

APPENDIX G
WETLAND DELINEATION MEMORANDUM

Technical Memorandum

Prepared For: Conewago Township, Adams County

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Project: Plum Creek Community Park Stream Improvements

Subject: Wetland and Waterway Presence/Absence Memorandum

Date: October 17, 2019

Introduction

Conewago Township purchased the former Hanover Airport and are developing Plum Creek Community Park on approximately 100 acres (Attachment 1). As a part of this park's development, the Township has recognized the opportunity, given the BMP effectiveness and cost-effectiveness values, to further implement the approved Master Plan for the park by undertaking a stream restoration project for Plum Creek. There are approximately 2,710 linear feet of stream that bisects the park. A portion of that (approximately 500 linear feet) is currently conveyed in a series of decommissioned steel boilers that have the ends removed to serve as makeshift culverts.

Purpose

This memorandum was prepared to satisfy the regulatory requirements of the U.S. Army Corps of Engineers (USACE) under the purview of Section 404 of the Clean Water Act and the regulatory requirements of Pennsylvania and the Department of the Environmental Protection.

Background Information

This project will remove the three side-by-side 6' diameter culverts (in their entirety). The channel will be daylighted the entire 500 feet and a natural channel will be constructed in its place. The stream will then be planted with a riparian buffer for long term stability. A future project could include construction of a single span (open bottom) structure to provide a road crossing and pedestrian walkway across the restored stream channel.

According to the U.S. Department of Agriculture (USDA), Natural Resource Conservation Service (NRCS) Web Soil Survey, the dominant soil series underlying the project area is Dunning silty clay loam, (NRCS, 2019). According to the National Wetlands Inventory (NWI) online mapping tool, one R5UBH (Plum Creek) is present within the project area (NWI, 2019). Two PFO wetlands are located within 400 feet of the project area; however, they are far removed from the project area in a wooded area upstream that they will not be impacted. The project area is located within FEMA panel 42001C0292D (FEMA, 2019). Mapping indicates that the site is located within a FEMA-mapped floodway and floodplain of Plum Creek.

Methods

The project area was investigated for palustrine wetland indicators of vegetative composition, soil development, and hydrology. The investigation was conducted in accordance with the *Corps of Engineers Wetland Delineation Manual* (Environmental Laboratory, 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont Region, Version 2.0* (USACE, 2012). Areas within and directly adjacent to the project area limits were investigated to determine wetland and waterway presence, so that if located, they could be shown on project mapping to aid in impact avoidance during project planning and development. The site was photo-documented to show current conditions.

Soils were characterized by evaluating the upper horizons of the soil profile. Soil pits were dug using a drain spade and spot checking was conducted using a hand auger. Soil horizons were evaluated using normal field protocols for determining texture and nomenclature. The *Munsell Soil Color Charts* (Munsell Color (Firm), 2009) were used to determine the colors of horizons and redoximorphic features. Hydric soil indicators were determined in the field using the Regional Supplement criteria and protocols.

Vegetation was identified using *A Field Guide to Trees and Shrubs* (Petrides, 1986), *Newcomb's Wildflower Guide* (Newcomb, 1977), and *Grasses: An Identification Guide* (Brown, 1979). Plant species were assigned an indicator status [i.e., Upland (UPL), Facultative Upland (FACU), Facultative (FAC), Facultative Wetland (FACW), or Obligate Wetland (OBL)] based on the *2016 National Wetland Plant List* (Lichvar *et al.*, 2016).

Results

GF environmental scientists conducted the field investigation for wetlands and waterways on May 6, 2019.

The surrounding land uses consisted of green space/park, roadways, mowed grass along the previous runway alignment, agricultural fields, and low to medium density residential neighborhoods (Attachment 2). Average temperature was 76 degrees Fahrenheit with sunny skies and 0.9 inches of precipitation recorded for the day prior on May 5, 2019. The previous four days experienced no recorded precipitation according to the Harrisburg International Airport weather station (Weather Underground, 2019).

The project area was investigated for land use, drainage patterns, hydrology features, and site conditions relevant to wetland identification and delineation. Approximately 80% of the project area was mowed turf grass, 10% wooded riparian buffer, 5% pavement, and 5% surface water.

No indication of past or present wetland hydrology was present within the upland sampling point at the time of investigation. A data form was collected for upland features (Attachment 3).

