Northeastern Bulrush (*Scirpus ancistrochaetus*) Conservation Plan

Pennsylvania Pipeline Project
USFWS #2014-0200

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September 2015

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LIST OF ACRONYMS and ABBREVIATIONS

ACRONYM	MEANING
ESA	Endangered Species Act
ft	Foot or Feet
G3	Global Vulnerable
HDD	Horizontal Directional Drill
LOD	Limit of Disturbance
LE	Federal Listed Endangered
m	Meter
mm	Millimeter
MNHESP	Massachusetts Natural Heritage & Endangered Species Program
NGL	Natural Gas Liquid
PA	Pennsylvania
PE	Pennsylvania Endangered
PNHP	Pennsylvania Natural Heritage Program
Project	Pennsylvania Pipeline Project
PPP	Pennsylvania Pipeline Project
PS&R	Pennsylvania Soil and Rock, Inc.
ROW	Right-of-Way
S3	State Vulnerable
Skelly and Loy	Skelly and Loy, Inc.
S&L	Skelly and Loy, Inc. (Figure 2)
SPLP	Sunoco Pipeline, L.P.
Tetra Tech	Tetra Tech Inc.
TT	Tetra Tech (Figure 2)
USGS	U.S. Geological Survey
USFWS	U.S. Fish and Wildlife Service

1.0 PROJECT INTRODUCTION

1.1 PROJECT OVERVIEW

Sunoco Pipeline, L.P. (SPLP) proposes to construct and operate the Pennsylvania Pipeline Project (PPP or Project) to expand existing pipeline systems and provide natural gas liquid (NGL) transportation of up to 350,000 barrels per day. The Project involves the phased installation of approximately 561 miles of two parallel pipelines within a 306-mile, 50-foot-wide right-of-way (ROW) from Houston, Washington County, Pennsylvania (PA) to SPLP's Marcus Hook facility in, Delaware County, Pennsylvania with the purpose of interconnecting with existing SPLP Mariner East pipelines. These lines would parallel the previously installed Mariner East 8-inch line for the majority of the Project. Initially, a 20-inch diameter pipeline would be installed within the ROW from Houston, PA to the Marcus Hook facility (306 miles) and a second, up to 20-inch diameter pipeline, is proposed be installed in the same ROW. The second line is proposed to be installed from SPLP's Delmont Station, Westmoreland County, Pennsylvania to the Marcus Hook facility, paralleling the initial line for approximately 255 miles. The Project location is shown on Figure 1 (Appendix A).

1.2 PURPOSE OF CONSERVATION PLAN

The northeastern bulrush is a federal listed endangered species protected under the federal Endangered Species Act (ESA). Tetra Tech, Inc. (Tetra Tech) was contracted by SPLP to coordinate with United States Fish and Wildlife Service (USFWS) regarding the potential presence of northeastern bulrush (*Scirpus ancistrochaetus*) along the proposed route of the Project. As a result of that coordination, the USFWS identified sections along the proposed ROW where presence/absence surveys would be required to ensure the species is protected (Appendix B, Agency Coordination).

This Northeastern Bulrush Conservation Plan provides a summary of the proposed project description, species biology and habitat preferences, results of presence/absence surveys, and measures to avoid potential impacts to identified northeastern bulrush populations in the vicinity of the Project.

2.0 NORTHEASTERN BULRUSH BIOLOGY AND HABITAT PREFERENCE

Northeastern bulrush is a perennial graminoid member of the Sedge Family (Cyperaceae) with culms over one meter (m) tall (MNHESP 2015). The reproductive culms have five to nine leaves 7 to 13 millimeters (mm) wide (MNHESP 2015). The inflorescence branches are downward arching at maturity, with long brown spikelets at the end (USFWS 1993; Rhoads and Block 2007). Each achene has six perianth bristles with tipped retrorse barbs (USFWS 1993). Northeastern bulrush is similar to dark green bulrush (*S. atrovirens*), leafy green bulrush (*S. hattorianus*), and Georgia bulrush (S*. georgianus*). Northeastern bulrush is distinguished from its congeners by its downward arching inflorescence rays and six perianth bristles with retrorse barbs (USFWS 1993). Photographs of northeastern bulrush can be found in Appendix D (Photographs 1 – 2, Appendix C).

Northeastern bulrush is globally ranked as G3 (Global Vulnerable), state ranked as S3 (State Vulnerable), and its federal status is Listed Endangered (LE) and its Pennsylvania status is Pennsylvania Endangered (PE) (Pennsylvania Natural Heritage Program [PNHP] 2015). Northeastern bulrush is found from Quebec south to West Virginia, with the largest number of occurrences in Pennsylvania (PNHP 2015; USFWS 2009). In Pennsylvania, northeastern bulrush is primarily found in the Appalachian Mountain physiographic section in vernal pools, open wetlands, floodplain depressions, and beaver ponds on top of broad high forested plateaus (PNHP 2015; USFWS 2009). In Pennsylvania, northeastern bulrush fruits July to August (PNHP 2015; Rhoads and Block 2007).

3.0 CONSERVATION PLAN

Consultation with USFWS identified the potential presence of northeastern bulrush in Cambria, Blair, Huntington, Juniata, and Perry Counties, PA in areas crossed by the Project. Consultation with USFWS determined that field surveys should focus on wetlands, waterbodies, and vernal pools within the Project area at 1300 feet elevation or higher as suitable habitat. Potential habitats had been previously identified and delineated within a 200-foot (ft) wide wetland study area corridor of the entire proposed pipeline by Tetra Tech in 2014 and 2015.

Tetra Tech conducted northeastern bulrush surveys in Juniata and Perry counties, PA in 2015 and contracted Skelly and Loy, LLC. (Skelly & Loy) to conduct northeastern bulrush surveys in Huntingdon and Blair counties in 2014, and Pennsylvania Soil & Rock, Inc. (PS&R) to conduct northeastern bulrush surveys in Cambria Co. in 2014 (Table 1, Appendix D). PS&R conducted additional surveys in Cambria, Blair, and Huntingdon counties in 2015 to capture areas not surveyed in 2014 (e.g., Project route revisions, inaccessible properties, proposed temporary access roads).

3.1 FIELD SURVEY

Using U.S. Geological Survey (USGS) topographic maps, aerial photography (Figure 2, Appendix B), and wetland delineation information, Study Areas were identified within the Project's proposed limit of disturbance (LOD). The LOD included all proposed workspaces involving new land disturbances, including the permanent ROW, temporary workspaces, access roads, pump stations, and staging areas. As a result, 46 Study Areas (200-ft wide, 100-ft on both sides of the Project centerline) were identified as requiring field survey for the northeastern bulrush (Figure 2, Appendix A). Note that Skelly & Loy conducted surveys in 600-ft wide survey corridors (300-ft each side of the Project centerline) in Blair and Huntingdon counties in 2014. In addition, PS&R surveyed a 700-ft wide area (350-ft on each side of the Project centerline) in the vicinity of an identified northeastern bulrush population in Cambria County. Figure 2 (Appendix A) shows all northeastern bulrush Survey Areas surveyed in 2014 and 2015; Survey Areas are identified by the surveyor (i.e. PS&R, Skelly & Loy [S&L], Tetra Tech [TT]) and a unique survey segment number (e.g. PS&R Seg 1, S&L Seg 1, TT Seg P1). 2015 PS&R Survey Areas are identified on Figure 2 as gap areas (e.g. PS&R Gap #1).

Field surveys identified 231 total potential northeastern bulrush habitat areas (e.g. vernal pools, wetlands, floodplain depressions) within the 46 Study Areas (Table 1, Appendix D). Field surveys of the 231 potential northeastern bulrush habitat areas identified two confirmed northeastern bulrush populations, one in Blair Co., and one in Cambria Co (Table 2, Appendix D).

The Blair Co. population is located outside of the proposed LOD, approximately 340-ft from the edge of the proposed LOD (Figure 3, Appendix A; Photographs 3 – 4, Appendix C; Skelly and Loy 2015).

The Cambria Co. population is located within the proposed LOD, approximately 75-ft from an existing access road (Figure 4, Appendix A; Photographs 5 – 6, Appendix C; PS&R 2014).

Additional information on the survey methodology and survey results can be found in the PS&R (PS&R 2014; 2015), Skelly & Loy (Skelly & Loy 2014), and Tetra Tech (Tetra Tech 2015) survey reports previously submitted to USFWS.

3.2 CONSERVATION MEASURES

3.2.1 *Pre-Construction*

From the onset of the Project, SPLP has instructed project designers to consider environmental impacts in regard to all aspects of the proposed Project and to avoid and minimize wherever possible while allowing safe installation. Pipeline engineers were provided a large list of restrictions, recommendations, and requirements to consider during the design phase. Major considerations, including co-location with existing utility corridors, limiting the construction corridor to the minimum amount practicable, and use of horizontal directional drilling (HDD) technology, have been implemented to avoid and minimize environmental impacts at sensitive habitats.

SPLP has co-located the Project with an existing SPLP right-of-way (ROW) for the majority of the route (~80%). With the use of portions of the existing ROW for construction, this is a major means for avoiding new impacts to sensitive resources (i.e., forested wetlands, forest areas, streams) and for minimizing environmental impacts for the entire Project. SPLP has also co-located with foreign utility lines whenever possible when routing pulls away from existing SPLP ROWs. In addition, SPLP has implemented a number route variations through environmental feedback, both minor and major, to further reduce the impacts associated with the Project. Many of these route variations are driven by environmental factors such as avoidance of forested wetlands or areas occupied by sensitive species.

In general, the construction ROW is limited to 75 feet in most areas. This is comprised of a 50-foot-wide permanent easement and 25 feet of temporary workspace required to facilitate construction. In some areas, additional temporary workspace is required to facilitate construction. The industry standard for installation of this size of pipe is 100 feet. Restricting construction to 75 feet significantly reduces impacts to the landscape including a large reduction in impacts to forested areas. Instead of continuing through the wetlands/streams with the 75-foot-wide construction ROW, SPLP has narrowed the construction ROW to 50 feet for all wetland/stream crossings thus minimizing temporary impacts to wetlands/streams during construction. This narrow construction corridor, along with co-location efforts has greatly minimized fragmentation of habitat impacts.

Another major construction alternative implemented by SPLP to avoid and minimize environmental impacts, is the horizontal directional drill (HDD) method at areas of unique sensitivity (i.e., bog turtle habitat, rare plant populations, large rivers or reservoirs, forested wetlands, and cultural resource sites). Without HDD, typical construction methods through these areas would involve conventional pipeline trenching (i.e. open cut trenching) construction methods, resulting in significant impacts. Specifically, conventional construction throughout the entire Project length would have required clearing, grading, and the excavation and disturbance of approximately 100 acres of wetlands and approximately 87,000 feet of stream crossings (linear length of stream in construction ROW). In comparison, with the currently proposed locations of HDD construction, impacts have been reduced to approximately 38 acres of wetlands and approximately 52,800 feet of stream crossings. Consequently, the alternative HDD construction method has reduced impacts by approximately 62 acres to wetlands and 34,200 feet to streams. Based on these reduced impacts to wetland/stream resources, the overall Project will result in fewer biological impacts, decreased disturbance to soils, decreased erosion sedimentation and runoff and water quality, and less recreational impacts. As such, SPLP has agreed to employ HDD construction methods at certain wetland and stream crossings.

3.2.2 *Construction*

The Blair Co. northeastern bulrush population is located in a vernal pool approximately 340-ft outside of the LOD edge (Figure 3, Appendix A; Skelly and Loy 2015). The preliminary Project LOD was initially located within 125-ft of this population (the preliminary LOD is not shown on Figure 3, Appendix A). SPLP is proposing to avoid potential impacts to this population by re-routing the Project centerline to the south (towards an existing ROW) to further avoid this population and provide a greater buffer area between the Project LOD and this population (the re-routed centerline is shown on Figure 3, Appendix A). Based on the

location of this population and the 340-ft buffer between the population and the current proposed LOD, the Project alignment will avoid this habitat and have no impact on this population.

The Cambria Co. northeastern bulrush population is located in a vernal pool within the proposed LOD, approximately 75-ft from an existing wind turbine access road (Figure 4, Appendix A; PS&R 2014). SPLP is proposing to avoid impacts to this population, the vernal pool/wetland the population is located within, and other wetlands located in the vicinity by installing the pipeline using HDD under a 1684-ft section of the proposed centerline (HDD Plan Profile, Appendix E). The proposed HDD will begin on the southeast side of the access road approximately 150-ft southeast of the northeastern bulrush population, continue for approximately 1684-ft, and end approximately 1534-ft northwest of the northeastern bulrush population location. The HDD depth will be approximately 50 feet below soil surface when passing underneath this population. The use of a HDD in this area will avoid trenching or any other surface disturbance in this 1684-ft section of the Project. The closest surface disturbance to this population will be 150-ft to the southeast, on the opposite side of the access road. There will be no travel through or tree clearing between the exit and entry points on this HDD. It is anticipated that the use of HDD in this area will avoid any potential direct or indirect impacts to this population by the Project.

Environmental Inspector will ensure construction fencing will be installed and no access signs placed on the northwest side off the access road to avoid potential inadvertent use of the area for travel through or other unplanned activities. Access will be limited between the HDDs to foot-travel for inspection of inadvertent returns and any professional land survey that may be required. The area will be regularly inspected for compliance.

Inadvertent return of drilling lubricant is a potential concern when HDD is utilized under sensitive habitats. The attached Inadvertent Return Plan (Appendix F) provides a summary of preventative measures designed to minimize the risk of an inadvertent return and responsive measures to be implemented in the unlikely event of an inadvertent return. Responsive measures are designed to minimize the impact of inadvertent returns on sensitive environmental resources, including the identified northeastern bulrush population.

SPLP anticipates that a Project re-route will avoid potential impacts to the Blair Co. population. SPLP anticipates that impacts to the Cambria Co. population will be avoided with the use of an HDD, along with exclusion fencing, signage, compliance inspection, and implementation of the inadvertent return plan. As such, SPLP concludes that the Project will not likely adversely impact any identified northeastern bulrush populations.

3.2.3 *Post-Construction*

SPLP does not anticipate any potential impacts to identified northeastern bulrush populations and does not anticipate the need for post-construction conservation measures. The Blair Co. population is located approximately 340-ft from the proposed ROW and will therefore not be impacted by Project construction activities or post-construction routine pipeline ROW operation and maintenance activities (e. g. mowing and erosion control).

