas client for Marcellus Shale-related activities.

**NEPA Analyst/Ecologist; NEPA Environmental Report in support of a DOE Federal Loan Guarantee Program for Clean Coal Technology for a Coal Gasification Plant; Beaumont, TX; Eastman Chemical; 2008-2009.** As a NEPA Specialist, Mr. Smith authored several ecological sections of an Environmental Report in support of an Environmental Impact Statement for the DoE for the TX Energy Industrial Gasification Plant.

**Biologist/Field Operations Leader; TX Energy Environmental Report; Eastman Chemical; Beaumont, TX; 2008.** As the Field Operations Leader, Mr. Smith coordinated and participated in Biological surveys including fish and benthic sampling on the Neches River and a site habitat characterization in Beaumont, TX.

**Deputy Project Manager/NEPA Analyst/Ecologist; Environmental Assessment for a Dredge Boat Basin at the U.S. Coast Guard Station, Marblehead, OH; 2007.** As a Deputy Project Manager/NEPA Analyst/Ecologist, Mr. Smith contributed to the planning and development of an environmental assessment and Finding of No Significant Impact/Record of Decision for a proposed blasting/dredging operation for the U.S. Coast Guard. He authored the geology, topography, soils, seismic zone considerations and coastal zone considerations; water resources and drainage; hazardous materials and hazardous waste; aquatic environment; threatened and endangered species; and the wild and scenic rivers sections of the environmental assessment in addition to assisting with overall document research and development.

**Commercial Nuclear Licensing**

**Aquatic Ecologist; South Texas Project Combined Construction and Operating License Application Environmental Report; Bechtel; Texas; 2007.** As an Aquatic Ecologist, Mr. Smith prepared the aquatic ecology sections for site alternatives to building and operating two Advanced Boiling Water Reactors (ABWR) units on the South Texas Project (STP) site. He evaluated the aquatic environmental impacts associated with developing new nuclear capacity at each of three alternative sites. Part of the evaluation included the impacts of water usage and disposal for electricity generation. Additionally, the impacts to threatened and endangered species were considered.

**Aquatic Ecologist; Beaver Valley Nuclear Power Station License Renewal Environmental Review Program; FirstEnergy Nuclear Operating Company; Pennsylvania; 2007.** As an Aquatic Ecologist, Mr. Smith prepared part of the aquatic impacts section of an environmental report for the Davis-Besse Nuclear Power Station license renewal. The focus of the section was assessing the impacts of impingement/entrainment on fish species and comparing the data to permissible rates.

**Technical Reviewer; Aquatic Ecology Field Study in support of a Combined Construction Permit and Operating License Application for Summer Electric Generating Plant; SCE&G; South Carolina; 2007.** Mr. Smith served as a technical reviewer for the report of a baseline aquatic ecology field study at the proposed site of the Summer Electric Generating Plant in South Carolina. Technical recommendations and review of the data generated during the field study were part of the review.

**Report Data Validator; Environmental Report in support of a Combined Construction Permit and Operating License Application for Summer Electric Generating Plant; SCE&G; South Carolina; 2007.** Mr. Smith was responsible for validating statements of fact for numerous sections of an environmental report generated under the guidance of National Environmental Policy Act (NEPA) assessing the potential impacts of a Combined Construction Permit and Operating License Application. All statements of fact were verified by comparing the statements in the document to appropriate references. All statements of fact were documented for submittal to the client.

**Report Data Validator; Three Mile Island Nuclear Station Unit 1 License Renewal Environmental Report; 2007.** Mr. Smith was responsible for validating statements of fact for numerous sections of an

environmental report generated under the guidance of National Environmental Policy Act (NEPA) assessing the potential impacts for operating license renewal and refurbishment activities at Three Mile Island Nuclear Station. All statements of fact were verified by comparing the statements in the document to appropriate references. All statements of fact were documented for submittal to the client.

**Report Data Validator; South Texas Project Combined Construction and Operating License Application Environmental Report; Bechtel; Texas; 2007.** Mr. Smith was responsible for validating statements of fact for numerous sections of an environmental report generated under the guidance of National Environmental Policy Act (NEPA) assessing the potential impacts of a Combined Construction Permit and Operating License Application for the South Texas Project. All statements of fact were verified by comparing the statements in the document to appropriate references. All statements of fact were documented for submittal to the client.

**Risk Assessment**

**Risk Assessor/Task Manager; MCRD Parris Island; Technical Memorandum Post-Construction Risk Assessment for Site 3; Parris Island, SC; 2010-2012.** As a Risk Assessor, Mr. Smith served as the technical focal point for the completion of the Tech Memo, attended meetings with state and Federal regulators, responded to comments, and reviewed the document.

**Project Manager; USCG Baltimore Yard; Arundel Cove Sediment Characterization Study/Dredging Project; Baltimore, MD; 2009-2014.** As a Project Manager, Mr. Smith developed a sampling and analysis plan in coordination with USEPA Region 3 and Maryland Department of the Environment. Other tasks include securing subcontractors, developing and tracking project budget, coordinating and assisting in field collection of sediment, lab procurement, generating a summary report for submission to regulators, and updating an Ecological Risk Assessment. Dredging duties included permit applications, securing subcontractors, dredging oversight, and final report submittal.

**Ecological Risk Assessor; MCB Camp Lejeune, NAVFAC Mid-Atlantic; Onslow County, NC; 2009.** As an Ecological Risk Assessor, Mr. Smith prepared a screening level ecological risk assessment for a former small arms range. The analysis included evaluating ecological impacts from surface soil and groundwater (as surface water) to plants, soil invertebrates, and aquatic organisms. Food chain modeling was also conducted to evaluate risks to herbivorous and insectivorous birds and mammals.

**Ecological Risk Assessor; Safety Light Corporation, USEPA; South Centre Township, PA; 2009.** As an Ecological Risk Assessor, Mr. Smith prepared a screening level ecological risk assessment for the former Safety Light Corporation. The analysis included evaluating ecological impacts from surface soil and sediment to plants, soil invertebrates, and aquatic organisms. Food chain modeling was also conducted to evaluate risks to herbivorous, insectivorous, and piscivorous birds and mammals.

**Ecological Risk Assessor; Lockheed Martin, Dump Road Martin State Airport; Middle River, MD; 2009-2011.** As an Ecological Risk Assessor, Mr. Smith prepared a screening level ecological risk assessment for the Martin State Airport Dump Road Site. The analysis included evaluating ecological impacts from surface soil, sediment, surface water and groundwater (as surface water) to plants, soil invertebrates, and aquatic organisms. Food chain modeling was also conducted to evaluate risks to herbivorous and insectivorous birds and mammals.

**Ecological Risk Assessor; Dominion Resources; Salem, WV; 2009.** As an Ecological Risk Assessor, Mr. Smith evaluated the ecological risk from previous operations at a natural gasoline conversion facility in support of a voluntary removal action site closure/characterization report.

**Ecological Risk Assessor; Invertebrate and Small Mammal Bioavailability Study at the USDA Beltsville Agricultural Research Center; US Department of Agriculture; 2007-2008.** As an ecological risk assessor, Mr. Smith provided support through all phases of an invertebrate and small mammal study to determine the extent of pesticide contamination from previous activities at USDA

Beltsville Agricultural Research Center and to develop preliminary remediation goals based on site specific data.

**Ecological Risk Assessor; U.S. Navy, EFANE/CLEAN, EFD NORTH/CLEAN and/or EFD SOUTH/CLEAN; NTC Great Lakes, Illinois; NSWC Crane, Indiana; NAS JRB Willow Grove, PA; Naval Station Newport, Newport Rhode Island, NAS Whiting Field, Milton, FL; NSF Indian Head, MD; NAS South Weymouth, Weymouth, Massachusetts; NCBC Davisville, North Kingstown, Rhode Island; EFAC Annapolis, MD; Charleston CNC, Charleston, SC; 2007-2011.** Prepared and contributed to several ecological risk assessments as part of RI/FS programs at DOD bases in Illinois, Indiana, Pennsylvania, Florida, Maryland, Massachusetts, South Carolina, and Rhode Island. The state and federal agencies reviewed and approved or are currently reviewing the procedures for conducting the risk assessments. Risk assessments included evaluation of surface water, sediment, and soil data. Some of the risk assessments involved the preparation of a baseline risk assessment and included the use of benthic data for evaluating impacts of site-related chemicals. Responses to regulator comments were also generated for several of the risk assessments.

**Ecological Risk Assessor; U.S. Air Force, Charleston AFB, Charleston, SC; 2007.** Mr. Smith prepared screening level ecological risk assessments at several sites at the base. Risk assessments included evaluation of surface water, sediment, and soil data.

**Project Manager; Assessment of the Impact of Fipronil on Benthic Communities; Bayer CropScience/BASF; Southeastern US; May 2005-May 2006.**

Mr. Smith was Project Manager of a study to determine the impact of the insecticide Fipronil on benthic organisms. Duties consisted of collecting sediments from a total of four sites in SC, GA, and AL and spiking the sediments with a high and low concentration of Fipronil. Sediments (spiked and reference) were then placed in window screen lined, mesh weave baskets and deployed at the collection sites. Conducted ten rounds of sampling throughout the project duration. Measured physical and chemical parameters including dissolved oxygen, turbidity, conductivity, hardness and alkalinity. Measured acute *in situ* toxicity using caged organisms on the deployed sediments during four sampling events. Assisted in generating the final technical report for the project.

**Project Manager; Flux of Sediment Associated Metals; Copper Development Association/Rio Tinto; Dayton, OH; October 2005-December 2006.**

Mr. Smith was Project Manager of a field study to determine the flux of sediment associated metals to pore water and the relationship to Acid Volatile Sulfides, Total Organic Carbon, Manganese and Iron. Duties consisted of collecting sediments from 6 sites and spiking with a high and low concentration of copper. Deployed sediments and conducted eight rounds of sampling throughout the project duration at four sites near Dayton, OH. Deployed Diffusion Gradient Thin Film (DGT) probes in the sediments to measure metal flux. Measured physical and chemical parameters including dissolved oxygen, turbidity, conductivity, hardness and alkalinity. Measured acute *in situ* toxicity using caged organisms on the deployed sediments during three sampling events. Assisted in generating the final technical report for the project.

**Project Assistant; Stormwater Effects on the Great Miami River; City Of Dayton; Dayton, OH; July 2005-October 2005.**

Project assistant for a study to determine the impact of stormwater runoff on the water quality of the Great Miami River. Duties consisted of assisting with in situ toxicity testing. Collected and identified benthic macroinvertebrates. Assessed habitat quality using the US EPA Qualitative Habitat Evaluation Index (QHEI) scoring summary. Contributed sections on benthic macroinvertebrate composition and habitat quality to the final project report.

**Site Assessment**

**Benthic Ecologist; U.S. Navy, NSF Dahlgren, VA; 2008-2011.** As a benthic ecologist, Mr. Smith prepared response to comments, attended meetings, and prepared a work plan for field studies, and a benthic report in support of benthic monitoring program at NSF Dahlgren.

**Ecologist; Endangered Species Review; Munitions Response Program; MCB Quantico; 2007-2008.** As an Ecologist, Mr. Smith prepared the endangered species section of the Munitions Response Program at the Marine Corps Base Quantico. He gathered information on species occurring at the base and determined the Federal and State status of those species and identified locations where those species are likely to occur.

**Project Manager; Phase I and II Environmental Site Assessment for the New Station Lake Charles; U.S. Coast Guard; Lake Charles, LA. 2011-2012.** As a project manager, Mr. Smith is currently managing all aspects of the Environmental Site Assessment for a proposed site of a new USCG facility in Lake Charles, LA from kickoff to completion. His duties included client management, budget monitoring, workload delegation, subcontractor procurement, contributing to various sections of the document, and publishing and submittal of all documents. The Phase II Site Assessment included groundwater, surface and subsurface soil, and surface and subsurface sediment sampling.

**Project Manager; Wetland Delineation for the New Station Lake Charles; U.S. Coast Guard; Lake Charles, LA. 2011-2012.** As a project manager, Mr. Smith is currently managing all aspects of the Wetland Delineation for a proposed site of a new USCG facility in Lake Charles, LA. His duties included client management, budget monitoring, workload delegation, and review of the jurisdictional determination.

