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Wetland & Waterbody Delineation Report

for

East Side Expansion Project
Line 1278 Loop

Prepared for: Columbia Gas Transmission Company, LLC

Prepared by: AK Environmental, LLC

October 2013

WETLAND & WATERBODY DELINEATION REPORT

FOR

EAST SIDE EXPANSION PROJECT LINE 1278 LOOP

West Vincent Township
Upper Uwchlan Township
Uwchlan Township
East Brandywine Township
Caln Township
Downingtown Township
West Bradford Township
Chester County, Pennsylvania

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This Wetland Identification and Delineation Report has been prepared to describe wetlands and waters that may be affected by the East Side Expansion Project. The report describes the habitats and major vegetative cover types within the Project area.

I. PROJECT DESCRIPTION

As part of the East Side Expansion Project (Project) Columbia Gas Transmission, LLC (Columbia) is proposing to construct approximately 9.5 miles of 26-inch-diameter natural gas pipeline in Chester County, Pennsylvania. To the extent practicable and feasible, Columbia proposes to locate the Line 1278 Loop pipeline parallel to existing pipelines and, where feasible, along existing right-of-way (ROW). Additionally, as part of the whole Project, Columbia proposes to construct modifications and upgrades at the Easton, Eagle, and Milford compressor stations, in Pennsylvania as well as the Pennsburg and Quakertown Meter Stations in Pennsylvania. Columbia proposes to begin construction of the Project facilities in November 2014 and to place the facilities in-service by September 2015.

The approximately 9.5 miles of Line 1278 Loop in Chester County, Pennsylvania will generally lay parallel to the existing 1278 pipeline between Eagle Compressor Station and Downingtown Compressor Station. There are six proposed alternative routes and one proposed contractor yard that were all investigated. Pipeline design will include a Launcher/Receiver at each end of the loop. It is assumed that there will be one mainline valve installed on this pipeline loop. Three Horizontal Directional Drill (HDD) sections are included to facilitate construction and right-of-way (ROW) acquisition across difficult highway, railroad and park areas. Construction and pipeline access is to be achieved through the use of existing and proposed access roads.

Initial field investigations were conducted November 13-15, 2012 by a team of two wetland scientists and two GPS techs from AK Environmental, LLC (AK). Where landowner access was available, alternative routes, access roads and additional work areas were surveyed December 5-7, 2012, March 27-28, 2013 and July 29 – August 27, 2013. Investigations were conducted to identify and delineate the extent and location of jurisdictional waters and wetlands within the project study area pursuant to the federal Clean Water Act (Sections 401 and 404) the PA Code Title 25 Chapter 105 Dam Safety and Waterway Management regulations. The Code of Federal Regulations (33 CFR Parts 320-330) and the PA Chapter 105 define wetlands and watercourses and provide regulatory jurisdictional guidance on water obstructions and encroachments. Jurisdictional wetlands are defined as those areas satisfying the technical criteria contained in the *Corps of Engineers Wetlands Delineation Manual* (USACE, 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont Region: Version 2* (USACE, April 2012). The wetland information presented herein is subject to verification by the US Army Corps of Engineers through the Jurisdictional Determination (JD) process. Professional qualifications of the individuals involved in the preparation of this report are provided in Appendix A.

II. STUDY AREA

The East Side Expansion Project study area consists of a 300-foot wide corridor along the pipeline route that is partially co-located with existing pipeline ROW. The study area of proposed construction access roads is 50 feet, 25 feet on each side of the center of the road. The Project study area extends from the Eagle Compressor Station in West Vincent Township, PA east of Fellowship Road to the Downingtown Compressor Station in West Bradford Township, PA south of Poorhouse Road. Figure 1 shows the location of the proposed pipeline loop Project corridor on the USGS 7.5 minute quadrangles of Downingtown and Unionville Pennsylvania. Figure 1A shows the location of the Milford Compressor Station site on the Milford USGS 7.5 minute quadrangle and Figure 1B shows the location of the Pennsburg and Quakertown Meter Station sites on the Milford Square USGS 7.5 minute quadrangle. During field investigations, the wetland scientists did not have survey access to a section of access road located at MP 2.3 due to landowner preference. In addition, one parcel located between MP 5.8 and MP 5.9 was not surveyed due to landowner preference as well. A property to the north was surveyed in case a re-route is needed. The study area surveyed is illustrated in Figure 2 – Appendix B.

The Project lies within the Upland Section of the Piedmont Physiographic Province. The Piedmont Upland Section consists of broad, gently rolling hills and valleys. Views from uplands often give the viewer the impression that the uplands comprise the remnants of a once continuous sloping surface that is now dissected by the valleys eroded into it. This upland area is developed mainly on metamorphic rocks called schists. These rocks usually have a very well developed plane (schistocity) that was formed during metamorphism. This plane dips at moderately steep angles to the south and stream erosion is often either parallel to or normal to the plane of schistocity. In some places the drainage pattern has a very pronounced rectangular orientation, but for the most part the drainage pattern is dendritic. Local relief is generally less than 300 feet, but it can be as much as 600 feet. Elevations in the section range from 100 to 1,220 feet, but are generally between 400 and 600 feet (Commonwealth of PA, 2012).
The habitat types throughout the Project are typically dominated by a mix of residential subdivisions, commercial retail, rolling mature woodlands, and agricultural and fallow fields. The proposed pipeline parallels a portion of an existing maintained gas pipeline ROW.

Project Location Map

East Side Expansion Project - Line 1278 Loop

7.5' USGS Downingtown and Unionville Quadrangles

Chester County, Pennsylvania

0 0.75 1.5 3 Miles

1 inch = 6,000 feet

Figure 1

Drawn On: September 10, 2013

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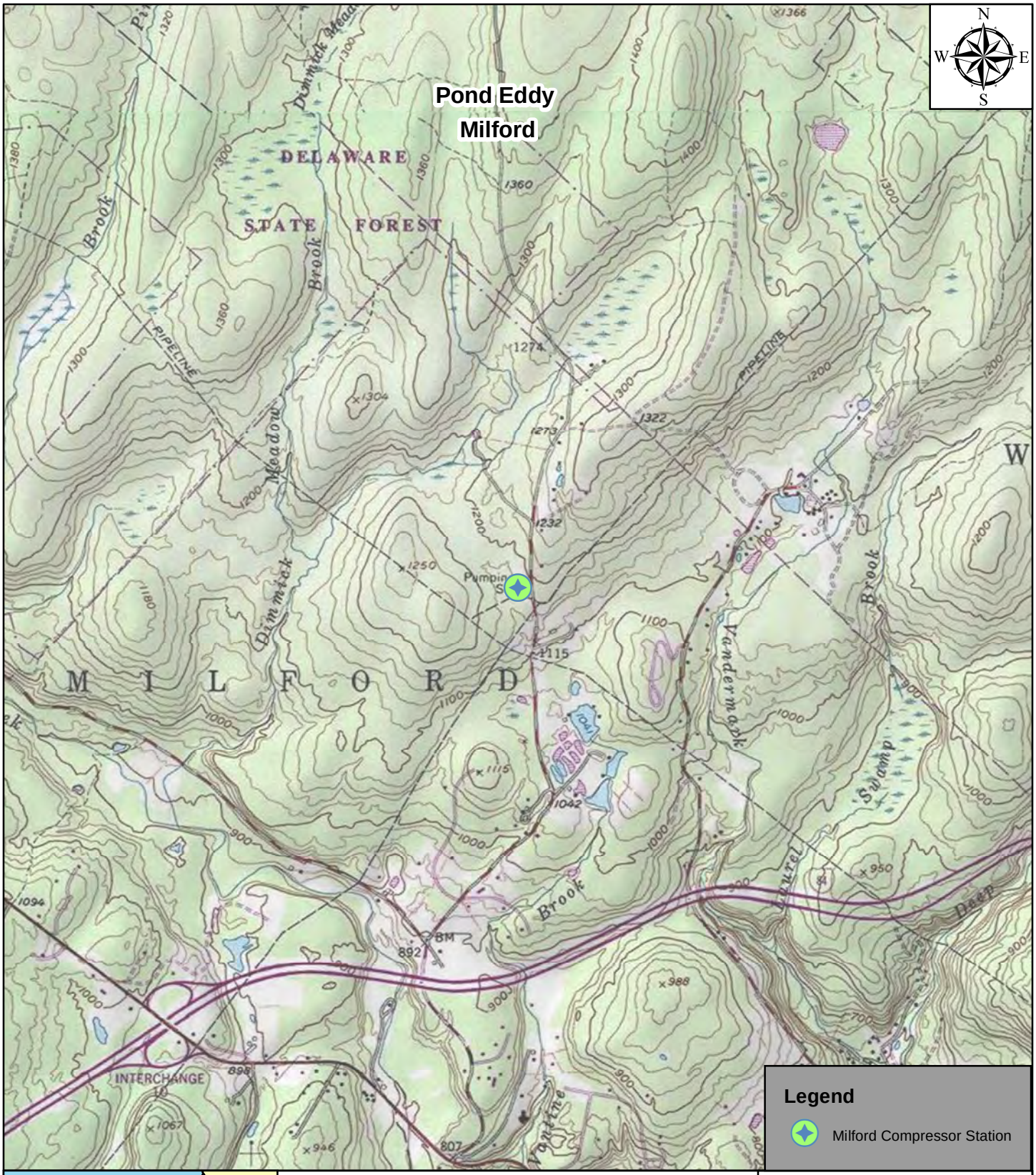