The Cambria Co. population is located along the proposed Project centerline, however, potential impacts to this population will be avoided using an approximately 1684-ft HDD under this population. The use of a HDD in this area will avoid surface disturbance in this 1684-ft section of the Project during construction and ensures that there will be no post-construction routine pipeline operation and maintenance activities (e.g. mowing and erosion control) occurring in the vicinity of this population.

After the completion of construction activities, one post-construction site visit will be conducted by a qualified northeastern bulrush surveyor to monitor the identified northeastern bulrush populations. The post-construction site visit will document completed Project activities in the vicinity of the identified populations. The identified populations will be visited during recommended survey periods (July – September) to count northeastern bulrush populations (total culms and reproductive culms) and describe the wetland habitats they are located in. A brief letter report summarizing the results of the post-construction monitoring will be submitted to USFWS.

4.0 CONCLUSION

Field surveys of the 231 potential northeastern bulrush habitat areas identified two confirmed northeastern bulrush populations, one in Blair Co., and one in Cambria Co. (Table 2, Appendix D). The Blair Co. population is located approximately 340-ft from the proposed ROW and will therefore not be impacted by Project construction activities or post-construction routine pipeline ROW operation and maintenance activities (e. g. mowing and erosion control). The Cambria Co. population is located along the proposed Project centerline, however, potential impacts to this population will be avoided using an approximately 1684-ft HDD under this population and installation of exclusion fencing and signage. SPLP does not anticipate any potential impacts to identified northeastern bulrush populations and does not anticipate the need for post-construction conservation measures. After the completion of Project construction activities, one post-construction site visit will be conducted by a qualified northeastern bulrush surveyor to monitor the identified northeastern bulrush populations. Based on SPLP commitments to the protection and conservation of the northeastern bulrush and what is known about the presence and/or potential presence of this ESA listed species in the vicinity of the Project areas, we conclude that the PPP is not likely to adversely affect the northeastern bulrush.

5.0 REFERENCES

Massachusetts Natural Heritage & Endangered Species Program (MNHESP). 2015. Massachusetts Endangered Plants: Northeastern bulrush (*Scirpus ancistrochaetus*). Available at: http://www.mass.gov/eea/docs/dfg/nhesp/species-and-conservation/nhfacts/scirpus-ancistrochaetus.pdf

Pennsylvania Natural Heritage Program (PNHP). 2015. Northeastern bulrush (*Scirpus ancistrochaetus*) Fact Sheet. Available at: http://www.naturalheritage.state.pa.us/factsheets/15236.pdf

Pennsylvania Soil & Rock, Inc. (PS&R). 2014. Botanical Survey for Northeastern Bulrush: Sunoco Pennsylvania Pipeline Project, USFWS #2014-0200, for Cambria County, Pennsylvania. Submitted October 16, 2014. 319pp.

Pennsylvania Soil & Rock, Inc. (PS&R). 2015. Supplemental Botanical Survey for Northeastern Bulrush: Sunoco Pennsylvania Pipeline Project, USFWS #2014-0200, for Cambria, Blair, and Huntingdon Counties, Pennsylvania. September 2015. 319pp.

Rhoads, AF and TA Block. 2007. The Plants of Pennsylvania: An Illustrated Manual (2nd ed.). Philadelphia, PA: University of Pennsylvania Press.

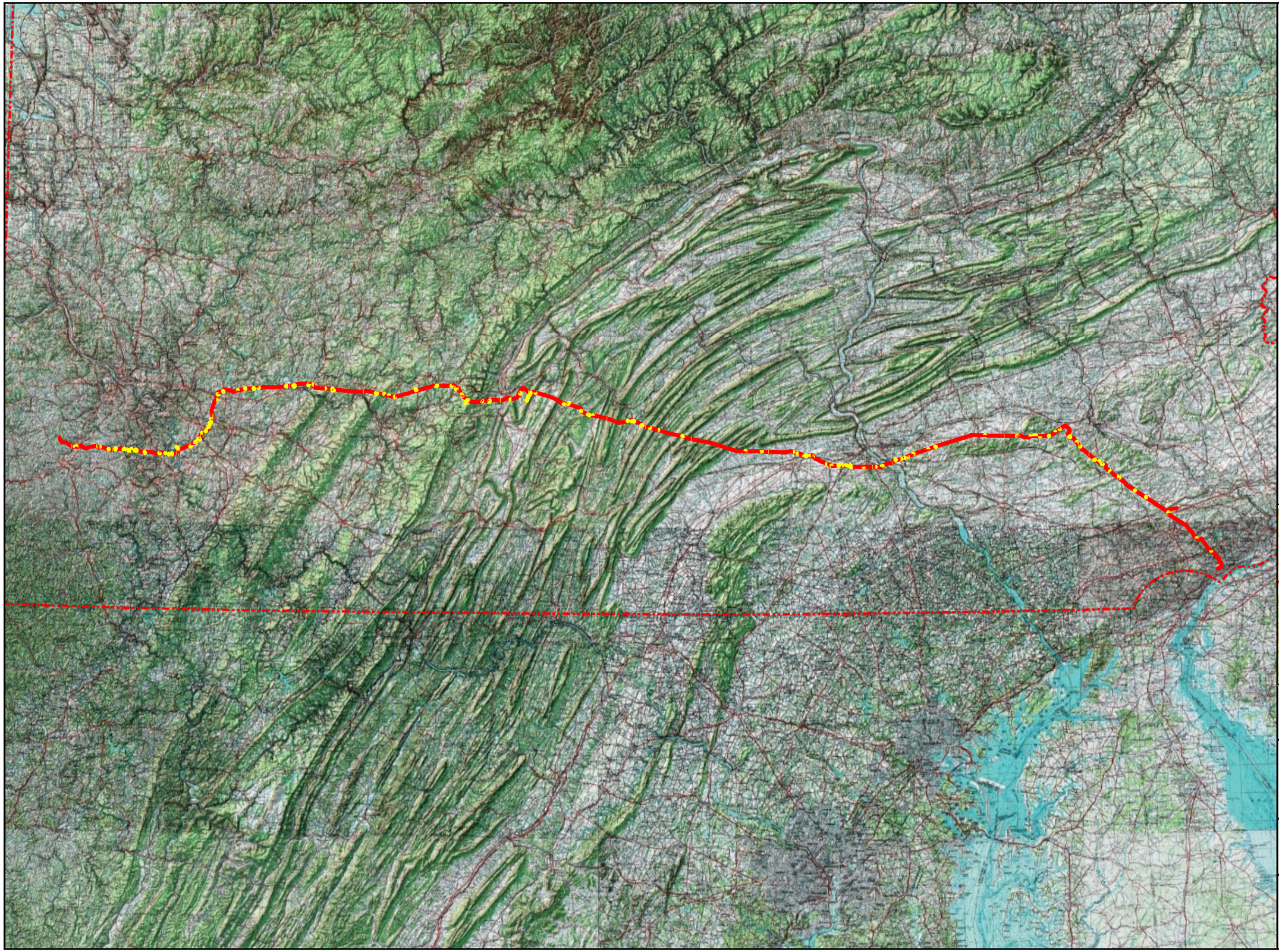
Skelly and Loy, Inc. (Skelly and Loy). 2015. PA Pipeline Project, USFWS #2014-0200, Huntingdon and Blair Counties, Pennsylvania, Northeastern Bulrush Survey Report. August 14, 2015. 48pp.

Tetra Tech, Inc. (Tetra Tech). 2015. Northeastern Bulrush (Scirpus ancistrochaetus) Survey Report. Pennsylvania Pipeline Project; USFWS #2014-0200. Juniata & Perry Counties, Pennsylvania. September 2015. 38pp.

United States Fish and Wildlife Service (USFWS). 1993. Northeastern bulrush (*Scirpus ancistrochaetus*) Recovery Plan. Hadley, MA. 68 pp.

United States Fish and Wildlife Service (USFWS). 2009. 5-Year Review: Northeastern bulrush (*Scirpus ancistrochaetus*). State College, PA. 55 pp.

APPENDIX A
Figures



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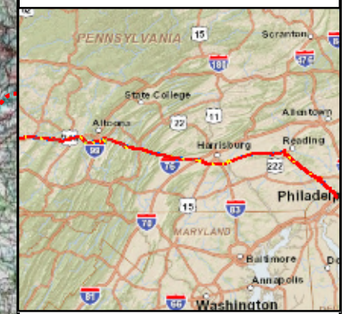

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Miles
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FIGURE 1
USGS PROJECT LOCATION MAP

PENNSYLVANIA PIPELINE PROJECT
SUNOCO LOGISTICS, L.P.
COUNTY,

TETRA TECH

Notes:
1) Aerial photograph provided by ESRI's ArcGIS Online World Imagery map service (© 2011 ESRI and its data suppliers).
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- Wetland Delineation Study Area
- NE Bulrush Study Area
- County Boundary

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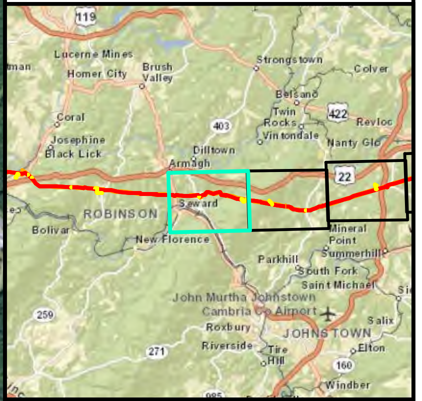

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NORTHEAST BULRUSH STUDY AREA OVERVIEW
FIGURE 2-1
PENNSYLVANIA PIPELINE PROJECT
AUGUST 19, ALIGNMENT
SUNOCO LOGISTICS, L.P.
INDIANA COUNTY, PA

TETRA TECH

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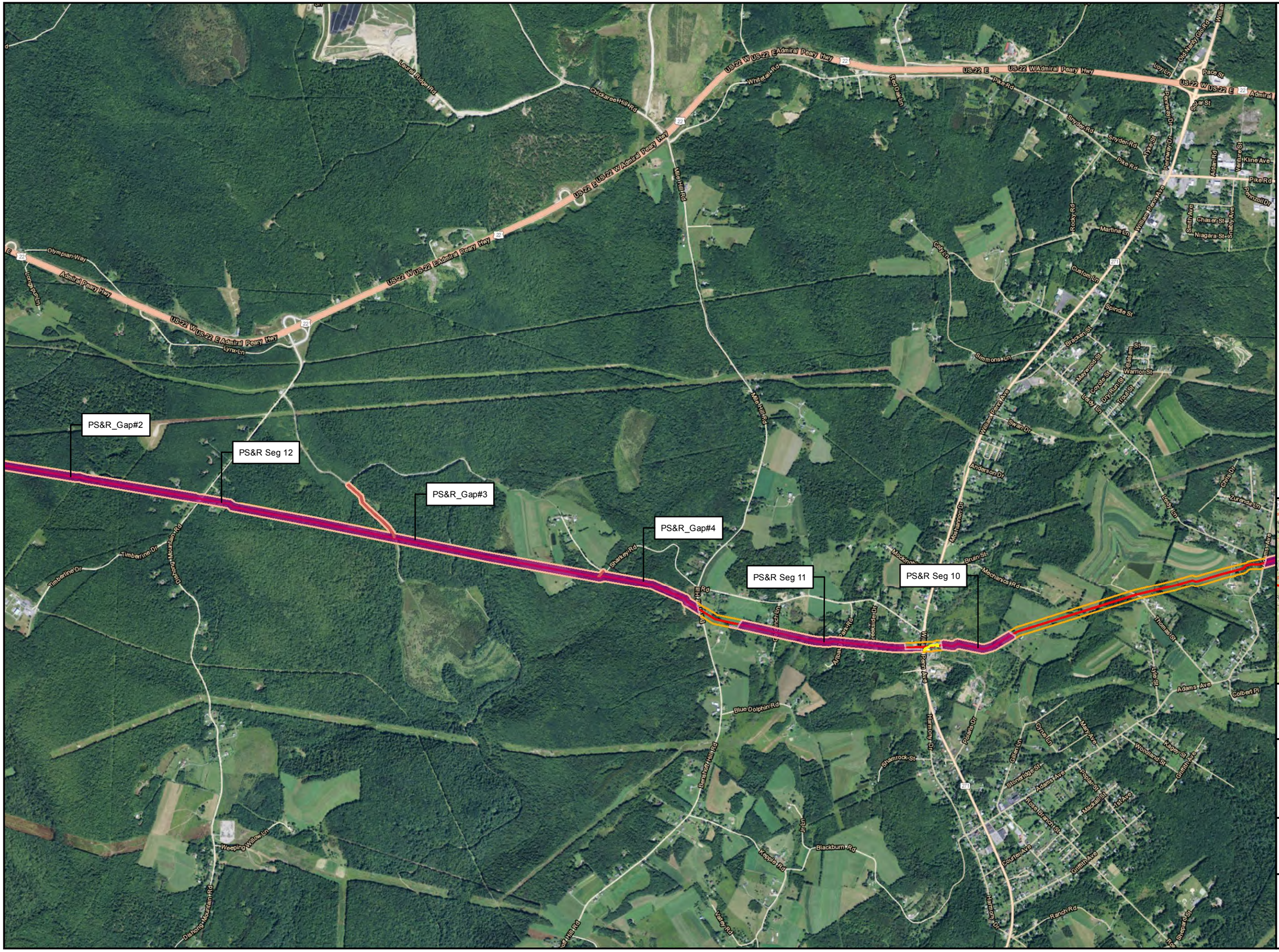

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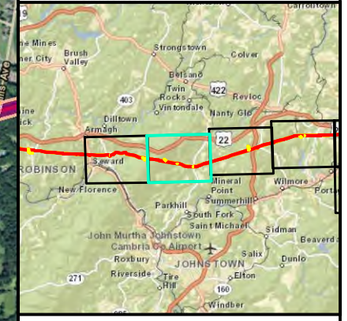

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NORTHEAST BULRUSH STUDY AREA OVERVIEW
FIGURE 2-2
PENNSYLVANIA PIPELINE PROJECT
AUGUST 19, ALIGNMENT
SUNOCO LOGISTICS, L.P.
CAMBRIA COUNTY, PA