**Sampling**

**Sediment Specialist; U.S. Navy, NSWC Crane, Indiana; 2008.** As a Sediment Specialist, Mr. Smith identified sediment depositional areas and collected sediment samples for the delineation of the extent of chemical contamination along Boggs Creek.

**Task Manager; Interim Monitoring Program, U.S. Navy, EFANE/CLEAN; Portsmouth Naval Shipyard, Kittery, Maine; 2007-2009.** As a task manager, Mr. Smith aided the field operations leader and project manager for an Interim Monitoring Program for a Naval Shipyard (PNS) in USEPA Region I. Tasks associated with the monitoring program include oversight of subcontractors collecting sediment and preparing data reports for each sampling round and various data evaluation reports.

**RI/FS**

**Task Manager; UFP-SAP; Site 27; MCRD Parris Island, Parris Island, SC; 2010.** As a Task Manager, Mr. Smith coordinated completion of and wrote sections of the UFP-SAP for field sampling and analysis of soil and groundwater, as well as, attended meetings with state and Federal regulators, and responded to comments.

**Task Manager; UFP-SAP; Sites 55, 9, and 16; MCRD Parris Island, Parris Island, SC; 2010.** As a Task Manager, Mr. Smith coordinated completion of and wrote sections of the UFP-SAP for field sampling and analysis of soil and groundwater, as well as, attended meetings with state and Federal regulators, and responded to comments.

**Mining**

**Project Manager/Aquatic Toxicologist; NPDES Biomonitoring Plan; Rosebud Mining, Garrett County, MD; 2010.** As a Project Manager/Aquatic Biologist, Mr. Smith developed a Biomonitoring Plan for a NPDES Permit for a mine discharge. The biomonitoring plan was developed using surrogate testing species not normally used for NPDES testing.

**CHRONOLOGICAL WORK HISTORY:**

**Wetlands and Ecological Services Department Manager, Tetra Tech NUS, Inc.; Pittsburgh, PA; November 2011-present.**

**Biologist/Ecological Risk Assessor; Tetra Tech NUS, Inc.; Pittsburgh, PA; January 2007-November 2011.**

**Research Assistant/Lab Manager: Wright State University; Dayton, OH; September 2003-December 2006.**
Managed an aquatic toxicology laboratory. Responsibilities included maintaining laboratory cultures and supplies, managing grant related research projects (see descriptions above), supervising undergraduate students, writing technical reports, conducting literature reviews, and maintaining laboratory and field equipment.

**Research Assistant; Indiana University of Pennsylvania; Indiana, PA; September 2002-August 2003.**
Provided support in maintaining laboratory insect cultures and supplies. Conducted small mammal surveys; endangered reptile surveys (Eastern Massasauga Rattlesnake); collected and identified amphibians and reptiles in Western Pennsylvania for the Pennsylvania Herpetological Atlas; identified benthic macroinvertebrates for Abandoned Mine Drainage projects.

**PUBLICATIONS:**

Biksey, T.M., A.M. Bernhardt, A.C. Schultz, B. Marion and P.R. Smith. 2010. Literature Review: Ecological and Human Health Risk Assessment. Water Environment Research. In press.

J.L. Slye, T.W. La Point , P. Smith, G. Burton Jr., 2008. Sediment Recolonization Study to Examine Potential Fipronil Effects on Benthic Macroinvertebrates in Freshwater Ecosystems in the Southern United States. Poster SETAC Annual Meeting.

A. Bernhardt, P. Smith, M. Bowersox, J. Roberts, D. Prevar, B. Pluta, K. Davis, J. Tuttle. 2008. Invertebrate and Small Mammal Bioavailability Study at the USDA Beltsville Agricultural Research Center. Poster SETAC Annual Meeting.

Biksey, T.M., A.M. Bernhardt, A.C. Schultz, B. Marion and P.R. Smith. 2008. Literature Review: Ecological and Human Health Risk Assessment. Water Environment Research. 80(10):1997-2025.

Taulbee, K., Burton, G.A. , Smith, P., Custer, K. , Kapo, K. , Zhang, X. , Airas, S. , Delbeke, K. , A field assessment of copper bioavailability and effects in freshwater sediments. Poster SETAC Europe Annual Meeting.

Biksey, T.M., A.M. Bernhardt, A.C. Schultz, B. Marion and P.R. Smith. 2007. Literature Review: Ecological and Human Health Risk Assessment. Water Environment Research. 79(10):2170-2191.

G. Allen Burton, Keith Taulbee and Preston Smith. 2007. A Field Assessment of Copper Bioavailability and Effects in Freshwater Sediments. Draft Final Report. Submitted to International Copper Association, Ltd., RioTinto, Inc., and Copper Development Association, Inc. July.

G. Allen Burton, Scott Ireland, Katherine Kapo and Preston Smith. 2007. Sediment testing. Chapter in *Aquatic Toxicology 3rd Edition*. Rand, Lewis, & Klaine, Editors. In press.

Burton, G.A., Kapo, K., Zhang, X. and Smith, P. 2005. An Assessment of Storm Water Quality in the Great Miami River, Dayton, OH. City of Dayton, Environmental Management Department. Final Report.

Burton, G.A., Green, A., Baudo, R., Forbes, V., Hong, L., Janssen, C., Kukkonen, J., Leppanen, M., Maltby, L., Soares, A., Kapo, K., Smith, P., and Dunning, J. 2006. Characterizing Sediment Acid Volatile Sulfide Concentrations in European Streams. Environ Toxicol Chem 26:1-12.

Custer, K.W., Burton, G.A., Coelho, R.S., and Smith, P.R. 2006. Determining Stressor Presence in Streams Receiving Urban and Agriculture Runoff: Development of a Benthic *in situ* Toxicity Identification Evaluation (B*i*TIE) Method. Environ Toxicol Chem 25:2299-2305.

Simmons, T. W. and Smith, P. R. 2002-2005. Acarina (Water Mite) Section in Current and Selected Bibliographies on Benthic Biology. North American Benthological Society Publication.

TETRA TECH

# Henry B. Schumacher, M.Sc., PWS
## Senior Ecologist IV

## EXPERIENCE SUMMARY

Mr. Schumacher, M.Sc., specializes in ecology, with over 16 years of experience conducting environmental field studies and more than 8 years of experience preparing environmental permit applications for energy development projects (gas transmission, waterline, electric, wind) and environmental remediation projects throughout Pennsylvania, Ohio, West Virginia, and New York. He is experienced conducting fieldwork, preparing reports, preparing environmental permit applications, and coordinating with regulatory agencies for linear energy projects requiring line siting, wetland delineation, stream identification, post-construction environmental monitoring, invasive species monitoring, and rare species surveys.

Mr. Schumacher is accustomed to conducting fieldwork in remote locations in challenging conditions and has conducted field surveys for private clients in Pennsylvania, West Virginia, Ohio, Minnesota, Wisconsin, New York, New Jersey, Maryland, Virginia, Missouri, and in the Oil Sands of Alberta, Canada. He has conducted habitat surveys for federal and state listed bats, snakes, mammals, and migratory bird nesting sites, and presence/absence surveys for non-native invasive species and over 30 state and federal listed plant species.

Mr. Schumacher is a Certified Ecologist with the Ecological Society of America, a Professional Wetland Scientist, has USACE 1987 Manual certification, Ohio EPA Wetland Biocriteria certification, and holds a PADCNR Plant Collection Permit for surveying rare, threatened, and endangered plant species. In addition to his environmental consulting experience, Mr. Schumacher has conducted experimental and observational scientific field studies in Pennsylvania, West Virginia, Louisiana, Massachusetts, Panama, England, and Zimbabwe.

## RELEVANT EXPERIENCE

### OIL/GAS

**Mountain Valley Pipeline, LLC; Mountain Valley Pipeline Project**

Prepared Nationwide Permit applications for USACE Pittsburgh District and USACE Huntington District and WV DEP Individual 401 Water Quality Certification application for a 301 mile natural gas pipeline project. Prepared wetland delineation/stream identification reports, project impact calculations, and compensatory mitigation plans. Participated in regulatory agency meetings. WV & VA.

**Sunoco Logistics, L.P.; Pennsylvania Pipeline Project**

Conducted a presence/absence survey for Northeastern bulrush (*Scirpus ancistrochaetus*), a federal and state-listed species, as part of a 561 mile natural gas pipeline project. Prepared reports for USFWS. USFWS #2014-0200. Perry Co., PA.

**Dominion; PL-1 Transmission Line Project**

Conducted a survey for invasive plant species along 40 miles of gas pipeline ROW in PA State Forests using the Montana Noxious Weed Survey & Mapping System. Assisted in preparation of the monitoring report and invasive species treatment recommendation report to meet regulatory requirements. Conducted post-construction wetland & stream monitoring along a 40-mile gas pipeline ROW in PA State Forests. Assisted in the evaluation of wetland & stream restoration success and in the preparation of the monitoring report to meet regulatory requirements.

### EDUCATION

M.Sc. Ecology, University of Pittsburgh, 2008

Bachelors of Science, Ecology, Tulane University, 2000

### AREA OF EXPERTISE

Botanical Surveys & Wetlands

### REGISTRATIONS/ AFFILIATIONS

*USFWS Qualified Surveyor for Northeastern Bulrush, 2012*

*USFWS Qualified Surveyor for Eastern Prairie-Fringed Orchid, 2009*

*PADCNR Wild Plant Management Permit No. 16-066,*

### TRAINING/CERTIFICATIONS

*Professional Wetland Scientist, 5/6/2014*

*Certified Ecologist (Ecological Society of America), 6/1/2014*

*Ohio Rapid Assessment Methods (ORAM) for Wetlands, 5/12/15.*

*USACE 1987 Manual Wetland Delineation, 7/17/08*

*Field ID of Grasses, Sedges, & Rushes, 8/10/13*

*OSHA HAZWOPER 40-Hr Training, 12/21/13. 8-Hr Refresher, 1/20/15*

*Wilderness First Aid, 4/12/15*

*First Aid/CPR/AED, 1/11/16*

### OFFICE

Pittsburgh, PA

### YEARS OF EXPERIENCE

15

### YEARS WITHIN FIRM

<1

### CONTACT

Henry.Schumacher@tetratech.com

**MarkWest Liberty Midstream and Resources, LLC; Fox to Midway-Candor Pipeline Project**

Conducted a wetland delineation & stream survey along 14-mile proposed natural gas pipeline. USACE Eastern Mountains and Piedmont Region. Washington Co., PA.

**MarkWest Liberty Midstream and Resources, LLC; Hunter to Majorsville Pipeline Major Modification Project**

Conducted a wetland delineation & stream survey in a 6-acre area for a proposed natural gas pipeline route modification project. USACE Eastern Mountains and Piedmont Region. Washington Co., PA.

**MarkWest Liberty Midstream and Resources, LLC; Lehman to Stewart Pipeline Major Modification Project**

Conducted a wetland delineation & stream survey in a 20-acre area for a proposed natural gas pipeline route modification project. USACE Eastern Mountains and Piedmont Region. Washington Co., PA.

**MarkWest Liberty Midstream and Resources, LLC; 3 Brothers to Simmons Pipeline Major Modification Project**

Conducted a wetland delineation & stream survey in a 25-acre area for a proposed natural gas pipeline route modification project. USACE Eastern Mountains and Piedmont Region. Washington Co., PA.

**Travis Peak Resources, LLC; Well Pads AH & Y Projects**

Conducted a wetland delineation & stream survey in a 120-acre area for two proposed natural gas well pad projects. USACE Northcentral and Northeast Region. Tioga Co., PA.

**Superior Appalachian Pipeline, LLC; Snow Shoe Pipeline Project**

Conducted a wetland delineation/stream survey & a survey for Northeastern bulrush (*Scirpus ancistrochaetus*), a federal and state-listed species, for a 14 mile natural gas pipeline and compressor station project. Prepared reports for PA state regulatory agencies. PNDI #20267. Centre Co., PA.

**Columbia Gas; Line 1360**

Conducted surveys for PA state-listed species including great Indian-plantain (*Cacalia muehlenbergii*) and leafcup (*Smallanthus uvedalius*) for a natural gas pipeline project. Prepared reports for PA state regulatory agencies. PNDI # 20043. Washington Co., PA.