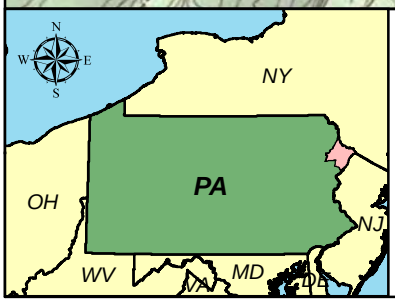

Milford Compressor Station Location

East Side Expansion Project

7.5' USGS Milford Quadrangle

Pike County, Pennsylvania

0 0.25 0.5 1 Miles

Figure 1A

Drawn On: September 23, 2013

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850 Bear Tavern Road
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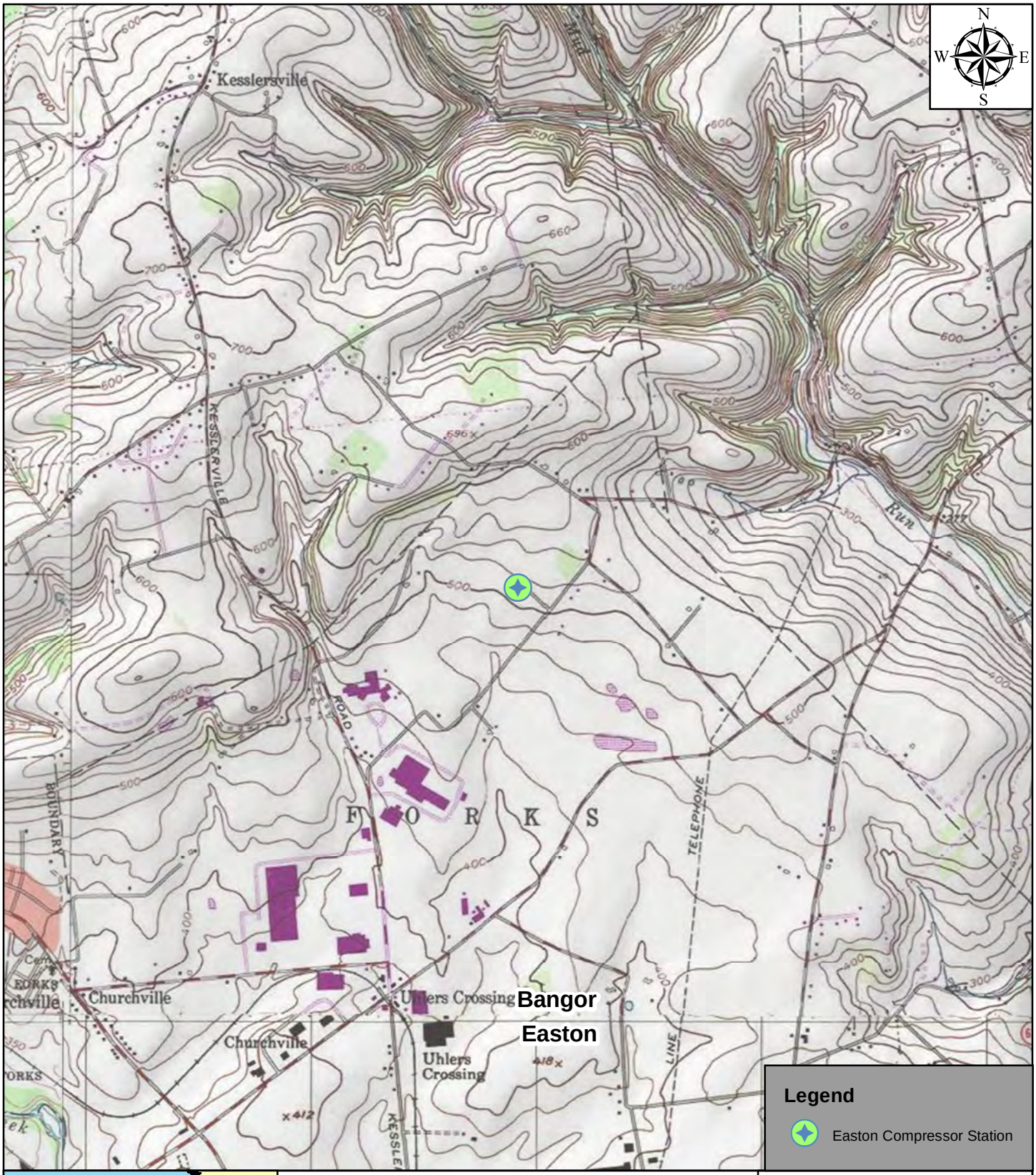
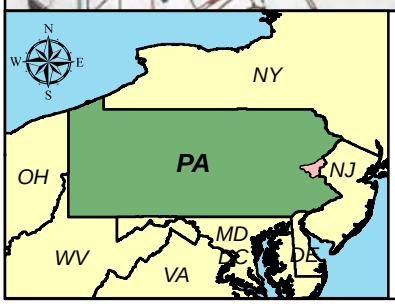
West Trenton, NJ 08628





Easton Compressor Station Location

East Side Expansion Project

7.5' USGS Bangor Quadrangle

Northampton County, Pennsylvania

0 0.25 0.5 1 Miles

Figure 1B

Drawn On: September 23, 2013

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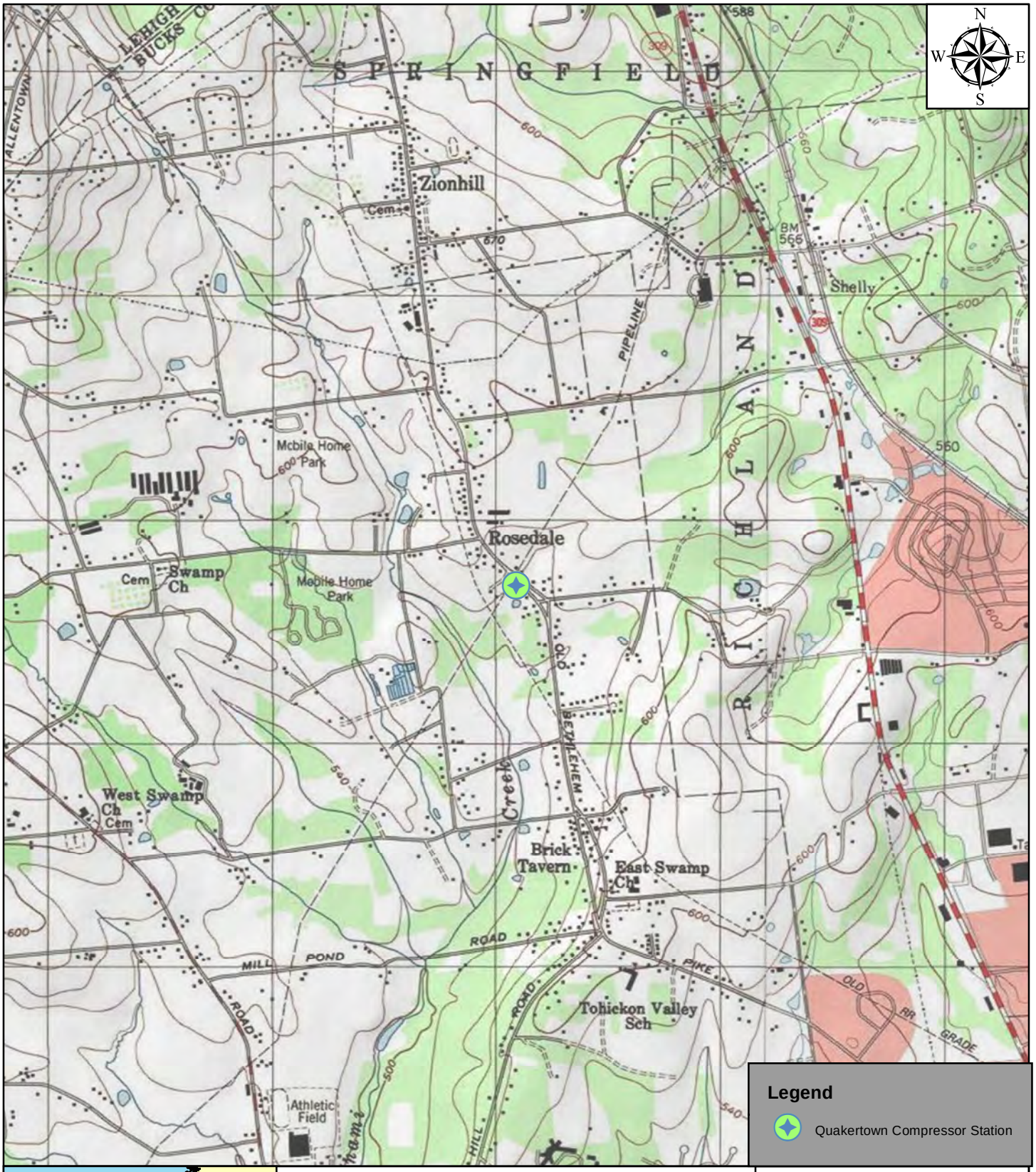