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PS&R Seg 7

PS&R_Gap#5

PS&R Seg 8

PS&R Seg 9

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- Wetland Delineation Study Area
- NE Bulrush Study Area
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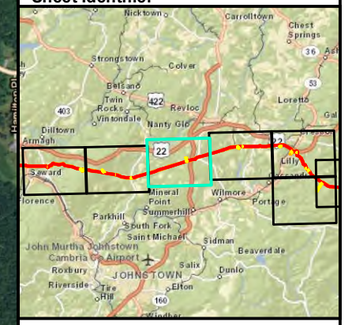

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NORTHEAST BULRUSH STUDY AREA OVERVIEW
FIGURE 2-3
PENNSYLVANIA PIPELINE PROJECT
AUGUST 19, ALIGNMENT
SUNOCO LOGISTICS, L.P.
CAMBRIA COUNTY, PA

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PS&R_Gap#6

PS&R Seg 6

PS&R Seg 5

PS&R Seg 4

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- NE Bulrush Study Area
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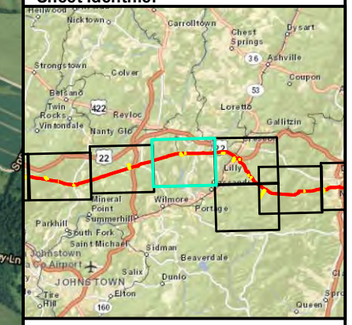

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NORTHEAST BULRUSH STUDY AREA OVERVIEW
FIGURE 2-4
PENNSYLVANIA PIPELINE PROJECT
AUGUST 19, ALIGNMENT
SUNOCO LOGISTICS, L.P.
CAMBRIA COUNTY, PA

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PS&R Seg 4

PS&R_Gap#7

PS&R Seg 3

PS&R_Gap#8

PS&R Seg 2

PS&R_Gap#9

PS&R Seg 1

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- Access Road
- Wetland Delineation Study Area
- NE Bulrush Study Area
- County Boundary

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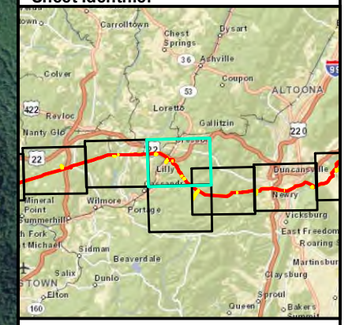

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NORTHEAST BULRUSH STUDY AREA OVERVIEW
FIGURE 2-5
PENNSYLVANIA PIPELINE PROJECT
AUGUST 19, ALIGNMENT
SUNOCO LOGISTICS, L.P.
CAMBRIA COUNTY, PA

TETRA TECH

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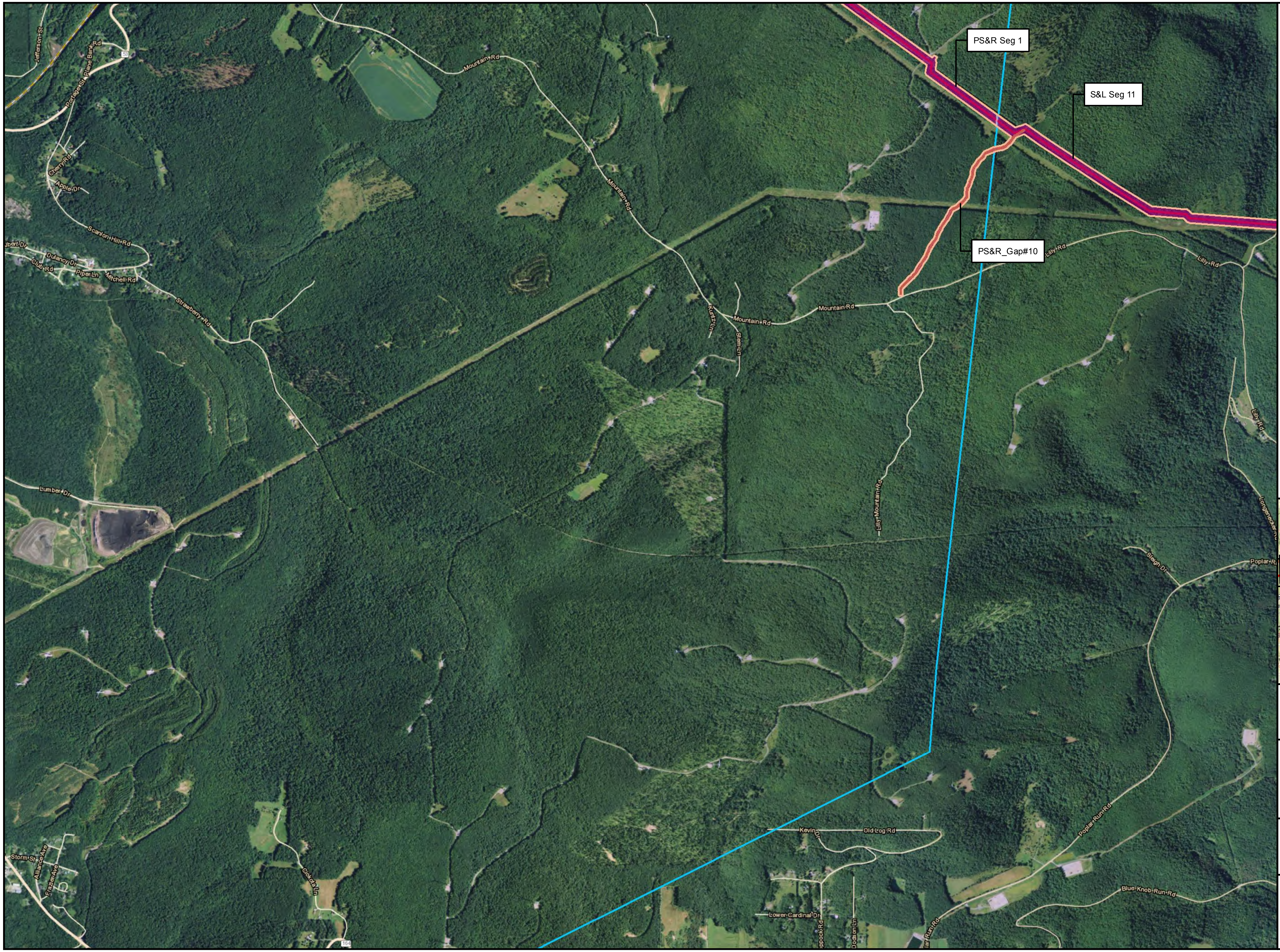

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- Wetland Delineation Study Area
- NE Bulrush Study Area
- County Boundary

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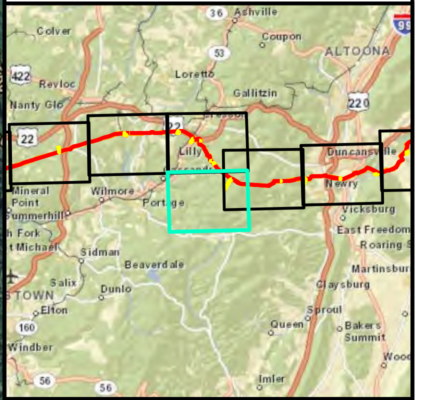

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NORTHEAST BULRUSH STUDY AREA OVERVIEW
FIGURE 2-6
PENNSYLVANIA PIPELINE PROJECT
AUGUST 19, ALIGNMENT
SUNOCO LOGISTICS, L.P.
CAMBRIA COUNTY, PA

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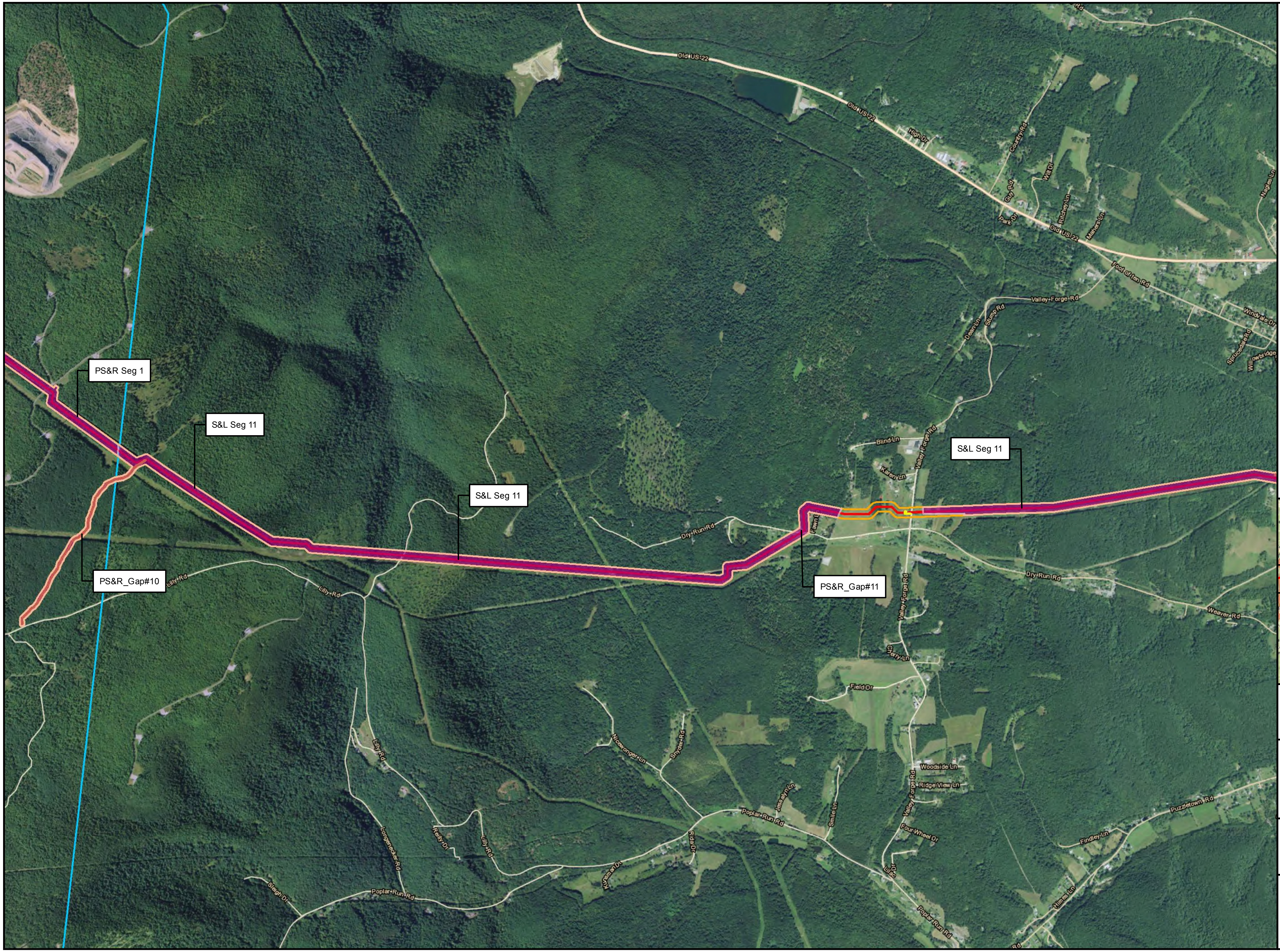

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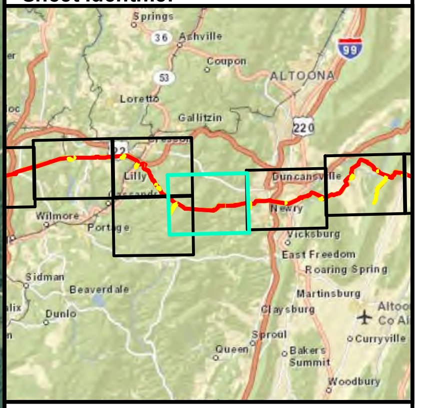

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NORTHEAST BULRUSH STUDY AREA OVERVIEW
FIGURE 2-7
PENNSYLVANIA PIPELINE PROJECT
AUGUST 19, ALIGNMENT
SUNOCO LOGISTICS, L.P.
BLAIR COUNTY, PA

TETRA TECH

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S&L Seg 9

S&L Seg 10
PS&R_Gap#12

S&L Seg 10

S&L Seg 11

PS&R_Gap#13

Legend

- Alignment Centerline
- Access Road
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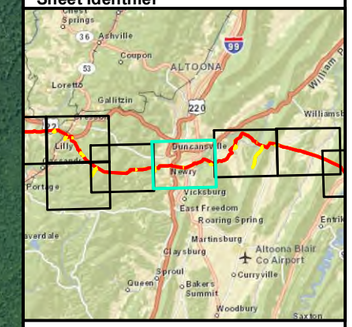
- NE Bulrush Study Area
- County Boundary