**Chief Oil & Gas; Korban to Phelps Pipeline Project**

Conducted a wetland delineation/stream survey and a survey for PA state-listed species including bog rosemary (*Andromeda polifolia*) and soft-leaved rush (*Carex disperma*) for a 7 mile natural gas pipeline project. Prepared reports for PA state regulatory agencies. PNDI #20558. Wyoming, Susquehanna, & Lycoming Co., PA.

**Laurel Mountain Midstream LLC; Shamrock Compressor Station and Dogleg Natural Gas Pipelines**

Conducted a wetland delineation/stream survey and a survey for PA state-listed species including wild oat (*Chasmanthium latifolia*) and heart-leaved meehania (*Meehania cordata*) for a 10-acre compressor station and 10 mile natural gas pipeline project. Prepared reports for PA state regulatory agencies. PNDI # 20609. Fayette Co., PA

**Williams; Guardasoni Pipeline Project**

Conducted surveys for PA state-listed species including snow trillium (*Trillium nivale*), harbinger-of-spring (*Erigenia bulbosa*), and white trout-lily (*Erythronium albidum*) for a 4 mile natural gas pipeline project. Prepared reports for PA state regulatory agencies. PNDI # 20110217283784. Westmoreland Co., PA.

**Williams; Gamelands to Jordan Pipeline Project**

Conducted surveys for PA state-listed species including shining ladies' tresses (*Spiranthes ovalis*), wild senna (*Senna marilandica*), leaf-cup (*Smallanthus uvedalius*), sourwood (*Oxydendron arboreum*), crested dwarf iris (*Iris cristata*), St. Andrew's cross (*Hypericum stragulum*), harbinger-of-spring (*Erigenia bulbosa*), lobed spleenwort (*Asplenium pinnatifidum*), puttyroot (*Aplectrum hyemale*), single-headed pussytoes (*Antennaria solitaria*), and blue monkshood (*Aconitum uncinatum*) for a 6 mile natural gas pipeline project. Prepared reports for PA state regulatory agencies. PNDI # 20556. Greene Co., PA.

**Confidential Client; Confidential Project**

Conducted a habitat assessment survey for Kirtland's snake (*Clonophis kirtlandii*), a PA state-listed species for a commercial development project. Prepared reports for PA state regulatory agency review. Allegheny Co., PA.

**Williams; Jury to 6-inch Pipeline Project**

Conducted surveys for PA state-listed species including purple rocket (*Iodanthus pinnatifidus*), scouring rush (*Equisetum x ferrissii*) and Torrey's sedge (*Juncus torreyi*) for a 4 mile natural gas pipeline project. Prepared reports for PA state regulatory agencies. PNDI # 20110202280993. Westmoreland Co., PA.

**Williams; Hoehn to Crable Pipeline Project**

Conducted a wetland delineation/stream survey and a survey for PA state-listed species including wild oat (*Chasmanthium latifolium*) and heartleaf meehania (*Meehania cordata*) for a 3 mile natural gas pipeline project. Prepared reports for PA state regulatory agencies. PNDI # 20110629304606. Fayette Co., PA.

**XTO; North Discharge/Indiana Extension Pipeline Project**

Conducted a wetland delineation/stream survey and a survey for PA state-listed species including purple fringeless orchid (*Platanthera peramoena*), bushy bluestem (*Andropogon glomeratus*), shining ladies' tresses (*Spiranthes lucida*), leafcup (*Smallanthus uvedalius*), and eastern coneflower (*Rudbeckia fulgida*) for a 12 mile natural gas pipeline project. Prepared reports for PA state regulatory agencies. PNDI # 21307. Westmoreland & Indiana Co., PA.

**Williams; Huczko to Clark Pipeline Project**

Conducted surveys for PA state-listed species including purple fringeless orchid (*Platanthera peramoena*), bushy bluestem (*Andropogon glomeratus*), shining ladies' tresses (*Spiranthes lucida*), and mountain bugbane (*Actea podocarpa*). Prepared reports for PA state regulatory agencies. PNDI # 21603. Westmoreland Co., PA.

**Dominion; Appalachian Gateway TL-492 Project**

Conducted surveys for PA state-listed species including puttyroot (*Aplectrum hyemale*), harbinger-of-spring (*Erigenia bulbosa*), white trout-lily (*Erythronium albidum*), and cranefly orchid (*Tipularia discolor*) for a 40 mile natural gas pipeline project. Prepared reports for PA state regulatory agencies. PNDI # 19950. Greene, Washington, & Westmoreland Co., PA.

**Dominion East Ohio; Franklin 20" Storage Pipeline Project**

Conducted surveys for federal-listed species including eastern prairie-fringed orchid (*Platanthera leucophaea*) and northern monkshood (*Aconitum noveboracensis*) for a natural gas pipeline storage project. Prepared reports for USFWS. USFWS 2008-TA-0548. Wayne & Summit Co., OH.

**Columbia Gas; Line 1278/Line K Replacement**

Conducted surveys for NY &PA state-listed species including checkered rattlesnake plantain (*Goodyera tessalata*), prickley pear cactus (*Opuntia humifusa*), and roseroot stonecrop (*Sedum rosea*) and four habitats of concern for a 12 mile natural gas pipeline replacement project. PNDI # 20474. Prepared reports for NY & PA state regulatory agencies. Pike Co., PA & Orange Co., NY.

**Superior Appalachian Pipeline, LLC; Pittsburgh Mills Pipeline Project**

Conducted a survey for federal-listed Indiana bat (*Myotis sodalis*) roost trees along a proposed 9-mile gas pipeline in Allegheny Co., PA for winter tree clearing. Coordinated with USFWS on results of the surveys. Allegheny Co. PA.

**Shell; Pierre River Mine Environmental Impact Assessment**

Conducted an ecological field assessment for a proposed Canadian Oil Sands mine development project Environmental Impact Assessment (EIA), including vegetation reconnaissance, rare plant and rare plant community survey, invasive species survey, and traditional use species survey. Alberta, Canada.

**MEG Energy; Christina Lake Regional Project Pre-Disturbance Assessment**

Conducted a pre-disturbance ecological field assessment for a proposed Steam Assisted Gravity Drainage oil recovery project in the Canadian Oil Sands, including vegetation reconnaissance, rare plant and rare plant community survey, invasive species survey, and merchantable timber assessment. Alberta, Canada.

**Suncor - Firebag Project Pre-Disturbance Assessment**

Conducted a pre-disturbance ecological field assessment for a proposed Steam Assisted Gravity Drainage oil recovery project in the Canadian Oil Sands, including vegetation reconnaissance, rare plant and rare plant community survey, and invasive species survey. Alberta, Canada.

**Cenovus - Foster Creek Project Pre-Disturbance Assessment**

Assisted in a geohazard assessment of 100+ miles of natural gas pipeline including: subsurface investigations (DCPTs - direct cone penetration tests); crack monitoring; and site characterization (delineation, headscarp monitoring stakes, alignment stakes, and geodetic monitoring stakes). Alberta, Canada.

**NiSource; Crawford Storage Field Expansion Project**

Conducted a survey for potential migratory bird nest holes and crevices in trees along a potential natural gas pipeline ROW for winter clearing of potential nest trees. Assisted in the preparation of the survey report. USFWS Permit # MB213433-0. Fairfield & Hocking Co., OH.

**Dominion; Ross Rd Forest Mitigation Project**

Co-designed monitoring protocols, conducted monitoring, prepared report, and evaluated reforestation success to meet regulatory requirements of compensatory mitigation reforestation project. Calvert Co., MD.

**Dominion; Swann Wetland Mitigation Project**

Co-designed monitoring protocols, conducted monitoring, prepared report, and evaluated functional wetland status to meet regulatory requirements of a compensatory mitigation wetland project. Calvert Co., MD.

**Confidential Client; Confidential Natural Gas Well Pad Project**

Conducted a post-construction forensic review of a well pad site to determine the pre-construction location and extent of wetland & stream resources and the approximate environmental impacts of project construction. Prepared report for EPA review. USACE Eastern Mountains and Piedmont Region. WV.

**Keys Energy; Keys Pipeline Project**

Conducted a wetland delineation & stream survey along 7-mile proposed ROW for a waterline and a 12-mile proposed ROW for a natural gas pipeline. USACE Atlantic and Gulf Coastal Plain Region. Charles & Prince George's Co., MD.

## TRANSPORTATION

**Canadian National Railway Company (CN); - Steelton Yard Project**

Conducted a wetland delineation & stream survey along a 7-mile area for a proposed railroad track upgrade project. Prepared a report for USACE and MN state regulatory agency review. USACE Northcentral and Northeast Region. St. Louis Co., MN.

**Canadian National Railway Company (CN); - Ladysmith Project**

Conducted a wetland delineation & stream survey along a 2-mile area for a proposed railroad track upgrade project. Prepared a report for USACE and WI state regulatory agency review. USACE Northcentral and Northeast Region. Rusk Co., WI.

**Wisconsin Central, Ltd; - Waterbury Siding Project**

Conducted a wetland delineation & stream survey along a 2-mile area for a proposed railroad siding project. Prepared a report for USACE and WI state regulatory agency review. USACE Northcentral and Northeast Region. Jackson Co., WI.

**Wisconsin Central, Ltd; - Deer Lane Realignment Project**

Conducted a wetland delineation & stream survey within a 115-acre area for a proposed road realignment project. Prepared a report for USACE and WI state regulatory agency review. USACE Northcentral and Northeast Region. Portage Co., WI.

**PennDOT; Interstate I-99 Project**

Assisted in the evaluation of impacts on natural wetlands by the construction of Interstate I-99 in central PA. Assisted in the monitoring and functional evaluation of compensatory mitigation wetlands. Blair & Centre Co., PA.

**Norfolk Southern Railroad; Midlands Project**

Conducted a wetland delineation & stream survey along 2-miles of existing railroad for a railroad maintenance project. Prepared reports and permit application for USACE and PA state regulatory agency review. USACE Eastern Mountains and Piedmont Region. Beaver Co., PA.

## ENVIRONMENTAL REMEDIATION

**Pfizer; American Cyanamide Bound Brook Remediation Project**

Conducted habitat assessments for the ecological risk assessment component of the pre-design investigations for the planned Remedial Action at a CERCLA facility. Somerset Co., NJ.

**Freeport-McMorhan; Satralloy Remedial Investigation Project**

Conducted surface water quality sampling and assisted with geophysical survey for the remedial investigation of a former ferrochromium alloy facility. Jefferson Co., OH.

**PA Department of Environmental Protection; Vinton No. 6 to Wehrum Connect Project**

Conducted a wetland delineation & stream survey along a 1-mile proposed water line and 5 acres of proposed work space for a proposed mine water treatment project. USACE Eastern Mountains and Piedmont Region. Cambria Co., PA.

## EMPLOYMENT HISTORY

***Tetra Tech, Inc.* –** Senior Ecologist IV (2015 – present)

***Golder Associates, Inc.* –** Project Ecologist (2012 to 2015)

***Pennsylvania Soil & Rock, Inc.* –** Lead Environmental Specialist (2011 to 2012)

***GAI Consultants, Inc.* –** Lead Environmental Specialist (2008 to 2010)

## SCIENTIFIC/TECHNICAL PUBLICATIONS

Gora, E, L Battaglia, H Schumacher and W Carson. Patterns of coarse woody debris volume among 18 late-successional and mature forest stands in Pennsylvania. Journal of the Torrey Botanical Society, 141 (2014), 151 – 160.

Schumacher, H and W Carson. Biotic homogenization of the sapling layer in 19 late-successional and old-growth stands in Pennsylvania. Journal of the Torrey Botanical Society, 140 (2013), 313 - 328.

Reese, GT; AJ Baumert; HB Schumacher. 2009. Natural Gas Pipelines: Impacts of Broken Canopies on Forest Habitat and Interior Species. Prepared for INGAA Foundation, Inc.

Bradford, MA, HB Schumacher, S Catovsky, T Eggers and GM Tordoff. Impacts of invasive plant species on riparian plant assemblages: interactions with elevated atmospheric carbon dioxide and nitrogen deposition. Oecologia, 152 (2007), 791 - 803.