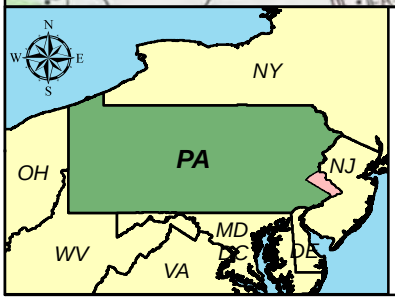

Quakertown Compressor Station Location

East Side Expansion Project

7.5' USGS Milford Square Quadrangle

Bucks County, Pennsylvania

0 0.25 0.5 1 Miles

Figure 1C

Drawn On: September 23, 2013

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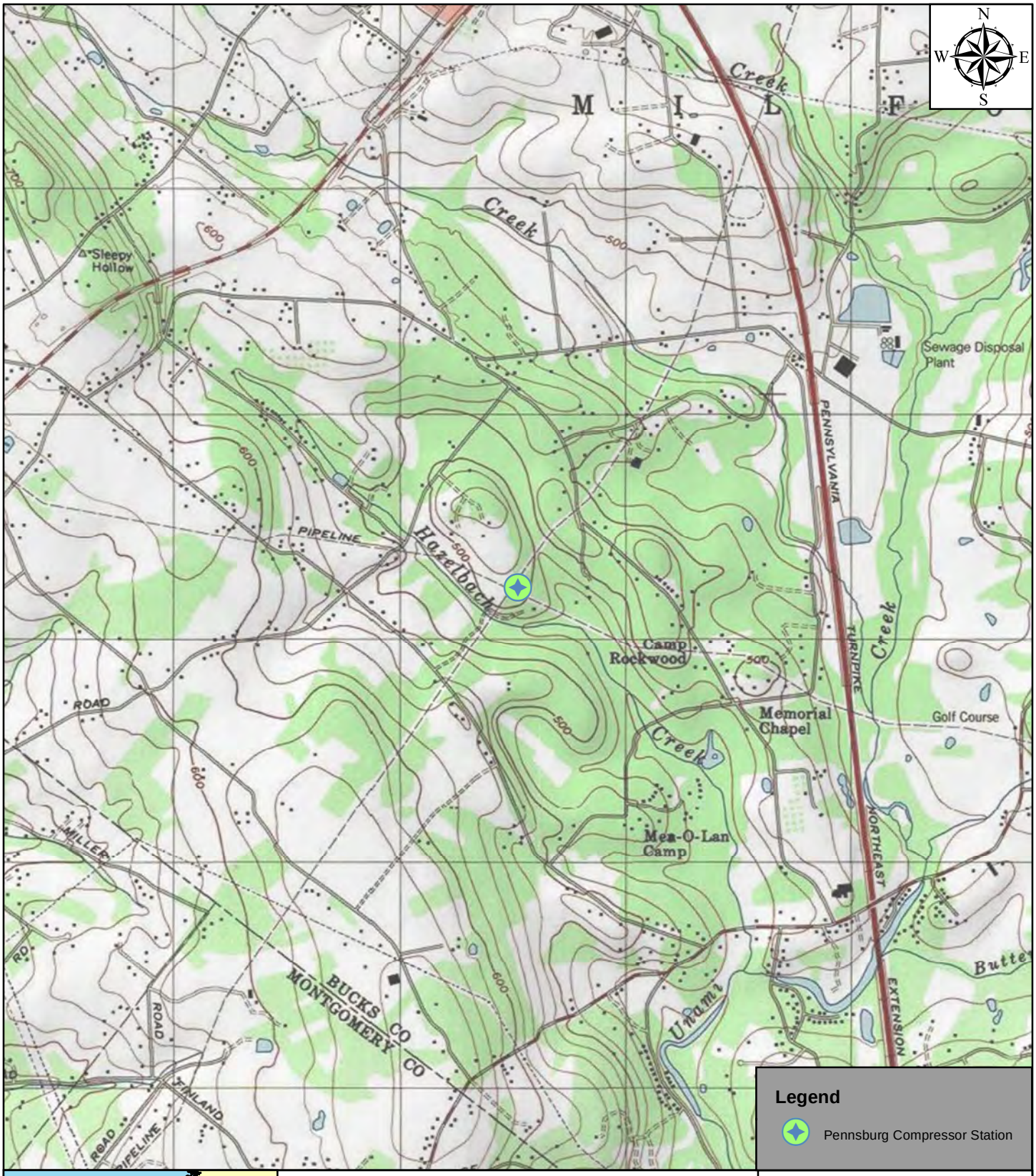
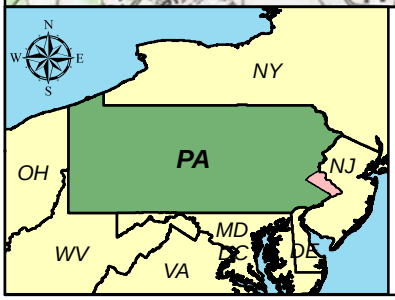