Sheet Identifier



Feet
0 1,000 2,000

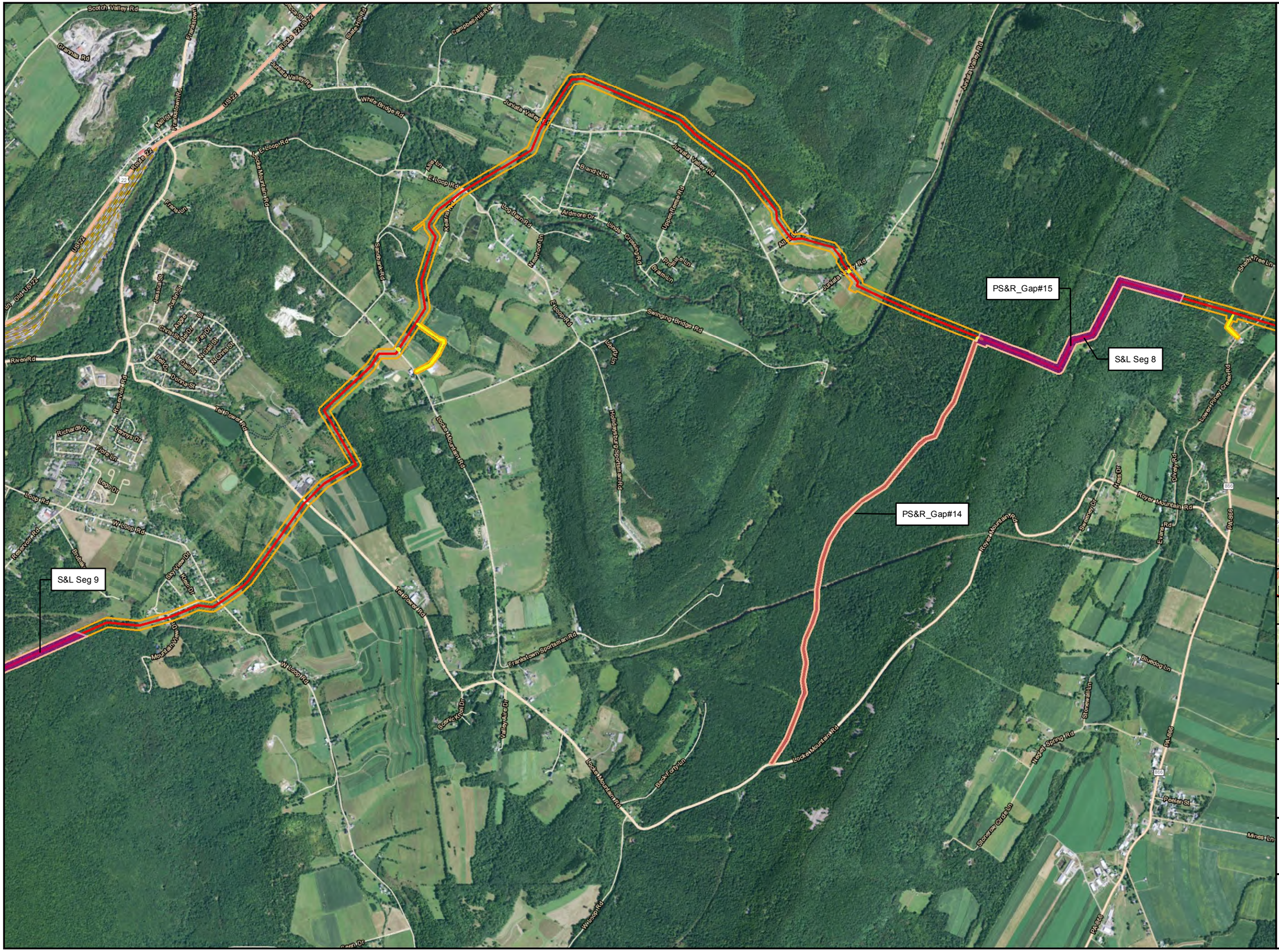
Meters
0 300 600

NORTHEAST BULRUSH STUDY AREA OVERVIEW
FIGURE 2-8
PENNSYLVANIA PIPELINE PROJECT
AUGUST 19, ALIGNMENT
SUNOCO LOGISTICS, L.P.
BLAIR COUNTY, PA

TETRA TECH

Notes:
1) Aerial photograph provided by ESRI's ArcGIS Online World Imagery map service (© 2011 ESRI and its data suppliers).

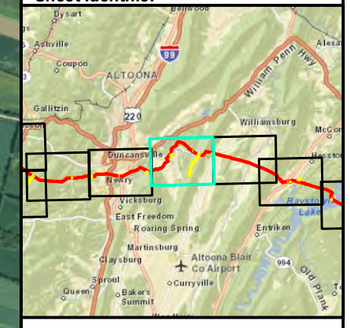
PGH: P:\GIS\SUNOCO\MARINER EAST 2\MXD\PENNPIPELINE_NE-BULRUSH_AERIALCONSRPT.MXD 09/04/15 JN



Legend

- Alignment Centerline
- Access Road
- Wetland Delineation Study Area
- NE Bulrush Study Area
- County Boundary

Sheet Identifier



NORTHEAST BULRUSH STUDY AREA OVERVIEW
FIGURE 2-9
PENNSYLVANIA PIPELINE PROJECT
AUGUST 19, ALIGNMENT
SUNOCO LOGISTICS, L.P.
BLAIR COUNTY, PA

TETRA TECH

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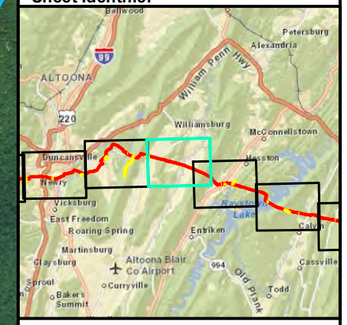
PGH: P:\GIS\SUNOCO\MARINER EAST 2\MXD\PENNPIPELINE_NEBULRUSH_AERIAL.CONSRPT.MXD 09/04/15 JN

Legend

- Alignment Centerline
- Access Road
- Wetland Delineation Study Area
- NE Bulrush Study Area
- County Boundary

Sheet Identifier



N

0 1,000 2,000 Feet

0 300 600 Meters

NORTHEAST BULRUSH STUDY AREA OVERVIEW
FIGURE 2-10
PENNSYLVANIA PIPELINE PROJECT
AUGUST 19, ALIGNMENT
SUNOCO LOGISTICS, L.P.
BLAIR COUNTY, PA

TETRA TECH

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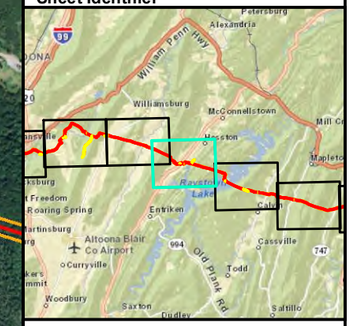
S&L Seg 6

PS&R_Gap#16

Legend

- Alignment Centerline
- Access Road
- Wetland Delineation Study Area
- NE Bulrush Study Area
- County Boundary

Sheet Identifier



Feet
0 1,000 2,000

Meters
0 300 600

NORTHEAST BULRUSH STUDY AREA OVERVIEW
FIGURE 2-11
PENNSYLVANIA PIPELINE PROJECT
AUGUST 19, ALIGNMENT
SUNOCO LOGISTICS, L.P.
HUNTINGDON COUNTY, PA

TETRA TECH

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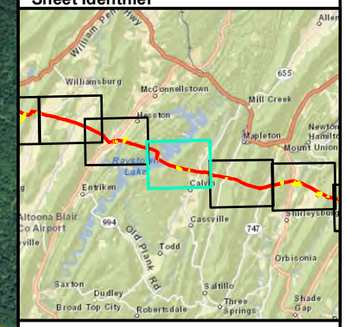
Legend

- Alignment Centerline
- Access Road
- Wetland Delineation Study Area
- NE Bulrush Study Area
- County Boundary

Sheet Identifier



N

Feet
0 1,000 2,000

Meters
0 300 600

NORTHEAST BULRUSH STUDY AREA OVERVIEW
FIGURE 2-12
PENNSYLVANIA PIPELINE PROJECT
AUGUST 19, ALIGNMENT
SUNOCO LOGISTICS, L.P.
HUNTINGDON COUNTY, PA

TETRA TECH

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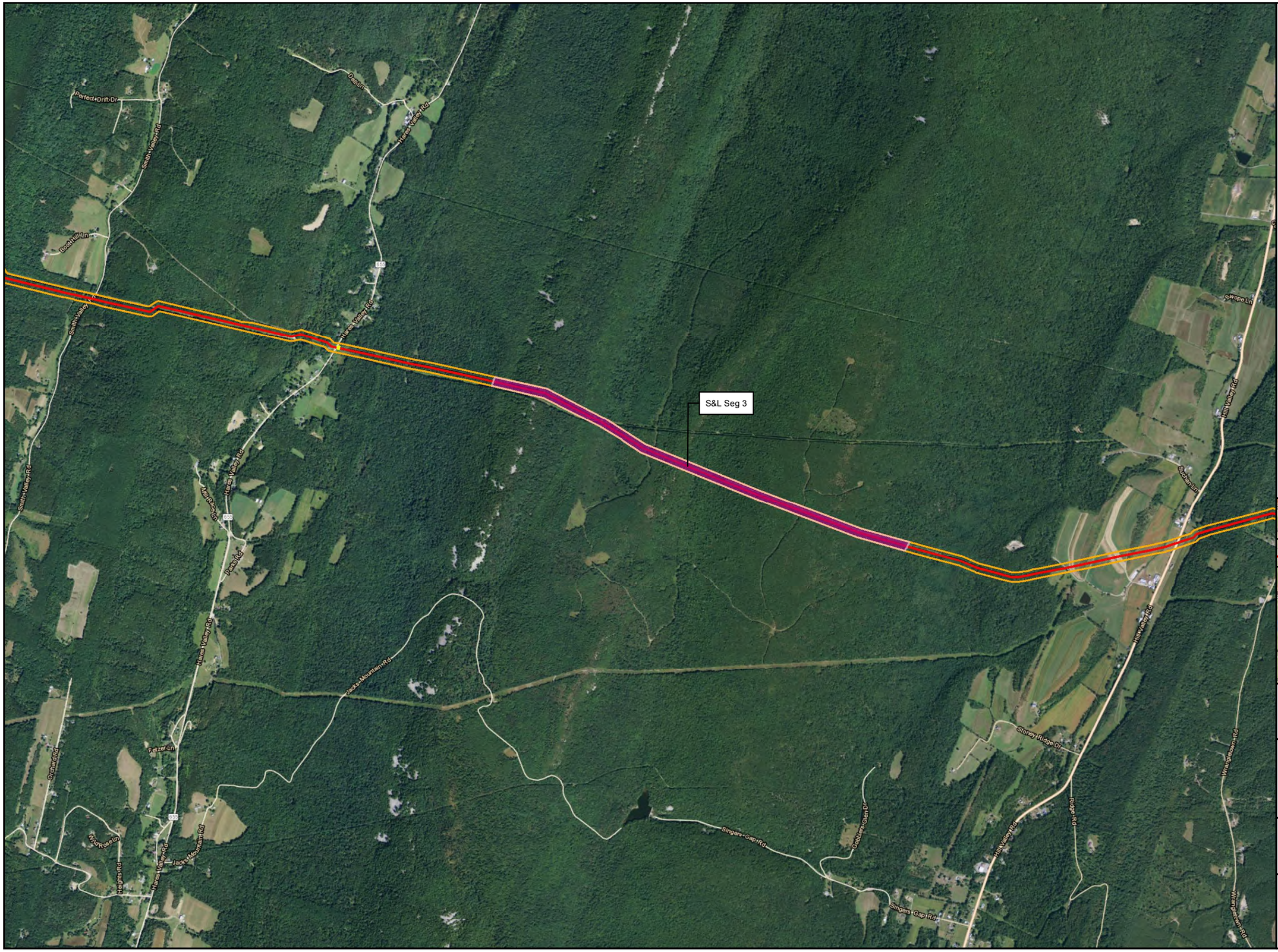
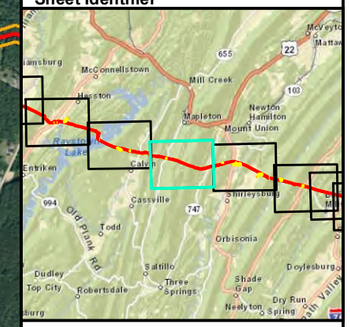


Legend

- Alignment Centerline
- Access Road
- Wetland Delineation Study Area
- NE Bulrush Study Area
- County Boundary

Sheet Identifier



N

0 1,000 2,000 Feet

0 300 600 Meters

NORTHEAST BULRUSH STUDY AREA OVERVIEW
FIGURE 2-13
PENNSYLVANIA PIPELINE PROJECT
AUGUST 19, ALIGNMENT
SUNOCO LOGISTICS, L.P.
HUNTINGDON COUNTY, PA

TETRA TECH

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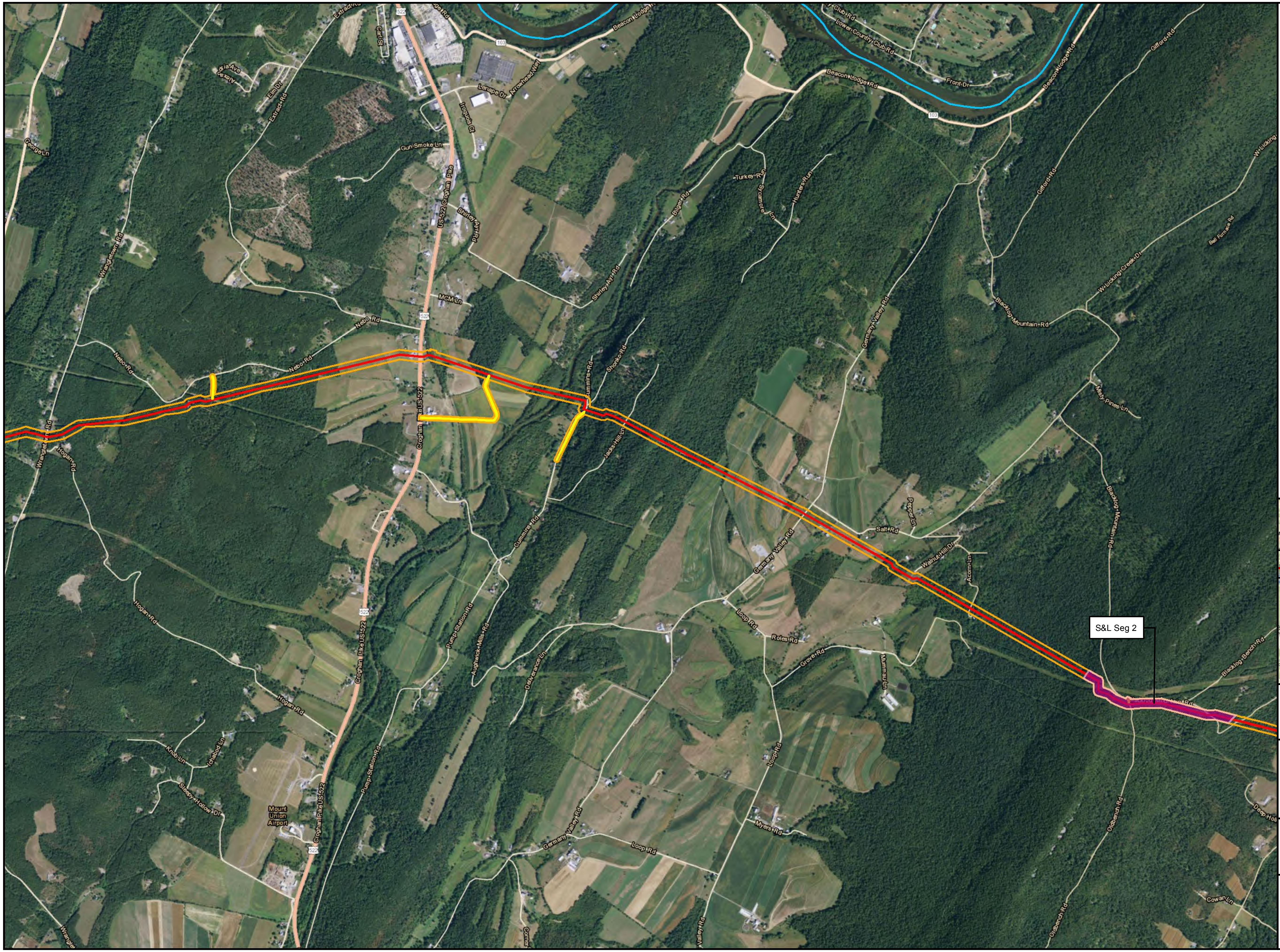
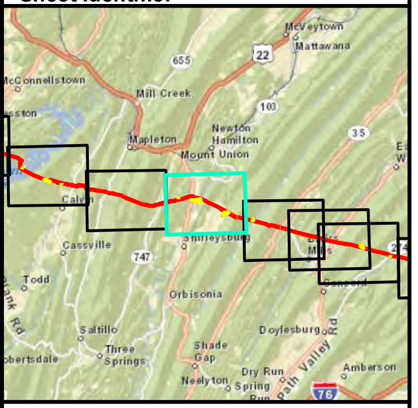