Vegetation identified was predominantly herbaceous with intermediate mature trees growing along the riparian buffer. Vegetation not within the ordinary high-water mark of the stream was consistent with upland species not tolerant of wetland conditions (Attachment 3).

Soils were investigated in the project area. The soil throughout the site appeared to be a combination of silt clay loam and fill from the previous airport and sanitary sewer right of way. The primary soil mapped in the area is Dunning silty clay loam; however, the project area has been filled and intact soil horizons and potential hydrology was drained or filled for the runway development. Soils were consistent with upland conditions (Attachment 3).

Plum Creek is a warm water fishery (WWF) perennial stream that originates south of Hanover Borough. Plum Creek classifies as a R5UBH which is a riverine, perennial, unconsolidated bottom, permanently

flooded stream (USFWS, 2019). A mapped FEMA floodplain exists for Plum Creek within the project area. No other waterways were identified within the project area.

Summary

In the professional opinion of GF, Plum Creek is a jurisdictional waterway feature identified within the project area. No wetlands that conformed to wetland parameters were observed within the project area. One (1) upland test pit was taken to document upland conditions.

cc: File 065281

References:

Brown, L. 1979. *Grasses An Identification Guide*. Houghton Mifflin Company, Boston, New York, London.

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<https://msc.fema.gov/portal/search#searchresultsanchor>.

Lichvar, R.W., D.L. Banks, W.N. Kirchner, and N.C. Melvin, 2016. *The National Wetland Plant List: 2016 Wetland Ratings*. Phytoneuron 2016-30: 1-17. April 2016.

Munsell Color (Firm). *Munsell Soil Color Charts: with Genuine Munsell Color Chips*. Grand

Newcomb, L. 1977. *Newcomb's Wildflower Guide*. Little, Brown and Company.

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Petrides, G.A. 1986. *A Field Guide to Trees and Shrubs*. New York: Houghton Mifflin Co.

US Army Corps of Engineers, 2012. **Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont Region Version 2.0**, ERDC/EL TR-12-9. Vicksburg, MS: U.S. Army Engineer Research and Development Center. April, 2012.

USFWS, 2019. National Wetland Inventory, Wetlands Mapper. Accessed March 19, 2019
<https://www.fws.gov/wetlands/data/Mapper.html>

Weather Underground, 2019. Accessed March 19, 2019. <https://www.wunderground.com/>

Attachment 1

Project Location Maps

- Figure 1 - USGS Topographical Location Map
- Figure 2 - Project Location and Study Area Map
- Figure 3 - Soil Survey Map
- Figure 4 - National Wetlands Inventory Map)