Legend

Pennsburg Compressor Station



Pennsburg Compressor Station Location

East Side Expansion Project

7.5' USGS Milford Square Quadrangle

Bucks County, Pennsylvania

0 0.25 0.5 1 Miles

Figure 1D

Drawn On: September 23, 2013

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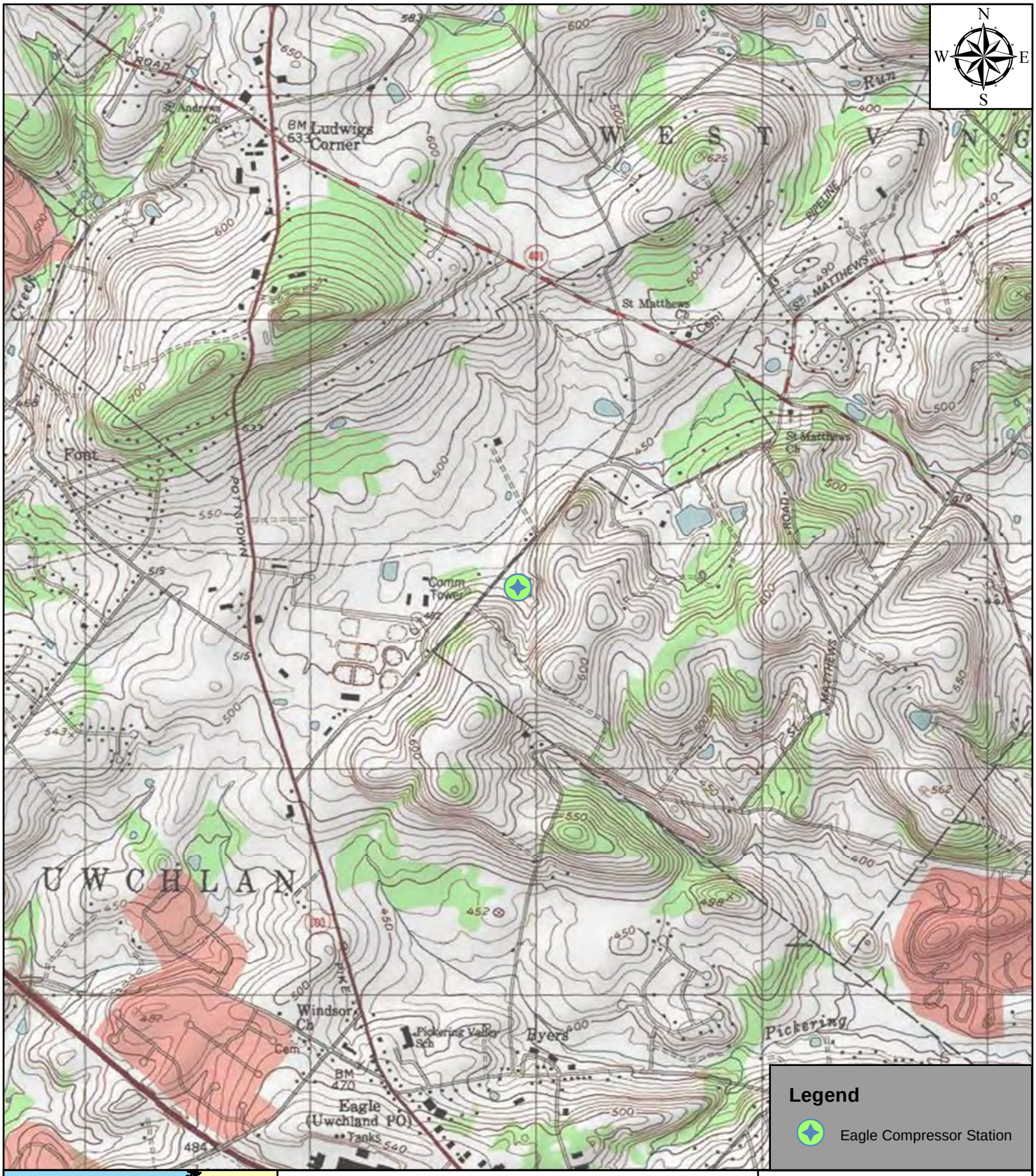

Eagle Compressor Station Location

East Side Expansion Project

7.5' USGS Downingtown Quadrangle

Chester County, Pennsylvania

0 0.25 0.5 1 Miles

Figure 1E

Drawn On: September 23, 2013

Prepared For: Columbia Gas Transmission — A NiSource Company

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III. RECORDS RESEARCH

Prior to field surveys, AK obtained habitat information from A Natural Area Inventory of Chester County, PA (1994), reviewed the 7.5' U.S.G.S. topographic quadrangles, the National Wetlands Inventory (NWI) web-based Interactive Mapper, and the Web Soil Survey to identify areas with topographical configurations, mapped wetlands and/or hydric soils which may suggest the presence of wetlands. Figure 1 shows the location of the study site on USGS maps and Figure 2 shows the study area on aerial photo with NWI and NRCS Soil Survey overlay. Water quality classifications which are listed in Title 25 of the PA Code Chapter 93 were obtained from the PA Code online as published in the PA Bulletin (PA Bulletin, 2010) and from the PA Department of Environmental Protection (PADEP) online GIS map with county-based updates on existing use of water quality available through the PADEP (http://www.depweb.state.pa.us).

The Natural Areas Inventory of Chester County, PA shows that Dowlin Woods is a relatively large woodland for this area and buffers East Branch of Brandywine Creek. It lies just east of the proposed Project corridor. The Project corridor also skirts the southern edge of core habitats SP520/SP514. An aquatic plant species of concern has been found at locations along East Branch Brandywine Creek. These natural areas are located at the intersection of Dowlin Forge Road and Shelmire Road. The project is also located approximately 0.5 miles east of the Bureau of State Parks, Marsh Creek State Park.

A. USGS Topographic Maps

The Project study area crosses nine “blue-line” topographic streams. They include: 2 Unnamed Tributaries (UNT) to Marsh Creek, UNT to Pickering Creek, Shamona Creek, 2 UNTs to East Branch Brandywine Creek, East Branch Brandywine Creek, UNT to Beaver Creek, and Beaver Creek. The proposed Project corridor lies within the Schuylkill and Brandywine-Christina River sub-basins of the Lower Delaware River. The stream crossings are shown on the USGS map (Figure 1) and identified in Table 3. In Pennsylvania, water quality classifications are established in Chapter 93 of the PA Code and available on the web mapper. Waters east of Pottstown Pike flow into Pickering Creek, which is designated as HQ-TSF (High Quality, Trout Stocked Fishery). Waters that lay between Pottstown Pike and Dorlan Mill Road flow into Marsh Creek and are also designated as HQ-TSF. Waters that lay between Dorlan Mill Road and Highway 30 flow into East Branch Brandywine Creek, which is designated as HQ-TSF in the northern section and WWF-TSF (Warm Water Fishery) in the southern section. Waters that lay south of Highway 30 flow into Beaver Creek are designated a CWF-TSF (Cold Water Fishery) (PA Bulletin, 2010).

Elevations within the study area range between approximately 300 feet above mean sea level (AMSL) to approximately 600 feet AMSL.

B. National Wetland Inventory (NWI) Map

Review of the NWI map indicated twelve palustrine wetlands within the study corridor. There are three palustrine, unconsolidated bottom (PUB) wetlands, four palustrine emergent (PEM) wetlands, two palustrine forested (PFO) wetland, one palustrine scrub/shrub (PSS)/PEM wetland complex, and two PFO/PSS/PEM wetland complexes.

These mapped wetlands were delineated and included as part of wetlands identified in Table 2 and Figures 2, 2A and 2B. Wetland classification is based on Classification of Wetlands and Deepwater Habitats of the United States (Cowardin et al, 1979).

C. Soil Survey

There are 26 separate soil series identified within the Project study corridor in Chester County, 7 separate soil series identified in Bucks County, and 3 separate soil series identified in Pike County. Table 1 presents the physical soil characteristics and limitations of these soil mapping units in the Project area. Soil descriptions are located in Appendix C. The Soil Survey mapping is included on the Environmental Resources Maps in Appendix B.

Table 1. Soil Physical Characteristics/Limitations

Soil Code	Soil Name	Hydric	Depth to *Restrictive Layer (inches)	Prime Farmland	Depth to Seasonal High Water (feet)
Chester County, Pennsylvania					
CaA	Califon loam, 0 to 3 percent slopes	No	20-30	Prime	0.5-3.5
CaB	Califon loam, 3 to 8 percent slopes	No	20-30	Prime	0.5-3.5
CaC	Califon loam, 8 to 15 percent slopes	No	20-30	Statewide	0.5-3.5
ClA	Clarksburg silt loam, 0 to 3 percent slopes	No	20-36	Prime	1.5-5.0
ClB	Clarksburg silt loam, 3 to 8 percent slopes	No	60 -99	Prime	1.5-5.0
Co	Codorus silt loam	No	72-99	Prime	1.5->6.0
CpA	Cokesbury silt loam, 0 to 3 percent slopes	Yes	20-99	NA	0-2.5
CpB	Cokesbury silt loam, 3 to 8 percent slopes	Yes	20-99	NA	0-2.5
CtA	Conestoga silt loam, 0 to 3 percent slopes	No	60-99	Prime	NA
CtB	Conestoga silt loam, 3 to 8 percent slopes	No	60-99	Prime	NA
CtC	Conestoga silt loam, 8 to 15 percent slopes	No	60-99	NA	NA
EdB	Edgemont channery loam, 3 to 8 percent slopes	No	42-84	Prime	NA
EdC	Edgemont channery loam, 8 to 15 percent slopes	No	42-84	Statewide	NA
EdD	Edgemont channery loam, 15 to 25 percent slopes	No	42-84	NA	NA
ExF	Edgemont channery sandy loam, 25 to 60 percent slopes, extremely stony	No	42-84	NA	NA
GdA	Gladstone gravelly loam, 0 to 3 percent slopes	No	60-100	Prime	NA
GdB	Gladstone gravelly loam, 3 to 8 percent slopes	No	60-100	Prime	NA
GdC	Gladstone gravelly loam, 8 to 15 percent slopes	No	60-100	Statewide	NA
GdD	Gladstone gravelly loam, 15 to 25 percent slopes	No	60-100	NA	NA
GeD	Gladstone-Parker gravelly loams, 15 to 25 percent slopes	No	60-100	NA	NA