## MEMBERSHIPS

Society of Wetland Scientists

Botanical Society of Western Pennsylvania (Vice President 2016 – present)

Ecological Society of America

TETRA TECH

# Korey M. McCluskey
## Environmental Scientist IV – Technical Lead

## EXPERIENCE SUMMARY

Mr. Korey McCluskey a wetland/environmental scientist - technical lead with 9+ years of experience in wetland delineation, stream evaluation, State and Federal rare, threatened & endangered (SOSC) botanical surveying and assessment, and construction monitoring throughout Pennsylvania, Ohio, West Virginia, New Jersey and New York. Korey has performed hundreds of wetland delineations and stream evaluations as well as conducted numerous botanical surveys, habitat assessments, and related report generation. Korey is on the USFWS short list of qualified surveyors for the federally listed Running Buffalo Clover, Small Whorled Pogonia, and Virginia Spirea in West Virginia. He has provided environmental consultation to clients in the commercial Oil and Gas, residential development, and public utility sectors to ensure compliance with local, state, and federal environmental regulations and ordinances through the environmental permitting process, including minimization of impacts to aquatic and terrestrial resources. This permitting, documentation, and guidance includes the preparation of wetland delineation and stream evaluation reports, botanical reports, wetland creation, wetland monitoring, 401, 404, 105 and related state and local permits, assisting with environmental assessments, and preparation of other environmental reports. He also has experience performing bat hibernaculum and summer roost tree habitat surveys in Western Pennsylvania.

## RELEVANT EXPERIENCE

### PERMITTING (OIL/GAS)

**Wetland/Environmental Scientist IV - Department Technical Lead; Stonehenge Appalachia, L.L.C.; Renick to Shields Natural Gas Pipeline Project, Butler County, Pennsylvania; January 2016 to present.** Responsibilities included co-preparing the Joint Permit application and all associated agency documentation to permit anticipated impacts along a 7.9 mile proposed pipeline.

**Wetland/Environmental Scientist IV - Department Technical Lead; Equitrans, L.P. (Equitrans); Equitrans Expansion Project (EEP), Allegheny, Washington, and Greene Counties, Pennsylvania; March 2016 to present.** Responsibilities included assisting in preparing permit documents for the 401 Water Quality Certification. Additional work included preparation of many of the required components of a Joint Permit.

**Wetland/Environmental Scientist IV - Department Technical Lead; Sunoco Logistics; S P L P Houston Tank Farm Project, Washington County, Pennsylvania; May 2015 to present.** Responsibilities included performing a supplemental wetland delineation, functions and values assessment, wetland report, and Joint Permit preparation for the proposed wetland impacts at the 21 acre proposed tank farm Project.

## EDUCATION

B.A., Environmental Sciences, University of Pittsburgh, April. 2006

Geographical Information Systems (GIS) Certificate, University of Pittsburgh, April. 2006

## REGISTRATIONS

Wild Plant Management Permit, PA, since 2013, Permit # 16-624

USFWS Certified Qualified Surveyor for the Federally Listed Running Buffalo Clover, Small Whorled Pogonia, and Virginia Spirea in West Virginia. Since May 2015

## AREA OF EXPERTISE

Wetland Delineation and Stream Identification & State and Federal RTE Botanical Surveys

## TRAINING/CERTIFICATIONS

USFWS and WV DNR Sponsored Training for the Identification of the Federally Listed Running Buffalo Clover, Virginia Spirea, and Small Whorled Pogonia, May 2015.

2015 PA Plant Forum and Winter Woody ID workshop. Sponsored by the PA DCNR and Western Pennsylvania Conservancy, April 2015.

Creation and Restoration of Wetlands - The Olentangy River Wetland Research Park, The Ohio State University, July 2011.

Identification of Freshwater Wetland Sedges, Grasses, and Rushes - Pennsylvania Institute for Conservation Education, August 2010.

Ohio Rapid Assessment Method (ORAM) for Wetlands v. 5.0- Ohio Environmental Protection Agency, March. 2009.

ACOE-based 40-hour Wetland Delineation Certification - Richard Chinn Environmental Training, Inc., March. 2007.

## OFFICE

Pittsburgh, PA

## YEARS OF EXPERIENCE

9+

## YEARS WITHIN FIRM

3+

## CONTACT

Korey.McCluskey@TetraTech.com

## FIELD (OIL/GAS)

**Wetland/Environmental Scientist IV - Department Technical Lead; Sunoco Logistics; OPP and PPP Natural Gas Pipeline Projects, Multiple Counties across Ohio, West Virginia, and Pennsylvania; October 2013 to present.** Responsibilities included aiding in wetland delineations, stream assessments, and report preparation for the proposed 450 miles of the Ohio Pipeline (OPP) and Pennsylvania Pipeline Projects (PPP).

**Wetland/Environmental Scientist IV - Department Technical Lead; Sunoco Logistics; OPP and PPP Natural Gas Pipeline Projects, Rare, Threatened, and Engendered Species Surveys; 43 listed Species of Special Concern (SOSC); March 2014 to present.** Pennsylvania. Segments 1, 2, and 3 Botanical Survey Lead, and crew leader. Responsibilities included organizing and conducting all field work operations for multiple botanical crews, conducted botanical surveys for 43+ PA State listed species for the 350 miles of proposed pipeline installation for the Ohio Pipeline (OPP) and Pennsylvania Pipeline Projects (PPP). Additional work included proposing potential re-routes and avoidance recommendations on a potential environmental impact basis, and preparing Botanical Reports, Conservation Plans, and Monitoring for the Project. Also aided in conducting a RTE survey for the federally listed Running Buffalo Clover in the WV segment of OPP.

**Wetland/Environmental Scientist IV - Department Technical Lead; Dominion Transmission, Inc.; Lebanon West II - TL-400 FERC Pipeline Project; Tuscarawas, Licking, Muskingum, Harrison, Coshocton, Columbiana, and Carroll Counties, Ohio (OH) and in Beaver County, Pennsylvania (PA); June 2014 to present**. Responsible for conducting wetland delineations and stream evaluations for the natural gas pipeline replacement segments of the TL-400 FERC Pipeline Project. Specific tasks included field surveys, report preparation, and completion of Ohio EPA specific wetland and stream assessments.

**Wetland/Environmental Scientist IV - Department Technical Lead; Noble Energy, Inc.; Various Water Withdrawal Projects; Greene, Fayette, Washington Counties (PA), and Marshall County (WV); March 2014 to present**. Responsible for conducting numerous wetland delineations and stream evaluations for proposed water withdrawal projects located in southwestern Pennsylvania and the panhandle of West Virginia. Also prepared wetland delineation and stream assessment reports for each project in support of permit submissions.

**Wetland/Environmental Scientist IV - Department Technical Lead; Noble Energy, Inc.; Dunkard Fork Water Withdrawal Project; Greene County, PA; June 2014 to September 2014**. Responsible for conducting botanical surveys and habitat assessments for 5 listed SOSC. Responsible for preparing a botanical survey and habitat assessment report in support of permit submissions.

**Wetland/Environmental Scientist IV - Department Technical Lead; Noble Energy, Inc.; Wolfe Run Resevoir Water Withdrawal, Water Pipeline, and Access Road Project; Marshall County, WV; May 2014 to September 2014**. Responsible for conducting a wetland delineation and stream evaluation for a proposed water withdrawal, water pipeline, and its associated access road. Also prepared a wetland delineation and stream assessment report in support of permit submissions.

**Wetland/Environmental Scientist IV - Department Technical Lead; Rice Drilling D, LLC; Various Water Withdrawal Projects; Harrison and Belmont Counties (OH); March 2014 to present**. Responsible for conducting numerous wetland delineations and stream evaluations for proposed water withdrawal projects located in eastern Ohio. Also prepared wetland delineation and stream assessment reports for each project in support of permit submissions.

**Wetland/Environmental Scientist IV - Department Technical Lead; Rice Poseidon Midstream, LLC; North Fork Dunkard Fork Water Withdrawal Project; Greene County, PA; December 2014 to January 2015**. Responsible for conducting a botanical habitat assessment for 2 listed SOSC. Responsible for preparing a botanical habitat assessment report in support of permit submissions.

**Wetland/Environmental Scientist IV - Department Technical Lead; Rice Drilling B, LLC; Fink Pond Impoundment Project; Greene County, PA; October 2014**. Responsible for conducting a wetland delineation and stream investigation, as well as a botanical survey for 2 listed SOSC. Responsible for preparing a wetland delineation and stream identification report and a botanical survey report in support of permit submissions.

**Wetland/Environmental Scientist IV - Department Technical Lead; Rice Poseidon Midstream, LLC; Waterboy to Pollock Natural Gas Pipeline Project; Washington County, PA; July 2014 to January 2015**. Responsible for conducting a wetland delineation and stream identification survey. Responsible for preparing a wetland delineation and stream identification report in support of permit submissions.

**Wetland/Environmental Scientist IV; MarkWest Liberty Midstream and Resources, LLC; Boyscout Camp Wetland Restoration Project & Post-Restoration Monitoring; Harrison County, PA; November 2012 to present.** Responsible for evaluating post-impact conditions at a recently disturbed wetland, assist in designing a USACE approved wetland restoration plan. Plans included survey of current and proposed wetland habitats, elevations, and hydrologic inputs; planting/seeding plan and implementation instructions; and construction/earthwork calculations and implementation instructions. Also responsible for wetland restoration monitoring for the past two years.

**Wetland/Environmental Scientist III; Sunoco Logistics; Mariner East [ME1] Pipeline Project Natural Gas Pipeline Projects, Rare, Threatened, and Engendered Species Surveys; 8 listed Species of Special Concern (SOSC); April 2013 to August 2013.** Botanical Survey Lead, and crew leader. Responsibilities included organizing and conducting all field work operations for multiple botanical crews, conducted botanical surveys for the 20 miles of the 40 mile proposed pipeline installation Mariner East [ME1] Pipeline Project. Additional work included proposing potential avoidance recommendations based on a potential environmental impact basis.

**Wetland/Environmental Scientist III; MarkWest Ohio Gathering Company, LLC; Wetland Delineations for Miscellaneous Natural Gas Pipeline Projects; Ohio.** Responsible for performing and assisting with wetland delineations for various proposed natural gas pipeline projects in eastern Ohio. Specific tasks included field survey, report preparation, and completion of Ohio EPA specific wetland and stream assessments.

**Wetland/Environmental Scientist III; Gulfport Energy Corporation; Wetland Delineations for Miscellaneous Natural Gas Well Pad Projects; Ohio.** Responsible for performing and assisting with wetland delineations for various proposed natural well pads southeastern Ohio. Specific tasks included field survey, report preparation, and completion of Ohio EPA specific wetland and stream assessments.

**Wetland/Environmental Scientist III; Williams/Laurel Mountain Midstream Operations, LLC; Brown to Davis Natural Gas Pipeline Project; Fayette County, PA; January 2013 to present.** Conducted a wetland delineation and stream evaluation for the Brown to Davis natural gas pipeline project. Also prepared a wetland delineation and stream evaluation report in support of permit submissions.

**Wetland Scientist; Joseph and Lori Baker; Baker Property Wetland Restoration Project; Derry Township, Westmoreland County, PA; March 2010 to June 2010.** As onsite environmental consultant to Joseph and Lori Baker, responsible for wetland and stream encroachment survey and assessment and assisted with a wetland restoration design and planting/seeding design.

**Wetland Scientist/Project Manager; Range Resources; Multiple Temporary and Permanent Water Pipelines; Washington County, Pennsylvania. 2010 to 2011.** Mr. McCluskey was responsible for wetland delineations and stream evaluations on dozens of temporary and permanent water pipelines linking frac water impoundments in the Washington County area.

## FIELD (ENERGY TRANSMISSION)

**Wetland Scientist; Orange & Rockland Utilities, Inc., Counties of Bergen (NJ) and Rockland (NY); Transmission Line 702 – Proposed Shield Wire Replacement Project; November 2008 to February 2009.** Responsible for wetland delineation and stream evaluation of a 500 foot wide, 10 mile long transmission line corridor.