Legend

- Alignment Centerline
- Access Road
- Wetland Delineation Study Area
- NE Bulrush Study Area
- County Boundary

Sheet Identifier



Feet: 0 — 1,000 — 2,000

Meters: 0 — 300 — 600

NORTHEAST BULRUSH STUDY AREA OVERVIEW
FIGURE 2-14
PENNSYLVANIA PIPELINE PROJECT
AUGUST 19, ALIGNMENT
SUNOCO LOGISTICS, L.P.
HUNTINGDON COUNTY, PA

TETRA TECH

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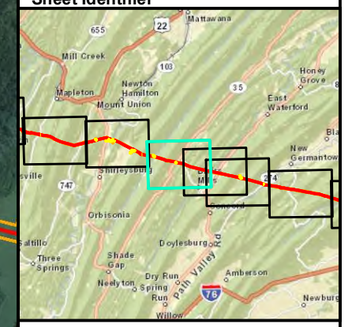
S&L Seg 1

PS&R_Gap#18

Legend

- Alignment Centerline
- Access Road
- Wetland Delineation Study Area
- NE Bulrush Study Area
- County Boundary

Sheet Identifier



Feet
0 1,000 2,000

Meters
0 300 600

NORTHEAST BULRUSH STUDY AREA OVERVIEW
FIGURE 2-15
PENNSYLVANIA PIPELINE PROJECT
AUGUST 19, ALIGNMENT
SUNOCO LOGISTICS, L.P.
HUNTINGDON COUNTY, PA

TETRA TECH

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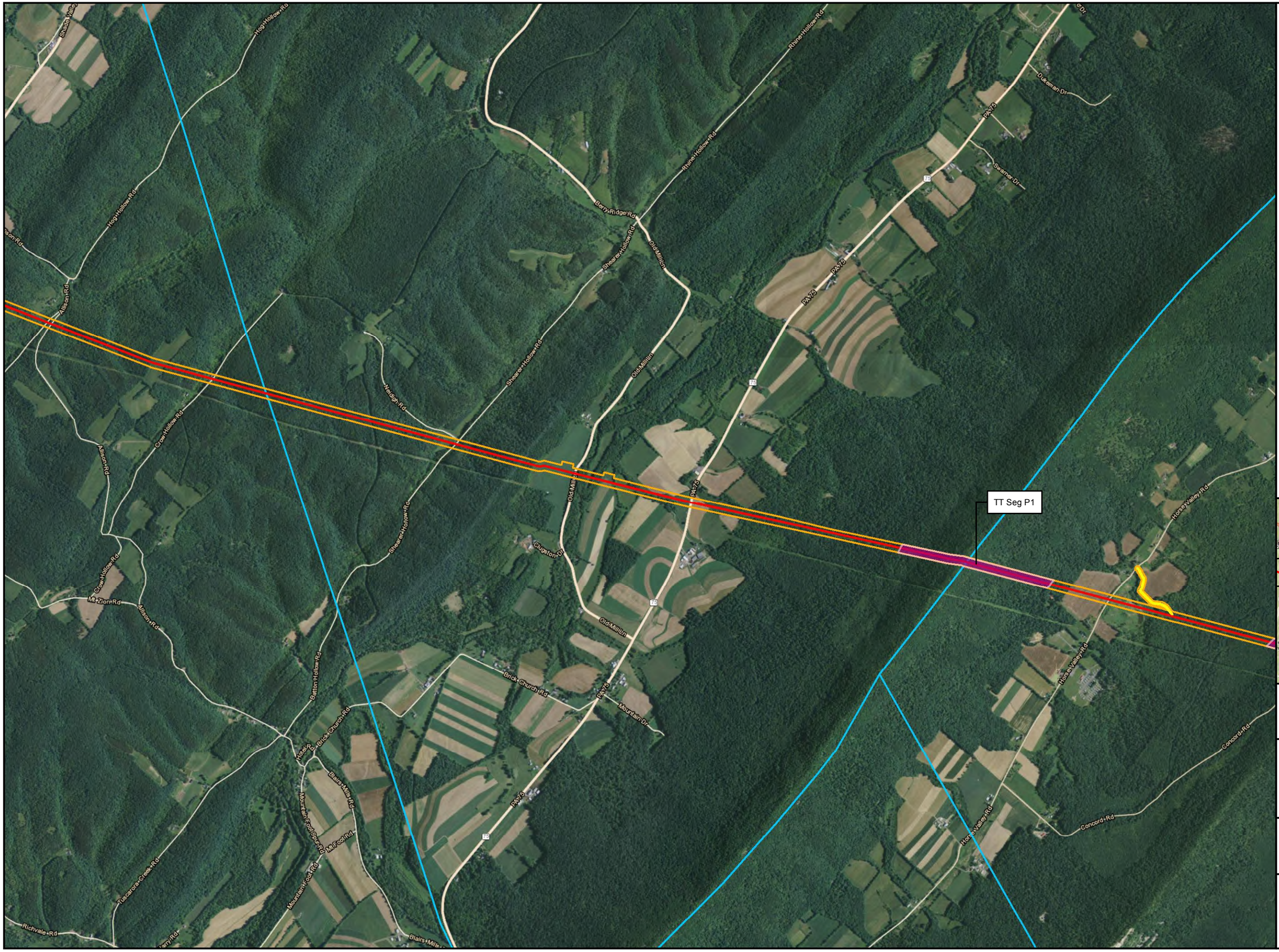
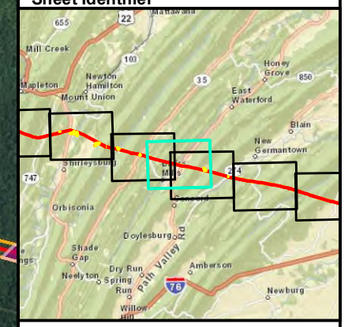


Legend

- Alignment Centerline
- Access Road
- Wetland Delineation Study Area
- NE Bulrush Study Area
- County Boundary

Sheet Identifier



N

Feet
0 1,000 2,000

Meters
0 300 600

NORTHEAST BULRUSH STUDY AREA OVERVIEW
FIGURE 2-16
PENNSYLVANIA PIPELINE PROJECT
AUGUST 19, ALIGNMENT
SUNOCO LOGISTICS, L.P.
JUNIATA COUNTY, PA

TETRA TECH

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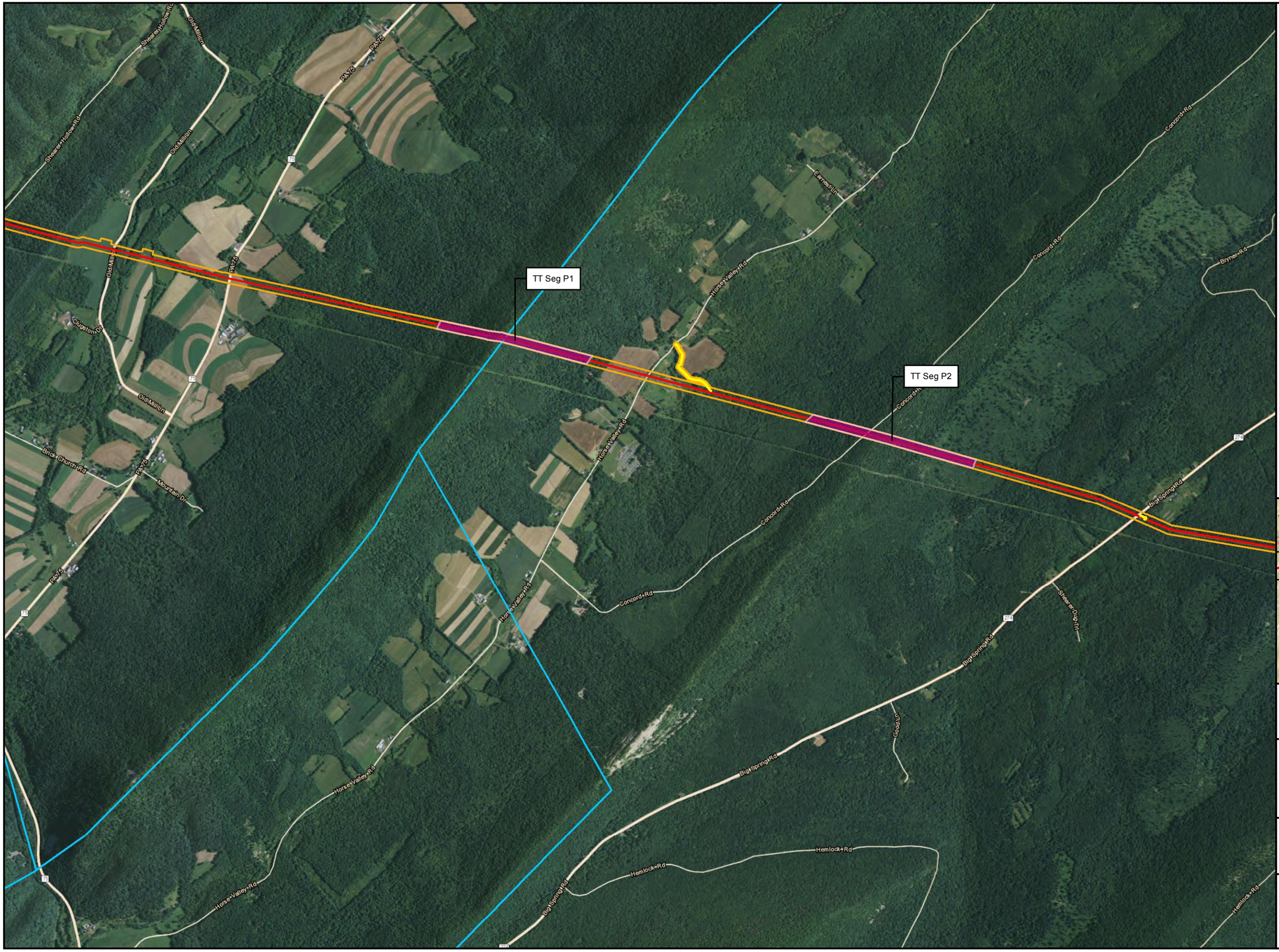
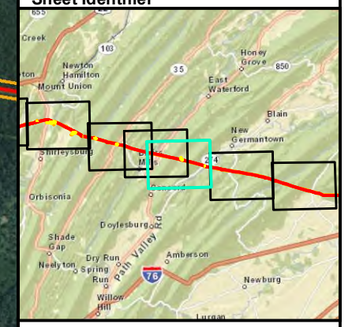


Legend

- Alignment Centerline
- Access Road
- Wetland Delineation Study Area
- NE Bulrush Study Area
- County Boundary

Sheet Identifier



Feet
0 1,000 2,000

Meters
0 300 600

NORTHEAST BULRUSH STUDY AREA OVERVIEW
FIGURE 2-17
PENNSYLVANIA PIPELINE PROJECT
AUGUST 19, ALIGNMENT
SUNOCO LOGISTICS, L.P.
PERRY COUNTY, PA

TETRA TECH

Notes:
1) Aerial photograph provided by ESRI's ArcGIS Online World Imagery map service (© 2011 ESRI and its data suppliers).