Table 1. Soil Physical Characteristics/Limitations					
Soil Code	**Soil Name**	**Hydric**	**Depth to *Restrictive Layer (inches)**	**Prime Farmland**	**Depth to Seasonal High Water (feet)**
GfB	Gladstone gravelly loam, 0 to 8 percent slopes, very bouldery	No	60-100	NA	NA
GfD	Gladstone gravelly loam, 8 to 25 percent slopes, very bouldery	No	60-100	NA	NA
GfF	Gladstone gravelly loam, 25 to 50 percent slopes, very bouldery	No	60-100	NA	NA
GgA	Glenelg silt loam, 0 to 3 percent slopes	No	60-120	Prime	NA
GgB	Glenelg silt loam, 3 to 8 percent slopes	No	72-120	Prime	NA
GlB	Glenville silt loam, 3 to 8 percent slopes	No	15-30	Prime	0.5-2.5
Ha	Hatboro silt loam	Yes	60-99	NA	0->6.0
HlC	Hollinger silt loam, 8 to 15 percent slopes	No	60-99	Statewide	NA
HlD	Hollinger silt loam, 15 to 25 percent slopes	No	60-99	NA	NA
Ho	Holly silt loam	Yes	NA	Statewide	0->6.0
Ln	Lindside silt loam	No	>60	Prime	1.5->6.0
MaB	Manor loam, 3 to 8 percent slopes	No	72-99	Prime	NA
MaC	Manor loam, 8 to 15 percent slopes	No	72-99	Statewide	NA
MaD	Manor loam, 15 to 25 percent slopes	No	72-99	NA	NA
MaE	Manor loam, 25 to 35 percent slopes	No	72-99	NA	NA
MlB	Mount Lucas silt loam, 3 to 8 percent slopes	No	48-99	Prime	1.0->6.0
PaD	Parker gravelly loam, 15 to 25 percent slopes	No	60-118	NA	NA
PaE	Parker gravelly loam, 25 to 35 percent slopes	No	60-118	NA	NA
PdA	Penlaw silt loam, 0 to 3 percent slopes	No	15-72	Statewide	0.5->6.0
PdB	Penlaw silt loam, 3 to 8 percent slopes	No	15-72	Statewide	0.5->2.5
Pt	Pits, quarries	No	NA	NA	NA
Th	Thorndale silt loam	Yes	20-99	NA	0->6.0
UrB	Urban land, 0 to 8 percent slopes	No	10-98	NA	NA
UrgB	Urban land-Conestoga complex, 0 to 8 percent slopes	No	10-99	NA	NA
UudB	Urban land-Udorthents, limestone complex, 0 to 8 percent slopes	No	60-99	NA	NA
UugB	Urban land-Udorthents, schist and gneiss complex, 0 to 8 percent slopes	No	10-99	NA	0.5->6.0
UugD	Urban land-Udorthents, schist and gneiss complex, 8 to 25 percent slopes	No	10-99	NA	NA
Bucks County, Pennsylvania					
Ha	Hatboro silt loam	Yes	60-99	NA	0->6.0
LmB	Lehigh channery silt loam, 3 to 8 percent	No	40-60	Prime	0.5-3.4

Table 1. Soil Physical Characteristics/Limitations					
Soil Code	**Soil Name**	**Hydric**	**Depth to *Restrictive Layer (inches)**	**Prime Farmland**	**Depth to Seasonal High Water (feet)**
MlC	Mount Lucas silt loam, 8 to 15 percent slopes	No	48-99	Statewide	1.0->6.0
MmD	Mount Lucas silt loam, 8 to 25 percent slopes, extremely stony	No	48-99	NA	0.5->6.0
NhD	Neshaminy, gravelly silt loam, 8 to 25 percent slopes, extremely bouldery	No	48-72	NA	NA
ToB	Towhee silt loam, 3 to 8 percent slopes	Yes	20-30	NA	0-2.6
Pike County, Pennsylvania					
30B	Wurtsboro stony fine sandy loam, 0 to 8 percent slopes, extremely stony	No	17-28	NA	1.0-2.3
38B	Swartswood stony fine sandy loam, 0 to 8 percent slopes, extremely stony	No	28-36	NA	2.2-3.0
897C	Lordstown-Swartswood complex, 8 to 15 percent slopes, extremely stony	No	20-40	NA	2.2-3.0

IV. FIELD INVESTIGATIONS

Investigations were conducted within the study area to verify the mappings, and to identify land use, plant community types, and presence of regulated wetland and water resources within the study area. Locations of wetland and stream features were captured utilizing a hand-held Trimble GPS unit with sub-meter accuracy. Pipeline centerline of the study corridor was based on GPS location which may vary from an actual survey-staked centerline.

Land use within the study area is a mix of residential subdivisions, commercial retail, and rolling mature forest land. Following are brief descriptions of plant communities identified in the Project area.

Forested Plant Community

The forested plant communities are dominated by sweet gum (*Liquidambar styraciflua*), American beech (*Fagus grandifolia*), oak species (*Quercus spp*.), hickory species (*Carya spp*.), maple species (*Acer spp*.), tulip poplar (*Liriodendron tulipifera*), eastern hemlock, (*Tsuga canadensis*), greenbriar (*Smilax rotundifolia*), mapleleaf viburnum (*Viburnum acerifolium*), and eastern red cedar (*Juniperus viginiana*).

Fallow Field Plant Community

Dominant field species included common mid-western prairie species such as; little bluestem (*Schizachyrium scoparium*), Indian-grass (*Soraghastrum nutans*), orchard grass (*Dactylis glomerata),* Queen Anne's lace (*Daucus carota*), goldenrod species (*Solidago spp.),* milkweed species (*Asclepias spp.)*, smooth brome (*Bromus inermis*), tall fescue (*Schedonorus*

arundinaceus), bluegrass (*Poa pratensis),* plantain species (*Plantago spp*.) and thistle species (*Carduus and Cirsium spp.).*

Residential and Commercial Plant Community

These areas are generally maintained and landscaped. The lawns and common areas are mowed, and trees and shrubs are trimmed. Turf grass species grow within the lawns and ornamental trees and shrubs are planted throughout.

Agricultural Plant Community

The proposed project is planned to cross several active agricultural fields. Common crops for this area include corn, soybeans and alfalfa.

Water and Wetland Habitat

All plant community types were investigated for wetlands and waterbodies. Wetlands and waters were identified as emergent, scrub/shrub, or forested wetlands, perennial streams, intermittent streams, or ephemeral streams. Perennial streams and intermittent streams are always considered waters of the U.S. Streams are considered perennial if they contain base flow throughout the year, which is supported with groundwater. Intermittent streams are those which contain base flow at least a portion of the year (seasonally), which is supported with groundwater. Ephemeral channels, stormwater ditches and seeps are sometimes considered waters of the U.S. In ephemeral channels and stormwater channels, the primary sources of hydrology are snow and rain precipitation. Stormwater channels are manmade features specifically constructed for the conveyance of surface water from upland areas. Seeps may discharge groundwater or surface water. These channels can be considered waters of the U.S. if they exhibit an Ordinary High Water Mark (OHWM), exhibit a bed and bank, are tributary to jurisdictional waters or if they are built in waters of the U.S. or wetlands. The OHWM is that line on the shore established by the fluctuations of water and typically characterized by a clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, or the presence of litter and debris (USC Title 33). Stormwater channels are also considered waters of the U.S. in the absence of an OHWM, if the channel connects two wetlands or waters of the U.S. or are tributary to jurisdictional waters. Waters of the U.S. are ultimately determined based on the outcome of a USACE jurisdictional determination.

Wetlands, if identified, were delineated in the field by AK in accordance with the *Corps of Engineers Wetlands Delineation Manual* (USACE, 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont: Version 2* (USACE, 2012). The on-site field investigation involved inspection of the study area to identify areas that satisfy the three wetland criteria: a predominance of hydrophytic (wetland) vegetation, wetland hydrology, and hydric soils. In order to make a determination that an area is a wetland, the Regional Supplement requires that, under natural (typical) conditions, a minimum of one primary wetland indicator be confirmed for each of the three wetland parameters. A failure to confirm all three parameters must result in a finding that the area under evaluation is a non-wetland under typical conditions. Palustrine emergent wetlands (PEM) are dominated by

herbaceous vegetation, palustrine scrub-shrub wetlands (PSS) are dominated by shrub and sapling vegetation and palustrine forested wetlands (PFO) are dominated by mature trees. Palustrine unconsolidated bottom (PUB) communities are dominated by open water, usually a pond, lined with unconsolidated material.

A. Findings

Several wetlands and waterbodies were identified within the Project study corridor. The summary of these findings are outlined below.

