

5. ADDITIONAL INFORMATION

The PNDI environmental review website is a preliminary screening tool. There are often delays in updating species status classifications. Because the proposed status represents the best available information regarding the conservation status of the species, state jurisdictional agency staff give the proposed statuses at least the same consideration as the current legal status. If surveys or further information reveal that a threatened and endangered and/or special concern species and resources exist in your project area, contact the appropriate jurisdictional agency/agencies immediately to identify and resolve any impacts.

For a list of species known to occur in the county where your project is located, please see the species lists by county found on the PA Natural Heritage Program (PNHP) home page (www.naturalheritage.state.pa.us). Also note that the PNDI Environmental Review Tool only contains information about species occurrences that have actually been reported to the PNHP.

6. AGENCY CONTACT INFORMATION

PA Department of Conservation and Natural Resources

Bureau of Forestry, Ecological Services Section
400 Market Street, PO Box 8552
Harrisburg, PA 17105-8552
Email: RA-HeritageReview@pa.gov
Fax: (717) 772-0271

PA Fish and Boat Commission

Division of Environmental Services
450 Robinson Lane, Bellefonte, PA 16823
Email: RA-FBPACENOTIFY@pa.gov

U.S. Fish and Wildlife Service

Pennsylvania Field Office
Endangered Species Section
110 Radnor Rd; Suite 101
State College, PA 16801
NO Faxes Please

PA Game Commission

Bureau of Wildlife Habitat Management
Division of Environmental Planning and Habitat Protection
2001 Elmerton Avenue, Harrisburg, PA 17110-9797
Email: RA-PGC_PNDI@pa.gov
NO Faxes Please

7. PROJECT CONTACT INFORMATION

Name: JEFFREY E. SKINNER
Company/Business Name: BCM ENGINEERS
Address: 920 GERMANTOWN PIKE, SUITE 200
City, State, Zip: PLYMOUTH MEETING, PA 19462
Phone: (610) 313-3100 Fax: (610) 313-3151
Email: jeffrey.skinner@atcassociates.com

8. CERTIFICATION

I certify that ALL of the project information contained in this receipt (including project location, project size/configuration, project type, answers to questions) is true, accurate and complete. In addition, if the project type, location, size or configuration changes, or if the answers to any questions that were asked during this online review change, I agree to re-do the online environmental review.


applicant/project proponent signature

12/16/16
date



United States Department of the Interior



FISH AND WILDLIFE SERVICE

Pennsylvania Field Office
110 Radnor Road, Suite 101
State College, Pennsylvania 16801-4850

December 8, 2016

Cheryl Matasovsky
A.D. Marble
2200 Renaissance Bld., Suite 260
King of Prussia, PA 19406

RE: USFWS Project #2017-0178
PNDI Receipt #605220

RECEIVED
DEC 12 2016

BY:

Dear Ms. Matasovsky:

Thank you for your letter dated November 2016, which provided the Fish and Wildlife Service (Service) with additional information regarding the proposed Eberclear S.R. 0010 and S.R. 0724 water main installation project located in the City of Reading, Borough of Birdsboro, and Robeson Township, Berks County, 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.

This project is in the 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, you, a recognized qualified bog turtle surveyor, conducted a Phase 1 bog turtle habitat assessment on July 19 and 20, 2016. According to the report, nine wetlands were identified within 300 feet of the proposed limit of disturbance. Following the methods described under "Bog Turtle Habitat Survey" (Phase 1 survey) of the *Guidelines for Bog Turtle Surveys* (revised April 2006), you determined that two wetlands (W5 and WA) met the criteria of soils, vegetation, and hydrology typical of habitat occupied by bog turtles. However, after review of the submitted information, although the criteria may have been met, we do not concur that the wetlands are likely to be

inhabited by bog turtles. Our conclusions are based on Wetland 5 being in an area of high disturbance and Wetland A only being able to be probed to a depth of 3 inches of muck.

Based on our review, we conclude that suitable bog turtle habitat within the surveyed area is not present; therefore, no adverse effects to the species are anticipated. This determination is valid for two years from the date of this letter. If the proposed project has not been fully implemented prior to this, an additional review by this office is recommended. Should project plans change, or if additional information on listed or proposed species becomes available, this determination may be reconsidered.

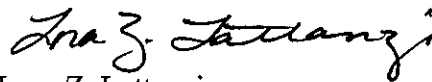
If the Phase 1 habitat assessment did not include all wetlands in all areas that will be directly or indirectly affected by the proposed project and project-associated features (*e.g.*, roads, water and sewer lines, utility lines, stormwater and sedimentation basins, buildings and other structures, driveways, parking lots, yards/lawns, wells), expand the scope of the Phase 1 survey to include these areas. If any wetlands are located, submit the results of the expanded wetland and Phase 1 investigation to our office for review so that we can confirm whether the above determination is still valid.

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.

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

Please contact Bonnie Dershem of this office at (814) 234-4090 if you have any questions or require further assistance regarding this matter.

Sincerely,

A handwritten signature in black ink, appearing to read "Lora Z. Lattanzi".

Lora Z. Lattanzi
Field Office Supervisor



pennsylvania
DEPARTMENT OF CONSERVATION
AND NATURAL RESOURCES

BUREAU OF FORESTRY

December 16, 2016

PNDI Number: PNDI-605225

Jeffrey Skinner
BCM Engineers
920 Germantown Pike, Suite 200
Plymouth Meeting, PA 19462
Email: Jeffrey.skinner@atcassociates.com (hard copy not to follow)

Re: Birdsboro Power LLC PA Route 724 Water Main
Robeson Township, and Borough of Birdsboro, Berks County, PA

Dear Mr. Skinner,

Thank you for the submission of the Pennsylvania Natural Diversity Inventory (PNDI) Environmental Review Environmental Review Receipt Number **PNDI-605225** for review. PA Department of Conservation and Natural Resources screened this project for potential impacts to species and resources of concern under DCNR's responsibility, which includes plants, terrestrial invertebrates, natural communities, and geologic features only.

No Impact Anticipated

PNDI records indicate species or resources under DCNR's jurisdiction located in the vicinity of the project. However, based on the information you submitted concerning the nature of the project, the immediate location, and our detailed resource information, DCNR has determined that no impact is likely. No further coordination with our agency is needed for this project.

DCNR recommends the following to help prevent the spread of invasive plant species and to encourage the use of native plants:

- Avoid using seed mixes that include invasive plant species if the project requires re-vegetating the area (<http://www.ernstseed.com/seed-mixes/>). Please also attempt to use weed-free straw or hay mixes when possible. A complete list of all Pennsylvania invasive plant species can be found here: http://www.dcnr.state.pa.us/cs/groups/public/documents/document/dcnr_20026634.pdf.

This response represents the most up-to-date review of the PNDI data files and is valid for two (2) years only. If project plans change or more information on listed or proposed species becomes available, our determination may be reconsidered. Should the proposed work continue beyond the period covered by this letter, please resubmit the project to this agency as an "Update" (including an updated PNDI receipt, project narrative and accurate map). As a reminder, this finding applies to potential impacts under DCNR's jurisdiction only. Visit the PNHP website for directions on contacting the Commonwealth's other resource agencies for environmental review.

Should you have any questions or concerns, please contact Frederick Sechler, Jr., Ecological Information Specialist, by phone (717-705-2819) or via email (c-frsechle@pa.gov).

Sincerely,

Greg Podnieszinski, Section Chief
Natural Heritage Section, DCNR Bureau of Forestry

conserve

sustain

enjoy

P.O. Box 8552, Harrisburg, PA 17015-8552 717-787-3444 (fax) 717-772-0271



Pennsylvania Fish & Boat Commission

Division of Environmental Services

Natural Diversity Section

450 Robinson Lane

Bellefonte, PA 16823

814-359-5237

March 20, 2017

IN REPLY REFER TO

SIR# 47043

BCM Engineers
Jeffrey Skinner
920 Germantown Pike
Plymouth Meeting, Pennsylvania 19462

**RE: Species Impact Review (SIR) – Rare, Candidate, Threatened and Endangered Species
PNDI Search No. 605225_1
Birdsboro Power LLC PA Route 724 Water Main
BERKS County: Birdsboro Borough, Robeson Township**

Dear Jeffrey Skinner:

This responds to your inquiry about a Pennsylvania Natural Diversity Inventory (PNDI) Internet Database search “potential conflict” or a threatened and endangered species impact review. These projects are screened for potential conflicts with rare, candidate, threatened or endangered species under Pennsylvania Fish & Boat Commission jurisdiction (fish, reptiles, amphibians, aquatic invertebrates only) using the Pennsylvania Natural Diversity Inventory (PNDI) database and our own files. These species of special concern are listed under the Endangered Species Act of 1973, the Wild Resource Conservation Act, and the Pennsylvania Fish & Boat Code (Chapter 75), or the Wildlife Code.

An element occurrence of a rare, candidate, threatened, or endangered species under our jurisdiction is known from the vicinity of the proposed project. However, given the nature of the proposed project, the immediate location, or the current status of the nearby element occurrence(s), no adverse impacts are expected to the species of special concern.

This response represents the most up-to-date summary of the PNDI data and our files and is valid for two (2) years from the date of this letter. An absence of recorded species information does not necessarily imply species absence. Our data files and the PNDI system are continuously being updated with species occurrence information. Should project plans change or additional information on listed or proposed species become available, this determination may be reconsidered, and consultation shall be re-initiated.

Our Mission:

www.fish.state.pa.us

To protect, conserve and enhance the Commonwealth's aquatic resources and provide fishing and boating opportunities.

If you have any questions regarding this review, please contact Robert Morgan at 814-359-5129 and refer to the SIR # 47043. Thank you for your cooperation and attention to this important matter of species conservation and habitat protection.

Sincerely,

A handwritten signature in black ink that reads "Christopher A. Urban". The signature is written in a cursive, flowing style.

Christopher A. Urban, Chief
Natural Diversity Section

CAU/RTM/dn

ATTACHMENT C

Experience of E&SC Plan Preparer

RECORD OF TRAINING AND EXPERIENCE

IN EROSION AND SEDIMENTATION CONTROL METHODS AND TECHNIQUES

NAME OF PLAN PREPARER: John Brandenburger

FORMAL EDUCATION:

Name of college or technical institute: Montgomery County Community College
 Curriculum or program: Drafting and Design
 Dates of attendance: From: September 1987 to: May 1990
 Degree received: _____

OTHER TRAINING:

Name of training: NPDES Phase II Post-Construction Stormwater Workshop
 Presented by: The Southeast Association of Conservation District
 Date: April 8, 2004

EMPLOYMENT HISTORY:

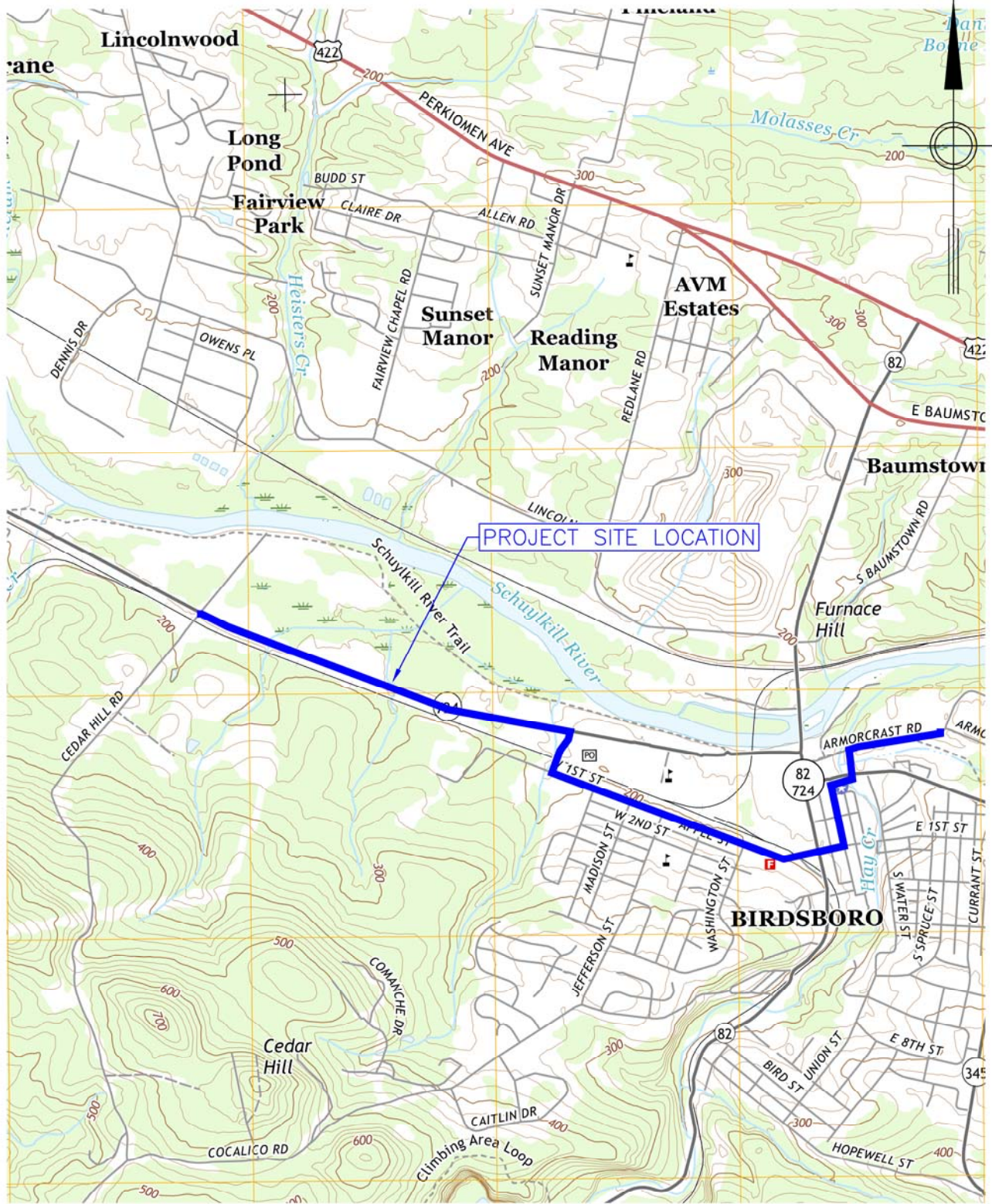
Current employer: BCM Engineers
 Telephone: (610) 313-3100
 Former employer: _____
 Telephone: () _____

RECENT EROSION AND SEDIMENTATION CONTROL PLANS PREPARED:

	#1	#2	#3	#4	#5
Name of Project:	Transfer Station	Merrill Hills	Abington Edge Hill Phase 2	Ontelaunee Township	Robeson Twp. Water main extension
County:	Bucks, PA	Montgomery, PA	Montgomery, PA	Berks, PA	Berks, PA
Municipality:	North Penn Water Authority	Lower Gwynedd Township	Abington Township	Ontelaunee Township	Robeson Township
Approving Agency:	Bucks County Conservation District	Montgomery County Conservation District	Montgomery County Conservation District	Berks County Conservation District	Berks County Conservation District

ATTACHMENT D
USGS Quadrangle Location Map

\\atcmpste01.corp.atc.int\files\server\57\FILESERVER\Engineering\Projects\RAWA\Emberclear\Permits\USGS MAPS\USGS MAPS.dwg, NPDES USGS MAP, 3/7/2017 9:49:19 AM, 1:1



1,000 500 0 1,000 2,000 3,000



SCALE IN FEET

RAWA/
BIRDSBORO
POWER, LLC –
WATER MAIN



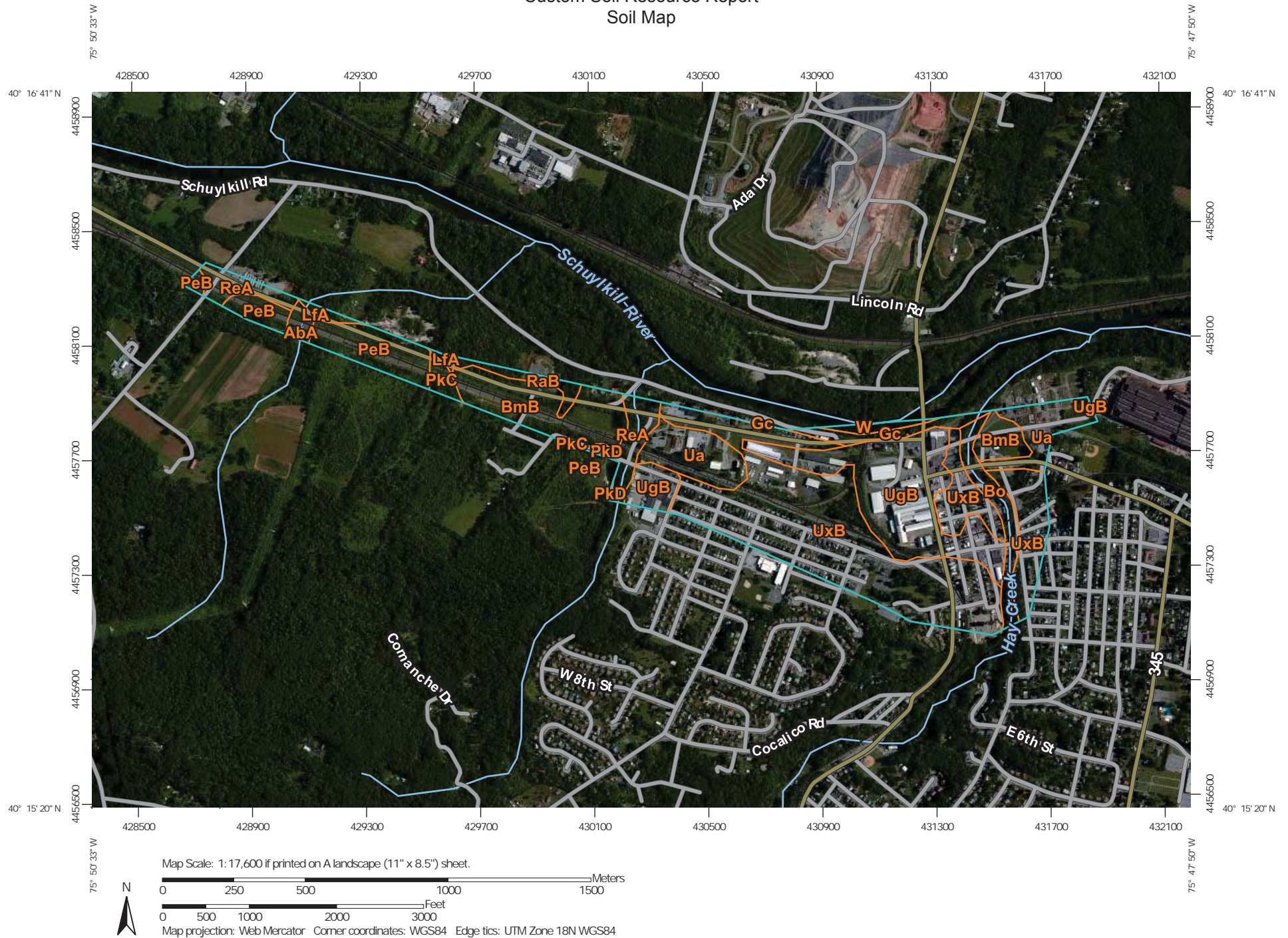
BIRDSBORO QUADRANGLE MAP
ROBESON TOWNSHIP, BERKS COUNTY

SCALE: 1"=1,000'