## FIELD (MINING)

**Wetland Scientist; Rosebud Mining Company; Kiski Junction Railroad Allegheny River Spur Re-activation Project; Bethel and Gilpin Townships, Armstrong County, PA; 2007 to 2008.** As onsite environmental consultant to Rosebud Mining Company, responsible for wetland delineation and assisted with the preparation of a Joint Permit Application for USACE Individual Permit, as well as assisting with wetland mitigation site search and wetland mitigation design for railroad re-activation project.

**Wetland Scientist; MEPCO, LLC.; Coresco Overland Coal Conveyor Project; Greene (PA) and Monogalia (WV) Counties.** Responsible for wetland delineation and review and stream evaluation of a 10 mile overland coal conveyor. Rare, threatened, and endangered species (SOSC) survey and permitting services were provided.

## CHRONOLOGICAL HISTORY

Wetland/Environmental Scientist IV - Department Technical Lead; Tetra Tech, Inc.; Pittsburgh, PA, June 2014 – Present.

Wetland/Environmental Scientist III; Tetra Tech, Inc.; Pittsburgh, PA, October 2012 – June 2014.

Wetland Specialist/Project Manager; Pennsylvania Soil & Rock, Inc.; Monroeville, PA, May 2010 – October 2012.

Wetland/Environmental Specialist; Pennsylvania Soil & Rock, Inc.; Monroeville, PA, March 2008 – May 2010.

Wetlands Technician/Field Technician; Pennsylvania Soil & Rock, Inc.; Monroeville, PA, November 2006 – March 2008.

Park Naturalist; Frick Environmental Center – City of Pittsburgh; Pittsburgh, PA, April 2006 – November 2006.

## SCIENTIFIC/TECHNICAL PUBLICATIONS

- N/A

## MEMBERSHIPS

- Society of Wetland Scientists (SWS)

## AWARDS

- N/A

TETRA TECH

# Jason McGuirk
## Wetland/Environmental Scientist IV

## EXPERIENCE SUMMARY

Mr. Jason McGuirk has six years of professional experience in wetland delineation, permitting, fisheries and wildlife, and stream assessments and classification in Pennsylvania, New York, Ohio, and Alaska. Mr. McGuirk has conducted hundreds of wetland delineations, stream evaluations as well as conducted and produced habitat assessments, and post monitoring impact statements and assessments on over 800 miles of proposed natural gas pipeline, and fifty plus proposed well pad sites. He has extensive knowledge in watercourse classification and assessment including the Rosgen method. In particular attention of his has been focused on fisheries habitat and macro-invertebrate work, with over fifty miles of stream classifications in Alaska. Mr. McGuirk's educational background is in Fisheries and Aquaculture with a minor focus in Marine Biology and Wildlife management.

## RELEVANT EXPERIENCE

**Environmental Scientist III; Sunoco Logistics; Wetland Delineations for Miscellaneous Natural Gas Pipeline Projects, Engendered Species Surveys; Reptilia (*Glyptemys muhlenbergii*), Plantae (*Ellisia nyctelea*);** Pennsylvania. Segments 1, 2, and 3 wetlands field lead, and crew leader. Responsibilities include organizing and conducting all field work operations for multiple wetlands crews, wetland delineations and stream assessments for the proposed 450 mile Pennsylvania Pipeline Project. Additional work included proposing potential re-route on an environmental basis.

**Environmental Scientist III; MarkWest Liberty Midstream & Resources, LLC; Wetland Delineations for Miscellaneous Natural Gas Pipeline Projects; Pennsylvania.** Responsible for performing and assisting with wetland delineations for various proposed natural gas pipeline projects in southwestern Pennsylvania. Specific tasks included field survey, report preparation, and wetland functional assessments.

**Environmental Scientist III; MarkWest Ohio Gathering Company, LLC; Wetland Delineations for Miscellaneous Natural Gas Pipeline Projects; Ohio.** Responsible for performing and assisting with wetland delineations for various proposed natural gas pipeline projects in eastern Ohio. Specific tasks included field survey, report preparation, and completion of Ohio EPA specific wetland and stream assessments.

## EDUCATION

B.T. Fisheries and Aquaculture, SUNY Cobleskill, 2011T

## REGISTRATIONS

Wild Plant Management Permit, PA, 2014, Permit # 14-651

## AREA OF EXPERTISE

Wetland Delineation and Stream Identification, Fisheries, and Botanical Surveys

## TRAINING/CERTIFICATIONS

Winter Vegetation ID, Rutgers University, 2012

Amtrak Contractor Certification, 2014

Certified Wetland Assessment Delineator, NY, 2009

## OFFICE

Pittsburgh, PA

## YEARS OF EXPERIENCE

6+

## YEARS WITH TETRA TECH

2+

**Environmental Scientist III; Gulfport Energy Corporation; Wetland Delineations for Miscellaneous Natural Gas Well Pad Projects; Ohio.** Responsible for performing and assisting with wetland delineations for various proposed natural well pads southeastern Ohio. Specific tasks included field survey, report preparation, PCN preparation, and completion of Ohio EPA specific wetland and stream assessments.

**Environmental Scientist III; MarkWest Liberty Midstream & Resources, LLC; Wetland Delineation and Engendered Species Survey (*Ranunculus flabellaris and Alopecurus aequalis*) for Vanport to Butler Gas Pipeline; Butler County, Pennsylvania.** Responsible for performing and assisting with wetland delineation and endangered species survey along pipeline right-of-way. Specific tasks included field survey and report preparation.

**Environmental Scientist III; Antero Resources Appalachian Corp.; Wetland Delineations for Miscellaneous Natural Gas Pipeline Projects; Ritchie and Doddridge Counties, West Virginia.** Responsible for performing and assisting with wetland delineations for various proposed natural gas well pads and access roads in northern West Virginia. Specific tasks included field survey and report preparation.

**Wetland & Watercourse Biologist; Chesapeake Energy; Schoharie County, PA; November 2011 to October 2012.** Responsible for conducting wetland delineations for proposed pipe line routes and reroutes. Performed PA Rapid Assessments, stream evaluation, and preparation of wetland report for 30 miles of pipeline in Northeastern Pennsylvania.

**Wetland & Watercourse Biologist; Southwest Energy L.P; Schoharie County, PA; November 2011 to October 2012.** Responsible for conducting wetland delineations on proposed Well pad and compressor sites. Performed PA Rapid Assessments, stream evaluation, and preparation of wetland report for 15 proposed well pad locations in Northeastern Pennsylvania.

**Wetland & Watercourse Biologist; Southwest Energy L.P; Susquehanna County, PA; November 2011 to October 2012.** Responsible for conducting wetland delineations on proposed Well pad and compressor sites. Performed PA Rapid Assessments, stream evaluation, and preparation of wetland report for 20 proposed well pad locations in Northeastern Pennsylvania.

**Wetland & Watercourse Biologist; Chesapeake Energy; Carroll, Jefferson County, OH; November 2011 to October 2012.** Responsible for conducting wetland delineations for proposed pipe line routes and reroutes. Performed ORAM and QHEI Assessments, and preparation of wetland report for 30 miles of pipeline in Eastern Ohio.

**Wetland & Watercourse Biologist; Shell Oil; Butler County, PA; November 2011 to October 2012.** Responsible for conducting wetland delineations for proposed pipe line routes and reroutes. Performed PA Rapid Assessments, stream evaluation, and preparation of wetland report for 40 miles of pipeline in Western Pennsylvania.

**Wetland & Watercourse Biologist; Chesapeake Energy; Schoharie County, PA; November 2011 to October 2012.** Responsible for conducting Indiana Bat habitat surveys on multiple proposed natural gas pipelines in Northeastern Pennsylvania.

**Wetland & Watercourse Biologist; Chesapeake Energy; Schoharie County, PA; November 2011 to October 2012.** Responsible for conducting post construction habitat monitoring and assessment of constructed natural gas pipelines in Northeastern Pennsylvania.

## CHRONOLOGICAL HISTORY

Wetland Environmental Scientist IV; Tetra Tech, Inc.; Pittsburgh, PA, June 2014 - Present

Wetland Environmental Scientist III; Tetra Tech, Inc.; Pittsburgh, PA, February 2013 - June 2014

Wetland & Watercourse Biologist; Hanover Engineering & Associates; Towanda, PA, November 2011 - October 2012

Assistant Hatchery Manager; SUNY Cobleskill; Cobleskill, NY, September – May of 2009- 2011

Biological Fisheries Technician, US Forest Service; Thorne Bay, AK, May 2010 - August 2010

Fisheries Technician, Cook Inlet Aquaculture Association, Kenai, AK, May 2009 – August 2009

## SCIENTIFIC/TECHNICAL PUBLICATIONS

- McGuirk, J, M, "Walleye (*Sander vitreus)* spawning movements and habitat utilization in Otsego Lake, NY, 2011

## MEMBERSHIPS

- N/A

## AWARDS

- David E. Moorehouse Award for Outstanding Junior in Fisheries and Aquaculture B.T.

TETRA TECH

# Codie Vileno
## Environmental Scientist IV

## EXPERIENCE SUMMARY

Mr. Vileno has worked in the environmental field for over seven years. His experience includes conducting wetland delineations, habitat assessments, and endangered species surveys. He has additional experience performing and supervising Phase 1 archaeological surveys. Mr. Vileno's educational background includes graduate level studies in wetland ecology, stream ecology, hydrology, wetland/stream restoration methods, geology, and environmental impact assessments.

## RELEVANT EXPERIENCE

**Environmental Scientist III; Environmental and Restoration Services Contract for Site 73, Site 178, and Site 20. Army Corps of Engineers Louisville District. Savanna, Illinois; November 2014.** Conducted wetland delineation and threatened and endangered species review in support of remedial activities. Responsible for field effort and report deliverables.

**Environmental Scientist III; Sunoco Logistics; Wetland Delineation and Engendered Species Survey for Pennsylvania Pipeline Project; Pennsylvania, January 2014 to December 2014.** Conducted wetland delineations and endangered species survey along pipeline right-of-way. Specific tasks included field survey and report preparation.

**Environmental Scientist III; Sunoco Logistics; Wetland Delineation and Engendered Species Survey for Ohio Pipeline Project; Ohio, West Virginia, Pennsylvania, January 2014 to December 2014.** Conducted wetland delineations and endangered species survey along pipeline right-of-way. Specific tasks included field survey, report preparation, and permitting activities.

**Environmental Scientist III; Rice Energy; Wetland Delineations for Miscellaneous Natural Gas Pipeline Projects; Pennsylvania and Ohio.** Conducts wetland delineations and permitting activities for various proposed natural gas pipeline projects in eastern Ohio. Specific tasks include field survey, report preparation, completion of Ohio EPA specific wetland/stream assessments, agency consultation, and compiling of PCN.

**Environmental Scientist III; MarkWest Liberty Midstream & Resources, LLC; Wetland Delineations for Miscellaneous Natural Gas Pipeline Projects; Pennsylvania.** Conducts wetland delineations for various proposed natural gas pipeline projects in southwestern Pennsylvania. Specific tasks included field survey, report preparation, and wetland functional assessments.

**Environmental Scientist III; MarkWest Ohio Gathering Company, LLC; Wetland Delineations for Miscellaneous Natural Gas Pipeline Projects; Ohio.** Conducts wetland delineations for various proposed natural gas pipeline projects in eastern Ohio. Specific tasks included field survey, report preparation, and completion of Ohio EPA specific wetland and stream assessments.

**Environmental Scientist III; Gulfport Energy Corporation; Wetland Delineations for Miscellaneous Natural Gas Well Pad Projects; Ohio.** Responsible for performing and assisting with wetland delineations for various proposed natural well pads southeastern Ohio. Specific tasks included field survey, report preparation, PCN preparation, and completion of Ohio EPA specific wetland and stream assessments.