Wetlands

There were 38 freshwater palustrine wetlands identified during this investigation. Twenty-four of the features are PEM wetlands, one is a PSS wetland, four are PFO wetlands, three are PUB wetlands, and six are mixed community wetlands composed of PEM/PFO or PEM/PSS. These communities are dominated by more than one vegetative community that may or may not be distinctly separated. Features and wetland types are listed in Table 2 below and representative photos are provided in Appendix D. Wetland data forms are included in Appendix E and features are shown on the Environmental Resources Maps in Appendix B. Information including dominant plant species, hydrology, and soils are presented in each wetland data form set. Upland data sheets as well as transitional wetland data sheets were collected.

Table 2. Wetlands Identified in the Project Area

Photo #	Figure 2 Sheet #	Feature Designation	Wetland Type*	Designated/ Existing Use**	Associated Streams	Comments
Chester County, Pennsylvania						
1	1 of 6	W225PA	PUB	HQ-TSF	S200PA	Pond - NWI
3	1 of 6	W200PA	PEM	HQ-TSF	S200PA	Cont's west of ROW
4	1 of 6	W201PA	PEM	HQ-TSF	N/A	Isolated
5	1 of 6	W202PA	PEM	HQ-TSF	N/A	Isolated
6	1 of 6	W1ALT	PEM	HQ-TSF	N/A	Isolated
10	1 of 6	W226	PFO	HQ-TSF	S225	Headwaters to Pickering Creek - NWI
11	1 of 6	W227	PEM	HQ-TSF	N/A	Stormwater basin
12	1 of 6	W228	PEM	HQ-TSF	N/A	Stormwater basin
13	1 of 6	W229	PEM	HQ-TSF	N/A	Stormwater basin
14	1 of 6	W9ALT	PEM	HQ-TSF	N/A	Stormwater outfall
15	1 of 6	W11ALT	PEM	HQ-TSF	N/A	Stormwater outfall
16, 17	1 of 6	W204PA	PEM/PFO	HQ-TSF	N/A	Cont's west of ROW - NWI
18	1 of 6	W205PA	PEM	HQ-TSF	S203PA	Cont's east of ROW
23, 24	2 of 6	W206PA	PEM/PFO	HQ-TSF	S204PA/ S205PA	Cont's west of ROW
27	2 of 6	W207PA	PFO	HQ-TSF	S205PA	Cont's west of ROW

Table 2. Wetlands Identified in the Project Area						
Photo #	**Figure 2 Sheet #**	**Feature Designation**	**Wetland Type***	**Designated/ Existing Use****	**Associated Streams**	**Comments**
Chester County, Pennsylvania						
28	2 of 6	W2ALT	PFO	HQ-TSF	S1ALT	Abuts Stream
30	2 of 6	W3ALT	PEM	HQ-TSF	S1ALT	Abuts Stream
31	2of 6	W203PA	PEM/PSS	HQ-TSF	S201PA	Cont's east and west of ROW - NWI
36	3 of 6	W208PA	PEM	HQ-TSF	S207PA	Adjacent East Branch Brandywine - NWI
38	4 of 6	W209PA	PEM/PSS	HQ-TSF	S208PA	Cont's north of ROW
39	4 of 6	W211PA	PEM	HQ-TSF	N/A	Isolated
40	4 of 6	W231PA	PEM	HQ-TSF	N/A	Fallow field
41	4 of 6	W230PA	PEM	HQ-TSF	N/A	Fallow field
N/A	4 of 6	W210PA	PEM/PSS	HQ-TSF	S209PA/ S210PA	Cont's east of ROW
51	4 of 6	W400PA	PFO	WWF-TSF	S402PA	Cont’s south of ROW
55	5 of 6	W401PA	PEM	WWF-TSF	N/A	Isolated pocket wetland within ROW
56	5 of 6	W300PA	PEM	CWF-TSF	S216PA	Depressional mowed field within Lloyd Park
57	5 of 6	W301PA	PEM	CWF-TSF	S216PA	Cont’s southeast of ROW
60	5 of 6	W213PA	PEM	HQ-TSF	S214PA/ S215PA	Spring fed, old dam structure
62	5 of 6	W212PA	PUB	WWF-TSF	S212PA	Old pond, now stormwater detention for residential
66	5 of 6	W232PA	PEM	CWF-TSF	S227	Field depression
67	5 of 6	W4ALT	PSS	CWF-TSF	S4ALT	Cont's southeast of ROW - NWI
68	5 of 6	W10ALT	PEM	CWF-TSF	N/A	Stormwater outfall
70	5 of 6	W8ALT	PUB	CWF-TSF	N/A	Pond - NWI
71	5 of 6	W5ALT	PEM	CWF-TSF	S12ALT	Adjacent to Stream
81, 82	5 of 6	W214PA	PEM/PFO	CWF-TSF	S216PA	Abuts Beaver Creek, Cont's west of ROW - NWI
85	5 of 6	W7ALT	PEM	CWF-TSF	S6ALT	Abuts Stream - NWI
89	6 of 6	W215PA	PEM	CWF	S219PA	Cont's northwest of ROW

Table 2. Wetlands Identified in the Project Area						
Photo #	**Figure 2 Sheet #**	**Feature Designation**	**Wetland Type***	**Designated/ Existing Use****	**Associated Streams**	**Comments**
Pike County, Pennsylvania						
90	1 of 1	W1PA	PFO	HQ-CWF	S1PA	Abuts S1PA

* PEM = Palustrine Emergent, PFO=Palustrine Forested, PSS= Palustrine Scrub/Shrub, PUB = Palustrine Unconsolidated Bottom (Cowardin et al, 1979),
**From PA Chapter 93; TSF=Trout Stocked Fishery, HQ= High Quality, CWF= Cold Water Fishery, WWF= Warm Water Fishery. N/A = not applicable

Each wetland is individually unique; however, some wetlands do share similar characteristics. Wetlands will be discussed in a generally north to south order along the proposed Project corridor except in cases where wetlands have similar character.

The majority of the wetlands within the study corridor have been created (stormwater facilities) or altered by adjacent development. These are lower quality wetlands that have a lesser value to their location proximate to roadways, existing pipeline right of ways (ROW), residential subdivisions, recreational facilities, churches, and commercial development. They are primarily PEM wetlands and include: W200PA, W201PA, W202PA, W1ALT, W227PA-W229PA, W9ALT, W11ALT, W205PA, W3ALT, W208PA, W211PA, W210PA, W401PA, W213PA, W212PA, W232PA, W10ALT, and W215PA.

Several of the wetlands are located adjacent to, or are the fringe of other waterbodies. These wetlands provide greater value due to their ability to store and dissipate flood water, provide wildlife habitat, and provide areas for groundwater recharge. These wetlands include W226PA, W206PA, W207PA, W2ALT, W203PA, W209PA, W300PA, W301PA, W4ALT, W5ALT, W214, W7ALT, and W1PA.

The remaining wetlands occur as either depressions in fallow fields, are isolated or open water impoundments. They include W204PA, W231PA, W230PA, W232PA, and W8ALT.

Larger wetland complexes such as, W226PA, W206PA, W207PA, W203PA, W401PA, and W214PA appear to provide the highest value in the study area. W226PA is a large forested wetland with open water areas and large mature trees. It occurs at the headwaters of Pickering Creek and between a church and a residential subdivision. It is fed by S225PA, which originates from an old spring house. W206PA and W207PA are located to the north and south of S205PA, which is an unnamed tributary to Marsh Creek. These wetlands are forested and comprise the floodplain of S205PA. They are downslope of a horse farm and a recreational complex. W203PA is located on the fringe of S201PA. It is part of a floodplain area located in a stream valley downslope of two large residential developments. W401PA is a large PFO wetland located directly south of U.S. Route 30 at the base of the slope. S402PA flows through W401PA and into the East Branch of Brandywine Creek. Wetland W214PA is located in a large floodplain to Beaver Creek and is situated in a riparian zone downslope of residential and commercial development. W1PA is a PFO located on both sides of an existing access road near the Milford Compressor Station. It is bisected by S1PA and lies within the Vantine Brook watershed.

Wetland W208PA is a PEM wetland that lays adjacent to East Branch Brandywine creek and Shamona Creek, HQ-TSF tributaries. The area is used for recreation by fisherman as well as runners and cyclists, as there is a paved park trail that parallels the creek. The wetland provides good habitat value as well as aesthetic value for the public. Although the wetland is next to a large mapped NWI PFO wetland, the floodplain has accumulated an abundant amount of sandy alluvium. The sand does not display any redoximorphic features or any sandy soil hydric character. The sandy soils are greater than 18 inches in depth and no herbaceous wetland vegetation or wetland hydrology exist to support such hydrophytic vegetation. The mature trees that grow along the stream have taproots that are able to access groundwater.