DATE: 03/07/17

ATTACHMENT E
NRCS Soil Survey Maps

Custom Soil Resource Report Soil Map



ATTACHMENT F

NRCS Soil Use Limitations and Resolutions

<u>Soil Survey</u>										
Symbol	AbA	BmB	LfA	PeB	PkC	RaB	ReA	Ua	UgB	UxB
Soil	Abbottstown Silt Loam	Birdsboro Silt Loam	Lamington Silt Loam	Penn Channery Silt Loam	Penn- Klinesville Channery Silt Loams	Raritan Silt Loam	Readington Silt Loam	Udorthents	Urban Land	Urban Land - Penn Complex
Drainage Class	Somewhat Poorly Drained	Well Drained	Poorly Drained	Well Drained	Well Drain	Moderately Well Drained	Moderately Well Drained	Moderately Well Drained	N/A	Well Drained
Slope Range	0 to 3%	3 to 8%	0 to 3%	3 to 8%	8 to 15%	3 to 8%	0 to 3%	0 to 8%	0 to 8%	0 to 8%
Hydrologic Group	D	B	D	B	B	C/D	C	N/A	N/A	B
Bedrock Depth	46 to 50"	72 to 99"	60 to 99"	20 to 40"	20 to 40"	60 to 99"	40 to 70"	10 to 100"	N/A	20 to 40"
Depth to Water Table	6 to 18"	24 to 72"	0 to 6"	>80"	>80"	6 to 31"	18 to 36"	>80"	N/A	>80"
Flooding Potential	None	None	None	None	None	None	None	None	N/A	None
Profile Permeability	Low	Moderate	Low	Low	Low	Low	Low	N/A	N/A	N/A
Hydric	No	No	Yes	No	No	No	No	No	No	No
Runoff classification	Moderately Low to Moderately High	Medium	Very High	Low	Low	Medium	Low	Very High	N/A	Very Low
Limitations	Depth to Water Table	Depth to Water Table	Depth to Water Table	Depth to Bedrock	Depth to Bedrock	Depth to Water Table	Depth to Water Table	Depth to Bedrock	N/A	Depth to Bedrock

Soil Limitations	Resolutions
Depth to Water Table	Manage Pumped Water
Depth to Bedrock	None
Ponding	Manage Pumped Water
Flooding	Manage Pumped Water

The potential for erosion of exposed soil is addressed by strict adherence to the following requirements:

1. The seeding and mulching specifications
2. Installation of erosion control measures indicated on the approved erosion and sedimentation control plans
3. By limiting the area, extent and maximum amount of soil disturbance occurring at any one time
4. By limiting the cut and fill slopes to maximum 1:3 vertical to horizontal where possible
5. Compliance with the sequence of construction operations.

ATTACHMENT G

Experience of PCSM Plan Preparer

RECORD OF TRAINING AND EXPERIENCE

IN EROSION AND SEDIMENTATION CONTROL METHODS AND TECHNIQUES

NAME OF PLAN PREPARER: Jeffrey E. Skinner

FORMAL EDUCATION:

Name of college or technical institute: Pennsylvania State University
 Curriculum or program: Architectural Engineering
 Dates of attendance: From: September 1983 to: May 1987
 Degree received: Bachelor of Architectural Engineering

OTHER TRAINING:

Name of training: _____
 Presented by: _____
 Date: _____

EMPLOYMENT HISTORY:

Current employer: BCM Engineers
 Telephone: (610) 313-3100
 Former employer: William G. Majors Assoc.
 Telephone: (215) 785-3288

RECENT NPDES PLANS PREPARED:

	#1	#2	#3	#4	#5
Name of Project:	30" Water Transmission Main	Sanitary Sewer Interceptor Replacement	Bristol Commerce Center	Decker Land Development	Silvi Industrial Development
County:	Bucks, PA	Montgomery, PA	Bucks, PA	Bucks, PA	Bucks, PA
Municipality:	North Penn Water Authority	Cheltenham Township	Bristol Township	Bristol Township	Bristol Township
Approving Agency:	Bucks County Conservation District	Montgomery County Conservation District	Bucks County Conservation District	Bucks County Conservation District	Bucks County Conservation District

ATTACHMENT H

Wetlands Report

October 4, 2016

Mr. Dean Miller, Executive Director
Reading Area Water Authority
1801 Kutztown Road
Reading, PA 19604

**RE: Aquatic Resources Letter Report
Emberclear Water Main, S.R. 0010 and S.R. 0724 Installation Project
City of Reading, Town of Birdsboro, and Robeson Township,
Berks County, Pennsylvania**

Dear Mr. Miller:

A.D. Marble has conducted an aquatic resources investigation along the corridors of S.R. 0010 and S.R. 0724 for the Emberclear Water Main projects in the City of Reading, the Borough of Birdsboro, and Robeson Township, Berks County, Pennsylvania (Enclosure A: Figures 1A and 1B). The Emberclear Water Main project incorporates two locations for its project area: S.R. 0010 in the City of Reading and S.R. 0724 in Birdsboro and Robeson Township. The project consists of a proposed water main line installment along a 1.3-mile corridor in the S.R. 0010 project area and a 2.4-mile corridor in the S.R. 0724 project area. The construction width is 10 feet on paved surfaces and 40 feet on non-paved surfaces.

The desktop review included the examination of the following maps: the U.S. Department of Agriculture, Natural Resources Conservation Service (USDA-NRCS) soils map, the U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) map, and the Federal Emergency Management Agency (FEMA) 100-year floodplain map.

Based on the USDA-NRCS soil data, there are a total of 20 soil mapping units within the project areas (Enclosure A: Figures 2A and 2B). Three soil mapping units (Bowmansville-Knauers silt loams (Bo); Holly silt loam (Ho), and Lamington silt loam, 0 to 3 percent slopes (LfA) contain hydric soils components.

The USFWS NWI maps (Enclosure A: Figures 3A and 3A) indicate one NWI mapped palustrine, unconsolidated bottom, permanently flooded, diked/impounded (PUBHh) wetland is adjacent to the S.R. 0010 project area and several NWI mapped palustrine forested/scrub-shrub/emergent (PFO1/PSS/PEM) wetlands are adjacent to the S.R. 0724 project area; however, no NWI mapped wetlands are within the project areas. The FEMA map also indicates a southern portion of the S.R. 0010 project area is within the 100-year floodplain of Angelica Creek and the eastern portion of the S.R. 0724 project area is within the 100-year floodplain of Hay Creek.

The project area was defined by the engineers to encompass all anticipated ground disturbance for the proposed water main installations. After the wetland investigation was completed, a portion of the S.R. 0724 project area between W 1st Street and S.R. 0724 was rerouted to parallel Jackson Street to avoid landowner issues. Waterways present in this section are contained within a culvert or a concrete-lined channel. These waterways were not delineated, and the approximate locations are noted on the figures in this report. The project study area of the two locations combined is approximately 15.9 acres in size and is depicted on Figures 1 to 4 (Enclosure A). The study area includes residential, commercial, industrial, transportation, utility, forested, and public and private land uses.

The wetland investigation was conducted in accordance with the U.S. Army Corps of Engineers' (USACE) *Wetlands Delineation Manual* (1987) and *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont Regional Supplement, Version 2.0* (January 2012); the Pennsylvania Department of Environmental Protection (PADEP) Chapter 105 Regulations; and Section 404 of the Federal Clean Water Act. Wetland habitats were classified according to the USFWS's *Classifications of Wetlands and Deepwater Habitats of the United States* (1979). Pertinent information, including dominant vegetation, hydric soil indicators, wetland hydrology indicators, and types of disturbance (if applicable), was recorded on the attached wetland determination data forms (Enclosure C).

As a result of the field investigations, five wetlands and nine waterways were delineated within the project area. Table 1 is a summary table of the wetlands, and Table 2 is a summary of the waterways within the project area. Detailed descriptions of wetlands and waterways are provided

below. Figures 4A to 4M depict the locations of these aquatic resources. Photographs are included as Enclosure B; and wetland data sheets are provided as Enclosure C.

Table 1. Wetlands Summary.

Resource ID	Classification	Figure 4 Sheet Location	Size (acre)	Size (acre) Within Project Study Area	Open Ended?
Wetland 1	POW	Figure 4M	0.05	NA	No
Wetland 2	PEM	Figure 4L	0.04	NA	Yes
Wetland 3	PEM	Figure 4L	0.03	0.02	Yes
Wetland 4	PFO	Figure 4H	0.02	NA	No
Wetland 5	PEM	Figure 4F	0.23	NA	No

PEM – Palustrine emergent

PFO – Palustrine forested

POW – Palustrine open water

Table 2. Waterways Summary.

Resource ID	Waterway Name	Figure 4 Sheet Location	Chapter 93 Classification	Approved Trout Water	Size (linear feet) Within Project Study Area
Waterway 1	Angelica Creek	Figures 4D, 4E	CWF, MF	No	85
Waterway 2	Hay Creek	Figures 4L, 4M	CWF, MF	Yes	80
Waterway 3	UNT to the Schuylkill River	Figure 4H	WWF, MF	No	No
Waterway 4	UNT to the Schuylkill River	Figures 4G, 4H	WWF, MF	No	No
Waterway 5	UNT to the Schuylkill River	Figure 4F	WWF, MF	No	No
Waterway 6	UNT to the Schuylkill River	Figure 4F	WWF, MF	No	No
Waterway 7	UNT to the Schuylkill River	Figure 4F	WWF, MF	No	No
Waterway 8	UNT to the Schuylkill River	Figure 4I	WWF, MF	No	No
Waterway 9	UNT to the Schuylkill River	Figure 4I	WWF, MF	No	No

CWF, MF – Cold Water Fishery, Migratory Fishery

WWF, MF – Warm Water Fishery, Migratory Fishery

WETLANDS

Five wetlands were delineated within the project area and are described below.

Wetland 1

Wetland 1 is a POW wetland with herbaceous vegetation along the edge of the wetland. Wetland 1 was 0.05 acre in size and located within the S.R. 0724 project area in a drainage ditch adjacent to Armorcast Road in Birdsboro. Wetland 1 is within the 100-year floodplain of Hay Creek.

Wetland 1 was an isolated wetland that contained no inlet or outlet. Vegetation was scarce within the wetland; however, dominant vegetation growing along the edge of the open water included *Phragmites australis* (common reed), *Rosa multiflora* (multiflora rose), *Toxicodendron radicans* (poison ivy), *Muscadine rotundifolia* (grapevine), and *Lythrum salicaria* (purple loosestrife). The vegetation in Wetland 1 passed the dominance and prevalence index tests for hydrophytic vegetation.

Soil test pits were dug to observe soils matrix colors and hydric soil indicators; however, a soil profile was inaccessible due to the loose soil profile within the water column. Because hydrophytic vegetation and hydrological indicators of surface water (A1), high water table (A2), saturation (A3), sparsely vegetated concave surface (B8), and microtopographic relief (D4) were present, it was assumed soils within Wetland 1 were hydric. Surface water within Wetland 1 was at a depth of 14 inches, and saturation was present at the surface.

Wetland 2

Wetland 2 is a PEM wetland approximately 0.04 acre in size located within the S.R. 0724 project area along the right bank of Hay Creek (Waterway 2) in Birdsboro. The wetland shared the same hydrology and soils as Wetland 3, but was separated by the East Main Street bridge over Waterway 2. Wetland 2 is within the 100-year floodplain of Hay Creek. Herbaceous vegetation was diverse, with dominant vegetation of *Typha latifolia* (broadleaf cattail), *Impatiens capensis* (spotted jewelweed), *Salix nigra* (black willow), *Platanus occidentalis* (American sycamore), poison ivy, and grapevine. The vegetation in Wetland 2 passed the dominance and prevalence index tests for hydrophytic vegetation.

Soil test pits were dug to observe soil matrix colors and hydric soil indicators. From 0 to 7 inches, the soil was a dark brown (7.5YR 3/2) loam with red (7.5YR 4/4) redoximorphic features. A rock restrictive layer was present at 7 inches. Wetland 2 met the redox dark surface (F6) indicator of hydric soils. Indicators of wetland hydrology observed within Wetland 2 included surface water (A1) at the ground surface, a high water table (A2), saturation (A3), and geomorphic position (D2).

Wetland 3

Similar to Wetland 2, Wetland 3 is a PEM wetland approximately 0.02 acre in size located within the S.R. 0724 project area and continued southeast along the right bank of Hay Creek (Waterway 2) in Birdsboro. The wetland shared the same hydrology and soils as Wetland 2, but was separated by the East Main Street bridge over Hay Creek. Wetland 3 is within the 100-year floodplain of Hay Creek. Dominant vegetation in the wetland included *Phalaris arundinacea* (reed canary grass), spotted jewelweed, and black willow. The vegetation in Wetland 3 passed the dominance and prevalence index tests for hydrophytic vegetation.

Soil test pits were dug to observe soil matrix colors and hydric soil indicators. From 0 to 8 inches, the soil was a dark brown (7.5YR 3/2) loam with red (7.5YR 4/4) redoximorphic features. A rock restrictive layer was present at 8 inches. Wetland 3 met the redox dark surface hydric soil indicator. Indicators of wetland hydrology observed within Wetland 3 included a high water table (A2) at 2 inches, saturation (A3) at the surface, and geomorphic position (D2).

Wetland 4

Wetland 4 is a PFO wetland located south of S.R. 0724 and adjacent to Waterway 3. The wetland was 0.02 acre in size and within a concave depressed area that received stormwater runoff from S.R. 0724. During stormwater events, it is likely that hydrology from Wetland 4 is conveyed into Waterway 3. Dominant vegetation within the wetland included *Acer negundo* (box elder) and spotted jewelweed. The vegetation in Wetland 4 passed the dominance and prevalence index tests for hydrophytic vegetation.

Soil test pits were dug to observe soil matrix colors and hydric soil indicators. From 0 to 4 inches, the soil was a dark brown (5YR 4/1) loam with reddish-brown (5YR 4/4) redoximorphic features, and contained a co-matrix from 4 to 18 inches of grey (5YR 7/1) and reddish brown (5YR 4/4) loam with dark brown (5YR 3/2 and 2.5YR 4/3) redoximorphic features. The soils in Wetland 4 met the depleted matrix (F3) indicator for hydric soils. Indicators of wetland hydrology observed within Wetland 4 included drainage patterns (B10) and microtopographic relief (D4).

Wetland 5

Wetland 5 is a PEM wetland located south of S.R. 0724 and draining to Waterway 7. The wetland was 0.23 acre in size and within a concave depressed area that contained groundwater seeps and stormwater runoff from S.R. 0724. During stormwater events, it is likely that hydrology from Wetland 5 is conveyed into Waterway 7. Dominant vegetation within the wetland included reed canary, spotted jewelweed, and purple loosestrife. The vegetation in Wetland 4 passed the dominance and prevalence index tests for hydrophytic vegetation.

Soil test pits were dug to observe soil matrix colors and hydric soil indicators. From 0 to 24 inches, the soil was a strong dark brown (7.5YR 2/1) muck. The soils in Wetland 5 met the 2-centimeter muck (A10) indicator for hydric soils. Indicators of wetland hydrology observed within Wetland 5 included surface water (A1) at 4 inches, high water table (A2), saturation (A3), and drainage patterns (B10).

WATERWAYS

Waterway 1

Waterway 1 (Angelica Creek) is a perennial waterway within the project area. Waterway 1 flows roughly northwest to southeast in the southern portion of the S.R. 0010 project area. The waterway crosses under S.R. 0010 and parallels the Angelica Creek Trail. Waterway 1 averages 0.5 foot in depth and 20 feet in width. The substrate is predominantly cobble, gravel, and sand. Chapter 93 designates Waterway 1 as a CWF, MF. Waterway 1 is not listed by the Pennsylvania Fish and Boat Commission (PFBC) as an approved trout water or a Class A Wild Trout Stream. Angelica Creek is a Stream Listed with Naturally Reproducing Trout 1.5 miles upstream of the project area; however, no in-stream restrictions will be required for the proposed project.

Waterway 2

Waterway 2 (Hay Creek) is a perennial waterway within the project area. Waterway 2 flows roughly south to north in the eastern portion of the S.R. 0724 project area. The waterway crosses under S.R. 0724 in Birdsboro. Waterway 2 averages 0.5 foot in depth and 30 feet in width. The substrate is predominantly boulder, cobble, gravel, and silt. Chapter 93 designates Waterway 2 as a CWF, MF. Waterway 2 is listed by the PFBC as an approved trout water, a Stream Listed with

Naturally Reproducing Trout, and as an approved trout stream. In-stream restrictions will be required between March 1 through June 15 and October 1 through December 31.

Waterway 3

Waterway 3 is an ephemeral unnamed tributary (UNT) to the Schuylkill River and is located in the S.R. 0724 project area. The waterway originated from West 1st Street and extended northeast through a culvert under an active railroad and S.R. 0724. Waterway 3 contained 0.5-inch deep water in shallow pools. There was no other surface water within the waterway at the time of survey. The substrate is composed primarily of cobble and silt. Waterway 3 contains hydrology runoff from Wetland 4. Waterway 3 is not listed by the PFBC as an approved trout water, Class A Wild Trout Stream, or Stream Listed with Naturally Reproducing Trout. No in-stream restrictions will be required.

Waterway 4

Waterway 4 is an intermittent UNT to the Schuylkill River and is located in the S.R. 0724 project area. Water flows from the southeast to the northwest through a culvert under an active railroad and S.R. 0724. Waterway 4 contained 1-foot deep pools at the location of the culverts at the time of survey, with fish present within the pools. There was no other surface water within the waterway at the time of survey. The substrate is composed primarily of cobble, gravel, and silt. Waterway 4 is not listed by the PFBC as an approved trout water, Class A Wild Trout Stream, or Stream Listed with Naturally Reproducing Trout. No in-stream restrictions will be required.

Waterway 5

Waterway 5 is an ephemeral UNT to the Schuylkill River and is located in the S.R. 0724 project area between S.R. 0724 and an active railroad. Water flows in an east to west direction parallel to S.R. 0724 and into Waterway 6. There was no surface water present within Waterway 5 at the time of survey. The substrate is composed primarily of gravel and silt. Waterway 5 is not listed by the PFBC as an approved trout water, Class A Wild Trout Stream, or Stream Listed with Naturally Reproducing Trout. No in-stream restrictions will be required.

Waterway 6

Waterway 6 is a perennial UNT to the Schuylkill River and is located in the S.R. 0724 project area. Water flows in a southwest to northeast direction through a culvert under an active railroad and S.R. 0724. Waterway 6 receives hydrology from Waterways 5 and 7. Waterway 6 contained 1 inch of surface water at the time of survey. Hydrophytic vegetation such as *Lemna minor* (duckweed) is present within the waterway. The waterway substrate is composed gravel and silt. Waterway 6 is not listed by the PFBC as an approved trout water, Class A Wild Trout Stream, or Stream Listed with Naturally Reproducing Trout. No in-stream restrictions will be required.