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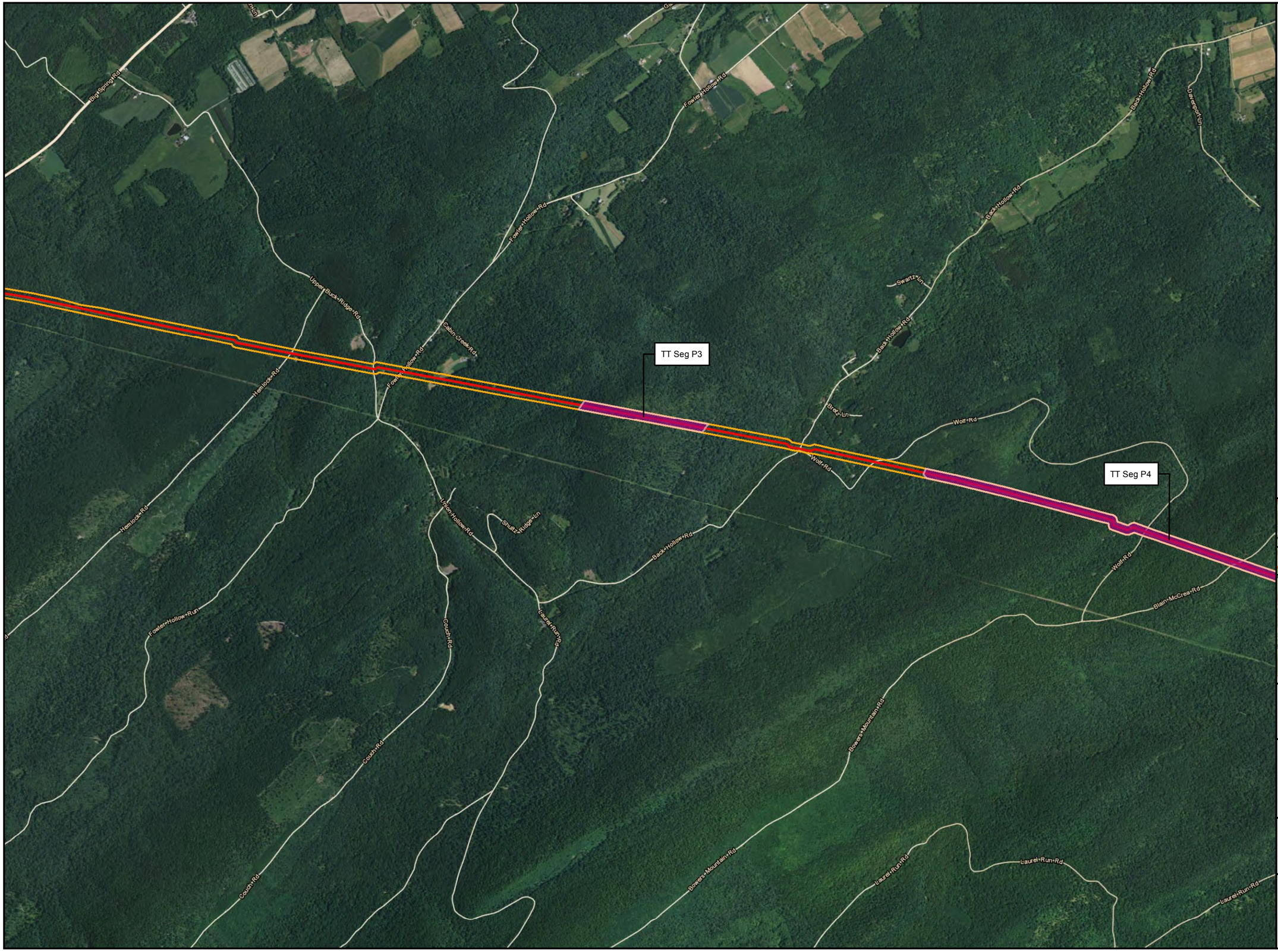
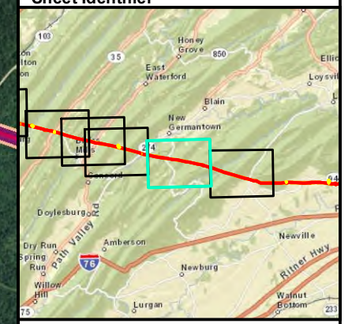


Legend

- Alignment Centerline
- Access Road
- Wetland Delineation Study Area
- NE Bulrush Study Area
- County Boundary

Sheet Identifier



N

Feet
0 1,000 2,000

Meters
0 300 600

NORTHEAST BULRUSH STUDY AREA OVERVIEW
FIGURE 2-18
PENNSYLVANIA PIPELINE PROJECT
AUGUST 19, ALIGNMENT
SUNOCO LOGISTICS, L.P.
PERRY COUNTY, PA

TETRA TECH

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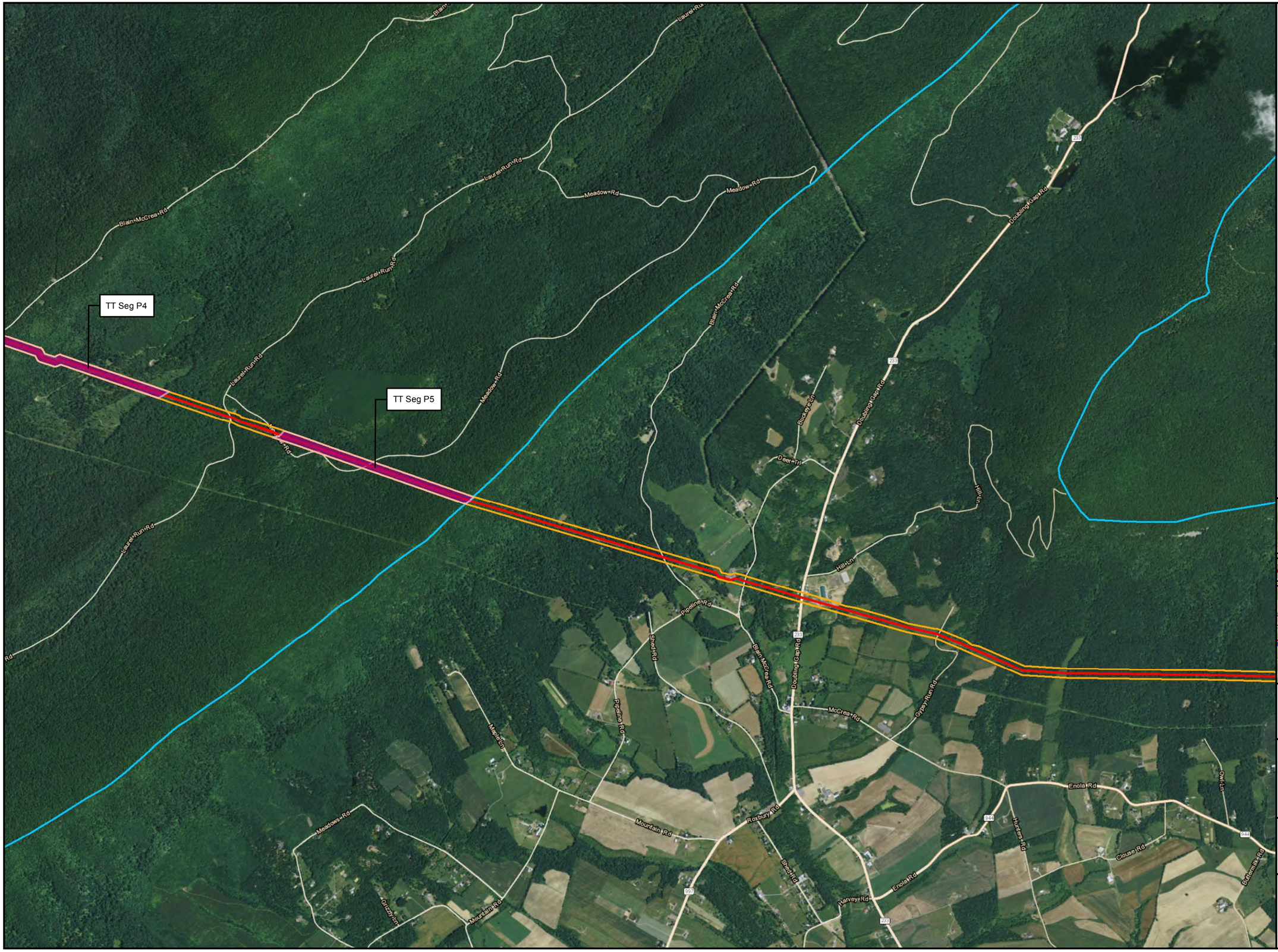
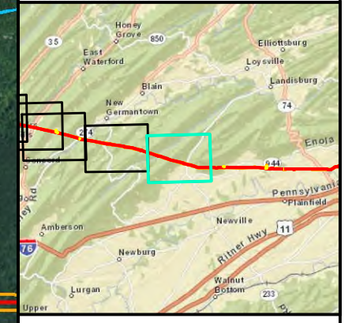


Legend

- Alignment Centerline
- Access Road
- Wetland Delineation Study Area
- NE Bulrush Study Area
- County Boundary

Sheet Identifier



N

Feet
0 1,000 2,000

Meters
0 300 600

NORTHEAST BULRUSH STUDY AREA OVERVIEW
FIGURE 2-19
PENNSYLVANIA PIPELINE PROJECT
AUGUST 19, ALIGNMENT
SUNOCO LOGISTICS, L.P.
PERRY COUNTY, PA

TETRA TECH

Notes:
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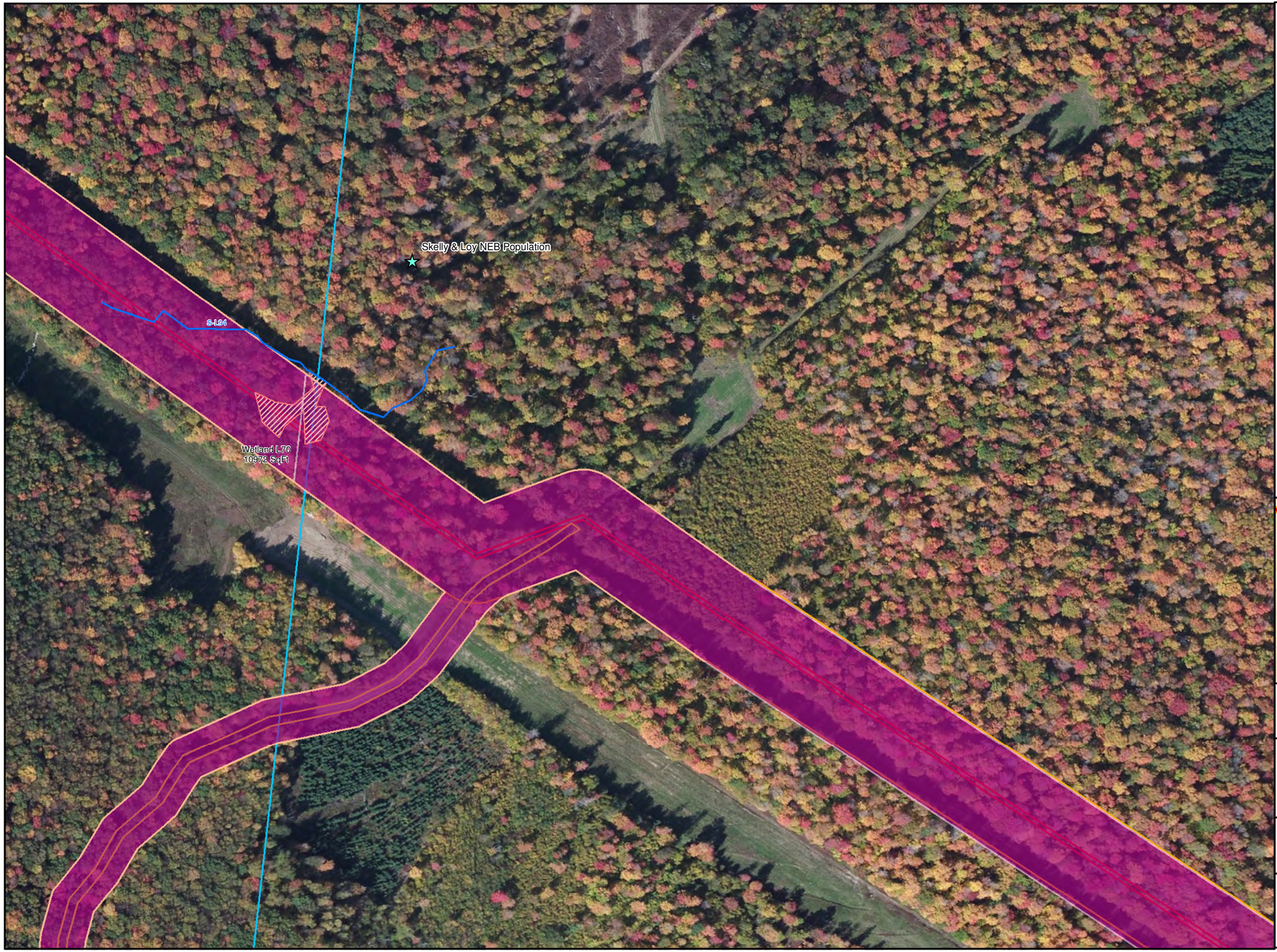


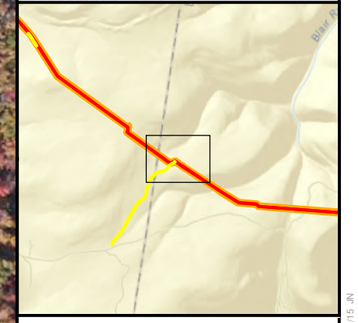
Legend

- NE Bulrush Population
- NE Bulrush Study Area
- Alignment Centerline
- Access Road
- Wetland Study Area
- County Boundary
- Stream

Wetland

- PFO

Sheet Identifier



N

0 100 200 Feet

0 30.45 60.9 Meters

NORTHEAST BULRUSH POPULATION
FIGURE 3
PENNSYLVANIA PIPELINE PROJECT
AUGUST 19, ALIGNMENT
SUNOCO LOGISTICS, L.P.
BLAIR COUNTY, PA

TETRA TECH

Notes:
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2) Map insets are at a scale of 1 inch = 50 feet unless otherwise noted.