### EDUCATION

B.A., Anthropology, 2007, State University College at Buffalo

### AREA OF EXPERTISE

Wetland Science

### TRAINING/CERTIFICATIONS

38 Hour ACOE Wetland Delineation Training Program, November 2009

Ohio Rapid Assessment Method for Wetlands Training Course, May 2013

Identifying Grasses, Sedges, and Rushes, June 2014

Winter Woody Plant Identification, April 2015

Running Buffalo Clover, Virginia Spirea, and Small Whorled Pogonia Federal RTE Identification Workshop, May 2015

Engineering for Ecosystem Restoration Workshop, June 2010

American Red Cross Adult First Aid/CPR/AED, March 2015

16 Hour Wilderness First Aid, November 2012

40 hours EPA 165.5 HAZWOPER Health and Safety Worker 2012

### OFFICE

Pittsburgh, PA

### YEARS OF EXPERIENCE

7+

### YEARS WITHIN FIRM

7+

### CONTACT

Codie.Vileno@TetraTech.com

**Environmental Scientist III; MarkWest Liberty Midstream & Resources, LLC; Wetland Delineation and Engendered Species Survey (Ranunculus flabellaris and Alopecurus aequalis) for Vanport to Butler Gas Pipeline; Butler County, Pennsylvania.** Responsible for performing and assisting with wetland delineation and endangered species survey along pipeline right-of-way. Specific tasks included field survey and report preparation.

**Environmental Scientist III; Antero Resources Appalachian Corp.; Wetland Delineations for Miscellaneous Natural Gas Pipeline Projects; Ritchie and Doddridge Counties, West Virginia.** Responsible for performing and assisting with wetland delineations for various proposed natural gas well pads and access roads in northern West Virginia. Specific tasks included field survey and report preparation.

**Environmental Scientist III; Stone Energy; Wetland Delineation for Mercer 1 Well Pad; Sisterville, Tyler County, West Virginia; September 2012.** Performed wetland delineation for proposed natural gas well pad and associated access road. Specific tasks included field survey and report preparation.

**Environmental Scientist III; Laurel Mountain Midstream Operating, LLC; Endangered Species Survey (Yellow Passionflower) for Miller to Headlee Pipeline Project; Greene and Cumberland Townships, Greene County, Pennsylvania; September 2012.** Assisted with botanical survey for yellow passionflower along the proposed Miller to Headlee natural gas pipeline right-of-way and access roads. Tasks included pre-survey research, field survey, and report preparation.

**Environmental Scientist III; Laurel Mountain Midstream Operating, LLC; Endangered Species Survey (Drooping Bluegrass) for Nickelville Pipeline Project; Nickelville, Venango County, Pennsylvania; July 2012.** Assisted with botanical survey for drooping bluegrass along the proposed Nickelville natural gas pipeline right-of-way. Specific tasks included field survey and report preparation.

**Environmental Scientist III; Laurel Mountain Midstream Operating, LLC; Endangered Species Survey (Tall Larkspur) for Dunlap Creek Pipeline Project; Luzerne and Redstone Townships, Fayette County, Pennsylvania; June 2012.** Assisted with botanical survey for tall larkspur along the proposed Dunlap Creek natural gas pipeline right-of-way and access roads. Specific tasks included field survey and report preparation.

**Environmental Scientist III; Laurel Mountain Midstream Operating, LLC; Wetland Delineations for Miscellaneous Natural Gas Pipeline Projects; Pennsylvania.** Responsible for performing and assisting with wetland delineations for various proposed natural gas pipeline projects in southwestern Pennsylvania. Specific tasks included field survey and report preparation.

**Environmental Scientist III; Enervest Operating, LLC; Wetland Delineations for Miscellaneous Natural Gas Pipeline Projects; Ohio.** Responsible for performing and assisting with wetland delineations for various proposed natural gas pipeline projects in southeastern Ohio. Specific tasks included field survey, report preparation, and completion of Ohio EPA specific wetland and stream assessments.

**Environmental Scientist III; NAVFAC Washington; Marine Corps Base Quantico Wetland Functional Analysis; Quantico, Virginia; April 2012.** Assisted with wetland functional assessments in support of remedial activities.

**Environmental Scientist III; NASA; Wallops Flight Facility Remedial Action Contract; Wallops Island, Virginia; March 2012.** Assisted with wetland delineation and wetland functional assessments in support of remedial activities.

**Environmental Scientist III; Burnett Oil Company, Inc.; New Salem, Pennsylvania; December 2011 to February 2012.** Responsible for performing and assisting with wetland delineations for various proposed natural gas pipeline projects in southwestern Pennsylvania. Specific tasks included field survey and report preparation.

**Scientist I; Army Corps of Engineers; South Park Lake Dredge Project; Buffalo, New York; October 2011.** Supervised Phase 1 archaeological survey in preparation of dredging activities.

**Scientist I; Dominion East Ohio; Monroe County Gas Pipeline Project; Indiana Bat Habitat Assessment and Wetland Delineation; Woodsfield, Ohio; July 2011 to September 2011.** Assisted with Indiana Bat habitat assessment and wetland delineation along a proposed natural gas pipeline right-of-way. Specific tasks included field survey and completion of Ohio EPA specific wetland and stream assessments. Other responsibilities included Phase 1A archaeological assessment

**Archaeological Technician; National Grid; Lockport to Mortimer; Rochester, New York; May 2011 to October 2011.** Performed Phase 1 archaeological survey in support of transmission line replacement. Assisted with report preparation.

**Scientist I; National Fuel Gas Company; Tioga Pipeline Expansion; Tioga County, Pennsylvania; June 2011 to September 2011.** Assisted with wetland delineation along proposed natural gas pipeline right-of-way. Other responsibilities included performing a Phase 1A archaeological assessment and supervising a Phase 1 archaeological survey.

**Archaeological Technician; National Fuel Gas Company; Allegheny National Forest Pipeline Project; Warren, Pennsylvania; September 2009 to October 2009.** Performed Phase 1 archaeological survey along proposed natural gas pipeline right-of-way.

**Archaeological Technician; Dominion East Ohio; Pipeline Replacement; Wooster, Ohio; June 2008 to July 2009.** Performed Phase 1 archaeological survey along proposed natural gas pipeline right-of-way.

**Archaeological Technician; Haley & Aldrich, Inc.; AES Sparrows Point LNG; Cecil County, Maryland; June 2008 to July 2008.** Performed Phase 1 archaeological survey along proposed natural gas pipeline right-of-way.

**Archaeological Technician; Horizon Wind Energy, LLC; Arkwright Wind Farm; Arkwright, New York; September 2008 to March 2009.** Performed Phase 1 archaeological survey on proposed turbine pads and transmission lines.

**Archaeological Technician; National Fuel Gas Supply Company.; Galbraith Storage Field Expansion Project; Allegheny National Forest, Marienville, Pennsylvania; August 2008 to October 2008.** Performed Phase 1 archaeological survey along proposed natural gas pipeline right-of-way.

## CHRONOLOGICAL HISTORY

Environmental Scientist IV; Tetra Tech, Inc.; Pittsburgh, Pennsylvania; 2011 – Present

Scientist I; Tetra Tech, Inc.; Buffalo, New York; June 2008 – November 2011

Research Assistant; State University of New York Research Foundation; Buffalo, New York; October 2009 – January 2010

On-Call Research Assistant; State University of New York Research Foundation; Buffalo, New York; May 2009 – August 2009

Report Writer; Test America Laboratories; Amherst, New York; November 2007 – June 2008

## SCIENTIFIC/TECHNICAL PUBLICATIONS

N/A

## MEMBERSHIPS

- Society of Wetland Scientists

TETRA TECH

# Stephanie A. Zabowski Lieb
## Environmental Scientist III

## EXPERIENCE SUMMARY

Ms. Stephanie Zabowski Lieb is a wetland/environmental scientist with 5+ years of experience in wetland delineation and stream evaluation, and rare, threatened & endangered botanical surveying and assessment, throughout Pennsylvania, Ohio, and West Virginia. This includes preparation of wetland delineation and stream evaluation reports, botanical reports, US Army Corps Joint and Nation Wide Permits, and PA Department of Environmental Protection General Permits. Stephanie has additional experience preforming geographic information systems (GIS) data processing and figure creation using ArcGIS10.1. She also has experience performing bat hibernaculum and summer roost tree habitat surveys in West Virginia.

## RELEVANT EXPERIENCE

**Wetland/Environmental Scientist III; Sunoco Logistics; OPP Natural Gas Pipeline Projects, Ohio and West Virginia; August 2015 to present.** Responsibilities included aiding in wetland delineations and stream assessments for the proposed 70 miles of the Ohio Pipeline and West Virginia Pipeline Projects.

**Wetland/Environmental Scientist III; MarkWest Liberty Midstream & Resources, LLC; Fox to Houston Natural Gas Pipeline Project, Washington County, PA; August 2015 to present.** Responsible for conducting wetland delineations and stream assessments for the approximate 1 mile of proposed pipeline.

**Environmental Scientist; Pittsburgh Botanic Garden; Kentucky Hollow Site, Allegheny County, PA; 2015.** Responsible conducting wetland delineations and stream assessments for the approximate 40 acre area for proposed construction of trails and passive acid mine drainage treatment system. Prepared wetland delineation and stream assessment reports and associated GIS data processing and figure creation.

**Environmental Scientist; EQT Gathering; NIMC S001 Pipeline Project, Allegheny & Washington Counties, PA; 2015.** Responsible for conducting botanical survey for wild hyacinth (*Cammasia scilloides*) and snow trillium (*Trillium nivale*), PA state-listed species. Responsible for preparing a botanical survey report.

**Environmental Scientist; Grace Baptist Church Additions; Grace Baptist Church, Allegheny County, PA; 2015.** Responsible for compiling components of the NPDES permit package and GIS figure creation for church additions.

**Environmental Scientist; NiSource Midstream Services, LLC; East Washington Gathering Pipeline Project, Washington County, PA; 2015.** Assisted in the transplantation of Short's sedge

## EDUCATION

B.S. Environmental Resource Management, The Pennsylvania State University, May 2009

Minors: Wildlife and Fisheries Science, May 2009; Watershed and Water Resources, May 2009

## REGISTRATIONS

Wild Plant Management Permit, PA, 2015
Permit # 15-650

## AREA OF EXPERTISE

Wetland Delineation and Stream Identification; RTE Botanical Surveys

## TRAINING/CERTIFICATIONS

USFWS and WV DNR Sponsored Training for the Identification of the Federally Listed Running Buffalo Clover, Virginia Spirea, and Small Whorled Pogonia, May 2015.

2015 PA Plant Forum and Winter Woody ID workshop. Sponsored by the PA DCNR and Western Pennsylvania Conservancy, April 2015.

USACE 1987 Manual and Regional Supplement Wetland Delineation Training, Swamp School, 2013.

Ohio Rapid Assessment Method for Wetlands Training, Ohio EPA, 2013.

Grasses, Sedges and Rushes Identification Workshop. Taught by Sarah Chamberlain, 2013.

Sedge Identification Workshop. Taught by Dr. Timothy Block and Dr. Ann Rhoads, 2013.

## OFFICE

Pittsburgh, PA

## YEARS OF EXPERIENCE

5+

## YEARS WITHIN FIRM

0

## CONTACT

Stephanie.ZabowskiLieb@TetraTech.com

(*Carex shortiana*), a PA state-listed species, as part of mitigation request by PA DCNR. Responsible for associated GIS data processing and figure creation.

**Environmental Scientist; West Newton Borough; 100 Pemberton Place Retaining Wall, Westmoreland County, PA; 2015.** Responsible for compiling joint permit registration package and associated GIS figure creation for a 130 foot long retaining wall.

**Environmental Scientist; Plum Borough School District; Regency Park Elementary School, Allegheny County, PA; 2015.** Responsible for conducting wetland delineations and stream assessments for the approximate 5 acre school property. Prepared wetland delineation and stream assessment reports and associated GIS data processing and figure creation.

**Environmental Scientist; Freeport Area School Athletic Field; Freeport Area School District, Butler County, PA; 2015.** Responsibilities for compiling components of the NPDES permit package and associated GIS figure creation.

**Environmental Scientist; EQT Corporation; Above Ground Storage Tank Inspection/Registration, various Counties, WV; 2014.** Responsible for GIS data processing, shapefile creation, organization, progress tracking, and mapping of 1600+ above ground storage tanks.