Waterway 7

Waterway 7 is an intermittent UNT to the Schuylkill River and is located in the S.R. 0724 project area between S.R. 0724 and an active railroad. Waterway 7 conveys hydrology from Wetland 5 into Waterway 6. The substrate is composed primarily of gravel and silt. Waterway 7 is not listed by the PFBC as an approved trout water, Class A Wild Trout Stream, or Stream Listed with Naturally Reproducing Trout. No in-stream restrictions will be required.

Waterway 8

Waterway 8 is a perennial UNT to the Schuylkill River and is located in the S.R. 0724 project area. Water flows from the southwest to the northeast through a culvert under West 1st Street, then through a concrete-lined channel under a railroad, and finally through another culvert under S.R. 0724 and into the Schuylkill River. The original project area extended west on West 1st Street, crossing over Waterway 8. Since the time of wetland and waterways delineation, the proposed location of the water line was rerouted northeast along Jackson Street, turning west on S.R. 0724. Waterway 8 receives hydrology from Waterway 9. Waterway 8 averages 2 inches in depth and 10 feet in width. The waterway substrate was composed of cobble and gravel. Waterway 8 is not listed by the PFBC as an approved trout water, Class A Wild Trout Stream, or Stream Listed with Naturally Reproducing Trout. No in-stream restrictions will be required.

Waterway 9

Waterway 9 is an ephemeral UNT to the Schuylkill River and was located in the S.R. 0724 project area. Water flows in an east to west direction parallel to West 1st Street and into

Waterway 8. There was no surface water within the waterway at the time of survey. The waterway substrate is composed of gravel. Waterway 9 is not listed by the PFBC as an approved trout water, Class A Wild Trout Stream, or Stream Listed with Naturally Reproducing Trout. No in-stream restrictions will be required.

SUMMARY

On July 19 and 20, 2016, A.D. Marble identified and delineated five wetlands (one POW, one PFO, and three PEM habitats) and nine waterways in accordance with the USACE's *Wetlands Delineation Manual* (1987) and *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont Regional Supplement, Version 2.0* (January 2012); the PADEP Chapter 105 Regulations; and Section 404 of the Federal Clean Water Act.

A.D. Marble appreciates this opportunity to be of service to you. Please contact Cheryl Matasovsky at 484-533-2522 or cmatasovsky@admarble.com with any comments or questions regarding this study.

Sincerely,
A.D. Marble



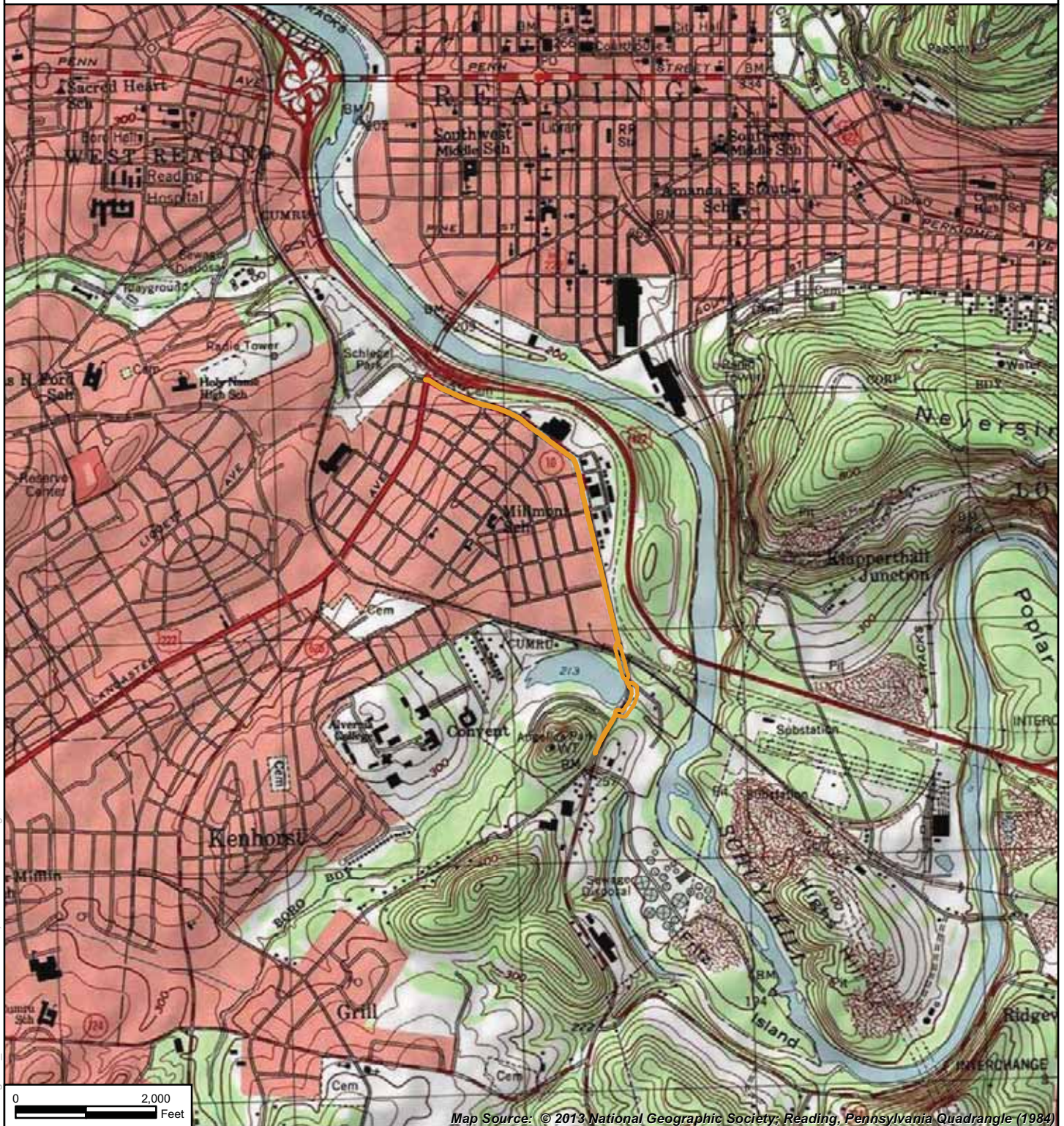
Cheryl Matasovsky
Senior Environmental Scientist

Enclosures

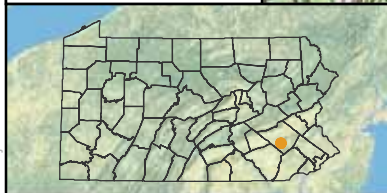
Enclosure A: Figures
Enclosure B: Photographs
Enclosure C: Wetland Data Sheets

Enclosure A: Figures

Figure 1A
Project Location Map
 S.R. 0010 Emberclear Water Main
 City of Reading, Berks County, Pennsylvania



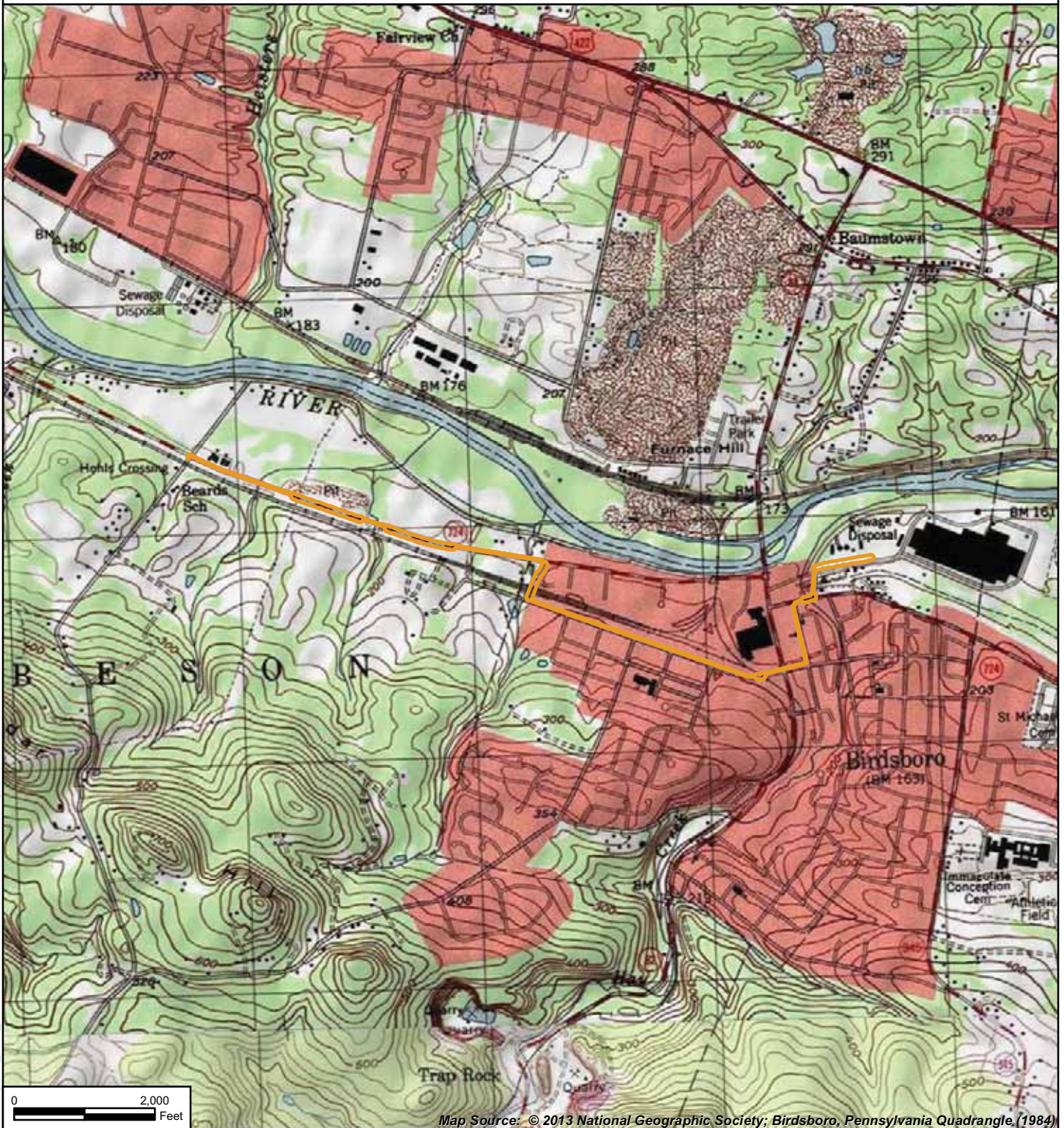
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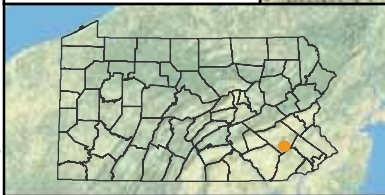
 Project Area

Figure 1B Project Location Map

S.R. 0724 Emberclear Water Main
Birdsboro Borough and Robeson Township, Berks County, Pennsylvania



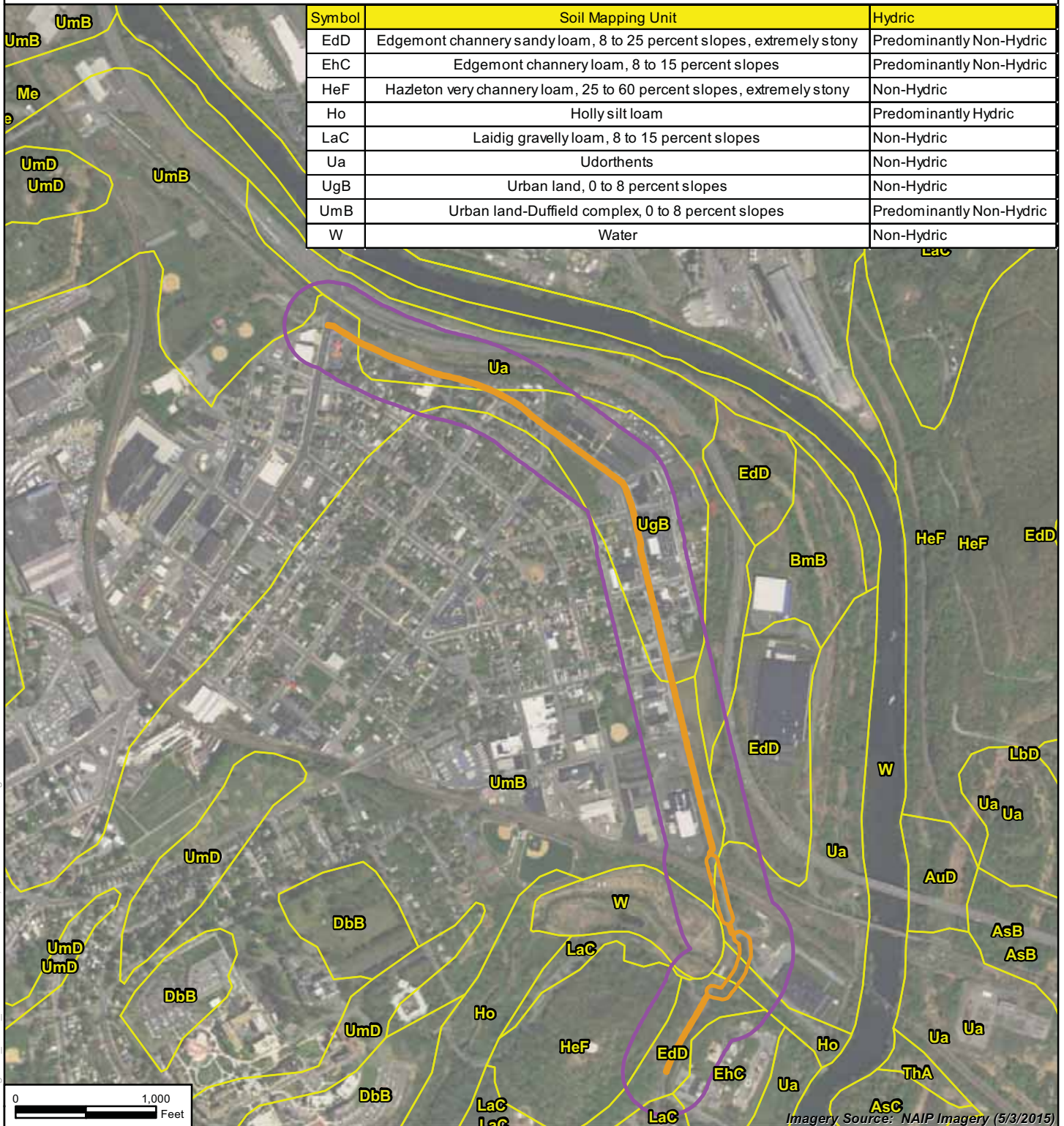
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 Project Area

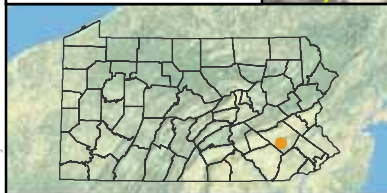
Figure 2A Soils Map

S.R. 0010 Emberclear Water Main
City of Reading, Berks County, Pennsylvania



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Imagery Source: NAIP Imagery (5/3/2015)



Project Area

300-Foot Buffer



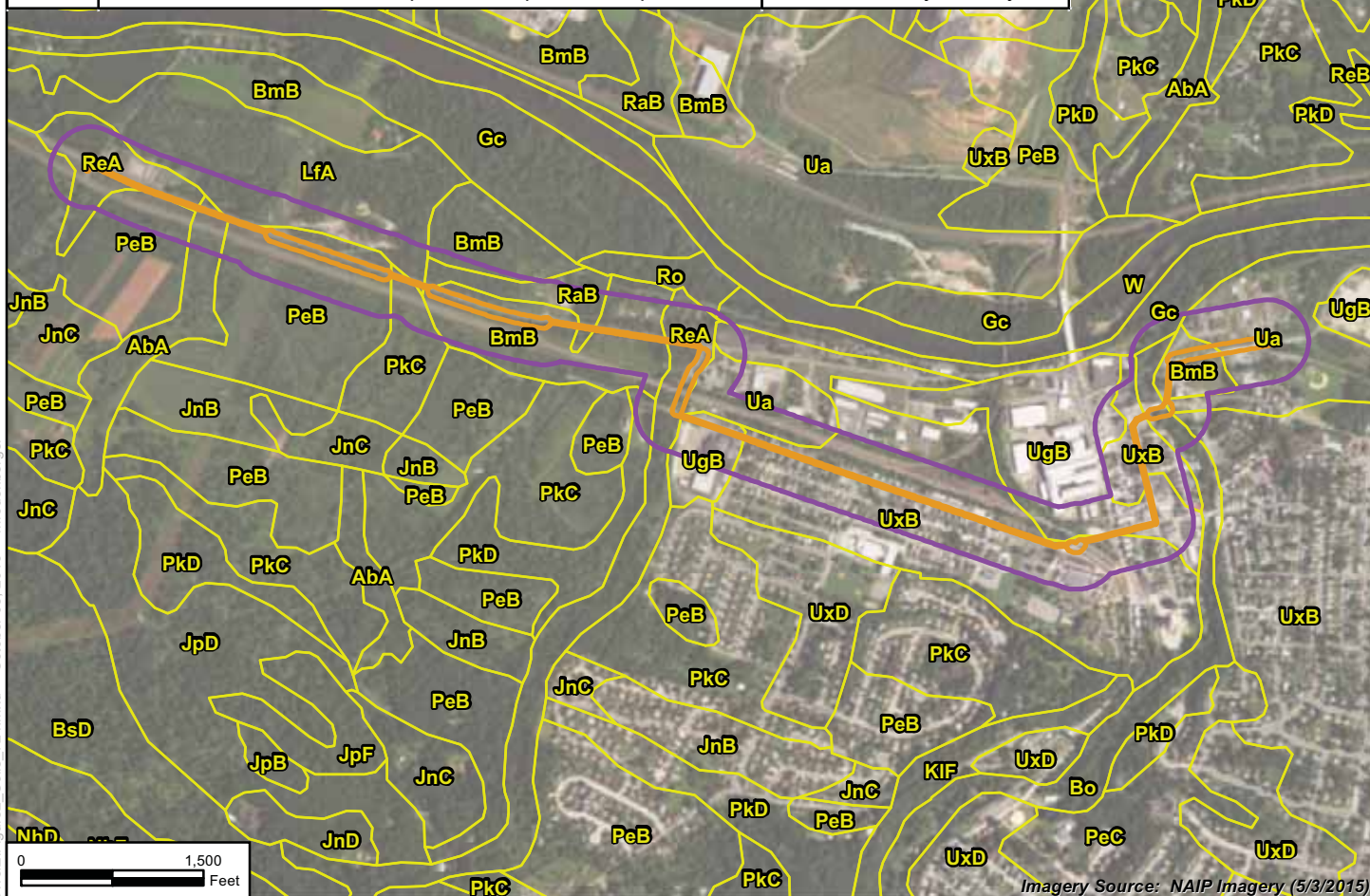
NRCS Soils

Data Source: USDA Berks County Soils 2014

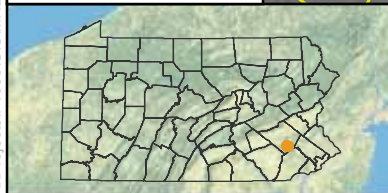
Figure 2B Soils Map

S.R. 0724 Emberclear Water Main
Birdsboro Borough and Robeson Township, Berks County, Pennsylvania