Waterbodies

The Project study area is located within the Schuylkill and Brandywine-Christina sub-basins within the Delaware River basin. The project study corridor crosses the headwaters of Pickering Creek and the main channels of East Branch Brandywine Creek and Beaver Creek. All three of these waters are Approved Trout Waters (Trout Stocked-TSF). The Project watershed area was searched to see if any tributaries were classified as Class A Wild Trout Waters or PA Wilderness Trout Waters. None of the streams were classified as any of these. The East Branch Brandywine Creek is listed as a Pennsylvania Scenic River in its Lower Brandywine section. The portion of the Creek that is designated scenic, lays south of the Norfolk-Southern R/R overpass to the confluence with Brandywine Creek. This Project does not lie within the designated corridor, and the creek crossing is planned for Horizontal Directional Drill (HDD).

There were 55 waterbodies identified as part of this corridor investigation. The following were identified within or crossing the pipeline study corridor: 20 perennial streams, 16 intermittent streams, and 12 ephemeral streams and 7 swales. Two additional perennial waterbody features were identified at 2 of the aboveground facility locations. Perennial stream S1PA was delineated at the Milford Compressor Station and Perennial stream S600PA was delineated at the Pennsburg Meter Station. Features and waterbody types are listed in Table 3 below and representative photos are provided in Appendix D. Waterbody data forms are included in Appendix E and features are shown on the Environmental Resources Maps in Appendix B. There is only one data sheet for the 2 crossings of waterbody feature S402PA and one data sheet for the 3 crossings of waterbody S216PA.

Table 3. Waterbodies Identified in the Project Area

Photo Number	Figure 2 Sheet #	Feature Designation	Waterbody Type	Water Quality Classification*	Bank-to-Bank Width (Feet)	Comments
Chester County, Pennsylvania						
2	1 of 6	S200PA	Intermittent	HQ-TSF	5	UNT to Pickering Creek
7	1 of 6	S225PA	Perennial	HQ-TSF	8	Pickering Creek
8	1 of 6	S225BPA	Perennial	HQ-TSF	4	UNT to Pickering Creek
9	1 of 6	S225CPA	Intermittent	HQ-TSF	3	UNT to Pickering Creek

Table 3. Waterbodies Identified in the Project Area						
Photo Number	**Figure 2 Sheet #**	**Feature Designation**	**Waterbody Type**	**Water Quality Classification***	**Bank-to-Bank Width (Feet)**	**Comments**
Chester County, Pennsylvania						
19	1 of 6	S203PA	Intermittent	HQ-TSF	2	UNT to Marsh Creek
20	1 of 6	S203BPA	Intermittent	HQ-TSF	2	UNT to Marsh Creek, Flows into S203PA
21	1 of 6	S203CPA	Ephemeral	HQ-TSF	2	UNT to Marsh Creek, Flows into S203PA
22	1 of 6	S203DPA	Intermittent	HQ-TSF	2	UNT to Marsh Creek, Flows into S203PA
25	2 of 6	S204PA	Intermittent	HQ-TSF	4	UNT to Marsh Creek, Flows into S205PA
26	2 of 6	S205PA	Perennial	HQ-TSF	10	UNT to Marsh Creek
29	2 of 6	S1ALT	Perennial	HQ-TSF	5	UNT to Marsh Creek
32	2 of 6	S201PA	Perennial	HQ-TSF	8	UNT to Marsh Creek
33	3 of 6	S202PA	Intermittent	HQ-TSF	2	UNT to East Branch Brandywine Creek
34	3 of 6	S206PA	Perennial	HQ-TSF	40	Shamona Creek, flows into E. Branch Brandywine Creek
35	4 of 6	S207PA	Perennial	WWF-TSF	100	E. Branch Brandywine Creek
37	4 of 6	S208PA	Perennial	HQ-TSF	10	UNT to E. Branch Brandywine Creek
N/A	4 of 6	S208BPA	Ephemeral	HQ-TSF	2	Flows into S208PA, UNT to E. Branch Brandywine Creek
N/A	4 of 6	S208C	Ephemeral	HQ-TSF	3	Flows into S208PA, UNT to E. Branch Brandywine Creek
N/A	4 of 6	S226PA	Ephemeral	HQ-TSF	2	Spring seep, Watershed of E. Branch Brandywine Creek
42	4 of 6	S211PA	Intermittent	HQ-TSF	8	UNT to E. Branch Brandywine Creek
43	4 of 6	S209PA	Intermittent	HQ-TSF	15	UNT to E. Branch Brandywine Creek
N/A	4 of 6	S209BPA	Intermittent	HQ-TSF	3	Flows into S209PA, UNT to E. Branch Brandywine Creek
44	4 of 6	S210PA	Swale	HQ-TSF	Swale	Swale to W210PA, Watershed of E. Branch Brandywine Creek

Table 3. Waterbodies Identified in the Project Area						
Photo Number	**Figure 2 Sheet #**	**Feature Designation**	**Waterbody Type**	**Water Quality Classification***	**Bank-to-Bank Width (Feet)**	**Comments**
Chester County, Pennsylvania						
45	4 of 6	S3ALT	Intermittent	HQ-TSF	10	UNT E. Branch Brandywine Creek
46	4 of 6	S2ALT	Perennial	HQ-TSF	15	UNT E. Branch Brandywine Creek
47	4 of 6	S401PA	Ephemeral	HQ-TSF	3	UNT E. Branch Brandywine Creek
48	4 of 6	SWA400PA	Swale	HQ-TSF	Swale	Watershed of E. Branch Brandywine Creek
N/A	4 of 6	S400PA	Ephemeral	WWF-TSF	8	UNT E. Branch Brandywine Creek
49	4 of 6	S207BPA	Perennial	WWF-TSF	60	East Branch Brandywine Creek
50	4 of 6	S402PA Crossing 1	Perennial	WWF-TSF	5	UNT E. Branch Brandywine Creek.
N/A	4 of 6	S402PA Crossing 2	Perennial	CWF-TSF	5	UNT E. Branch Brandywine Creek.
52	5 of 6	S300PA	Intermittent	WWF-TSF	10	UNT E. Branch Brandywine Creek.
53	5 of 6	S300BPA	Ephemeral-Concrete channel	WWF-TSF	3	UNT E. Branch Brandywine Creek.
54	5 of 6	S300CPA	Ephemeral-Concrete channel	WWF-TSF	3	UNT E. Branch Brandywine Creek.
58	5 of 6	S215PA	Ephemeral	WWF-TSF	5	UNT to E. Branch Brandywine Creek
59	5 of 6	S214PA	Intermittent	WWF-TSF	3	UNT to E. Branch Brandywine Creek
61	5 of 6	S213PA	Swale	WWF-TSF	Swale	UNT to E. Branch Brandywine Creek
63	5 of 6	S212PA	Swale	WWF-TSF	Swale	Flows into W212PA, Watershed of E. Branch Brandywine Creek
64	5 of 6	S227PA	Ephemeral	WWF-TSF	2	Roadside ditch, Watershed of E. Branch Brandywine Creek
65	5 of 6	S227BPA	Ephemeral	WWF-TSF	2	Roadside culvert, flows to S227, Watershed of E. Branch Brandywine Creek
69	5 of 6	S4ALT	Perennial	CWF-TSF	8	UNT to Beaver Creek

Table 3. Waterbodies Identified in the Project Area						
Photo Number	**Figure 2 Sheet #**	**Feature Designation**	**Waterbody Type**	**Water Quality Classification***	**Bank-to-Bank Width (Feet)**	**Comments**
Chester County, Pennsylvania						
72	5 of 6	S5ALT	Perennial	CWF-TSF	20	Beaver Creek
73	5 of 6	S12ALT	Swale	CWF-TSF	Swale	UNT Beaver Creek
74	5 of 6	S218PA	Intermittent	CWF-TSF	5	UNT to Beaver Creek
75	5 of 6	S216PA Crossing 1	Perennial	CWF-TSF	15	Beaver Creek
75	5 of 6	S216PA Crossing 2	Perennial	CWF-TSF	15	Beaver Creek
76, 77	5 of 6	S10ALT	Perennial	CWF-TSF	10	UNT to Beaver Creek
78	5 of 6	S11ALT	Intermittent	CWF-TSF	6	UNT to Beaver Creek
79	5 of 6	S216PA Crossing 3	Perennial	CWF-TSF	15	Beaver Creek
80	5 of 6	S8ALT	Perennial	CWF-TSF	20	Beaver Creek
83	5 of 6	S6ALT	Perennial	CWF-TSF	4	UNT Beaver Creek
84	5 of 6	SWA300PA	Swale	CWF-TSF	Swale	UNT to Beaver Creek
86	6 of 6	S7ALT	Ephemeral	CWF	4	UNT to Beaver Creek
87	6 of 6	S220PA	Swale	CWF	Swale	UNT to Beaver Creek
88	6 of 6	S219PA	Intermittent	CWF	6	UNT to Beaver Creek