**Environmental Scientist; Sunoco Logistics; Pennsylvania Pipeline Project, Cambria County, PA; 2014.** Responsible for conducting botanical survey for federally listed Northeastern Bulrush (*Scirpus ancistrochaetus*) along the 23 mile pipeline route in Cambria County, PA and associated data processing.

**Environmental Scientist; Bethel Park Municipal Authority; Bethel Park Wastewater Treatment Plant Expansion, Allegheny County, PA; 2014.** Responsible for compiling joint permit registration package and associated GIS figure creation for wastewater treatment plant expansion.

**Environmental Scientist; EQT Gathering; Yablonski Well Line Project, Washington & Greene Counties, PA; 2014.** Responsible for conducting botanical survey for fringed bluets (*Houstonia canadensis*) and tall larkspur (*Delphinium exaltatum*), PA state-listed species, and preparing associated botanical report for 3 mile pipeline project.

**Environmental Scientist; Y-Grade Pipeline Project; Hilcorp Energy Company, Columbiana County, OH; 2014.** Responsible for conducting wetland delineations and stream assessments of access roads for proposed pipeline project. Prepared wetland delineation and stream assessment report. Assisted in erosion and sediment control monitoring during pipeline construction.

**Environmental Scientist; various projects; Antero Resources, various counties, WV; 2014.** Responsible for conducting wetland delineations and stream assessments for various proposed pipeline projects. Prepared wetland delineation and stream assessment reports.

**Biologist II; NRG Homer City Services, LLC; Homer City Ash Landfill Expansion, Indiana County, PA; 2013.** Responsible for conducting wetland delineations and stream assessments for the approximate 130 acre proposed ash landfill expansion Prepared wetland delineation and stream assessment reports and associated GIS data processing and figure creation.

**Biologist II; MarkWest Liberty Midstream & Resources, LLC; Burg to Wack Pipeline, Butler County, PA; 2013.** Responsible for conducting wetland delineations and stream assessments for the approximate 2.5 mile proposed pipeline. Prepared wetland delineation and stream assessment reports, associated GIS data processing and figure creation, and PA DEP general permit package.

**Biologist II; MarkWest Liberty Midstream & Resources, LLC; Bame to Bluestone Pipeline, Butler County, PA; 2013.** Responsible for conducting wetland delineations and stream assessments for the approximate 3 mile proposed pipeline. Prepared wetland delineation and stream assessment reports, associated GIS data processing and figure creation, and PA DEP general permit package.

**Biologist II; MarkWest Liberty Midstream & Resources, LLC; Stebbins to McElhinney Pipeline, Butler County, PA; 2013.** Responsible for conducting wetland delineations and stream assessments for the approximate 3 mile proposed pipeline. Prepared wetland delineation and stream assessment reports, associated GIS data processing and figure creation, and PA DEP general permit package.

**Biologist II; EQT Gathering, LLC; NIJU S026 Pipeline, Washington County, PA; 2013.** Responsible for conducting wetland delineations and stream assessments for the approximate 2.5 mile proposed pipeline. Prepared wetland delineation and stream assessment reports, associated GIS data processing and figure creation, and PA DEP general permit package. Assisted with archeology field work and GIS figure creation.

**Biologist II; MarkWest Liberty Midstream & Resources, LLC; Lynn to Stebbins Pipeline, Butler County, PA; 2013.** Responsible for conducting a wetland delineation and stream investigation, as well as a botanical survey for a PA state-listed species. Prepared a wetland delineation and stream identification report, botanical survey report, associated GIS data processing and figure creation, and PA DEP general permit package.

**Biologist II; EQT Gathering, LLC; MOME S007 Pipeline, Harrison County, WV; 2012.** Responsible for preparing nationwide permit package. Also assisted in Indiana Bat habitat assessment and report preparation.

**Environmental Scientist; Williams; Huczko to Clark Pipeline Project, Westmoreland County, PA; 2012.** Assisted in surveys for PA state-listed species including purple fringeless orchid (*Platanthera peramoena*), bushy bluestem *(Andropogon glomeratus*), shining ladies' tresses (*Spiranthes lucida*), and mountain bugbane (*Actea podocarpa*). Prepared reports for PA state regulatory agencies and associated GIS figure creation.

**Environmental Scientist; Williams; Jury to 6-inch Pipeline Project, Westmoreland County, PA; 2011**. Assisted in botanical surveys for PA state-listed species including purple rocket (*Iodanthus pinnatifidus*), scouring rush (*Equisetum x ferrissii*), and Torrey's sedge (*Juncus torreyi*) for a 4 mile natural gas pipeline project. Prepared reports for PA state regulatory agencies and associated GIS figure creation.

**Environmental Scientist; XTO; North Discharge/Indiana Extension Pipeline Project, Westmoreland & Indiana Counties, PA; 2011.** Assisted in a wetland delineation/stream survey and a survey for PA state-listed species including purple fringeless orchid (Platanthera peramoena), bushy bluestem (Andropogon glomeratus), shining ladies' tresses (*Spiranthes lucida*), leafcup (*Smallanthus uvedalius*), and eastern coneflower (*Rudbeckia fulgida*) for a 12 mile natural gas pipeline project. Prepared reports for PA state regulatory agencies and associated GIS figure creation.

**Environmental Scientist; Williams; Gamelands to Jordan Pipeline Project, Greene County, PA; 2011**. Assisted in surveys for state-listed species including shining ladies' tresses (Spiranthes ovalis), wild senna (*Senna marilandica*), leaf-cup (*Smallanthus uvedalius*), sourwood (*Oxydendron arboreum*), crested dwarf iris *(Iris cristata*), St. Andrew's cross *(Hypericum stragulum*), harbinger-of-spring *(Erigenia bulbosa*), lobed spleenwort *(Asplenium pinnatifidum*), puttyroot (*Aplectrum hyemale*), single-headed pussytoes (*Antennaria solitaria*), and blue monkshood (*Aconitum uncinatum*). Prepared reports for PA state regulatory agencies.

**Environmental Scientist; Range Resources; Multiple Temporary and Permanent Water Pipelines; Washington County, Pennsylvania. 2010 to 2011.** Responsible for wetland delineations and stream evaluations on dozens of temporary and permanent water pipelines linking frac water impoundments in the Washington County area. Also prepared wetland delineation and stream assessment reports.

## CHRONOLOGICAL HISTORY

Wetland/Environmental Scientist III; Tetra Tech, Inc.; Pittsburgh, PA, August 2015 – Present.

Environmental Scientist – Part-time; Pennsylvania Soil and Rock, Inc. Monroeville, PA, March 2015 – August 2015

Environmental Scientist; Dawood Engineering Inc., Canonsburg, PA, February 2014 – January 2015

Biologist II; AECOM Technical Services, Inc.; Pittsburgh, PA, August 2012 – February 2014

Environmental Scientist; Pennsylvania Soil and Rock, Inc.; Monroeville, PA, April 2010 – August 2012

Black Fly Suppression Program Intern; Pennsylvania Department of Environmental Protection; Pittsburgh, PA, May 2008 – August 2008

## SCIENTIFIC/TECHNICAL PUBLICATIONS

- N/A

## MEMBERSHIPS

- Botanical Society of Western Pennsylvania

## AWARDS

- N/A

TETRA TECH

# Cody R. Stoliker

ENVIRONMENTAL SCIENTIST III

## EXPERIENCE SUMMARY

Cody R. Stoliker has approximately 2 years of professional experience in wetland delineation, permitting, and stream assessments and classification in Pennsylvania, New York, Ohio, Virginia and West Virginia. With 4 years of fisheries and wildlife management experience, specializing in large game conservation, Mr. Stoliker has technical expertise working with bear, elk, moose, deer, and wolves in Wyoming, as well as lead biologist experience working with whitetail deer, red stag, feral hogs, and the endangered American Burying Beetle in Oklahoma along pipeline routes where he produced habitat assessments, post monitoring impact statements and performed population control. Mr. Stoliker is assisting Tetra Tech field leads and other environmental scientists to assess and delineate streams and wetlands along natural gas pipeline routes, access roads, right-of-ways, and well pad sites. He acts as Fleet Supervisor overseeing routine and preventative maintenance over department vehicles. Cody R. Stoliker's educational background is in Wildlife Management with a certified training in wetland assessment/delineation and fisheries.

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## RELEVANT EXPERIENCE

**Environmental Scientist September-October 2015,**
**Ninnescah Wind Farm, Platt, Kingman, and Sedgewick Counties, KS**
Conducted wetland and stream delineation for a proposed windfarm infrastructure that included turbines, access roads, electrical collection lines, and transmission lines. Specific tasks included micrositing turbines to avoid water resources on-the-fly, wetland delineation using methods outlined in the USACE wetland delinneation manual, and consultation with the Kansas Department of Water Resources and Kansas Department of Agriculture regarding construction in and around Waters of the United States and FEMA mapped flood zones. Specific tasks existed to monitor for potential habitat for threatened and endangered species, specifically, Arkansas darter, Strecker's Chorus Frog, Plains Minnow, and Arkansas River Speckled Chub. Field and desktop analysis were reported in several peer-reviewed reports.

## EDUCATION

Bachelor of Technology, Wildlife Management, 2013, State University of New York at Cobleskill

## AREA OF EXPERTISE

Large Game Wildlife Management & Conservation, Wetland Assessment

## REGISTRATIONS/ AFFILIATIONS

Ducks Unlimited 2012- Present

Rocky Mountain Elk Foundation 2013 – Present

National Wild Turkey Federation 2013 - Present

## TRAINING/CERTIFICATIONS

Certified Wetland Assessment Delineator, NY, 2010

NYS Certified Class A Interior Firefighter

## OFFICE

Tetra Tech OGA
Pittsburgh, PA

## YEARS OF EXPERIENCE

3

## YEARS WITH TETRA TECH

2

Environmental Scientist III; MarkWest Liberty Midstream & Resources, LLC; Wetland Delineations for Miscellaneous Natural Gas Pipeline Projects; West Virginia. Responsible for performing and assisting with wetland delineations and report drafting/review for various proposed natural gas pipeline projects in West Virginia. Specific tasks included field survey, report preparation, and wetland functional assessments.

Environmental Scientist II , March–February 2016
Equitrans, Mountain Valley Pipeline Project, West Virginia, Virginia, and Pennsylvania
Responsible for performing and assisting with wetland delineations for a proposed 42-inch natural gas pipeline project. Assisted with project start up and procedure implementation, acted as fleet manager for vehicles used during surveys, performed safety inspections and supervised upkeep and maintenance. Wetlands and streams were mapped using Trimble® software, data collected on Apple I-Pads, and worked as part of a team to review/revise collected data for QA/QC.Worked as part of a team reviewing, correcting, drafting, and creating Aquatic Resource Reports for 17 counties detailing +1000 collected features.

Environmental Scientist I; Sunoco Logistics; Wetland Delineations for Miscellaneous Natural Gas Pipeline Projects Pennsylvania. Responsible for performing and assisting with wetland delineations and stream assessments for the proposed Pennsylvania Pipeline Project. Other responsibilities included report preparation and wetland functional assessments.

Environmental Scientist I; MarkWest Liberty Midstream & Resources, LLC; Wetland Delineations for Miscellaneous Natural Gas Pipeline Projects; Pennsylvania. Responsible for performing and assisting with wetland delineations for various proposed natural gas pipeline projects in southwestern Pennsylvania. Specific tasks included field survey, report preparation, and wetland functional assessments.

Environmental Scientist I; MarkWest Ohio Gathering Company, LLC; Wetland Delineations for Miscellaneous Natural Gas Pipeline Projects; Ohio. Responsible for performing and assisting with wetland delineations for various proposed natural gas pipeline projects in eastern Ohio. Specific tasks included field survey, report preparation, and completion of Ohio EPA specific wetland and stream assessments.