Symbol	Soil Mapping Unit	Hydric
AbA	Abbottstown silt loam, 0 to 3 percent slopes	Predominantly Non-Hydric
BmB	Birdsboro silt loam, 3 to 8 percent slopes	Predominantly Non-Hydric
Bo	Bowmansville-Knauers silt loams	Partially Hydric
Gc	Gibraltar silt loam	Predominantly Non-Hydric
LfA	Lamington silt loam, 0 to 3 percent slopes	Predominantly Hydric
PeB	Penn channery silt loam, 3 to 8 percent slopes	Predominantly Non-Hydric
PkC	Penn-Klinesville channery silt loams, 8 to 15 percent slopes	Predominantly Non-Hydric
PkD	Penn-Klinesville channery silt loams, 15 to 25 percent slopes	Predominantly Non-Hydric
RaB	Raritan silt loam, 3 to 8 percent slopes	Predominantly Non-Hydric
ReA	Readington silt loam, 0 to 3 percent slopes	Predominantly Non-Hydric
Ro	Rowland silt loam	Predominantly Non-Hydric
Ua	Udorthents	Non-Hydric
UgB	Urban land, 0 to 8 percent slopes	Non-Hydric
UxB	Urban land-Penn complex, 0 to 8 percent slopes	Predominantly Non-Hydric



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Project Area

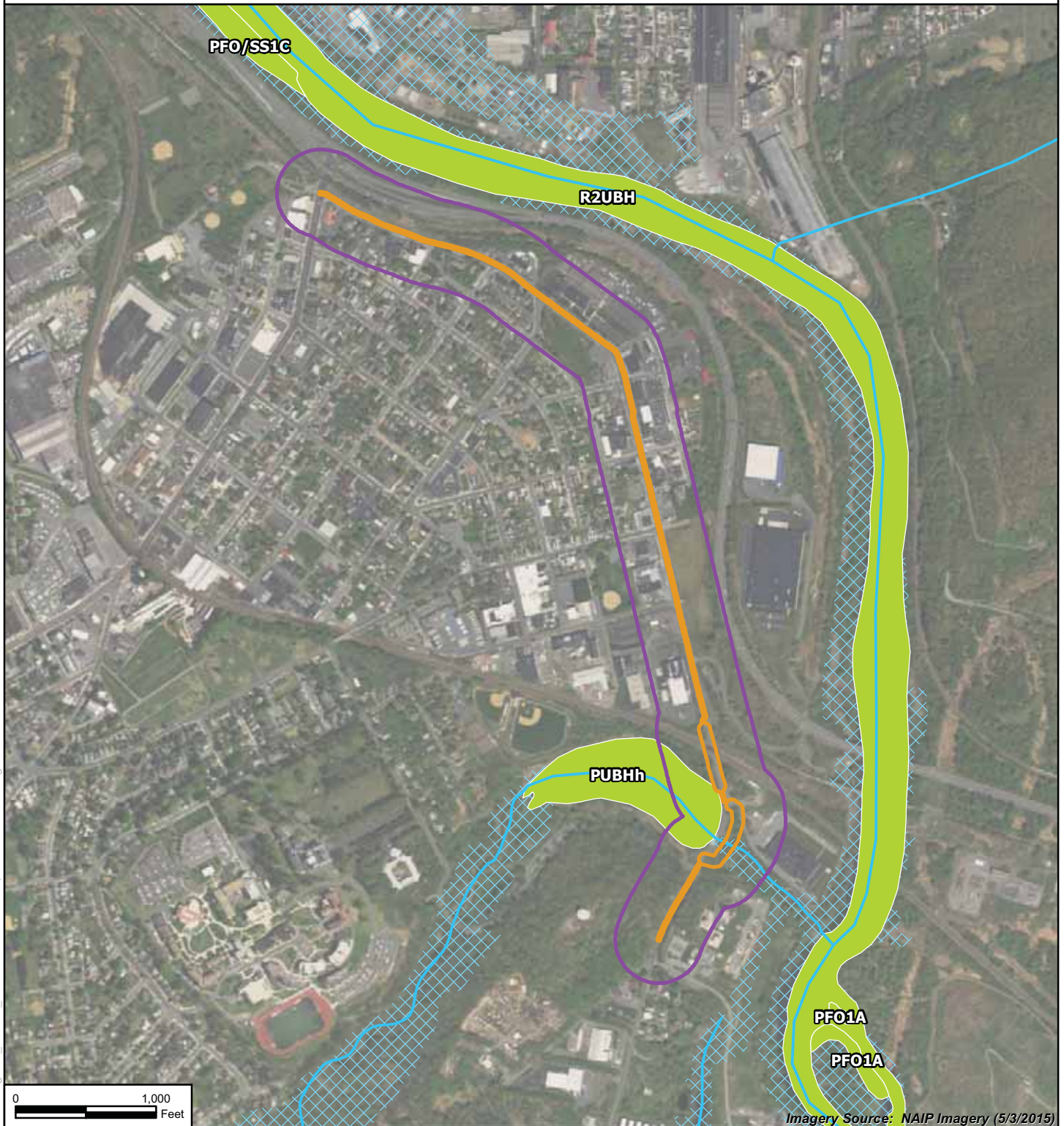
300-Foot Buffer



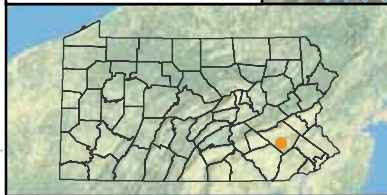
NRCS Soils

Data Source: USDA Berks County Soils 2014

Figure 3A
Natural Resources
 S.R. 0010 Emberclear Water Main
 City of Reading, Berks County, Pennsylvania



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Project Area



300-Foot Buffer



Streams



NWI (2015)

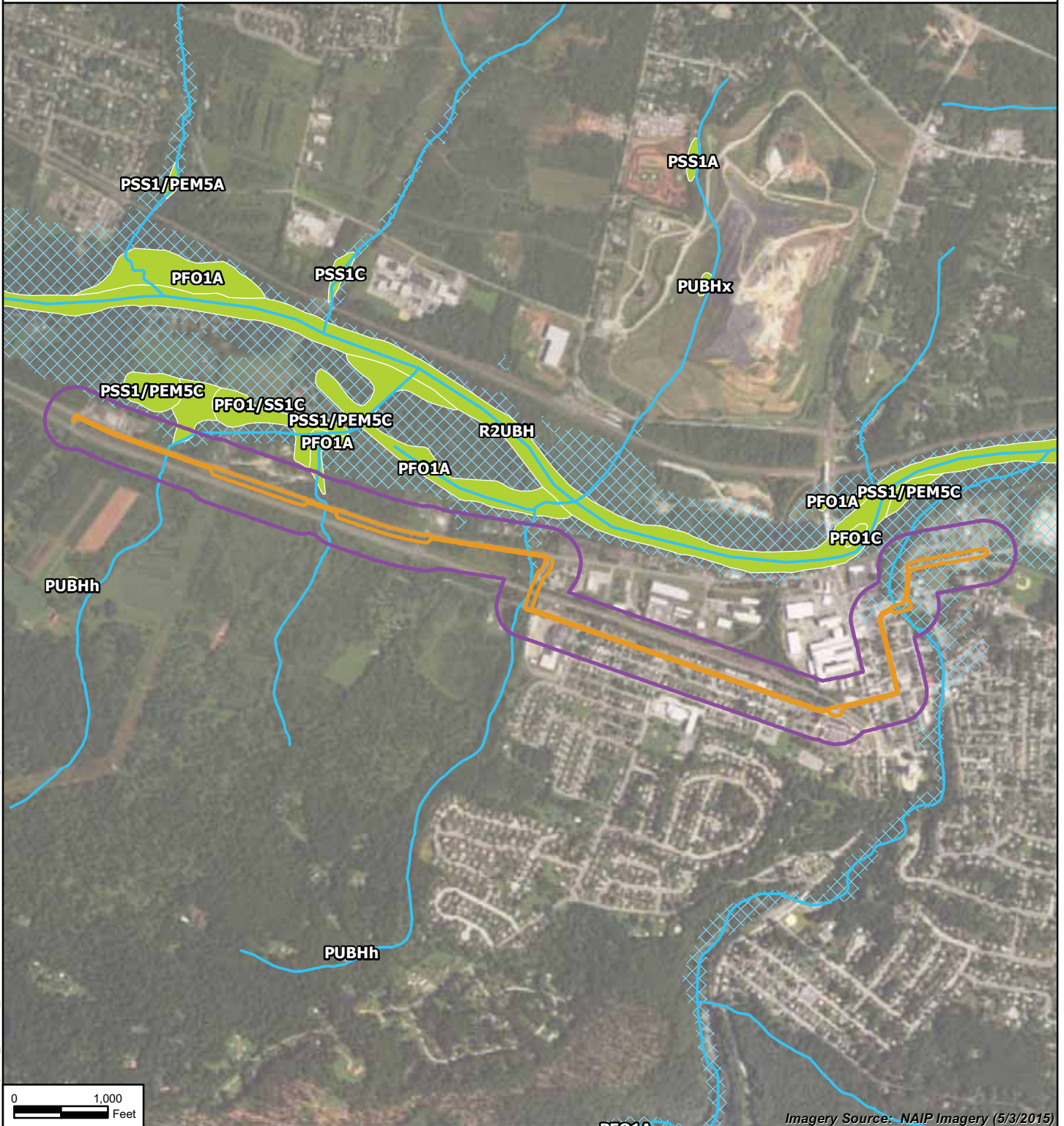


FEMA 100-Year Floodplain

Data Source: USFWS 2015, FEMA 2016, Chap93 Streams PASDA

Figure 3B Natural Resources

S.R. 0724 Emberclear Water Main
Birdsboro Borough and Robeson Township, Berks County, Pennsylvania



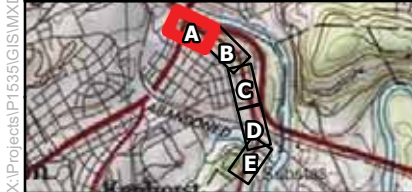
- Project Area
- 300-Foot Buffer
- NWI (2015)
- FEMA 100-Year Floodplain
- Streams



Data Source: USFWS 2015, FEMA 2016, Chap93 Streams PASDA



Imagery Source: NAIP Imagery (8/15/2015)



Project Area



Data Points



Waterway Points



Photographs

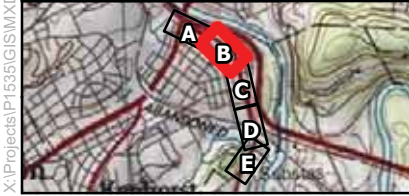


Delineated Waterway

Figure 4A
Aquatic Resources
S.R. 0010 Emberclear Water Main
City of Reading, Berks County, Pennsylvania



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Project Area



Data Points



Waterway Points



Photographs

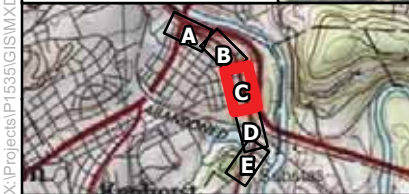


Delineated Waterway

Figure 4B
Aquatic Resources
S.R. 0010 Emberclear Water Main
City of Reading, Berks County, Pennsylvania



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Project Area



Data Points



Photographs



Waterway Points

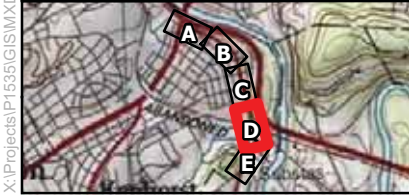


Delineated Waterway

Figure 4C
Aquatic Resources
S.R. 0010 Emberclear Water Main
City of Reading, Berks County, Pennsylvania



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Project Area



Data Points



Waterway Points



Photographs

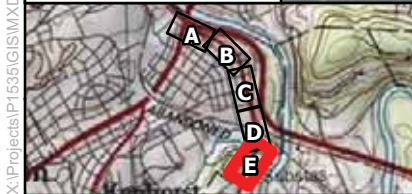


Delineated Waterway

Figure 4D
Aquatic Resources
S.R. 0010 Emberclear Water Main
City of Reading, Berks County, Pennsylvania



Imagery Source: NAIP Imagery (8/15/2015)



Project Area



Data Points



Photographs

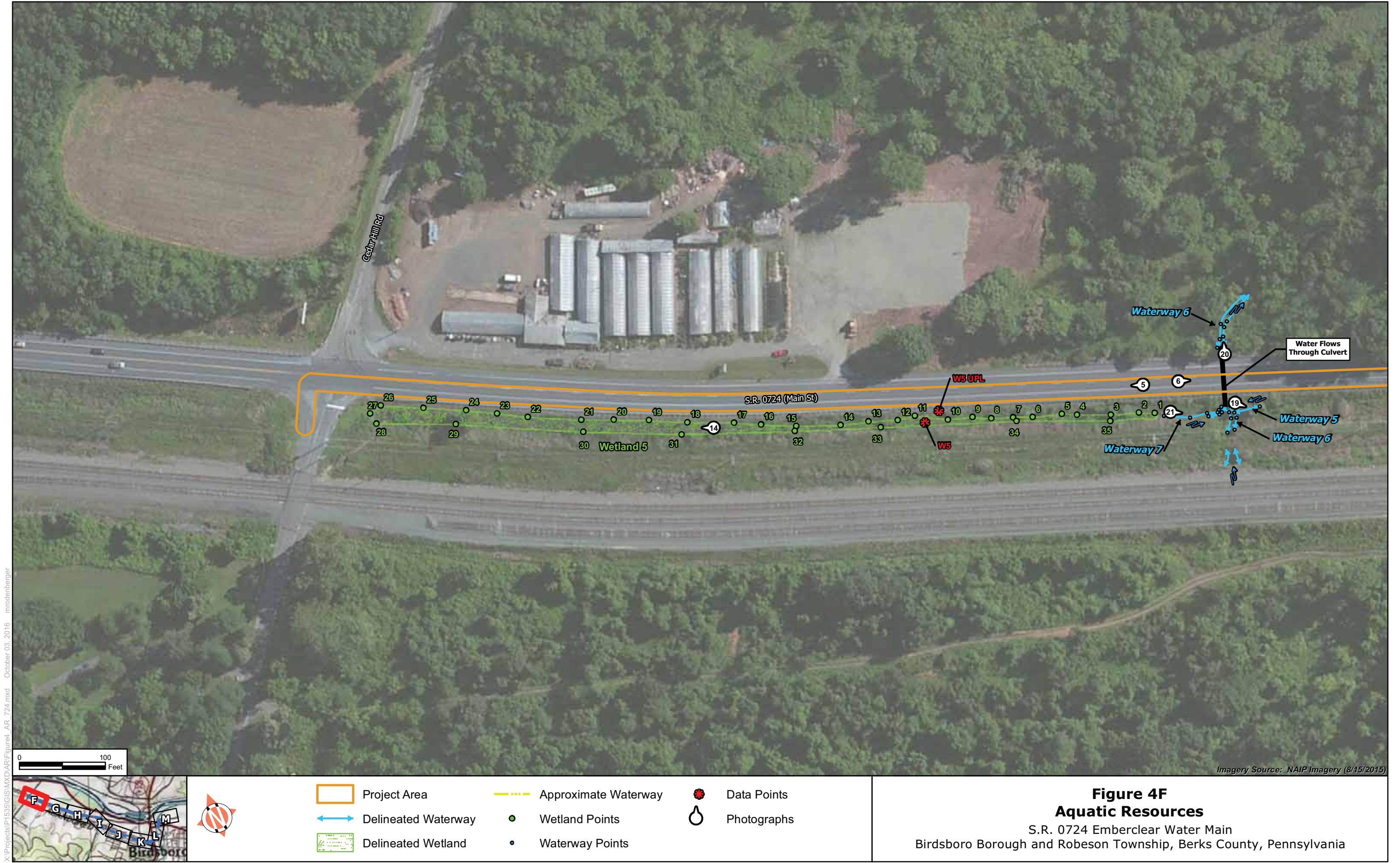


Waterway Points



Delineated Waterway

Figure 4E
Aquatic Resources
S.R. 0010 Emberclear Water Main
City of Reading, Berks County, Pennsylvania





Imagery Source: NAIP Imagery (8/15/2015)











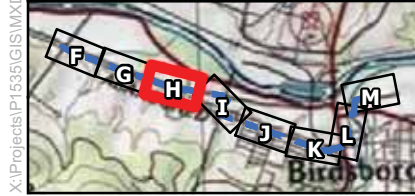
	Project Area		Approximate Waterway		Data Points
	Delineated Waterway		Wetland Points		Photographs
	Delineated Wetland		Waterway Points		

Figure 4G
Aquatic Resources
S.R. 0724 Emberclear Water Main
Birdsboro Borough and Robeson Township, Berks County, Pennsylvania



Imagery Source: NAIP Imagery (8/15/2015)