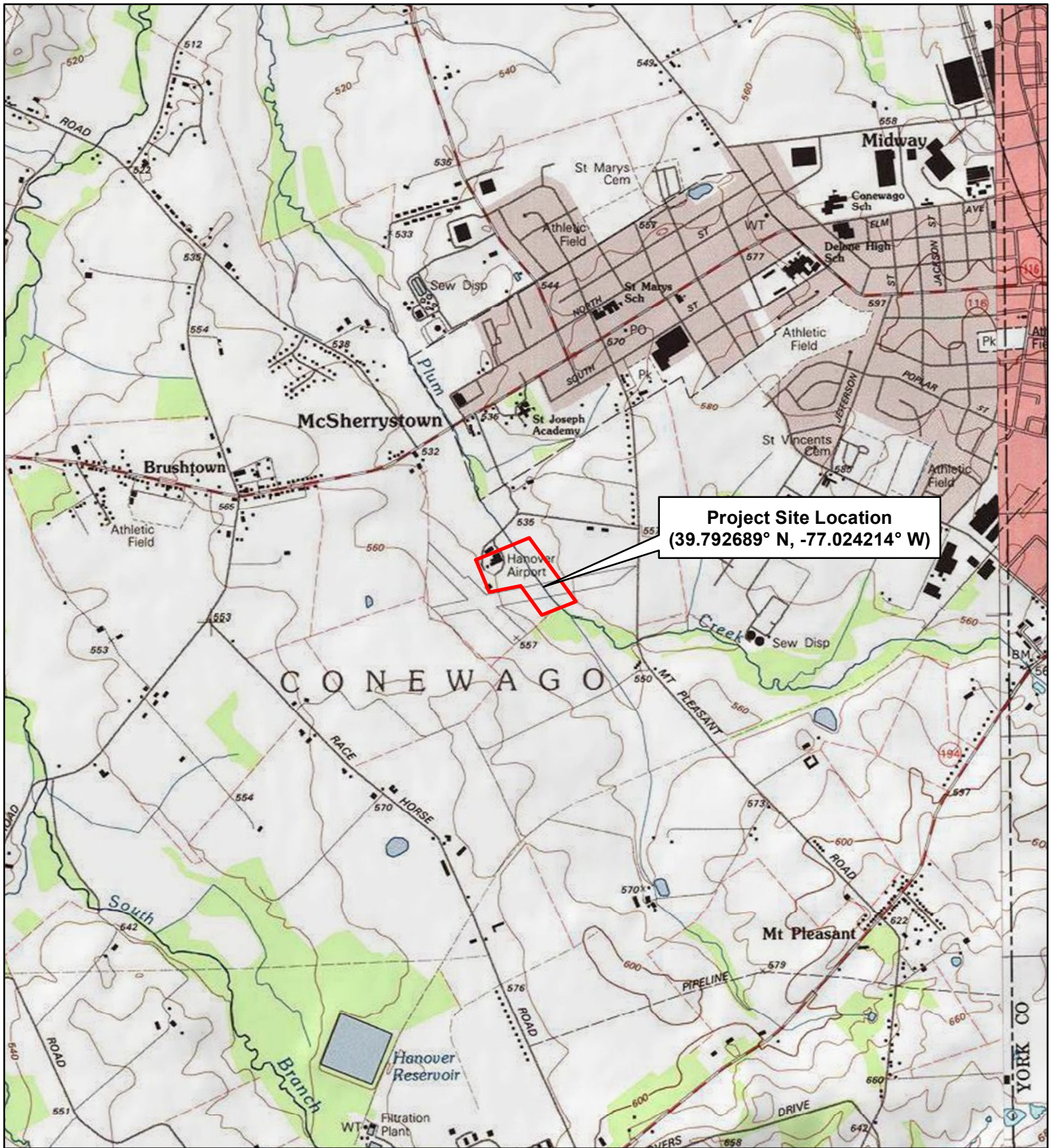



FIGURE 1
USGS TOPOGRAPHIC LOCATION MAP
MCSHERRYSTOWN, PA QUADRANGLE

CONEWAGO TOWNSHIP
PLUM CREEK COMMUNITY PARK
STREAM IMPROVEMENT PROJECT

ADAMS COUNTY, PENNSYLVANIA

Legend

 Project Study Area

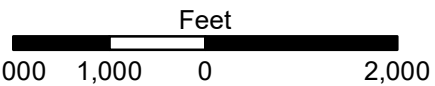




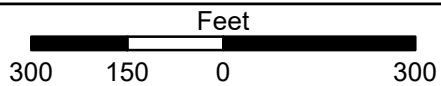
FIGURE 2
PROJECT LOCATION AND STUDY AREA MAP

CONEWAGO TOWNSHIP
PLUM CREEK COMMUNITY PARK
STREAM IMPROVEMENT PROJECT

ADAMS COUNTY, PENNSYLVANIA

Legend

- Project Study Area
- Streams
- ⊕ Soil Test Pit



Sources: Aerial imagery basemapping provided by ESRI ArcGIS Online webservices. Map Prepared: 01/18/2019; GF Project No. 065281