Table 3. Waterbodies Identified in the Project Area						
Photo Number	**Figure 2 Sheet #**	**Feature Designation**	**Waterbody Type**	**Water Quality Classification***	**Bank-to-Bank Width (Feet)**	**Comments**
Pike County, Pennsylvania						
90	1 of 1	S1PA	Perennial	HQ-CWF	2	UNT to Vantine Brook

Table 3. Waterbodies Identified in the Project Area						
Photo Number	**Figure 2 Sheet #**	**Feature Designation**	**Waterbody Type**	**Water Quality Classification***	**Bank-to-Bank Width (Feet)**	**Comments**
Bucks County, Pennsylvania						
91	1 of 1	S600PA	Perennial	HQ	15	Hazelbach Creek
*From PA Chapter 93; TSF=Trout Stocked Fishery, HQ= High Quality, CWF= Cold Water Fishery, WWF= Warm Water Fishery. N/A = not applicable						

There are 4 waterbody features located within the Pickering Creek Watershed, 8 waterbodies within the Marsh Creek Watershed, 26 waterbodies are in the East Branch Brandywine Creek watershed, and there are 15 waterbodies within the Beaver Creek Watershed. The two aboveground facility waterbodies are located in the Vantine Brook and Hazelbach Creek watersheds. Appendix E contains waterbody data sheets with common vegetation, water quality, habitat information, substrate, and profile information. The data sheets are in numerical order for easy navigation.

There are 7 swales and 4 ditches within the Project study corridor. Swales and ditches are not typically jurisdictional features and are not regulated by U.S. Army Corps of Engineers (USACE), unless they have a significant nexus to a traditional navigable waterway (TNW) or if they contribute to a surface connection between an adjacent wetland and TNW (Jurisdictional Determination Guidebook, 2007). Swales do not have an OHWM or defined bed and bank. The 7 swales are S210PA, S212PA, S213PA, S220PA, S12ALT, SWA300PA and SWA400PA. S210PA flows into a wetland, but the feature does not contribute to a nexus with a TNW. Swale S212PA is a riprap swale that conveys stormwater in a residential development to a detention pond (W212PA). There is no nexus to a TNW with either of these features. Swale SWA400PA flows downslope toward the East Branch Brandywine Creek. However, it disperses into a wooded area separated from the creek by a paved road. Swale S213PA flows through an existing pipeline ROW and dissipates into a forest. There is no connection with another feature. Swale S220PA topographically appears to flow into an UNT to Beaver Creek. Swale S12ALT and SWA300 may be jurisdictional due to proximity to a wetland and perennial stream Beaver Creek. The 4 ephemeral roadside ditches include: S300BPA, S300CPA, S227PA and S227BPA. S227PA and S227BPA are located immediately north and south of the U.S. Route 30/U.S. Route 322 intersection. They have an OHWM and defined bed and bank, but do not connect to any stream or wetland. They drain upland areas and empty into a fallow agricultural field to the north of U.S Route 322. S300BPA and S300CPA are located immediately south of U.S. Route 30 and join with S300PA to carry runoff across the Downingtown High School property outside of the study corridor.

Eight other ephemeral features do have a defined bed and bank as well as an OHWM. These features convey water during and after rain/snowmelt events and may be considered jurisdictional. The features include: S203CPA, S208BPA, S208CPA, S215PA, S226PA, S400PA, S401PA and S7ALT. Stream S203CPA flows into S203PA but is a short stream with the headcut beginning near the study corridor. Stream S204PA flows through wetland W206PA and joins stream S205PA. Stream S208BPA flows into S208PA. Streams S401PA and S400PA flow towards Creek Road and appear to flow to the base of the slope and dissipate before reaching the road. Stream S215PA has a steep gradient and looks to be actively down cutting through an existing ROW. Stream S7ALT has a steep gradient and defines the boundary between forest and a maintained lawn.

Sixteen intermittent streams were identified. Intermittent streams flow at least seasonally throughout the year and are regulated by USACE. These features include S200PA, S225CPA, S202PA, S203PA, S203BPA, S203DPA, S204PA, S209PA, S209BPA, S211PA, S300PA, S214PA, S218PA, S219PA, S3ALT and S11ALT. Six of the streams abut a wetland feature. Stream S200PA flows into W200PA and lays within an open fallow field, and it continues north

outside the study corridor. S203PA abuts wetland W205PA, and it is partially covered by hardwood canopy. Two smaller streams flow into it. S209PA is abutted by wetland W210PA. It flows into and splays out into the wetland. Intermittent stream S214PA originates at a spring. This spring was dammed at one point in the past but the structure is deteriorating. It creates a wetland (W213PA) within a maintained ROW. Stream S219PA is abutted by wetland W215PA. The stream crosses through a maintained ROW and through a small emergent wetland. Stream S11ALT is abutted by wetland W214PA. It flows through the wetland and joins perennial stream S216PA. The following streams do not abut or lay adjacent to wetlands. Stream S202PA crosses a maintained ROW and is surrounded by a residential development and maintained lawn. Stream S209BPA is a backchannel to S209PA and is exposed within the existing pipeline ROW. Intermittent stream S211PA has a narrow mature forested corridor and fallow fields and agricultural fields surround the forested corridor. Stream S218PA receives stormwater drainage from a residential development. There is no wooded buffer zone and the turf lawn is maintained throughout the year. S3ALT joins perennial stream S2ALT on a steep slope within forested terrain.

Twenty-two perennial stream crossings were identified. These streams flow continually all year and are jurisdictional features regulated by the USACE. Stream S201PA flows through a residential development and is surrounded by maintained lawns. Stream S205PA is abutted by a forested wetland to the north and is adjacent to another forested wetland to the south. Perennial stream S206PA, Shamona Creek, flows into East Branch Brandywine Creek. This stream is surrounded by hardwood forest and is impacted by a trail bridge crossing as well as a county highway crossing (Dowlin Forge Road). The stream was observed to have minnows and a fisherman was seen fishing in the East Branch Brandywine Creek (S207PA & S207BPA). E. Branch Brandywine is a trout stocked stream according to the PADEP eMapPA GIS website. Stream S208PA flows through a narrow portion of hardwoods and is impacted by Hwy 282/Creek Road. This reach of the stream has been impacted moderately and was observed to have trash on the banks. Perennial stream S402PA flows through the forested W400PA and into the East Branch Brandywine Creek (S207BPA) after it crosses under Creek Road immediately south of U.S. Route 30. Tributary S216PA is Beaver Creek and is joined by perennial stream S10ALT. S1ALT originates outside of the ROW, and also flows under an access road that we were denied survey access to. Stream S2ALT flows from a culvert through a hill and continues down a steep grade, out of the study corridor and is joined by intermittent stream S3ALT. Stream S4ALT enters the study corridor from its western extent and is abutted by wetland W4ALT. Perennial stream S5ALT is named Beaver Creek. Stream S8ALT is also Beaver creek and is abutted by wetland W214PA. Stream S10ALT flows into the study corridor from the north, joining Beaver Creek within wetland W214PA. S6ALT begins outside of the study corridor to the west. It is abutted by wetland W7ALT, which is located on the streams south bank. Located near the proposed construction at the Milford Compressor Station, stream S1PA bisects W1PA as it flows through a culvert under an access road. Perennial stream S600PA, Hazelbach Creek, flows under an existing access road that leads to the Pennsburg Meter Station. Hazelbach Creek is classified as HQ under Pennsylvania's Chapter 93 water quality classifications.

The findings of this wetland and waterbody delineation represent a study of the Project area for non-tidal wetlands. Findings depend on the season, the conditions at that time of year, site-specific influences (e.g. anthropogenic disturbance), and individual professional judgment. This report represents a professional estimate of the study area's wetlands and waterbodies based upon available information and techniques. Final verification of their boundaries for regulatory purposes can only be completed through a Jurisdictional Determination (JD) review by the USACE or their duly appointed representative.

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