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Project Area



Delineated Waterway



Delineated Wetland



Approximate Waterway



Wetland Points



Waterway Points



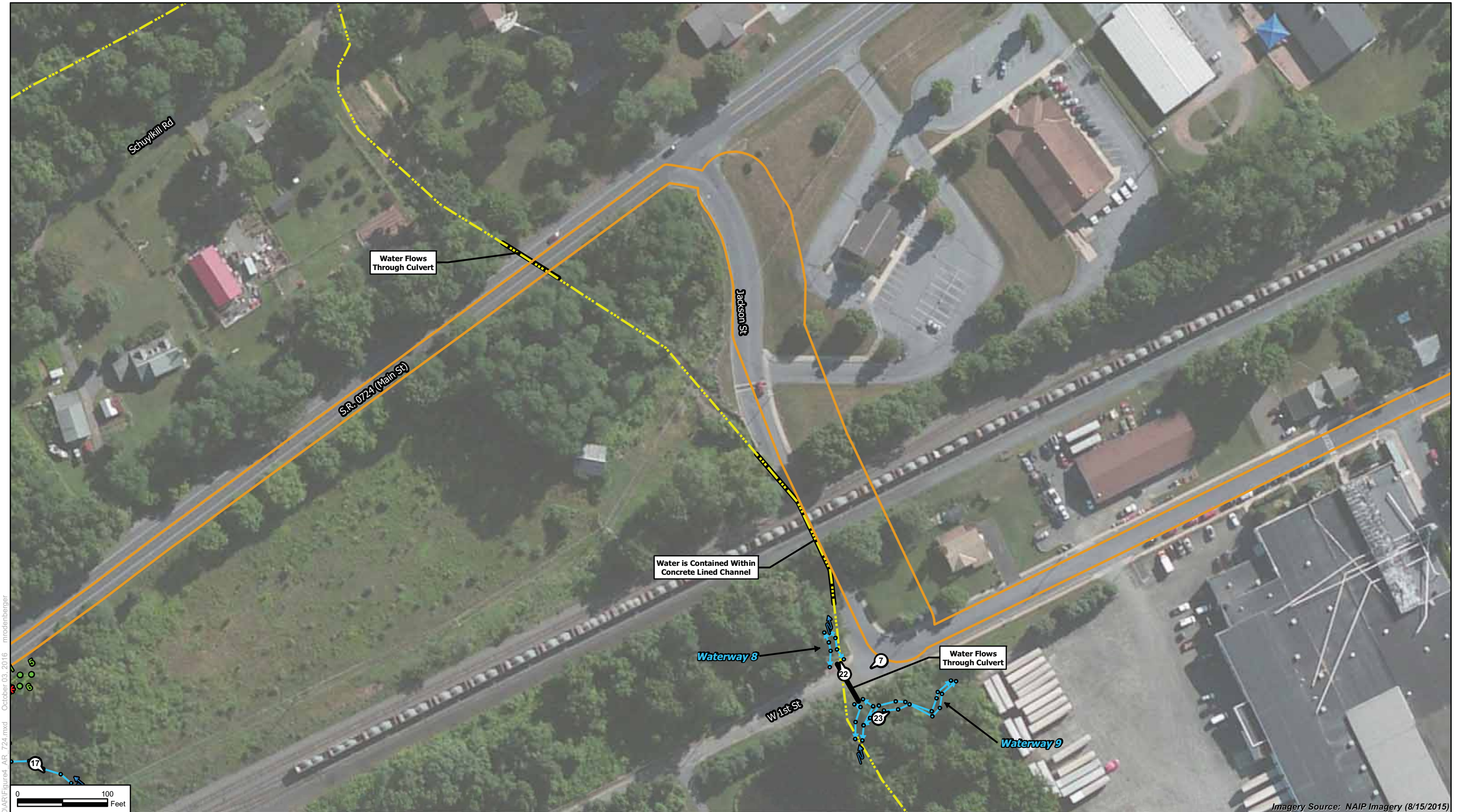
Data Points



Photographs

Figure 4H Aquatic Resources

S.R. 0724 Emberclear Water Main
Birdsboro Borough and Robeson Township, Berks County, Pennsylvania



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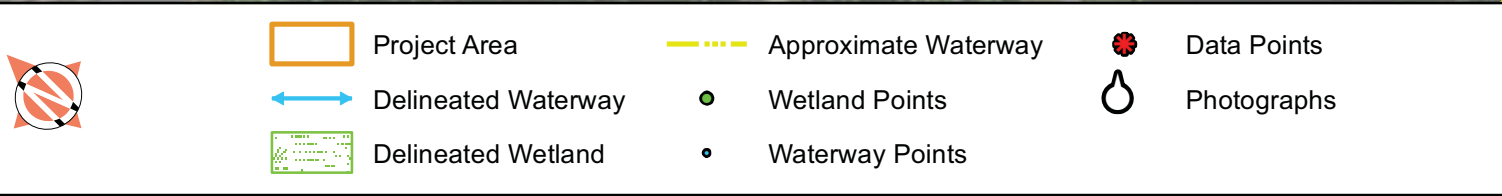
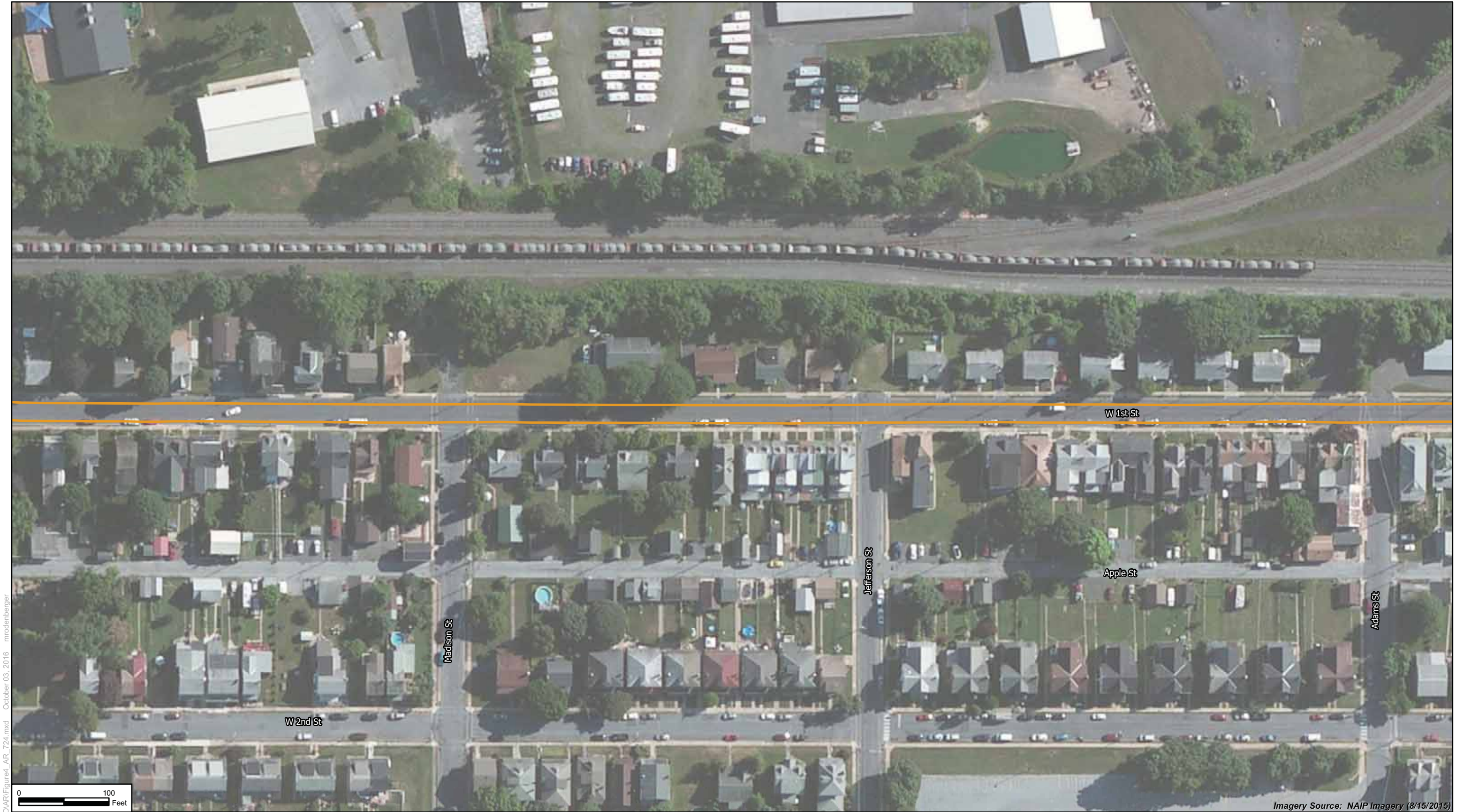


Figure 4I
Aquatic Resources
S.R. 0724 Emberclear Water Main
Birdsboro Borough and Robeson Township, Berks County, Pennsylvania



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Figure 4J
Aquatic Resources
S.R. 0724 Emberclear Water Main
Birdsboro Borough and Robeson Township, Berks County, Pennsylvania



Imagery Source: NAIP Imagery (8/15/2015)

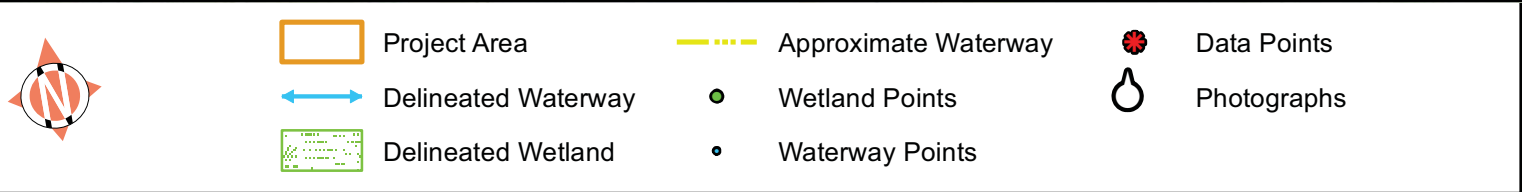
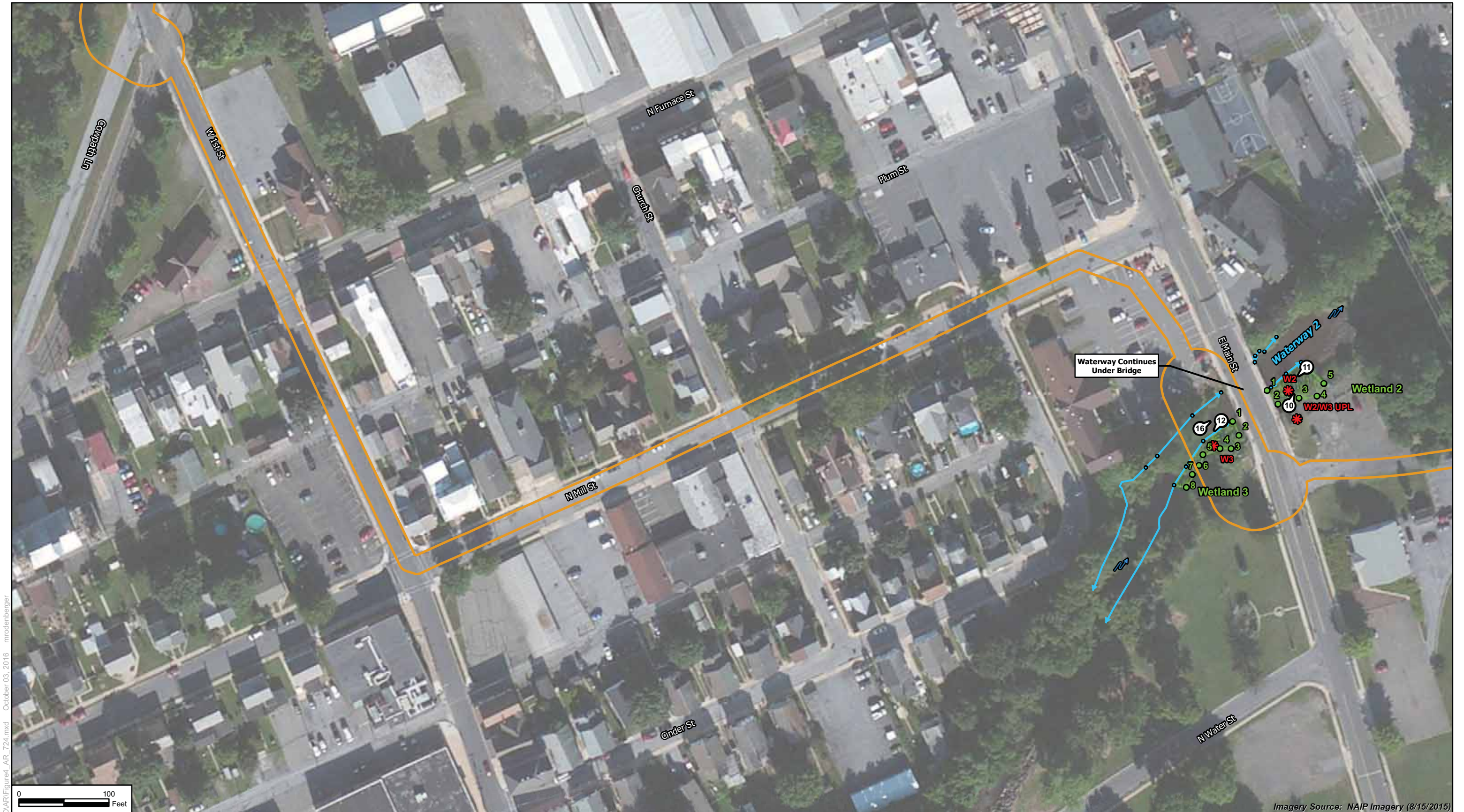


Figure 4K
Aquatic Resources
S.R. 0724 Emberclear Water Main
Birdsboro Borough and Robeson Township, Berks County, Pennsylvania



Imagery Source: NAIP Imagery (8/15/2015)

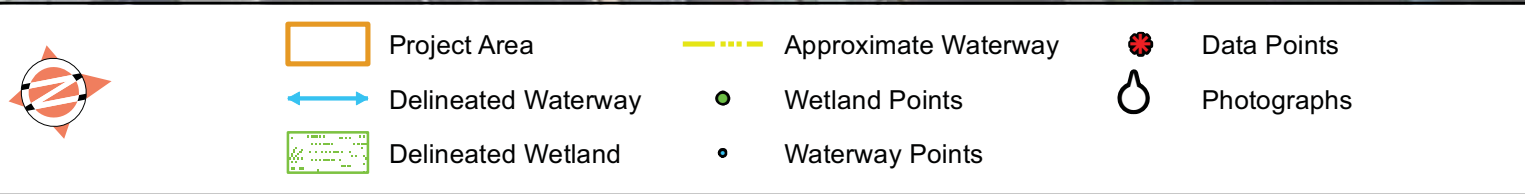
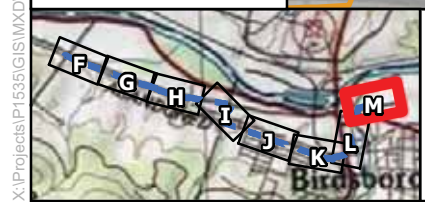


Figure 4L
Aquatic Resources
S.R. 0724 Emberclear Water Main
Birdsboro Borough and Robeson Township, Berks County, Pennsylvania

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Imagery Source: NAIP Imagery (8/15/2015)



Project Area	Approximate Waterway	Data Points
Delineated Waterway	Wetland Points	Photographs
Delineated Wetland	Waterway Points	

Figure 4M
Aquatic Resources
S.R. 0724 Emberclear Water Main
Birdsboro Borough and Robeson Township, Berks County, Pennsylvania

Enclosure B: Photographs



Photograph 1: View of the Emberclear Water Main S.R. 0010 project area, facing west (July 2016).



Photograph 2: View of the Emberclear Water Main S.R. 0010 project area, facing east (July 2016).



Photograph 3: View of the Emberclear Water Main S.R. 0010 project area, facing north (July 2016).



Photograph 4: View of the Emberclear Water Main S.R. 0010 project area, facing southeast (July 2016).



Photograph 5: View of the Emberclear Water Main S.R. 0724 project area, facing west (July 2016).



Photograph 6: View of the Emberclear Water Main S.R. 0724 project area, facing east (July 2016).



Photograph 7: View of the Emberclear Water Main S.R. 0724 project area, facing west (July 2016).



Photograph 8: View of the Emberclear Water Main S.R. 0724 project area, facing west (July 2016).



Photograph 9: View of Wetland 1, facing northeast (July 2016).



Photograph 10: View of Wetland 2, facing northwest (July 2016).



Photograph 11: Upstream view of Waterway 2 (Hay Creek), facing southeast (July 2016).



Photograph 12: View of Wetland 3, facing southeast (July 2016).



Photograph 13: View of Wetland 4, facing southwest (July 2016).



Photograph 14: View of Wetland 5, facing northwest (July 2016).



Photograph 15: Downstream view of Waterway 1 (Angelica Creek), facing southeast (July 2016).



Photograph 16: Downstream view of Waterway 2 (Hay Creek), facing northwest (July 2016).



Photograph 17: Upstream view of Waterway 3 (UNT to the Schuylkill River), facing south (July 2016).



Photograph 18: Upstream view of Waterway 4 (UNT to the Schuylkill River), facing south (July 2016).



Photograph 19: Upstream view of Waterway 5 (UNT to the Schuylkill River), facing southeast (July 2016).



Photograph 20: Downstream view of Waterway 6 (UNT to the Schuylkill River), facing northeast (July 2016).



Photograph 21: Downstream view of Waterway 7 (UNT to the Schuylkill River), facing southeast (July 2016).



Photograph 22: Downstream view of Waterway 8 (UNT to the Schuylkill River), facing north (July 2016).



Photograph 23: Upstream view of Waterway 9 (UNT to Schuylkill River), facing east (July 2016).

Enclosure C: Wetland Data Sheets

WETLAND DETERMINATION DATA FORM --Eastern Mountains and Piedmont Region

Project/Site: Emberclear Water Main City/County: Reading/Berks Sampling Date: 7/19/2016
 Applicant/Owner: Reading Water Authority State: PA Sampling Point: UPL1
 Investigator(s): CM, MM Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): terrace Local relief: flat Slope (%): 0
 Subregion (LRR or MLRA) MLA 148 Lat: 40.32271 Long: -75.930525 Datum: WGS 84
 Soil Map Unit Name: Udorthents (Ua) NWI classification: NA

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

VEGETATION -- Use Scientific Names of Plants

Tree Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u><i>Ailanthus altissima</i></u>	<u>80</u>	<u>Y</u>	<u>FACU</u>
2. <u><i>Prunus serotina</i></u>	<u>5</u>	<u>N</u>	<u>FACU</u>
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
8. _____	_____	_____	_____
	<u>85</u> = Total Cover		

Sapling/Shrub Stratum (Plot size: <u>15'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u><i>Lonicera maackii</i></u>	<u>70</u>	<u>Y</u>	<u>NI</u>
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
	<u>70</u> = Total Cover		

Herb Stratum (Plot size: <u>5'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u><i>Ailanthus altissima</i></u>	<u>5</u>	<u>Y</u>	<u>FACU</u>
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
8. _____	_____	_____	_____
9. _____	_____	_____	_____
10. _____	_____	_____	_____
11. _____	_____	_____	_____
12. _____	_____	_____	_____
13. _____	_____	_____	_____
	<u>5</u> = Total Cover		

Woody Vine Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u><i>Celastrus orbiculatus</i></u>	<u>10</u>	<u>Y</u>	<u>FACU</u>
2. <u><i>Parthenocissus quinquefolia</i></u>	<u>5</u>	<u>Y</u>	<u>FACU</u>
3. <u><i>Muscadinia rotundifolia</i></u>	<u>5</u>	<u>Y</u>	<u>FACU</u>
4. _____	_____	_____	_____
	<u>20</u> = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)
 Total Number of Dominant Species Across All Strata: 6 (B)
 Percent of Dominant Species That Are OBL, FACW or FAC 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL Species <u>0</u>	x 1 = <u>0</u>
FACW species <u>0</u>	x 2 = <u>0</u>
FAC species <u>0</u>	x 3 = <u>0</u>
FACU species <u>160</u>	x 4 = <u>640</u>
UPL species <u>0</u>	x 5 = <u>0</u>
Column Totals: <u>160</u> (A)	<u>640</u> (B)
Prevalence Index = B/A = <u>4.00</u>	

Hydrophytic Vegetation Indicators:

____ Rapid Test for Hydrophytic Vegetation
 ____ Dominance Test is >50%
 ____ Prevalence Index is ≤3.0¹
 ____ Morphological Adaptations¹ (Provide supporting data in Remarks or on separate sheet)
 ____ Problematic Hydrophytic Vegetation¹ (Explain)
¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Definitions of Vegetation Strata:

Tree - Woody plants 3 in. (7.6 cm) or more in DBH, regardless of height.
Sapling/shrub - Woody plants less than 3 in. DBH and greater than 3.28 ft (1m) tall.
Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall
Woody vines - All woody vines greater than 3.28 ft in height

Hydrophytic Vegetation Present? Yes _____ No X

Remarks: (Include photo numbers here or on separate sheet.) The herbaceous layer was dominated by leaf litter. Vegetation at UPL1 did not meet any of the hydrophytic vegetation tests. UPL1 was an upland point collected within a wooded tree line between the Schuylkill River Trail and S.R. 0010.