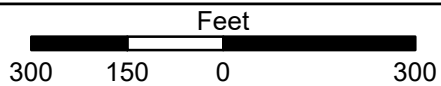
**FIGURE 3
SOIL SURVEY MAP**

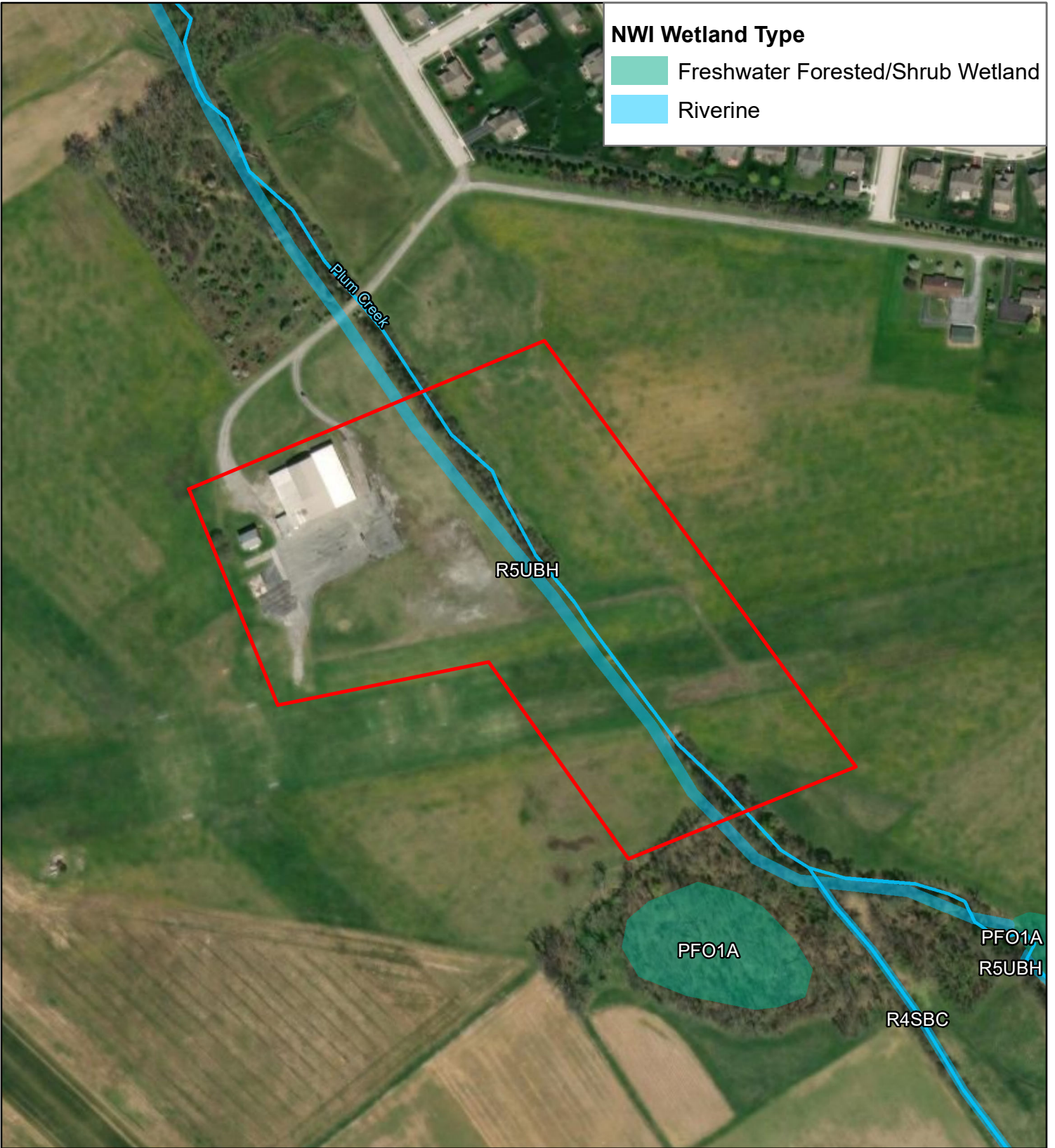
**CONEWAGO TOWNSHIP
PLUM CREEK COMMUNITY PARK
STREAM IMPROVEMENT PROJECT**

ADAMS COUNTY, PENNSYLVANIA

Legend

- Project Study Area
- Streams
- Adam County Soils





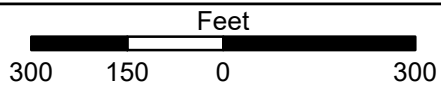
**FIGURE 4
NATIONAL WETLANDS INVENTORY MAP**

**CONEWAGO TOWNSHIP
PLUM CREEK COMMUNITY PARK
STREAM IMPROVEMENT PROJECT**

ADAMS COUNTY, PENNSYLVANIA

Legend

- Project Study Area
- Streams



Gannett Fleming

Attachment 2

Site Photographs



Photo 1 (5/6/2019)
Viewing the project area where culverts are proposed to be removed. Note sewer manhole in background.



Photo 2 (5/6/2019)
Viewing upstream section of failing culverts in Plum Creek and downstream limits of project.



Photo 3 (5/6/2019)
Viewing sinkhole that developed along the culvert alignment within the project area.



Photo 4 (5/6/2019)
Viewing culvert outfall and
downstream portion of the project
area.