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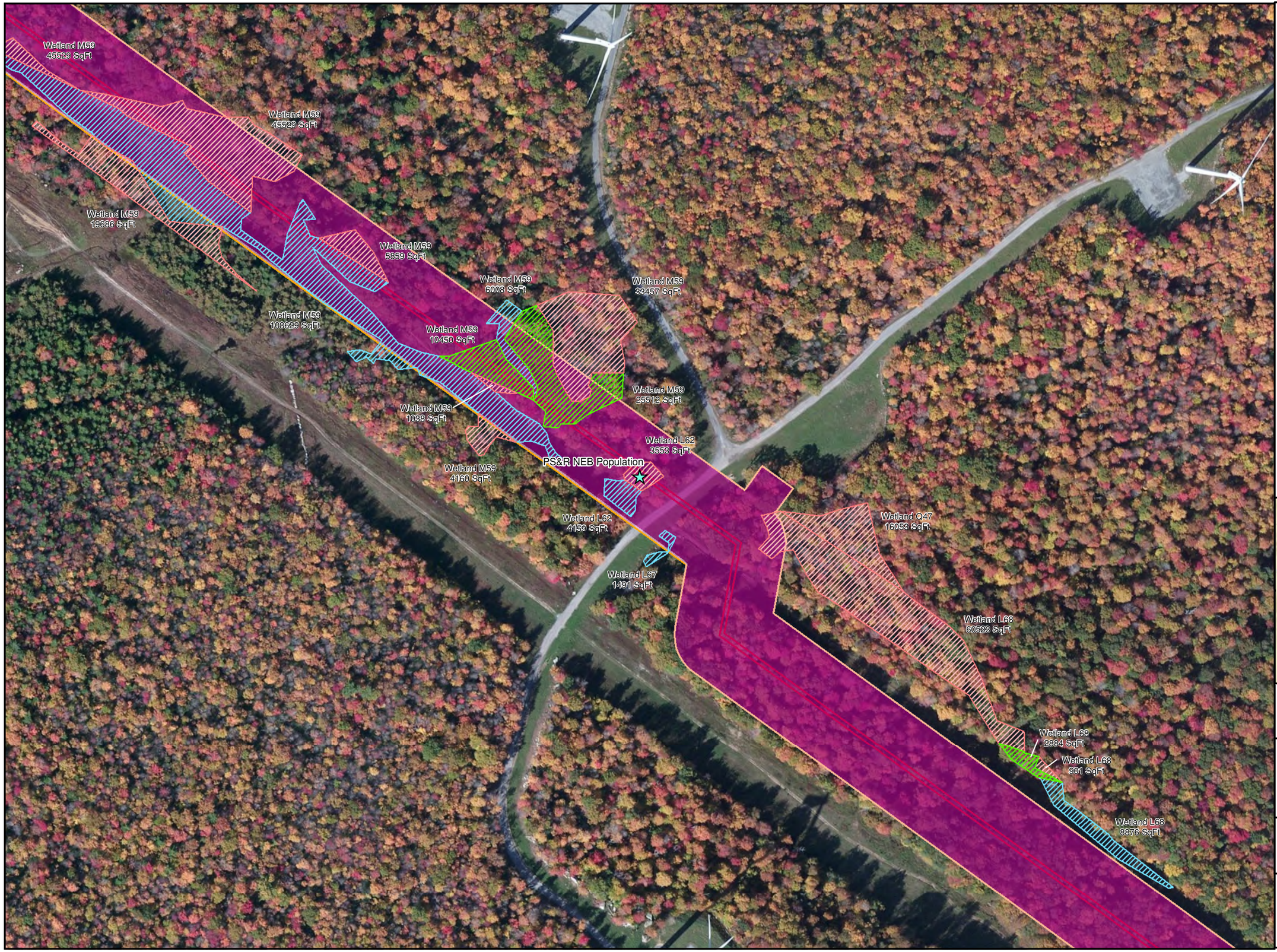


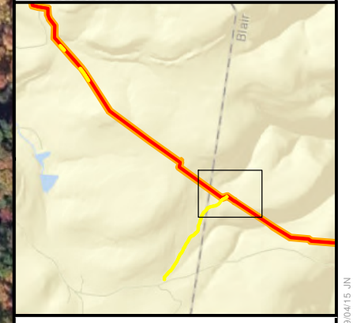
Legend

- NE Bulrush Population
- NE Bulrush Study Area
- Alignment Centerline
- Access Road
- Wetland Study Area
- County Boundary
- Stream

Wetland

- PEM
- PFO
- PSS

Sheet Identifier



N

0 100 200 Feet

0 30.45 60.9 Meters

NORTHEAST BULRUSH POPULATION
FIGURE 4
PENNSYLVANIA PIPELINE PROJECT
AUGUST 19, ALIGNMENT
SUNOCO LOGISTICS, L.P.
CAMBRIA COUNTY, PA

TETRA TECH

Notes:
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APPENDIX B
Agency Coordination

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Pennsylvania Field Office
315 South Allen Street, Suite 322
State College, Pennsylvania 16801-4850

March 19, 2014

Preston Smith
661 Anderson Drive
Foster Plaza
Pittsburgh, PA 15220

RE: USFWS Project #2014-0200

Dear Mr. Smith:

This responds to your project information received by our office on December 13, 2013. You requested information about federally listed and proposed endangered and threatened species within the area affected by the proposed Sunoco Mariner East 2 Pipeline project located in Washington, Allegheny, Westmoreland, Indiana, Cambria, Blair, Huntington, Juniata, Perry, Cumberland, York, Dauphin, Lebanon, Lancaster, Berks, Chester, and Delaware counties, Pennsylvania. The following comments are provided pursuant to the Endangered Species Act of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*) to ensure the protection of endangered and threatened species and the Migratory Bird Treaty Act (MBTA, 16 U.S.C. 703-712; Ch. 128; July 13, 1918; 40 Stat. 755, as amended) to ensure the protection of migratory bird species.

Indiana bat

The project is within the range of the Indiana bat (*Myotis sodalis*), a species that is federally listed as endangered. Indiana bats hibernate in caves and abandoned mines during the winter months (November through March), and use a variety of upland, wetland and riparian habitats during the spring, summer and fall. Indiana bats usually roost in dead or living trees with exfoliating bark, crevices or cavities. Female Indiana bats form nursery colonies under the exfoliating bark of dead or living trees, such as shagbark hickory, black birch, red oak, white oak, and sugar maple, in upland or riparian areas.

Land-clearing, especially of forested areas, may adversely affect Indiana bats by killing, injuring or harassing roosting bats, and by removing or reducing the quality of foraging and roosting habitat. Therefore, to determine whether the proposed project will affect Indiana bats, we will need additional project information about how much forest disturbance will occur (area, tree species, and size classes).

Northern Long-Eared bat

The northern long-eared bat (*Myotis septentrionalis*) was proposed for listing as an endangered species on October 2, 2013. No critical habitat has been proposed at this time. Species proposed for listing are not afforded protection under the ESA; however, as soon as a listing becomes effective, the prohibition against jeopardizing its continued existence and "take"[1] applies **regardless of an action's stage of completion**. Therefore, to avoid significant project delays we recommend that the effect of the project on northern long eared bats, and their habitat, be considered during the project planning and design. Additional information about northern long-eared bats, including ecology, habitat descriptions, listing status updates, and possible conservation measures may be found at *www.fws.gov/midwest/endangered/mammals/nlba/index.html* (click on Northern Long-eared Bat Interim Conference and Planning Guidance). We are available to discuss potential conservation measures specific to your project design.

Bog turtle

The project is within the known range of the bog turtle (*Clemmys muhlenbergii*), a species that is federally listed as threatened. Bog turtles inhabit shallow, spring-fed fens, sphagnum bogs, swamps, marshy meadows, and pastures characterized by soft, muddy bottoms; clear, cool, slow-flowing water, often forming a network of rivulets; high humidity; and an open canopy. Bog turtles usually occur in small, discrete populations occupying suitable wetland habitat dispersed along a watershed. The occupied "intermediate successional stage" wetland habitat is usually a mosaic of micro-habitats ranging from dry pockets, to areas that are saturated with water, to areas that are periodically flooded. Some wetlands occupied by bog turtles are located in agricultural areas and are subject to grazing by livestock.

To determine the potential effects of the proposed project on bog turtles and their habitat, begin by identifying all wetlands in, and within 300 feet of, the project area. The project area includes all areas that will be permanently or temporarily affected by any and all project features, including building, roads, staging areas, utility lines, outfall and intake structures, wells, stormwater retention or detention basins, parking lots, driveways, lawns, etc. The area of investigation should be expanded when project effects might extend more than 300 feet from the project footprint. For example, the hydrological effects of some projects (*e.g.*, large residential or commercial developments; golf courses; community water supply wells) might extend well beyond the project footprint due to the effects that impervious surfaces or groundwater pumping may have on the hydrology of nearby groundwater-dependent wetlands. Wetlands should be included on a map showing existing as well as proposed project features.

[1] As defined in the Act, take means ". . . to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct." "Harm" in the definition of take means an act which kills or injures wildlife. Such act may include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering (50 CFR part 17.3). "Harass" means an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering.

If someone qualified to identify and delineate wetlands has, through a field investigation, determined that no wetlands are located in or within 300 feet of the project area (or within the expanded investigation area, as described above), it is not likely that your project will adversely affect the bog turtle. If this is the case, no further consultation with the Fish and Wildlife Service is necessary, although we would appreciate receiving a courtesy copy of the wetland investigator's findings for our files.

If wetlands have been identified in or within 300 feet of the project area (or in an expanded investigation area, as described above), assess their potential suitability as bog turtle habitat, as described under "*Bog Turtle Habitat Survey*" (Phase 1 survey) of the *Guidelines for Bog Turtle Surveys* (revised April 2006). Survey results should be submitted to the Service for review and concurrence. The survey guidelines, as well as a Phase 1 field form and report template, are available from the Service upon request.

Due to the skill required to correctly identify potential bog turtle habitat, we recommend that the Phase 1 survey be done by a qualified surveyor (see enclosed list). If the Phase I survey is done by someone who is not on this list, it is likely that a site visit by a Fish and Wildlife Service biologist will be necessary to verify their findings. *Due to the limited availability of staff from this office, such a visit may not be possible for some time. Use of a qualified surveyor will expedite our review of the survey results.*

If potential bog turtle habitat is found in or near the project area, efforts should be made to avoid any direct or indirect impacts to those wetlands (see enclosed *Bog Turtle Conservation Zones*). Avoidance of direct and indirect effects means no disturbance to or encroachment into the wetlands (*e.g.*, filling, ditching or draining) for any project-associated features or activities. Adverse effects may also be anticipated to occur when lot lines include portions of the wetland; when an adequate upland buffer is not retained around the wetland (see *Bog Turtle Conservation Zones*); or when roads, stormwater/sedimentation basins, impervious surfaces, or wells affect the hydrology of the wetland.

If potential habitat is found, submit (along with your Phase 1 survey results) a detailed project description and detailed project plans documenting how direct and indirect impacts to the wetlands will be avoided. If adverse effects to these wetlands cannot be avoided, a more detailed and thorough survey should be done, as described under "*Bog Turtle Survey*" (Phase 2 survey) of the *Guidelines*. The Phase 2 survey should be conducted by a qualified biologist with bog turtle field survey experience (see enclosed list of qualified surveyors). Submit survey results to the Service for review and concurrence.

In cases where adverse effects to federally listed species cannot be avoided, further consultation with the Service would be necessary to avoid potential violations of section 9 (prohibiting "take" of listed species) and/or section 7 (requiring federal agencies to consult) of the Endangered Species Act. Information about the section 7 and section 10 consultation processes (for federal and non-federal actions, respectively) can be obtained by contacting this office or accessing the Service's Endangered Species Home Page (http://endangered.fws.gov).

Assessment of Risks to Migratory Birds

The Service is the principal Federal agency charged with protecting and enhancing populations and habitat of migratory bird species. The Migratory Bird Treaty Act (MBTA) prohibits the taking, killing, possession, transportation, and importation of migratory birds, their eggs, parts, and nests, except when specifically authorized by the Department of the Interior. While the MBTA has no provision for authorizing incidental take, the Service recognizes that some birds may be killed even if all reasonable measures to avoid take are implemented.

The potential exists for avian mortality from habitat destruction and alteration within the project boundaries. Site-specific factors that should be considered in project siting to avoid and minimize the risk to birds include avian abundance; the quality, quantity and type of habitat; geographic location; type and extent of bird use (*e.g.* breeding, foraging, migrating, etc.); and landscape features. Please review the enclosed information for general recommendations for avoiding and minimizing impacts to migratory birds within and around the project area. Please be aware that since these are general guidelines, some of them may not be applicable to the current project design or they may have already been included in the project design.

This response relates only to endangered and threatened species under our jurisdiction, based on an office review of the proposed project's location. No field inspection of the project area has been conducted by this office. Consequently, this letter is not to be construed as addressing potential Service concerns under the Fish and Wildlife Coordination Act or other authorities. A compilation of certain federal status species in Pennsylvania is enclosed for your information.

To avoid potential delays in reviewing your project, please use the above-referenced USFWS project tracking number in any future correspondence regarding this project.

If you have questions about Indiana bat please contact Pamela Shellenberger at (814) 234-4090 x 241. For questions about the bog turtle please contact Kayla Easler at (814) 234-4090 x 234. For questions regarding the Migratory bird information please contact Jennifer Siani at (814) 234-4090 x 225.

Sincerely,

Lora L. Zimmerman
Field Office Supervisor

Enclosures

Schumacher, Henry

From: Shellenberger, Pamela <pamela_shellenberger@fws.gov>
Sent: Tuesday, August 05, 2014 2:10 PM
To: Smith, Preston
Cc: Kayla Easler (Kayla_Easler@fws.gov); McCluskey, Korey
Subject: Re: Bulrush Surveys Sunoco PA Pipeline (USFWS #2014-0200)

Correct, after identifying elevation, survey wetlands within those counties and elevation areas.

Thanks,

Pamela Shellenberger
U.S. Fish and Wildlife Service
315 South Allen Street
State College, PA 16801
814-234-4090 x241
814-234-0748 (f)

http://fws.gov/northeast/pafo/index.html

Due to an imposed hiring freeze and the inability to back fill positions, we are experiencing increased project review times (a minimum of 60 days) and response times to phone calls and emails. Please be patient; we will address projects in the order in which they are received.

On Tue, Aug 5, 2014 at 1:32 PM, Smith, Preston <Preston.Smith@tetratech.com> wrote:

> Hi Pam,
>
> I hope your Summer is going well. I just wanted to follow up with a proposed strategy for the Northeastern Bulrush Surveys on the PA Pipeline Project. Since we have been through the areas that meet the elevation requirement in Cambria, Blair, Huntington, Juniata, and Perry Counties, would it be acceptable to focus our study areas on the wetland areas we have found? Based on the Life history listed on NatureServ Explorer listed below. Also, we plan to search our 200 ft survey corridor similar to other plant surveys. Please let me know if these are acceptable.
>
> Thanks,
>
> Preston

The habitat characteristics of Scirpus ancistrochaetus are discussed above in GHABCOM. More information is needed about the ecology of the species; see GRSRCHNEED.
Palustrine Habitat(s): HERBACEOUS WETLAND, TEMPORARY POOL
Habitat Comments: Throughout its range, Scirpus ancistrochaetus is found in open, tall herb-dominated wetlands. Often it grows at the water's edge, or in a few centimeters of water, but it may also be in fairly deep water (0.3-0.9 m) or away from standing water. In the southern part of its range, the most common habitat is sinkhole ponds, usually in sandstone. Water levels in these ponds tend to vary both with the season and from year to year. At least one site (in Massachusetts) is in a sandplain, where water level fluctuates as well. Two sites in Vermont are influenced to some extent by beaver activity as well as other hydrological factors.

With the information available it is difficult to compare sites throughout the plant's range. For example, lists of associated species may represent an entire wetland or the immediate vicinity of the plant, but this is not always possible to determine from available information. Nevertheless, examination of field reports indicates that there is considerable variety in associated species. A few species, however, are common to several of the sites. These are Dulichium arundinaceum, Scirpus cyperinus sens. lat., Glyceria canadensis, and Triadenum virginicum.