WETLAND DETERMINATION DATA FORM --Eastern Mountains and Piedmont Region

Project/Site: Emberclear Water Main City/County: Reading/Berks Sampling Date: 7/19/2016
 Applicant/Owner: Reading Water Authority State: PA Sampling Point: UPL2
 Investigator(s): CM, MM Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): terrace Local relief: flat Slope (%): 0
 Subregion (LRR or MLRA) MLA 148 Lat: 40.312895 Long: -75.924288 Datum: WGS 84
 Soil Map Unit Name: Urban land--Duffield complex, 0 to 8 percent slopes (UmB) NWI classification: NA

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

VEGETATION -- Use Scientific Names of Plants

Tree Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
8. _____	_____	_____	_____
<u>0</u> = Total Cover			

Sapling/Shrub Stratum (Plot size: <u>15'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
<u>0</u> = Total Cover			

Herb Stratum (Plot size: <u>5'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Lolium multiflorum</u>	<u>20</u>	<u>Y</u>	<u>FACU</u>
2. <u>Agrostis gigantea</u>	<u>20</u>	<u>Y</u>	<u>FACW</u>
3. <u>Trifolium pratense</u>	<u>15</u>	<u>N</u>	<u>FACU</u>
4. <u>Aster sp.</u>	<u>15</u>	<u>N</u>	<u>NA</u>
5. <u>Verbascum thapsus</u>	<u>10</u>	<u>N</u>	<u>FACU</u>
6. <u>Barbarea vulgaris</u>	<u>5</u>	<u>N</u>	<u>FACU</u>
7. <u>Daucus carota</u>	<u>5</u>	<u>N</u>	<u>UPL</u>
8. <u>Echinochloa crus-galli</u>	<u>5</u>	<u>N</u>	<u>FAC</u>
9. _____	_____	_____	_____
10. _____	_____	_____	_____
11. _____	_____	_____	_____
12. _____	_____	_____	_____
13. _____	_____	_____	_____
<u>95</u> = Total Cover			

Woody Vine Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
<u>0</u> = Total Cover			

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)
 Total Number of Dominant Species Across All Strata: 2 (B)
 Percent of Dominant Species That Are OBL, FACW or FAC 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL Species <u>0</u>	x <u>1</u> = <u>0</u>
FACW species <u>25</u>	x <u>2</u> = <u>50</u>
FAC species <u>20</u>	x <u>3</u> = <u>60</u>
FACU species <u>50</u>	x <u>4</u> = <u>200</u>
UPL species <u>5</u>	x <u>5</u> = <u>25</u>
Column Totals: <u>100</u> (A)	<u>335</u> (B)
Prevalence Index = B/A = <u>3.35</u>	

Hydrophytic Vegetation Indicators:

 Rapid Test for Hydrophytic Vegetation
 Dominance Test is >50%
 Prevalence Index is ≤3.0¹
 Morphological Adaptations¹ (Provide supporting data in Remarks or on separate sheet)
 Problematic Hydrophytic Vegetation¹ (Explain)
¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Definitions of Vegetation Strata:

Tree - Woody plants 3 in. (7.6 cm) or more in DBH, regardless of height.
Sapling/shrub - Woody plants less than 3 in. DBH and greater than 3.28 ft (1m) tall.
Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall
Woody vines - All woody vines greater than 3.28 ft in height

Hydrophytic Vegetation Present? Yes _____ No X

Remarks: (Include photo numbers here or on separate sheet.) Vegetation at UPL2 did not meet any of the hydrophytic vegetation tests. UPL2 was an upland point collected adjacent to S.R. 0010 and a railroad.

SOIL

Sampling Point: **UPL2****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	7.5YR 3/2	100					silt loam	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.²Location: PL=Pore Lining, M=Matrix.**Hydric Soil Indicators:**

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

Indicators for Problematic Hydric Soils³

<input type="checkbox"/> 2 cm Muck (A10) (MLRA 147, 148)
<input type="checkbox"/> Coastal Prairie Redox (A16) (MLRA 147, 148)
<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 136, 147)
<input type="checkbox"/> Very Shallow Dark Surface (TF12)
<input type="checkbox"/> Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.**Restrictive Layer (if observed):**

Type: _____ rock _____

Depth (inches): _____ 3 _____

Hydric Soil Present? Yes _____ No X

Remarks: Hydric soil indicators were not present.

HYDROLOGY**Wetland Hydrology Indicators:**

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

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

Secondary Indicators (minimum of two required)

<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Geomorphic Position (D2)	<input type="checkbox"/> Microtopographic Relief (D4)
<input type="checkbox"/> Drainage Patterns (B10)	<input type="checkbox"/> FAC-Neutral Test (D5)
<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"/> Sparsely Vegetated Concave Surface (B8)	

Field Observations:

Surface Water Present?	Yes _____	No <u>X</u>	Depth (inches): _____
Water Table Present?	Yes _____	No <u>X</u>	Depth (inches): _____
Saturation Present?	Yes _____	No <u>X</u>	Depth (inches): _____

(includes capillary fringe)

Hydrology Present? Yes _____ No X

Remarks: Wetland hydrology indicators were not present.

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

Hydrophytic Vegetation present?	Yes _____	No <u>X</u>	Is the Sample Area within a wetland?	Yes _____	No <u>X</u>
Hydric Soils Present?	Yes _____	No <u>X</u>	If yes, optional Wetland Site ID:	_____	
Wetland Hydrology Present?	Yes _____	No <u>X</u>			

Remarks: (Explain alternative procedures here or in a separate report.) UPL2 did not meet any of the wetland criteria. UPL2 was an upland point collected adjacent to S.R. 0010 and a railroad.

WETLAND DETERMINATION DATA FORM --Eastern Mountains and Piedmont Region

Project/Site: Emberclear Water Main City/County: Birdsboro/Berks Sampling Date: 7/19/2016
 Applicant/Owner: Reading Water Authority State: PA Sampling Point: W1
 Investigator(s): CM, MM Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): _____ depression Local relief: concave Slope (%): 0
 Subregion (LRR or MLRA) MLRA 148 Lat: 40.2675 Long: -75.804716 Datum: WGS 84
 Soil Map Unit Name: Udorthents (Ua) NWI classification: _____

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

VEGETATION -- Use Scientific Names of Plants

Tree Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
8. _____	_____	_____	_____
0 = Total Cover			

Sapling/Shrub Stratum (Plot size: <u>15'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Rosa multiflora</u>	10	Y	FACU
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
10 = Total Cover			

Herb Stratum (Plot size: <u>5'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Phragmites australis</u>	20	Y	FACW
2. <u>Lythrum salicaria</u>	5	Y	FACW
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
8. _____	_____	_____	_____
9. _____	_____	_____	_____
10. _____	_____	_____	_____
11. _____	_____	_____	_____
12. _____	_____	_____	_____
13. _____	_____	_____	_____
25 = Total Cover			

Woody Vine Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Toxicodendron radicans</u>	10	Y	FAC
2. <u>Muscadine rotundifolia</u>	10	Y	FACU
3. _____	_____	_____	_____
4. _____	_____	_____	_____
20 = Total Cover			

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)
 Total Number of Dominant Species Across All Strata: 5 (B)
 Percent of Dominant Species That Are OBL, FACW or FAC 0.6 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL Species <u>0</u>	x 1 = <u>0</u>
FACW species <u>25</u>	x 2 = <u>50</u>
FAC species <u>10</u>	x 3 = <u>30</u>
FACU species <u>20</u>	x 4 = <u>80</u>
UPL species <u>0</u>	x 5 = <u>0</u>
Column Totals: <u>55</u> (A)	<u>160</u> (B)
Prevalence Index = B/A = <u>2.91</u>	

Hydrophytic Vegetation Indicators:

 Rapid Test for Hydrophytic Vegetation
X Dominance Test is >50%
X Prevalence Index is ≤3.0¹
 Morphological Adaptations¹ (Provide supporting data in Remarks or on separate sheet)
 Problematic Hydrophytic Vegetation¹ (Explain)
¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Definitions of Vegetation Strata:

Tree - Woody plants 3 in. (7.6 cm) or more in DBH, regardless of height.
Sapling/shrub - Woody plants less than 3 in. DBH and greater than 3.28 ft (1m) tall.
Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall
Woody vines - All woody vines greater than 3.28 ft in height

Hydrophytic Vegetation Present? Yes X No _____

Remarks: (Include photo numbers here or on separate sheet.) Vegetation was present surrounding an area of open water. Hydrophytic vegetation was based on the dominance and prevalence index tests. Three out of four dominant species were OBL, FACW, or FAC.

SOIL

Sampling Point: W1

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		

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.²Location: PL=Pore Lining, M=Matrix.**Hydric Soil Indicators:**

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

Indicators for Problematic Hydric Soils³

<input type="checkbox"/> 2 cm Muck (A10) (MLRA 147, 148)
<input type="checkbox"/> Coastal Prairie Redox (A16) (MLRA 147, 148)
<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 136, 147)
<input type="checkbox"/> Very Shallow Dark Surface (TF12)
<input type="checkbox"/> Other (Explain in Remarks)

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 X No

Remarks: A soil sample was inaccessible due to a loose soil profile within the water column; however, with hydrophytic vegetation and hydrological indicators present within the sample point, it is assumed that soils at this point are also hydric.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Geomorphic Position (D2)	<input checked="" type="checkbox"/> Microtopographic Relief (D4)
<input type="checkbox"/> Drainage Patterns (B10)	<input type="checkbox"/> FAC-Neutral Test (D5)
<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 checked="" type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	

Field Observations:

Surface Water Present?	Yes <u>X</u>	No <u> </u>	Depth (inches):	<u>14</u>
Water Table Present?	Yes <u>X</u>	No <u> </u>	Depth (inches):	<u>0</u>
Saturation Present?	Yes <u>X</u>	No <u> </u>	Depth (inches):	<u>0</u>

(includes capillary fringe)

Hydrology Present? Yes X No

Remarks: Wetland hydrology indicators were present. Fourteen inches of surface water were present within the wetland. The wetland is a dredged ditch with no inlet or outlet.

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

Hydrophytic Vegetation present?	Yes <u>X</u>	No <u> </u>	Is the Sample Area within a wetland? Yes <u>X</u> No <u> </u> If yes, optional Wetland Site ID: _____
Hydric Soils Present?	Yes <u>X</u>	No <u> </u>	
Wetland Hydrology Present?	Yes <u>X</u>	No <u> </u>	

Remarks: (Explain alternative procedures here or in a separate report.) W1 met three out of three wetland criteria. A soil sample was inaccessible due to a loose soil profile within the water column; however, with hydrophytic vegetation and hydrological indicators present within the sample point, it is assumed that soils at this point are also hydric. W1 was the representative data point for Wetland 1. Wetland 1 is 100% POW wetland.

WETLAND DETERMINATION DATA FORM --Eastern Mountains and Piedmont Region

Project/Site: Emberclear Water Main City/County: Birdsboro/Berks Sampling Date: 7/19/2016
 Applicant/Owner: Reading Water Authority State: PA Sampling Point: W1 UPL
 Investigator(s): CM, MM Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): terrace Local relief: flat Slope (%): 0
 Subregion (LRR or MLRA) MLRA 148 Lat: 40.267412 Long: -75.804751 Datum: WGS 84
 Soil Map Unit Name: Udorthents (Ua) NWI classification: _____

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

VEGETATION -- Use Scientific Names of Plants

Tree Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
8. _____	_____	_____	_____
<u>0</u> = Total Cover			

Sapling/Shrub Stratum (Plot size: <u>15'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Lonicera maackii</u>	<u>5</u>	<u>Y</u>	<u>FACU</u>
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
<u>5</u> = Total Cover			

Herb Stratum (Plot size: <u>5'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Poa pratensis</u>	<u>100</u>	<u>Y</u>	<u>FACU</u>
2. <u>Plantago major</u>	<u>5</u>	<u>N</u>	<u>FACU</u>
3. <u>Trifolium pratense</u>	<u>5</u>	<u>N</u>	<u>FACU</u>
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
8. _____	_____	_____	_____
9. _____	_____	_____	_____
10. _____	_____	_____	_____
11. _____	_____	_____	_____
12. _____	_____	_____	_____
13. _____	_____	_____	_____
<u>110</u> = Total Cover			

Woody Vine Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Muscadinia rotundifolia</u>	<u>5</u>	<u>Y</u>	<u>FACU</u>
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
<u>5</u> = Total Cover			

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)
 Total Number of Dominant Species Across All Strata: 1 (B)
 Percent of Dominant Species That Are OBL, FACW or FAC 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL Species _____	x 1 = <u>0</u>
FACW species _____	x 2 = <u>0</u>
FAC species _____	x 3 = <u>0</u>
FACU species <u>82</u>	x 4 = <u>328</u>
UPL species _____	x 5 = <u>0</u>
Column Totals: <u>82</u> (A)	<u>328</u> (B)
Prevalence Index = B/A = <u>4.00</u>	

Hydrophytic Vegetation Indicators:

____ Rapid Test for Hydrophytic Vegetation
 ____ Dominance Test is >50%
 ____ Prevalence Index is ≤3.0¹
 ____ Morphological Adaptations¹ (Provide supporting data in Remarks or on separate sheet)
 ____ Problematic Hydrophytic Vegetation¹ (Explain)
¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Definitions of Vegetation Strata:

Tree - Woody plants 3 in. (7.6 cm) or more in DBH, regardless of height.
Sapling/shrub - Woody plants less than 3 in. DBH and greater than 3.28 ft (1m) tall.
Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall
Woody vines - All woody vines greater than 3.28 ft in height

Hydrophytic Vegetation Present? Yes _____ No X

Remarks: (Include photo numbers here or on separate sheet.) Area where sample point was taken is routinely mowed. Vegetation at W1 UPL did not meet any of the hydrophytic vegetation tests.

SOIL

Sampling Point: **W1 UPL****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		
0-2	7.5YR 3/3	100					loam	
2-5	7.5YR 4/3	100					loam	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.²Location: PL=Pore Lining, M=Matrix.**Hydric Soil Indicators:**

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

Indicators for Problematic Hydric Soils³

<input type="checkbox"/> 2 cm Muck (A10) (MLRA 147, 148)
<input type="checkbox"/> Coastal Prairie Redox (A16) (MLRA 147, 148)
<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 136, 147)
<input type="checkbox"/> Very Shallow Dark Surface (TF12)
<input type="checkbox"/> Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.**Restrictive Layer (if observed):**
 Type: _____ rock
 Depth (inches): _____ 5
Hydric Soil Present? Yes _____ No X

Remarks: Hydric soil indicators were not present.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Geomorphic Position (D2)	<input type="checkbox"/> Microtopographic Relief (D4)
<input type="checkbox"/> Drainage Patterns (B10)	<input type="checkbox"/> FAC-Neutral Test (D5)
<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"/> Sparsely Vegetated Concave Surface (B8)	

Field Observations:
 Surface Water Present? Yes _____ No X Depth (inches): _____
 Water Table Present? Yes _____ No X Depth (inches): _____
 Saturation Present? Yes _____ No X Depth (inches): _____
 (includes capillary fringe)
Hydrology Present? Yes _____ No X

Remarks: Wetland hydrology indicators were not present.

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

Hydrophytic Vegetation present?	Yes _____ No <u>X</u>	Is the Sample Area within a wetland?	Yes _____ No <u>X</u>
Hydric Soils Present?	Yes _____ No <u>X</u>	If yes, optional Wetland Site ID:	_____
Wetland Hydrology Present?	Yes _____ No <u>X</u>		

Remarks: (Explain alternative procedures here or in a separate report.) W1 UPL did not meet any of the wetland criteria. W1 UPL was the representative upland point for Wetland 1.

WETLAND DETERMINATION DATA FORM --Eastern Mountains and Piedmont Region

Project/Site: Emberclear Water Main City/County: Birdsboro/Berks Sampling Date: 7/19/2016
 Applicant/Owner: Reading Water Authority State: PA Sampling Point: W2
 Investigator(s): CM, MM Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): terrace Local relief: flat Slope (%): 0
 Subregion (LRR or MLRA) MLRA 148 Lat: 40.26662 Long: -75.806289 Datum: WGS 84
 Soil Map Unit Name: Birdsboro silt loam, 3 to 8 percent slopes (BmB) NWI classification: _____

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

VEGETATION -- Use Scientific Names of Plants

Tree Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
8. _____	_____	_____	_____
0 = Total Cover			

Sapling/Shrub Stratum (Plot size: <u>15'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Salix nigra</u>	5	Y	FACW
2. <u>Platanus occidentalis</u>	5	Y	FACU
3. <u>Cornus sericea</u>	5	Y	FACW
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
15 = Total Cover			

Herb Stratum (Plot size: <u>5'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Typha latifolia</u>	20	Y	OBL
2. <u>Impatiens capensis</u>	20	Y	FACW
3. <u>Lythrum salicaria</u>	10	N	FACW
4. <u>Asclepias incarnata</u>	10	N	OBL
5. <u>Persicaria sagittata</u>	10	N	OBL
6. <u>Daucus carota</u>	5	N	FACU
7. <u>Phalaris arundinacea</u>	5	N	FACW
8. <u>Persicaria perfoliata</u>	5	N	FAC
9. <u>Juncus effusus</u>	5	N	FACW
10. <u>Scirpus atrovirens</u>	5	N	OBL
11. <u>Euthamia graminifolia</u>	5	N	FAC
12. <u>Vicia sp.</u>	5	N	NA
13. _____	_____	_____	_____
105 = Total Cover			

Woody Vine Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Toxicodendron radicans</u>	5	Y	FAC
2. <u>Muscadine rotundifolia</u>	5	Y	FACU
3. _____	_____	_____	_____
4. _____	_____	_____	_____
10 = Total Cover			

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)
 Total Number of Dominant Species Across All Strata: 7 (B)
 Percent of Dominant Species That Are OBL, FACW or FAC 0.7 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL Species <u>50</u>	x 1 = <u>50</u>
FACW species <u>50</u>	x 2 = <u>100</u>
FAC species <u>15</u>	x 3 = <u>45</u>
FACU species <u>15</u>	x 4 = <u>60</u>
UPL species <u>0</u>	x 5 = <u>0</u>
Column Totals: <u>130</u> (A)	<u>255</u> (B)
Prevalence Index = B/A = <u>1.96</u>	

Hydrophytic Vegetation Indicators:

Rapid Test for Hydrophytic Vegetation
 X Dominance Test is >50%
 X Prevalence Index is ≤3.0¹
 _____ Morphological Adaptations¹ (Provide supporting data in Remarks or on separate sheet)
 _____ Problematic Hydrophytic Vegetation¹ (Explain)
¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Definitions of Vegetation Strata:

Tree - Woody plants 3 in. (7.6 cm) or more in DBH, regardless of height.