Photo 5 (5/6/2019)
Viewing downstream end of the
project area toward culvert outfalls.

Attachment 3

Data Forms

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Plum Creek Com Park Stream Improvement City/County: Conewago Twp, Adams Co Sampling Date: 5/6/2019
 Applicant/Owner: Conewago Township State: PA Sampling Point: UP-1
 Investigator(s): B. Blocher, M. Leisses Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Flat, Floodplain Local relief (concave, convex, none): None Slope (%): ≤1
 Subregion (LRR or MLRA): S Lat: 39°47'34.5"N Long: 77°1'26.5"W Datum: 1983
 Soil Map Unit Name: Codorus silt loam, 0 to 3 percent slopes, occasionally flooded NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No (If no, explain in Remarks.)
 Are Vegetation Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes No
 Are Vegetation Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Remarks: Upland vegetation observed with no hydrology or hydric soil indicators observed.	

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply) <input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> True Aquatic Plants (B14) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Other (Explain in Remarks) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> Aquatic Fauna (B13)	Secondary Indicators (minimum of two required) <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input type="checkbox"/> FAC-Neutral Test (D5)
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Field Observations: Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
 No wetland hydrology indicators observed.

VEGETATION (Five Strata) – Use scientific names of plants.

Sampling Point: UP-1

	Absolute % Cover	Dominant Species?	Indicator Status	
Tree Stratum (Plot size: <u>30'</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
_____ = Total Cover				
50% of total cover: _____ 20% of total cover: _____				
Sapling Stratum (Plot size: <u>N/A</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
_____ = Total Cover				
50% of total cover: _____ 20% of total cover: _____				
Shrub Stratum (Plot size: <u>15'</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
_____ = Total Cover				
50% of total cover: _____ 20% of total cover: _____				
Herb Stratum (Plot size: <u>5'</u>)				
1. <u>Fescue mix/turf grass</u>	<u>90</u>	<u>Y</u>	<u>FACU</u>	
2. <u>Glechoma hederacea</u>	<u>10</u>	<u>N</u>	<u>FACU</u>	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
_____ = Total Cover				
50% of total cover: _____ 20% of total cover: _____				
Woody Vine Stratum (Plot size: _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
_____ = Total Cover				
50% of total cover: _____ 20% of total cover: _____				
Remarks: (Include photo numbers here or on a separate sheet.)				
No hydrophytic vegetation observed within sampling plot.				

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of: _____ Multiply by:

OBL species 0 x 1 = _____

FACW species 0 x 2 = _____

FAC species 0 x 3 = _____

FACU species 100 x 4 = 400

UPL species _____ x 5 = _____

Column Totals: 100 (A) 400 (B)

Prevalence Index = B/A = 4.0

Hydrophytic Vegetation Indicators:

1 - Rapid Test for Hydrophytic Vegetation

2 - Dominance Test is >50%

3 - Prevalence Index is ≤3.0¹

4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)

Problematic Hydrophytic Vegetation¹ (Explain)

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

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes No

SOIL

Sampling Point: UP-1

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-3	10YR 3/1	100					SiCL	
3-12	7.5YR 4/4	100					SiL	gravel present

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

Hydric Soil Indicators:		Indicators for Problematic Hydric Soils³:	
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Dark Surface (S7)	<input type="checkbox"/> 2 cm Muck (A10) (MLRA 147)	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Polyvalue Below Surface (S8) (MLRA 147, 148)	<input type="checkbox"/> Coast Prairie Redox (A16) (MLRA 147, 148)	
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Thin Dark Surface (S9) (MLRA 147, 148)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 136, 147)	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Very Shallow Dark Surface (TF12)	
<input type="checkbox"/> Stratified Layers (A5)	<input type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Other (Explain in Remarks)	
<input type="checkbox"/> 2 cm Muck (A10) (LRR N)	<input type="checkbox"/> Redox Dark Surface (F6)		
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Dark Surface (F7)		
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Redox Depressions (F8)		
<input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR N, MLRA 147, 148)	<input type="checkbox"/> Iron-Manganese Masses (F12) (LRR N, MLRA 136)		
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Umbric Surface (F13) (MLRA 136, 122)		
<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 148)		
<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Red Parent Material (F21) (MLRA 127, 147)		

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

Restrictive Layer (if observed):
 Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes No

Remarks: No hydric soil indicators were observed.