## SCIENTIFIC/TECHNICAL PUBLICATIONS

N/A

## CHRONOLOGICAL HISTORY

Environmental Scientist I, Tetra Tech, 2014-2015, Pittsburgh, PA

Wildlife Biologist/Ranch Manager, Oklahoma Trophy Ranch, 2013-2014, Allen, OK

Wildlife Management Technician, Rolling Thunder & Rim Ranches, Spring-Fall 2013, Bondurant, WY

Assistant Herdsman, Bison Island, 2012-2013, Sharon Springs, NY

Avian Survey Technician, NYS Dept. of Environmental Conservation, Winter 2011, Albany NY

TETRA TECH

# Deanna N. Quinn
## Wetland/Environmental Scientist II

### EXPERIENCE SUMMARY

Ms. Quinn has five years' experience as an environmental scientist/ wildlife biologist with a background in wildlife and fisheries resource management. Deanna has performed numerous wildlife and vegetation surveys, stream assessments habitat assessments and related report generation. As an Environmental Scientist, Deanna has had the opportunity of working fulltime on wetland delineations under Environmental Wetland Specialists, primarily for Marcellus shale projects. She also has experience performing bat hibernaculum habitat surveys in Western Pennsylvania as well as Phase 1 Bog Turtle surveys in Pennsylvania.

### RELEVANT EXPERIENCE

**Mountain Valley Pipeline, LLC; Mountain Valley Pipeline Project**

Prepared wetland delineation/stream identification reports for proposed 301 mile natural gas pipeline project.

**Sunoco Logistics, Ohio-Pennsylvania Pipeline Project, Spanning from Delaware County, PA through Harrison County, Ohio.** Ms. Quinn conducted site investigations, wetland delineations, stream assessments, performed Ohio Rapid Assessment Method, PHWH HHEI & QHEI, Phase 1 Bog Turtle surveys, macroinvertebrate surveys, and wetland report preparation for proposed 300 mile natural gas pipeline reaching from the Delaware River in PA to Scio, OH.

**Gulfport Energy; Various Natural Gas Well Pad Sites; Belmont County, Ohio.** Ms. Quinn conducted site investigations, wetland delineations, stream assessments, performed Ohio Rapid Assessment Method, PHWH HHEI & QHEI, and wetland report preparation for proposed well pad locations in Belmont County, Ohio.

**MarkWest Liberty Midstream & Resources, LLC; Wetland Delineations for Miscellaneous Natural Gas Pipeline Projects; Pennsylvania.** Responsible for performing and assisting with wetland delineations for various proposed natural gas pipeline projects in southwestern Pennsylvania. Specific tasks included field survey, report preparation, and wetland functional assessments.

### CHRONOLOGICAL HISTORY

**Tetra Tech, Inc**. -Environmental Scientist II (2013-present) Pittsburgh, PA
**The University of Pittsburgh** –Animal Husbandry Services Technician I, (2013) Pittsburgh, PA

### EDUCATION

BT Wildlife Management, 2011, SUNY Cobleskill

AAS Animal Sciences & Ecology, 2009, SUNY Delhi

### REGISTRATIONS

*PADCNR Wild Plant Management Permit No. 16-652*

### TRAINING/CERTIFICATIONS

Certified Wetland Assessment Delineator, 2010, NY

First Aid/CPR/AED, 1/11/16

### OFFICE

Pittsburgh, PA

### YEARS OF EXPERIENCE

5

### YEARS WITH TETRA TECH

3 year 4 months

### CONTACT

Deanna.Quinn@tetratech.com

**National Parks Service**-Wildlife Ranger (2012) Yosemite, CA
**Loomacres Wildlife Management** -Wildlife Biologist (2010-2012) Cobleskill, NY
**The University of Florida** -Avian Research Technician (2011) Abaco, Bahamas
**New York State Department of Environmental Conservation**-Predator Research Technician (2010) Batavia, NY

## MEMBERSHIPS

- The Wildlife Society
- Society of Wetland Scientists

TETRA TECH

# Jennifer Bittner
## Environmental Scientist I

## EXPERIENCE SUMMARY

Jennifer Bittner has four years of experience in the environmental field. Her experience includes wetland delineation and stream assessments, wetland and stream mitigation monitoring, rare plant species surveys, and report preparation for longwall mining, natural gas pipeline, water withdrawal, and facility projects in Pennsylvania, West Virginia, and Ohio. She also has experience inspecting and recommending corrective actions for erosion and sedimentation issues on post-construction pipeline right-of-ways and facilities in PA and WV.

## RELEVANT EXPERIENCE

### ENERGY

- **Environmental Scientist I; Equitrans, LP; Mountain Valley Pipeline Project; May 2015 to Present.** Assisted with wetland delineations, stream assessments, and report preparation for the proposed 300 mile pipeline stations beginning in Wetzel County, WV to Pittsylvania County, VA.
- **Environmental Scientist I; Sunoco; Pennsylvania Pipeline Project; December 2014 – Present.** Assisted with wetland delineations, stream assessments, and report preparation for the proposed 300 mile pipeline beginning in Washington County, PA to Delaware County, PA.
- **Environmental Scientist I; MarkWest Liberty Midstream & Resources, LLC; January 2014 to Present.** Assisted with wetland delineations, stream assessments, and report preparation for multiple pipeline proposed pipeline projects and re-routes in Washington County, PA.
- **Environmental Scientist I; Range Resources; January 2014 to December 2015.** Assisted with wetland delineations, stream assessments, and report preparation for various proposed water withdrawal locations in Southwestern PA.
- **Environmental Scientist I; PADEP; December 2015.** Assisted with wetland delineations and stream assessments for a proposed pipeline in Indiana County.
- **Environmental Scientist I; Peoples TWP, LLC; September 2014 to October 2015.** Assisted with wetland delineations and stream assessments for a proposed distribution line in Cambria County.
- **Environmental Scientist I; Sunoco; Ohio Pipeline Project; December 2014 – April 2015.** Assisted with report preparation for wetland and stream delineations.
- **Environmental Scientist I; Rice Energy Inc.; December 2014.** Assisted with stream field surveys in Belmont County, OH.
- **Compliance Monitor; Hunt, Gulliot & Associates, April 2014 - November 2014.** Inspected post-construction pipeline and facility right-of-ways for erosion and sedimentation issues for Williams Companies, Inc. Tasks included documenting issues and recommending corrective actions, coordinating with other compliance monitors on how to effectively inspect all assigned pipeline and facilities each week, and completing weekly E&S Inspection reports.

### EDUCATION

M.S. Environmental Science and Management, Duquesne University

B.S. Marine Biology, Waynesburg University

### TRAINING/CERTIFICATIONS

40 Hour Army Corps of Engineers Wetland Delineation Training, Richard Chinn Environmental Training, Inc., 2015

CPR / First Aid / AED

### REGISTRATIONS/ AFFILIATIONS

PADCNR Wild Plant Management Permit
Permit No. 16-701 (2016)

Society of Wetland Scientists (SWS)

Environmental Professional Intern
Institute of Environmental Professional Practice
License 00210713

### AREA OF EXPERTISE

Environmental Science

### OFFICE

Pittsburgh, PA

### YEARS OF EXPERIENCE

4

### YEARS WITHIN FIRM

1

- **Staff Scientist; CONSOL Energy, Inc. May 2013 - December 2013.** Assisted with wetland and stream mitigation monitoring for longwall mining restoration projects. Tasks included conducting vegetation surveys, water sampling, soil surveys, and report preparation.

- **Staff Scientist; CONSOL Energy, Inc. May 2013.** Assisted with rare plant surveys for power line project. Tasks included making plots and documenting the rare plant observed.

- **Staff Scientist CONSOL Energy, Inc. October 2012 – December 2012.** Assisted with stream mitigation surveys for longwall mining projects**.** Tasks included conducting vegetation surveys, water sampling, and report preparation.

## SAMPLING

- **Water Quality Intern; Clearwater Marine Aquarium, May 2010 – August 2010.** Maintained water quality and appearance for all exhibits. Tasks included daily water testing using a YSI meter, recordkeeping, backwashing pumps, and feeding fish, sharks, and stingrays.

## CHRONOLOGICAL HISTORY

- Wetland/Environmental Scientist I; Tetra Tech, Pittsburgh, PA; December 2014 – Present
- Compliance Monitor; Hunt, Guillot & Associates, LLC; Pittsburgh, PA; April 2014 – November 2014
- Staff Scientist; Civil & Environmental Consultants, Inc.; Pittsburgh, PA; October 2012 – April 2014
- Teaching Assistant; Duquesne University; Pittsburgh, PA; January 2012 – April 2012

TETRA TECH

# Kevin Pulver
## Wetland/Environmental Scientist II

## EXPERIENCE SUMMARY

Mr. Kevin Pulver has 2 years of professional experience in wetland delineation and stream assessment and classification throughout Pennsylvania, Ohio, Virginia, and West Virginia. As a Wetland Environmental Scientist I, Mr. Pulver had the opportunity to perform numerous wetland delineations under the supervision of seasoned professionals within the Wetlands and Ecological Services Department of Tetra Tech. Delineations were primarily performed for natural gas pipeline projects. Mr. Pulver's educational background includes watershed management/stream restoration and environmental science. He is also versed in GIS and AutoCAD software application.

## RELEVANT EXPERIENCE

### OIL/GAS

**Environmental Scientist II; Equitrans, LP; Field Operations Coordinator; Mountain Valley Pipeline Project – 2015 to Present.** Responsible for the management and oversight of all wetland and stream delineation activities for the proposed Mountain Valley Pipeline Project.

**Environmental Scientist II; Sunoco Logistics; Wetland Delineations for Miscellaneous Natural Gas Pipeline Projects Pennsylvania – 2014 to Present.** Responsible for performing and assisting with wetland delineations and stream assessments for the proposed Pennsylvania Pipeline Project. Other responsibilities included report preparation and wetland functional assessments.

**Environmental Scientist II; Sunoco Logistics; Wetland Delineations for Miscellaneous Natural Gas Pipeline Projects Pennsylvania – 2014 to Present.** Responsible for performing and assisting with wetland delineations and stream assessments for the proposed Pennsylvania Pipeline Project. Other responsibilities included report preparation and wetland functional assessments.

**Environmental Scientist II; MarkWest Liberty Midstream & Resources, LLC; Wetland Delineations for Miscellaneous Natural Gas Pipeline Projects; Pennsylvania – 2014 to Present.** Responsible for performing and assisting with wetland delineations for various proposed natural gas pipeline projects in southwestern Pennsylvania. Specific tasks included field survey, report preparation, and wetland functional assessments.

## EDUCATION

B.A. Environmental Studies, 2011, Penn State University - Altoona

B.S. Geography: Watershed Management; Environmental Science, 2013, Mansfield University of Pennsylvania

## REGISTRATIONS/ AFFILIATIONS

PADCNR Wild Plant Management, Permit No. 16-673 (2016)

## TRAINING/CERTIFICATIONS

Certificate in Wetland Delineation from Wetland Training Institute (2013)

CPR / First Aid / AED (2015)

## OFFICE

Pittsburgh, PA

## YEARS OF EXPERIENCE

2

## YEARS WITH TETRA TECH

2

## CONTACT

Email: kevin.pulver@tetratech.com

Direct: 412.920.7024

**Environmental Scientist II; MarkWest Ohio Gathering Company, LLC; Wetland Delineations for Miscellaneous Natural Gas Pipeline Projects; Ohio – 2014 to Present.** Responsible for performing and assisting with wetland delineations for various proposed natural gas pipeline projects in eastern Ohio. Specific tasks included field survey, report preparation, and completion of Ohio EPA specific wetland and stream assessments.

**Environmental Scientist II; Travis Peak Resources, LLC; Wetland Delineations for a Proposed Water Withdrawal on Pine Creek and a Proposed Tank Farm Location in Tioga County, PA; Pennsylvania – 2016.** Responsible for performing and assisting with wetland delineations on a proposed water withdrawal and tank farm area in Tioga County, PA. Specific tasks included field survey and report preparation.

## EMPLOYEMENT HISTORY

- Wetland/Environmental Scientist II, Tetra Tech, Inc., November, 2014 – Present, Pittsburgh, PA
- AutoCAD Drafter, Land Services Group, November 2013-July 2014, Wellsboro, PA
- Cartographer, Intelligent Direct, Inc., May 2013 – November 2013, Wellsboro, PA
- Biological Scientist Intern, United States Geologic Survey - Northern Appalachian Research Laboratory, Summer 2012, Wellsboro, PA

## SCIENTIFIC/TECHNICAL PUBLICATIONS

- N/A

## MEMBERSHIPS

- Society of Wetland Scientists