Sapling/shrub - Woody plants less than 3 in. DBH and greater than 3.28 ft (1m) tall.

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

Woody vines - All woody vines greater than 3.28 ft in height

Hydrophytic Vegetation Present? Yes X No _____

Remarks: (Include photo numbers here or on separate sheet.) Hydrophytic vegetation was present based on the dominance and prevalence index tests. Five out of seven dominant species were OBL, FACW, or FAC.

SOIL

Sampling Point: **W2**

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		
0-7	7.5YR 3/2	85	7.5YR 4/4	15	C	M	loam	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.²Location: PL=Pore Lining, M=Matrix.**Hydric Soil Indicators:**

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

Indicators for Problematic Hydric Soils³

<input type="checkbox"/> 2 cm Muck (A10) (MLRA 147, 148)
<input type="checkbox"/> Coastal Prairie Redox (A16) (MLRA 147, 148)
<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 136, 147)
<input type="checkbox"/> Very Shallow Dark Surface (TF12)
<input type="checkbox"/> Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.**Restrictive Layer (if observed):**

Type: _____ rock _____

Depth (inches): _____ 7 _____

Hydric Soil Present? Yes ☒ No ☐

Remarks: Hydric soils were present at W2. Soils contained a redox dark surface.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Shallow Aquitard (D3)
<input checked="" type="checkbox"/> Geomorphic Position (D2)	<input type="checkbox"/> Microtopographic Relief (D4)
<input type="checkbox"/> Drainage Patterns (B10)	<input type="checkbox"/> FAC-Neutral Test (D5)
<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"/> Sparsely Vegetated Concave Surface (B8)	

Field Observations:

Surface Water Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Depth (inches):	0
Water Table Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Depth (inches):	0
Saturation Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Depth (inches):	0

(includes capillary fringe)

Hydrology Present? Yes ☒ No ☐

Remarks: Wetland hydrology indicators were present. Water was present at the surface. The wetland is within the floodway of Hay Creek.

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

Hydrophytic Vegetation present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Is the Sample Area within a wetland?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Hydric Soils Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	If yes, optional Wetland Site ID: _____		
Wetland Hydrology Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>			

Remarks: (Explain alternative procedures here or in a separate report.) W2 met three out of three wetland criteria. W2 was the representative data point for Wetland 2. Wetland 2 is 100% PEM wetland.

WETLAND DETERMINATION DATA FORM --Eastern Mountains and Piedmont Region

Project/Site: Emberclear Water Main City/County: Birdsboro/Berks Sampling Date: 7/19/2016
 Applicant/Owner: Reading Water Authority State: PA Sampling Point: W2/W3 UPL
 Investigator(s): CM, MM Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): terrace Local relief: flat Slope (%): 0
 Subregion (LRR or MLRA) MLRA 148 Lat: 40.266627 Long: -75.806172 Datum: WGS 84
 Soil Map Unit Name: Birdsboro silt loam, 3 to 8 percent slopes (BmB) NWI classification: _____

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

VEGETATION -- Use Scientific Names of Plants

<u>Tree Stratum</u> (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
8. _____	_____	_____	_____
<u>0</u> = Total Cover			

<u>Sapling/Shrub Stratum</u> (Plot size: <u>15'</u>)			
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
<u>0</u> = Total Cover			

<u>Herb Stratum</u> (Plot size: <u>5'</u>)			
1. <u>Poa pratensis</u>	<u>60</u>	<u>Y</u>	<u>FACU</u>
2. <u>Digitaria sanguinalis</u>	<u>40</u>	<u>Y</u>	<u>FACU</u>
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
8. _____	_____	_____	_____
9. _____	_____	_____	_____
10. _____	_____	_____	_____
11. _____	_____	_____	_____
12. _____	_____	_____	_____
13. _____	_____	_____	_____
<u>100</u> = Total Cover			

<u>Woody Vine Stratum</u> (Plot size: <u>30'</u>)			
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
<u>0</u> = Total Cover			

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL Species	<u>0</u>	x 1 =	<u>0</u>
FACW species	<u>0</u>	x 2 =	<u>0</u>
FAC species	<u>0</u>	x 3 =	<u>0</u>
FACU species	<u>100</u>	x 4 =	<u>400</u>
UPL species	_____	x 5 =	<u>0</u>
Column Totals:	<u>100</u> (A)		<u>400</u> (B)
Prevalence Index = B/A =			<u>4.00</u>

Hydrophytic Vegetation Indicators:

____ Rapid Test for Hydrophytic Vegetation
 ____ Dominance Test is >50%
 ____ Prevalence Index is ≤3.0¹
 ____ Morphological Adaptations¹ (Provide supporting data in Remarks or on separate sheet)
 ____ Problematic Hydrophytic Vegetation¹ (Explain)
¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Definitions of Vegetation Strata:

Tree - Woody plants 3 in. (7.6 cm) or more in DBH, regardless of height.
Sapling/shrub - Woody plants less than 3 in. DBH and greater than 3.28 ft (1m) tall.
Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall
Woody vines - All woody vines greater than 3.28 ft in height

Hydrophytic Vegetation Present? Yes _____ No X

Remarks: (Include photo numbers here or on separate sheet.) Area where sample point was taken is routinely mowed. Vegetation at W2/W3 UPL did not meet any of the hydrophytic vegetation tests.

SOIL

Sampling Point: **W2/W3 UPL****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		
0-2	7.5YR 3/3	100					loam	
2-5	7.5YR 4/3	100					loam	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.²Location: PL=Pore Lining, M=Matrix.**Hydric Soil Indicators:**

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

Indicators for Problematic Hydric Soils³

<input type="checkbox"/> 2 cm Muck (A10) (MLRA 147, 148)
<input type="checkbox"/> Coastal Prairie Redox (A16) (MLRA 147, 148)
<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 136, 147)
<input type="checkbox"/> Very Shallow Dark Surface (TF12)
<input type="checkbox"/> Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.**Restrictive Layer (if observed):**

Type: _____ rock _____

Depth (inches): _____ 5 _____

Hydric Soil Present? Yes _____ No X

Remarks: Hydric soil indicators were not present.

HYDROLOGY**Wetland Hydrology Indicators:**

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

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

Secondary Indicators (minimum of two required)

<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Shallow Aquitard (D3)
<input checked="" type="checkbox"/> Geomorphic Position (D2)	<input type="checkbox"/> Microtopographic Relief (D4)
<input type="checkbox"/> Drainage Patterns (B10)	<input type="checkbox"/> FAC-Neutral Test (D5)
<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"/> Sparsely Vegetated Concave Surface (B8)	

Field Observations:

Surface Water Present?	Yes _____	No <u>X</u>	Depth (inches):	<u>0</u>
Water Table Present?	Yes _____	No <u>X</u>	Depth (inches):	<u>0</u>
Saturation Present?	Yes _____	No <u>X</u>	Depth (inches):	<u>0</u>

(includes capillary fringe)

Hydrology Present? Yes _____ No X

Remarks: Wetland hydrology indicators were not present.

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

Hydrophytic Vegetation present?	Yes _____	No <u>X</u>	Is the Sample Area within a wetland?	Yes _____	No <u>X</u>
Hydric Soils Present?	Yes _____	No <u>X</u>	If yes, optional Wetland Site ID:	_____	
Wetland Hydrology Present?	Yes _____	No <u>X</u>			

Remarks: (Explain alternative procedures here or in a separate report.) W2/W3 UPL did not meet any of the wetland criteria. W2/W3 UPL was the upland representative data point for Wetlands 2 and 3.

WETLAND DETERMINATION DATA FORM --Eastern Mountains and Piedmont Region

Project/Site: Emberclear Water Main City/County: Birdsboro/Berks Sampling Date: 7/19/2016
 Applicant/Owner: Reading Water Authority State: PA Sampling Point: W3
 Investigator(s): CM, MM Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): terrace Local relief: flat Slope (%): 0
 Subregion (LRR or MLRA) MLRA 148 Lat: 40.266362 Long: -75.806138 Datum: WGS 84
 Soil Map Unit Name: Urban land-Penn complex, 0 to 8 percent slopes (UxB) NWI classification: _____

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

VEGETATION -- Use Scientific Names of Plants

Tree Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
8. _____	_____	_____	_____
0 = Total Cover			

Sapling/Shrub Stratum (Plot size: <u>15'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Salix nigra</u>	5	Y	FACW
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
5 = Total Cover			

Herb Stratum (Plot size: <u>5'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Phalaris arundinacea</u>	40	Y	FACW
2. <u>Impatiens capensis</u>	40	Y	FACW
3. <u>Lythrum salicaria</u>	10	N	FACW
4. <u>Dipsacus fullonum</u>	10	N	FACU
5. <u>Daucus carota</u>	5	N	FACU
6. <u>Vernonia noveboracensis</u>	5	N	FACW
7. _____	_____	_____	_____
8. _____	_____	_____	_____
9. _____	_____	_____	_____
10. _____	_____	_____	_____
11. _____	_____	_____	_____
12. _____	_____	_____	_____
13. _____	_____	_____	_____
110 = Total Cover			

Woody Vine Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
0 = Total Cover			

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)
 Total Number of Dominant Species Across All Strata: 3 (B)
 Percent of Dominant Species That Are OBL, FACW or FAC 1 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL Species <u>0</u>	x 1 = <u>0</u>
FACW species <u>100</u>	x 2 = <u>200</u>
FAC species <u>0</u>	x 3 = <u>0</u>
FACU species <u>15</u>	x 4 = <u>60</u>
UPL species <u>0</u>	x 5 = <u>0</u>
Column Totals: <u>115</u> (A)	<u>260</u> (B)
Prevalence Index = B/A = <u>2.26</u>	

Hydrophytic Vegetation Indicators:

Rapid Test for Hydrophytic Vegetation
 X Dominance Test is >50%
 X Prevalence Index is ≤3.0¹
 _____ Morphological Adaptations¹ (Provide supporting data in Remarks or on separate sheet)
 _____ Problematic Hydrophytic Vegetation¹ (Explain)
¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Definitions of Vegetation Strata:

Tree - Woody plants 3 in. (7.6 cm) or more in DBH, regardless of height.

Sapling/shrub - Woody plants less than 3 in. DBH and greater than 3.28 ft (1m) tall.

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

Woody vines - All woody vines greater than 3.28 ft in height

Hydrophytic Vegetation Present? Yes X No _____

Remarks: (Include photo numbers here or on separate sheet.) Hydrophytic vegetation was present based on the dominance and prevalence index tests. Three out of three dominant species were OBL, FACW, or FAC.

SOIL

Sampling Point: **W3**

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		
0-8	7.5YR 3/2	85	7.5YR 4/4	15	C	M	loam	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.²Location: PL=Pore Lining, M=Matrix.**Hydric Soil Indicators:**

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

Indicators for Problematic Hydric Soils³

<input type="checkbox"/> 2 cm Muck (A10) (MLRA 147, 148)
<input type="checkbox"/> Coastal Prairie Redox (A16) (MLRA 147, 148)
<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 136, 147)
<input type="checkbox"/> Very Shallow Dark Surface (TF12)
<input type="checkbox"/> Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.**Restrictive Layer (if observed):**

Type: _____ rock

Depth (inches): _____ 8

Hydric Soil Present? Yes ☒ No ☐

Remarks: Hydric soils were present at W3. Soils contained a redox dark surface.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Shallow Aquitard (D3)
<input checked="" type="checkbox"/> Geomorphic Position (D2)	<input type="checkbox"/> Microtopographic Relief (D4)
<input type="checkbox"/> Drainage Patterns (B10)	<input type="checkbox"/> FAC-Neutral Test (D5)
<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"/> Sparsely Vegetated Concave Surface (B8)	

Field Observations:

Surface Water Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches): _____
Water Table Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Depth (inches): _____ 2
Saturation Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Depth (inches): _____ 0

(includes capillary fringe)

Hydrology Present? Yes ☒ No ☐

Remarks: Wetland hydrology indicators were present. Saturation was present at the surface. The wetland is within the floodway of Hay Creek.

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

Hydrophytic Vegetation present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is the Sample Area within a wetland?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Hydric Soils Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	If yes, optional Wetland Site ID:	_____
Wetland Hydrology Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		

Remarks: (Explain alternative procedures here or in a separate report.) W3 met three out of three wetland criteria. W3 was the representative data point for Wetland 3. Wetland 3 is 100% PEM wetland.

WETLAND DETERMINATION DATA FORM --Eastern Mountains and Piedmont Region

Project/Site: Emberclear Water Main City/County: Birdsboro/Berks Sampling Date: 7/20/2016
 Applicant/Owner: Reading Water Authority State: PA Sampling Point: W4
 Investigator(s): CM, MM Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): _____ depression Local relief: _____ concave Slope (%): 0
 Subregion (LRR or MLRA) MLRA 148 Lat: 40.268502 Long: -75.823008 Datum: WGS 84
 Soil Map Unit Name: Birdsboro silt loam, 3 to 8 percent slopes (BmB) NWI classification: _____

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

VEGETATION -- Use Scientific Names of Plants

Tree Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Acer negundo</u>	<u>30</u>	<u>Y</u>	<u>FACW</u>
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
8. _____	_____	_____	_____
<u>30</u> = Total Cover			

Sapling/Shrub Stratum (Plot size: <u>15'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
<u>0</u> = Total Cover			

Herb Stratum (Plot size: <u>5'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Impatiens capensis</u>	<u>80</u>	<u>Y</u>	<u>FACW</u>
2. <u>Toxicodendron radicans</u>	<u>20</u>	<u>N</u>	<u>FAC</u>
3. <u>Urtica dioica</u>	<u>5</u>	<u>N</u>	<u>FACU</u>
4. <u>Alliaria petiolata</u>	<u>5</u>	<u>N</u>	<u>FACU</u>
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
8. _____	_____	_____	_____
9. _____	_____	_____	_____
10. _____	_____	_____	_____
11. _____	_____	_____	_____
12. _____	_____	_____	_____
13. _____	_____	_____	_____
<u>110</u> = Total Cover			

Woody Vine Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
<u>0</u> = Total Cover			

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)
 Total Number of Dominant Species Across All Strata: 2 (B)
 Percent of Dominant Species That Are OBL, FACW or FAC 1 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL Species <u>0</u>	x 1 = <u>0</u>
FACW species <u>110</u>	x 2 = <u>220</u>
FAC species <u>20</u>	x 3 = <u>60</u>
FACU species <u>10</u>	x 4 = <u>40</u>
UPL species <u>0</u>	x 5 = <u>0</u>
Column Totals: <u>140</u> (A)	<u>320</u> (B)
Prevalence Index = B/A = <u>2.29</u>	

Hydrophytic Vegetation Indicators:

 Rapid Test for Hydrophytic Vegetation
X Dominance Test is >50%
X Prevalence Index is ≤3.0¹
 Morphological Adaptations¹ (Provide supporting data in Remarks or on separate sheet)
 Problematic Hydrophytic Vegetation¹ (Explain)
¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Definitions of Vegetation Strata:

Tree - Woody plants 3 in. (7.6 cm) or more in DBH, regardless of height.
Sapling/shrub - Woody plants less than 3 in. DBH and greater than 3.28 ft (1m) tall.
Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall
Woody vines - All woody vines greater than 3.28 ft in height

Hydrophytic Vegetation Present? Yes X No _____

Remarks: (Include photo numbers here or on separate sheet.) Hydrophytic vegetation was present based on the dominance and prevalence index tests. All dominant species were OBL, FACW, or FAC.

SOIL

Sampling Point: **W4**

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		
0-4	5YR 4/1	90	5YR 4/4	10	C	M	loam	
4-18	5YR 7/1	35	5YR 3/2	15	C	M	loam	Co-matrix
	5YR 4/4	35	2.5YR 4/3	15	C	M	loam	Co-matrix

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.²Location: PL=Pore Lining, M=Matrix.**Hydric Soil Indicators:**

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

Indicators for Problematic Hydric Soils³

<input type="checkbox"/> 2 cm Muck (A10) (MLRA 147, 148)
<input type="checkbox"/> Coastal Prairie Redox (A16) (MLRA 147, 148)
<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 136, 147)
<input type="checkbox"/> Very Shallow Dark Surface (TF12)
<input type="checkbox"/> Other (Explain in Remarks)

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: Hydric soils were present at W4. Soils had a depleted matrix.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Geomorphic Position (D2)	<input checked="" type="checkbox"/> Microtopographic Relief (D4)
<input checked="" type="checkbox"/> Drainage Patterns (B10)	<input type="checkbox"/> FAC-Neutral Test (D5)
<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"/> Sparsely Vegetated Concave Surface (B8)	

Field Observations:
 Surface Water Present? Yes ☐ No ☒ Depth (inches): _____
 Water Table Present? Yes ☐ No ☒ Depth (inches): _____
 Saturation Present? Yes ☐ No ☒ Depth (inches): _____
 (includes capillary fringe)
Hydrology Present? Yes ☒ No ☐

Remarks: Wetland hydrology indicators were present. Drainage patterns and microtopographic relief were present within the wetland.

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

Hydrophytic Vegetation present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is the Sample Area within a wetland?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Hydric Soils Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	If yes, optional Wetland Site ID:	_____
Wetland Hydrology Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		

Remarks: (Explain alternative procedures here or in a separate report.) W4 met three out of three wetland criteria. W4 was the representative data point for Wetland 4. Wetland 4 is 100% PFO wetland.

WETLAND DETERMINATION DATA FORM --Eastern Mountains and Piedmont Region

Project/Site: Emberclear Water Main City/County: Birdsboro/Berks Sampling Date: 7/20/2016
 Applicant/Owner: Reading Water Authority State: PA Sampling Point: W4 UPL
 Investigator(s): CM, MM Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): terrace Local relief: flat Slope (%): 0
 Subregion (LRR or MLRA) MLRA 148 Lat: 40.268398 Long: -75.823176 Datum: WGS 84
 Soil Map Unit Name: Birdsboro silt loam, 3 to 8 percent slopes (BmB) NWI classification: _____

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

VEGETATION -- Use Scientific Names of Plants

Tree Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Acer negundo</u>	<u>70</u>	<u>Y</u>	<u>FACW</u>
2. <u>Juglans nigra</u>	<u>20</u>	<u>Y</u>	<u>FACU</u>
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
8. _____	_____	_____	_____
<u>90</u> = Total Cover			

Sapling/Shrub Stratum (Plot size: <u>15'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Acer negundo</u>	<u>40</u>	<u>Y</u>	<u>FACW</u>
2. <u>Lonicera maackii</u>	<u>10</u>	<u>Y</u>	<u>NI</u>
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
<u>50</u> = Total Cover			

Herb Stratum (Plot size: <u>5'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Impatiens capensis</u>	<u>50</u>	<u>Y</u>	<u>FACW</u>
2. <u>Alliaria petiolata</u>	<u>10</u>	<u>N</u>	<u>FACU</u>
3. <u>Hesperis matronalis</u>	<u>5</u>	<u>N</u>	<u>FACU</u>
4. <u>Persicaria virginiana</u>	<u>5</u>	<u>N</u>	<u>FAC</u>
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
8. _____	_____	_____	_____
9. _____	_____	_____	_____
10. _____	_____	_____	_____
11. _____	_____	_____	_____
12. _____	_____	_____	_____
13. _____	_____	_____	_____
<u>70</u> = Total Cover			

Woody Vine Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Celastrus orbiculatus</u>	<u>20</u>	<u>Y</u>	<u>FACU</u>
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
<u>20</u> = Total Cover			

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW or FAC 1 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL Species <u>0</u>	x <u>1</u> = <u>0</u>
FACW species <u>160</u>	x <u>2</u> = <u>320</u>
FAC species <u>5</u>	x <u>3</u> = <u>15</u>
FACU species <u>55</u>	x <u>4</u> = <u>220</u>
UPL species <u>10</u>	x <u>5</u> = <u>50</u>
Column Totals: <u>230</u> (A)	<u>605</u> (B)
Prevalence Index = B/A = <u>2.63</u>	

Hydrophytic Vegetation Indicators:

 Rapid Test for Hydrophytic Vegetation
 Dominance Test is >50%
X Prevalence Index is ≤3.0¹
 Morphological Adaptations¹ (Provide supporting data in Remarks or on separate sheet)
 Problematic Hydrophytic Vegetation¹ (Explain)
¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Definitions of Vegetation Strata:

Tree - Woody plants 3 in. (7.6 cm) or more in DBH, regardless of height.