The habitat seems to vary geographically, although there are not enough sites to allow generalizations to be made. However, one does observe that in the south, sinkhole ponds are the most common habitat for the plant, and in the north, other kinds of wetlands, including beaver-influenced wetlands, provide suitable habitat.

From: Shellenberger, Pamela [mailto:pamela_shellenberger@fws.gov]
Sent: Tuesday, July 01, 2014 4:12 PM
To: Smith, Preston
Cc: Christina Voorhees
Subject: Re: Bulrush

Preston,

Huntingdon County should also be targeted for surveys for this species. My apologizes for leaving this off of the list.

Thank you,

Pamela Shellenberger

U.S. Fish and Wildlife Service

315 South Allen Street

State College, PA 16801

814-234-4090 x241

814-234-0748 (f)

http://fws.gov/northeast/pafo/index.html

Due to an imposed hiring freeze and the inability to back fill positions, we are experiencing increased project review times (a minimum of 60 days) and response times to phone calls and emails. Please be patient; we will address projects in the order in which they are received.

On Wed, May 28, 2014 at 2:42 PM, Shellenberger, Pamela <pamela_shellenberger@fws.gov> wrote:

As discussed during our April 1, 2014 conference call, we recommend that you survey for northeastern bulrush in the mountain regions of Perry and Juniata Counties, as well as the mountain regions in Blair and Cambria Counties. Let me know if you need more specifics.

Additionally, we would like a report about how Sunoco plans to minimize impacts to migratory birds. The pipeline is going through the following Important Birds Areas (IBAs):

Upper Ridley - Crum Creek from 75.481290 39.942390 to 75.543745 39.987000

Great Marsh - from 75-743259 40.096344 to 75.806473 40.135070

Hay Creek/French Creek Forest Block and Glen Morgan Lake - from
75.873104 40.175884 to 75.918854 40.204548

Middle Creek Wildlife Management Area - from 76.195629 40.284658 to 76.279545 40.285417

Hawk Mountain Kittatinny Ridge, Tuscarora Ridge and The Pulpit - from 76.985094 40.200930 to -77.691794 40.300629

Tussy Mountain - from 78.164283 40.404402 to 78.192173 40.415671

Allegheny Front - from 78.446006 40.464409 to 78.605743 40.449196

Finally, please be aware of bald eagle nests, especially when crossing large bodies of water, such as lakes or rivers. See our Bald Eagle Management Guidelines

http://www.fws.gov/northeast/EcologicalServices/eagle.html

I will not in the office tomorrow, but you will see Kayla.

Thank you,

Pamela Shellenberger

U.S. Fish and Wildlife Service

315 South Allen Street

State College, PA 16801

814-234-4090 x241

814-234-0748 (f)

http://fws.gov/northeast/pafo/index.html

Due to an imposed hiring freeze and the inability to back fill positions, we are experiencing increased project review times (a minimum of 60 days) and response times to phone calls and emails. Please be patient; we will address projects in the order in which they are received.

On Tue, May 27, 2014 at 11:05 AM, Smith, Preston <Preston.Smith@tetratech.com> wrote:

Hi Pam and Kayla,

I hope your holiday weekend was relaxing. I was glad to focus on something other than the PA Pipeline project!

Anyway, can you send me the areas we should keep an eye out for the Northeastern Bulrush?

I guess I will be coming up there on Thursday with Brad Schaeffer for the Sunoco 8-inch repair meeting, so see you guys then.

Thanks,

Preston

Preston Smith | Manager, Wetlands and Ecological Services Department
Direct: 412.921.8167 | Main: 412.921.7090 | Fax: 412.921.4040
preston.smith@tetratech.com

Tetra Tech, Inc. | Appalachian Basin Oil and Gas Services

661 Andersen Drive Foster Plaza No. 7 | Pittsburgh, PA 15220 | www.tetratech.com

Live Green, Work Green, Save Green

APPENDIX C
Photographs

Photograph 1: *Scirpus ancistrochaetus* – Northeastern bulrush

Photograph 2: *Scirpus ancistrochaetus* – Northeastern bulrush

Photograph 3: Blair Co. Northeastern bulrush population habitat. Photograph reproduced from Skelly and Loy Northeastern Bulrush Survey Report, dated August 14, 2015.

Photograph 4: Blair Co. Northeastern bulrush population (center of photograph). Photograph reproduced from Skelly and Loy Northeastern Bulrush Survey Report, dated August 14, 2015.

Photograph 5: Cambria Co. Northeastern bulrush population habitat. Photograph reproduced from PS&R Botanical Report for Northeastern Bulrush, dated October 16, 2014.

Photograph 6: Cambria Co. Northeastern bulrush population. Photograph reproduced from PS&R Botanical Report for Northeastern Bulrush, dated October 16, 2014.

APPENDIX D
Tables

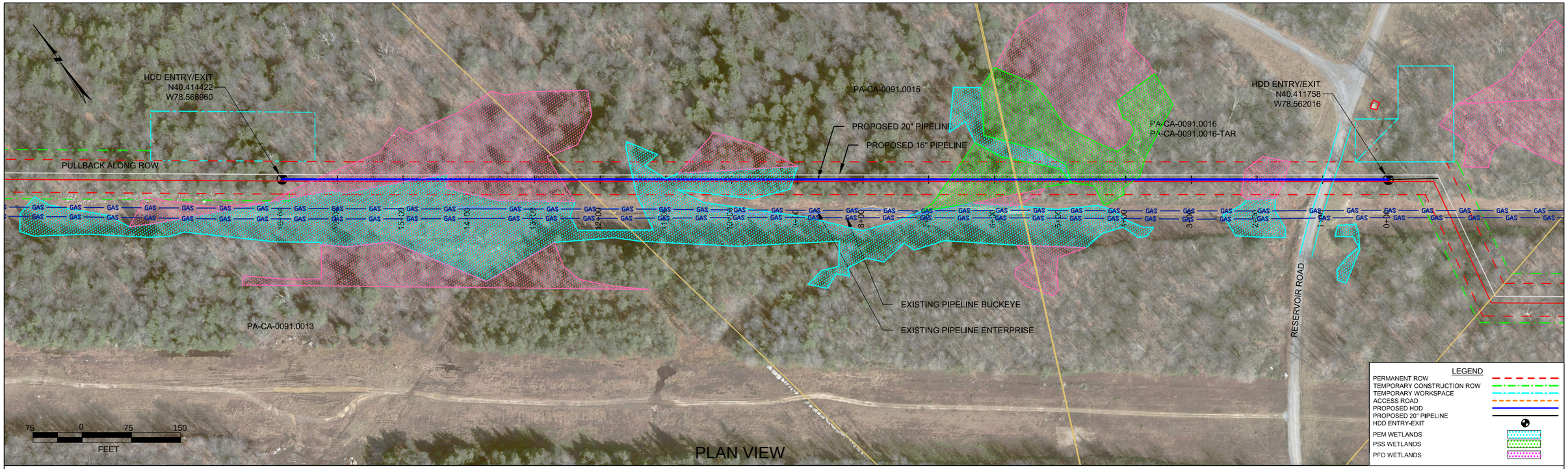
Table 1.
Northeastern Bulrush Survey Overview

	A	B	C	D	E	F	G
1	**Year**	**County**	**No. of Study Areas[#]**	**Potential Habitat Areas Surveyed**	**Surveyor**	**Populations Identified**	**Notes**
2	2014	Cambria	12	134	PS&R	1	1 Study Area shared with Blair Co., inlcuded in Cambria Co. tally
3		Blair	5	12	Skelly & Loy	1	
4		Huntingdon	6	16	Skelly & Loy	0	1 Study Area shared with Blair Co., inlcuded in Huntingdon Co. tally
5	2015	Cambria	10	44	PS&R	0	
6		Blair	5	23	PS&R	0	
7		Huntingdon	3	1	PS&R	0	
8		Juniata	1	0	Tetra Tech	0	
9		Perry	4	1	Tetra Tech	0	
10		**Total**	**46**	**231**		**2**	
11	# *Study Area - Areas above 1300-ft elevation and within 100-ft of the Project centerline)*						

Table 2.
Identified Northeastern Bulrush Populations

Surveyor	County	Habitat ID	Habitat Type	No. total culms	No. reproductive culms	Population Location
PS&R	Cambria	Wetland W-L62	Vernal Pool in Forested Wetland	55	12	Within LOD
Skelly & Loy	Blair	N/A	Vernal Pool in Forested Wetland	25-30	15	Outside of LOD

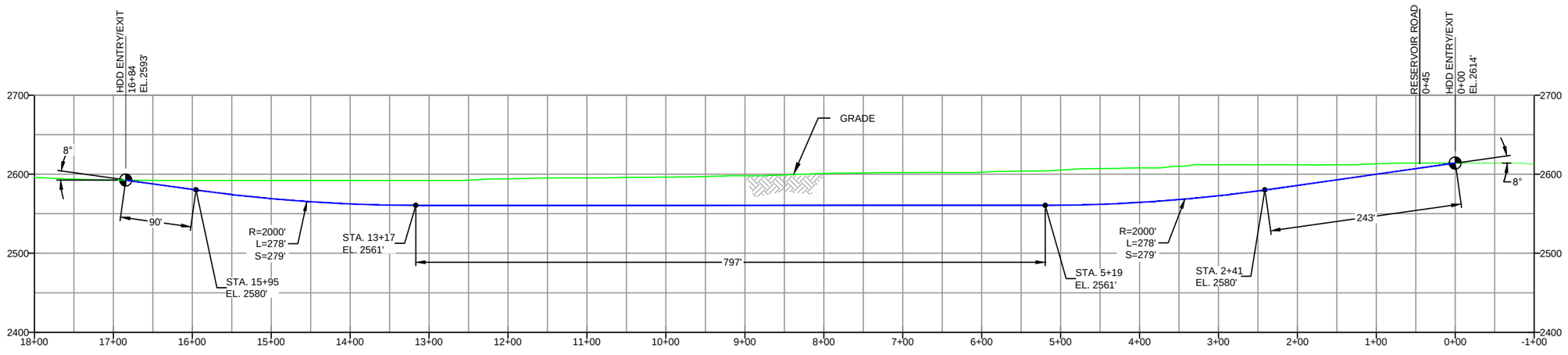
APPENDIX E
Horizontal Directional Drill Plan Profile



PLAN VIEW

PROFILE VIEW

CAMBRIA COUNTY, PENNSYLVANIA - JUANITA/WASHINGTON TOWNSHIP
S2-0100



DESIGN AND CONSTRUCTION:

1. CONTRACTOR SHALL FIELD VERIFY DEPTH OF ALL EXITING UTILITIES SHOWN OR NOT SHOWN ON THIS DRAWING.
2. THE MINIMUM SEPARATION DISTANCE FROM EXISTING SUBSURFACE UTILITIES SHALL NOT BE LESS THAN 10 FEET AS MEASURED FROM THE OUTSIDE EDGE OF THE UTILITY TO OUTSIDE OF PROPOSED PIPELINE.
3. DESIGNED IN ACCORDANCE WITH CFR 49 195 & ASME B31.4
4. CROSSING PIPE SPECIFICATION:
   HDD HORZ. LENGTH (L=):1684'
   HDD PIPE LENGTH (S=):1688'
   20" x 0.500" W.T., X-65, API5L, PSL2, ERW, BFW
   COATING: 14-16 MILS FBE WITH 30-35 MIL ARO (POWERCRETE OR ENGINEER APPROVED EQUAL)
5. INTERNAL DESIGN PRESSURE 1480 PSIG (SEAM FACTOR 1.0, DESIGH FACTOR 0.50).
6. INSTALLATION METHOD: HORIZONTAL DIRECTIONAL DRILL (HDD).
7. PIPELINE WARNING MARKERS SHALL BE INSTALLED ON BOTH SIDES OF ALL ROAD, RAILWAY, AND STREAM CROSSINGS.
8. CARRIER PIPE NOT ENCASED.
9. PIPE / AMBIENT TEMPERATURE MUST BE NO LESS THAN 30°F DURING PULLBACK WITHOUT PRIOR WRITTEN APPROVAL FROM THE ENGINEER.
10. CONDUCT 4-HOUR PRE-INSTALLATION HYDROTEST OF HDD PIPE STRING TO MINIMUM 1850 PSIG.

NOTES

1. ALL COORDINATES SHOWN ARE IN LATITUDE AND LONGITUDE. ALL MSL ELEVATIONS ARE NAD83
2. STATIONING IS BASED ON HORIZONTAL DISTANCES.
3. ROONEY ENGINEERING, INC. AND SUNOCO PIPELINE, LP ARE NOT RESPONSIBLE FOR LOCATION OF FOREIGN UTILITIES SHOWN IN PLOT PLAN OR PROFILE. THE INFORMATION SHOWN HEREON IS FURNISHED WITHOUT LIABILITY ON THE PART OF ROONEY ENGINEERING, INC. AND SUNOCO PIPELINE, LP, FOR ANY DAMAGES RESULTING FROM ERRORS OR OMISSIONS THEREIN.
4. CONTRACTOR IS RESPONSIBLE FOR LOCATING ALL UTILITIES. CONTACT ONE CALL AT 811 PRIOR TO DIGGING.
5. SUNOCO EMERGENCY HOTLINE NUMBER IS #1-800-786-7440.

REVISIONS

NO.	DESCRIPTION	BY	DATE	CHK	DATE	APP	DATE
B	ISSUED FOR BID	DLM	06/12/15	RMB	06/12/15	AAW	06/12/15
A	ISSUED FOR REVIEW	JAM	03/24/15	RMB	03/24/15	AAW	03/24/15

Sunoco Logistics Partners L.P.

TETRA TECH ROONEY
(303) 792-5911

SUNOCO PIPELINE, L.P.

HORIZONTAL DIRECTIONAL DRILL
BULRUSH
PENNSYLVANIA PIPELINE PROJECT

SCALE: 1"=150'

DWG. NUMBER: PA-CA-0091.0016-RD

APPENDIX F
HDD Inadvertent Return Plan

11/12/2016 Project Note: IR Plan not included due to revision. USFWS provided an updated Nov 2016 IR Plan. Always refer to the Project's most recent IR Plan.