Sapling/shrub - Woody plants less than 3 in. DBH and greater than 3.28 ft (1m) tall.

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

Woody vines - All woody vines greater than 3.28 ft in height

Hydrophytic Vegetation Present? Yes X No _____

Remarks: (Include photo numbers here or on separate sheet.) Vegetation at W4 UPL met the prevalence index test for hydrophytic vegetation.

SOIL

Sampling Point: **W4 UPL****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		
0-8	7.5YR 4/3	95	7.5YR 4/6	5	C	PL	loam	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.²Location: PL=Pore Lining, M=Matrix.**Hydric Soil Indicators:**

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

Indicators for Problematic Hydric Soils³

<input type="checkbox"/> 2 cm Muck (A10) (MLRA 147, 148)
<input type="checkbox"/> Coastal Prairie Redox (A16) (MLRA 147,148)
<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 136, 147)
<input type="checkbox"/> Very Shallow Dark Surface (TF12)
<input type="checkbox"/> Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.**Restrictive Layer (if observed):**

Type: tree roots

Depth (inches): 8

Hydric Soil Present? Yes ☐ No ☒

Remarks: Hydric soil indicators were not present.

HYDROLOGY**Wetland Hydrology Indicators:**

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

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

Secondary Indicators (minimum of two required)

<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Shallow Aquitard (D3)
<input checked="" type="checkbox"/> Geomorphic Position (D2)	<input type="checkbox"/> Microtopographic Relief (D4)
<input type="checkbox"/> Drainage Patterns (B10)	<input type="checkbox"/> FAC-Neutral Test (D5)
<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"/> Sparsely Vegetated Concave Surface (B8)	

Field Observations:

Surface Water Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	Depth (inches):	<u>0</u>
Water Table Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	Depth (inches):	<u>0</u>
Saturation Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	Depth (inches):	<u>0</u>

(includes capillary fringe)

Hydrology Present? Yes ☐ No ☒

Remarks: Wetland hydrology indicators were not present.

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

Is the Sample Area within a wetland?					
Hydrophytic Vegetation present?	Yes	<u>X</u>	No	<u> </u>	
Hydric Soils Present?	Yes	<u> </u>	No	<u>X</u>	
Wetland Hydrology Present?	Yes	<u> </u>	No	<u>X</u>	
If yes, optional Wetland Site ID: <u> </u>					

Remarks: (Explain alternative procedures here or in a separate report.) W4 UPL met 1 of 3 wetland criteria. W4 was the upland representative data point for Wetland 4.

WETLAND DETERMINATION DATA FORM --Eastern Mountains and Piedmont Region

Project/Site: Emberclear Water Main City/County: Robeson/Berks Sampling Date: 7/20/2016
 Applicant/Owner: Reading Water Authority State: PA Sampling Point: W5
 Investigator(s): CM, MM Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): _____ depression Local relief: _____ concave Slope (%): 0
 Subregion (LRR or MLRA) MLRA 148 Lat: 40.271634 Long: -75.83523 Datum: WGS 84
 Soil Map Unit Name: Penn chanery silt loam, 3 to 8 percent slopes (PeB) NWI classification: _____

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

VEGETATION -- Use Scientific Names of Plants

Tree Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
8. _____	_____	_____	_____
<u>0</u> = Total Cover			

Sapling/Shrub Stratum (Plot size: <u>15'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
<u>0</u> = Total Cover			

Herb Stratum (Plot size: <u>5'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Pharlis arundinacea</u>	<u>80</u>	<u>Y</u>	<u>FACW</u>
2. <u>Impatiens capensis</u>	<u>20</u>	<u>Y</u>	<u>FACW</u>
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
8. _____	_____	_____	_____
9. _____	_____	_____	_____
10. _____	_____	_____	_____
11. _____	_____	_____	_____
12. _____	_____	_____	_____
13. _____	_____	_____	_____
<u>100</u> = Total Cover			

Woody Vine Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
<u>0</u> = Total Cover			

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)
 Total Number of Dominant Species Across All Strata: 2 (B)
 Percent of Dominant Species That Are OBL, FACW or FAC 1.0 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL Species _____	x 1 = <u>0</u>
FACW species <u>100</u>	x 2 = <u>200</u>
FAC species _____	x 3 = <u>0</u>
FACU species _____	x 4 = <u>0</u>
UPL species _____	x 5 = <u>0</u>
Column Totals: <u>100</u> (A)	<u>200</u> (B)
Prevalence Index = B/A = <u>2.00</u>	

Hydrophytic Vegetation Indicators:

 Rapid Test for Hydrophytic Vegetation
X Dominance Test is >50%
X Prevalence Index is ≤3.0¹
 Morphological Adaptations¹ (Provide supporting data in Remarks or on separate sheet)
 Problematic Hydrophytic Vegetation¹ (Explain)
¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Definitions of Vegetation Strata:

Tree - Woody plants 3 in. (7.6 cm) or more in DBH, regardless of height.
Sapling/shrub - Woody plants less than 3 in. DBH and greater than 3.28 ft (1m) tall.
Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall
Woody vines - All woody vines greater than 3.28 ft in height

Hydrophytic Vegetation Present? Yes X No _____

Remarks: (Include photo numbers here or on separate sheet.) Hydrophytic vegetation was present based on the dominance and prevalence index tests. Both dominant species were OBL, FACW, or FAC.

SOIL

Sampling Point: **W5**

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		
0-24	7.5YR 2/1	85	7.5YR 4/4	15	C	M	muck	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.²Location: PL=Pore Lining, M=Matrix.**Hydric Soil Indicators:**

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

Indicators for Problematic Hydric Soils³

<input type="checkbox"/> 2 cm Muck (A10) (MLRA 147, 148)
<input type="checkbox"/> Coastal Prairie Redox (A16) (MLRA 147, 148)
<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 136, 147)
<input type="checkbox"/> Very Shallow Dark Surface (TF12)
<input type="checkbox"/> Other (Explain in Remarks)

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: Hydric soils were present at W5. The soil profile consisted of muck.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Geomorphic Position (D2)	<input type="checkbox"/> Microtopographic Relief (D4)
<input checked="" type="checkbox"/> Drainage Patterns (B10)	<input type="checkbox"/> FAC-Neutral Test (D5)
<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"/> Sparsely Vegetated Concave Surface (B8)	

Field Observations:

Surface Water Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Depth (inches):	<u>4</u>
Water Table Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Depth (inches):	<u>0</u>
Saturation Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Depth (inches):	<u>0</u>

(includes capillary fringe)

Hydrology Present? Yes ☒ No ☐

Remarks: Wetland hydrology indicators were present. Surface water was at a depth of 4 inches.

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

Hydrophytic Vegetation present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Is the Sample Area within a wetland?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Hydric Soils Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	If yes, optional Wetland Site ID: _____		
Wetland Hydrology Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>			

Remarks: (Explain alternative procedures here or in a separate report.) W5 met three out of three wetland criteria. W5 was the representative data point for Wetland 5. Wetland 5 is 100% PEM wetland.

WETLAND DETERMINATION DATA FORM --Eastern Mountains and Piedmont Region

Project/Site: Emberclear Water Main City/County: Robeson/Berks Sampling Date: 7/20/2016
 Applicant/Owner: Reading Water Authority State: PA Sampling Point: W5 UPL
 Investigator(s): CM, MM Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): terrace Local relief: flat Slope (%): 5
 Subregion (LRR or MLRA) MLA 148 Lat: 40.27165 Long: -75.835157 Datum: WGS 84
 Soil Map Unit Name: Penn channery silt loam, 3 to 8 percent slopes (PeB) NWI classification: NA

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

VEGETATION -- Use Scientific Names of Plants

Tree Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
8. _____	_____	_____	_____
0 = Total Cover			

Sapling/Shrub Stratum (Plot size: <u>15'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
0 = Total Cover			

Herb Stratum (Plot size: <u>5'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Securigera varia</u>	<u>30</u>	<u>Y</u>	<u>UPL</u>
2. <u>Phalaris arundinacea</u>	<u>20</u>	<u>Y</u>	<u>FACW</u>
3. <u>Lytrum salicaria</u>	<u>15</u>	<u>Y</u>	<u>FACW</u>
4. <u>Verbascum thapsus</u>	<u>5</u>	<u>N</u>	<u>FACU</u>
5. <u>Cirsium arvens</u>	<u>5</u>	<u>N</u>	<u>FACU</u>
6. _____	_____	_____	_____
7. _____	_____	_____	_____
8. _____	_____	_____	_____
9. _____	_____	_____	_____
10. _____	_____	_____	_____
11. _____	_____	_____	_____
12. _____	_____	_____	_____
13. _____	_____	_____	_____
75 = Total Cover			

Woody Vine Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
0 = Total Cover			

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)
 Total Number of Dominant Species Across All Strata: 3 (B)
 Percent of Dominant Species That Are OBL, FACW or FAC 0.67 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL Species <u>0</u>	x <u>1</u> = <u>0</u>
FACW species <u>35</u>	x <u>2</u> = <u>70</u>
FAC species <u>0</u>	x <u>3</u> = <u>0</u>
FACU species <u>10</u>	x <u>4</u> = <u>40</u>
UPL species <u>30</u>	x <u>5</u> = <u>150</u>
Column Totals: <u>75</u> (A)	<u>260</u> (B)
Prevalence Index = B/A = <u>3.47</u>	

Hydrophytic Vegetation Indicators:

 Rapid Test for Hydrophytic Vegetation
X Dominance Test is >50%
 Prevalence Index is ≤3.0¹
 Morphological Adaptations¹ (Provide supporting data in Remarks or on separate sheet)
 Problematic Hydrophytic Vegetation¹ (Explain)
¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Definitions of Vegetation Strata:

Tree - Woody plants 3 in. (7.6 cm) or more in DBH, regardless of height.
Sapling/shrub - Woody plants less than 3 in. DBH and greater than 3.28 ft (1m) tall.
Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall
Woody vines - All woody vines greater than 3.28 ft in height

Hydrophytic Vegetation Present? Yes X No _____

Remarks: (Include photo numbers here or on separate sheet.) Vegetation at W5 UPL met the dominant test for hydrophytic vegetation.

ATTACHMENT I

Preparedness, Prevention and Contingency (PPC) Plan

Preparedness, Prevention and Contingency Plan

This plan is part of the NPDES permit application for the discharge of stormwater associated with construction activities and the related Erosion and Sediment Control Plan. It is required to comply with Chapter 101.3(b) of the Rules and Regulations of the Department of Environmental Protection, and Conditions under the NPDES permit.

1. Name of Permittee: Birdsboro Power LLC
2. Name of Project: RAWA/Birdsboro Power, LLC – Water Main
3. Project Location: County: Berks Municipality: Boro. of Birdsboro & Robeson Twp.
4. List names and telephone numbers of responsible company officials to be contacted in case of emergency.

<u>Name</u>	<u>Day Phone #</u>	<u>Night Phone #</u>
<u>Robert Haley</u>	<u>(860) 301-2620</u>	<u>(860) 301-2620</u>

5. List name and telephone number of the following:

County emergency management:	<u>Brian Gottschall – (610) 374-4800</u>
Nearest fire department:	<u>Birdsboro-Union Fire Co. – (610) 582-0058</u>
Nearest hospital:	<u>Reading Hospital – (215) 345-2200</u>

6. Notification to the following agencies must be made immediately in the event of a spill of any polluting substances.

DEP Regional Office: DEP Southcentral Regional Office (Harrisburg, PA) 717-705-4700
PA Fish and Boat Commission: 717-705-7800

7. List Name and telephone number of any downstream water users including drinking water supplies, industrial intakes and agricultural uses. It is the permittee's/co-permittees responsibility to immediately contact water users if polluting material is released from the site.

8. General Description of Construction Activity.

Construction of the water system site work as shown on the attached plans.

SEE ATTACHED DRAWINGS

9. Material and Waste Inventory

A. Pesticides and herbicides*

<u>Name</u>	Quantity (pounds or gallons)
-------------	------------------------------

None	

B. Fertilizer*

<u>Name</u>	Quantity (pounds or gallons)
-------------	------------------------------

None	

C. Other Chemicals such as paints, detergents, acids for cleaning, solvents, soil additives, concrete curing compounds.*

<u>Name</u>	Quantity (pounds or gallons)
-------------	------------------------------

<u>These chemicals will be brought on site as needed. It is not anticipated that an inventory of these materials will be stored on site.</u>	

*Any items listed under A, B or C must have Material Safety Data Sheets (MSDS) on premises.

D. Petroleum based products

gasoline		gallons
diesel fuel		gallons
kerosene		gallons
lubricating oil		gallons
asphalts, tars		gallons
other		

Note: We do not expect to have any gasoline, diesel fuel, lubricating oils, etc. stored onsite. The heavy equipment will be serviced by fuel trucks on as needed basis. The fueling operations will not occur near any streams, drainageways or storm sewers. These operations will occur with proper supervision. It is understood that any liquid stored onsite must be kept within a diked area capable of holding 110% of the largest container's capacity. The dike will be an impervious barrier of clay, concrete or synthetic membrane liner.

10. List types and quantities of absorbent materials used for spill mitigation that are stored on premises. Quantities of absorbent booms and pads and other equipment needed to contain spills and begin cleanup should be kept at the site. List the types and quantities each.

A miscellaneous group of absorbent socks, mat pads, barrel top pads of various sizes will be kept onsite.

11. If any concrete work or paving will occur, steps must be taken to assure that no pollution occurs from cleanup operations. Mixer truck washings will be discharged onsite but shall be contained to a specific area that will prevent any migration of these materials into streams, drainage ways or storm sewers.
12. Particular attention should be given to the construction and operation of the equipment refueling area. It should be placed away from streams protected by a containment dike and secured from vandalism. Operators should be present during refueling and be familiar with response procedures in the event of a spill.
13. The site should be inspected daily for evidence of existing or potential spills or leaks, vandalism, and the condition of cleanup materials.
14. Material Management Practices.

The following are the material management practices that will be used to reduce the risk of spills or other accidental exposure of materials and substances to storm water runoff.

A. Good Housekeeping:

The following good housekeeping practices will be followed onsite during the construction project.

- An effort will be made to store only enough products required to do the job.
- All materials stored onsite will be stored in a neat, orderly manner in their appropriate containers and, if possible, under a roof or other enclosure.
- Products will be kept in their original containers with the original manufacturer's label.
- Substances will not be mixed with one another unless recommended by the manufacturer.
- Whenever possible, all of a product will be used up before disposing of container.
- Manufacturer's recommendations for proper use and disposal will be followed.
- The site superintendent will inspect daily to ensure proper use and disposal of materials onsite.
- Additionally, at least once per month, our safety consultant will inspect premises for conformance to all OSHA regulations.

B. Hazardous Products:

- These practices are used to reduce the risks associated with hazardous materials.
- Products will be kept in original containers unless they are not resealable.
- Original labels and material safety data will be retained; they contain important product information.
- If surplus product must be disposed of, manufacturer's or local and State recommended methods for proper disposal will be followed.

15. Product Specific Practices

The following product specific practices will be followed on site:

A. Petroleum Products:

All onsite vehicles will be monitored for leaks and receive regular preventive maintenance to reduce the chance of leakage. Petroleum products will be stored in tightly sealed containers which are clearly labeled. Any asphalt substances used onsite will be applied according to the manufacturer's recommendations.

B. Fertilizers:

Fertilizers used will be applied only in the minimum amounts recommended by the manufacturer. Once applied, fertilizer will be worked into the soil to limit exposure to storm water. Storage will be in a covered shed. The contents of any partially used bags of fertilizer will be transferred to a sealable plastic bin to avoid spills.

C. Chemical/Paints:

All containers will be tightly sealed and stored when not required for use. Excess paint will not be discharged to the storm sewer system but will be properly disposed of according to manufacturer's instructions or State and local requirements.

D. Concrete Trucks:

Concrete trucks washing will be discharged onsite but shall be contained to a specific area that will prevent any migration of these materials into streams, drainage ways or storm sewers. Once hardened, excess concrete and washing discharge shall be removed as required by material disposal and recycling requirements.

16. Spill Prevention Practices

In addition to the good housekeeping and material management practices discussed in the previous sections of this plan, the following practices will be followed for spill prevention and cleanup:

- Manufacturer's recommended methods for spill cleanup will be clearly posted and site personnel will be made aware of the procedures and the location of the information and cleanup supplies.
- Materials and equipment necessary for spill cleanup will be kept in the material storage closet are onsite in the field trailer. Equipment and materials will not be limited to brooms, dust pans, mops, rags, gloves, goggles, kitty litter, sand, sawdust, and plastic and metal trash containers specifically for this purpose.
- All spills will be cleaned up immediately after discovery.
- The spill area will be kept well ventilated and personnel will wear appropriate protective clothing to prevent injury from contact with a hazardous substance.
- Spills of toxic or hazardous material will be reported to the appropriate State or local government agency, regardless of size.
- The spill prevention plan will be adjusted to include measures to prevent this type of spill from reoccurring and how to clean up the spill if there is another one. A description of the spill, what caused it, and the cleanup measures will also be included.
- The site superintendent, responsible for the day-to-day site operations, will be the spill prevention and cleanup coordinator. He will designate at least three other site personnel who will receive spill prevention and cleanup training. These individuals will each become responsible for a particular phase of prevention and cleanup. The names of responsible spill personnel will be posted in the material storage area and in the office trailer onsite.

17. Security

All materials requiring security are to be kept and locked within secure containers stored in the designated construction staging areas.

18. All construction and site activities shall be in accordance with the specifications and plans submitted for approval by the appropriate governmental authorities. Activities shall also be monitored and inspected by the Township Engineer, inspection agencies, and the governing municipal authorities.