



# Wetlands, Riparian, and Littoral Habitat Study Report

Niagara Hydroelectric Project  
(FERC No. 2466)

December 6, 2021

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Prepared for:  
Appalachian Power Company



An AEP Company

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## Contents

1	Project Introduction and Background .....	1
2	Study Goals and Objectives .....	1
3	Study Area .....	2
4	Background and Existing Information .....	4
4.1	Wetlands and Waterbodies .....	4
4.2	Wetland, Riparian, and Littoral Vegetation and Wildlife .....	4
5	Methodology .....	5
5.1	Desktop Characterization of Wetland, and Riparian, and Littoral Habitats .....	5
5.2	Field Verification .....	6
5.2.1	Wetlands and Waterbodies .....	6
5.2.2	Littoral Zone .....	7
5.2.3	Riparian Zone .....	7
6	Study Results .....	8
6.1	Wetlands and Waterbodies .....	8
6.1.1	Palustrine Forested Wetlands .....	11
6.1.2	Palustrine Emergent Wetlands .....	11
6.1.3	Palustrine Unconsolidated Bottom .....	11
6.1.4	Riverine .....	11
6.2	Littoral Zone .....	12
6.3	Riparian Zone .....	15
7	Summary and Discussion .....	15
7.1	Wetland Habitat .....	15
7.2	Riverine Habitat .....	16
7.3	Littoral Habitat .....	16
7.4	Riparian Habitat .....	16
7.5	Invasive Plant Species .....	17
8	Project Impacts on Wetlands, Riparian, and Littoral Habitat .....	17
9	Variances from FERC-Approved Study Plan .....	17
10	Correspondence and Consultation .....	17
11	Literature Cited .....	17

## Tables

Table 1. HDR Field Verified Wetlands and Waterbodies in Project Area .....	8
Table 2. Wetlands in Project Area .....	12

## Figures

Figure 1. Study Area for Wetlands, Riparian, and Littoral Habitat Study .....	3
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Figure 2a. Identified Wetlands in the Study Area.....	9
Figure 2b. Identified Wetlands in the Study Area.....	10
Figure 3. Littoral Habitat and Riparian Areas.....	14

## Attachments

- Attachment 1 – Wildlife Species Observed in the Niagara Study Area
- Attachment 2 – Representative Photographs of Wetland Habitat
- Attachment 3 – Representative Photographs of Littoral Zone Habitat
- Attachment 4 – Representative Photographs of Riparian Habitat
- Attachment 5 – Wetland Determination Field Forms

## Acronyms

Appalachian or Licensee	Appalachian Power Company
CFR	Code of Federal Regulations
EAV	emergent aquatic vegetation
FERC or Commission	Federal Energy Regulatory Commission
GIS	Geographic Information System
HDR	HDR Engineering, Inc.
ILP	Integrated Licensing Process
ISR	Initial Study Report
m	meter
MW	megawatt
NHD	National Hydrography Dataset
NRCS	Natural Resources Conservation Service
NWI	National Wetlands Inventory
PAD	Pre-Application Document
PEM	Palustrine emergent wetlands
PFO	Palustrine forested wetlands
Project	Niagara Hydroelectric Project
PUB	Palustrine unconsolidated bottom
RSP	Revised Study Plan
SAV	submerged aquatic vegetation
SPD	Study Plan Determination
USACE	U.S. Army Corps of Engineers
USC	United States Code
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
USR	Updated Study Report
VDEQ	Virginia Department of Environmental Quality
VDCR	Virginia Department of Conservation and Recreation
WetCAT	Wetland Conditional Assessment Tool

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# 1 Project Introduction and Background

Appalachian Power Company (Appalachian or Licensee) is the Licensee, owner, and operator of the run-of-river, 2.4-megawatt (MW) Niagara Hydroelectric Project (Project) (Federal Energy Regulatory Commission [FERC or Commission] Project No. 2466), located on the Roanoke River (river mile 355) in Roanoke County, Virginia.

The Project is currently licensed by the FERC under the authority granted to FERC by Congress through the Federal Power Act, 16 United States Code (USC) §791(a), et seq., to license and oversee the operation of non-federal hydroelectric projects on jurisdictional waters and/or federal land. The Project underwent relicensing in the early 1990s, and the current operating license for the Project expires on February 29, 2024. Accordingly, Appalachian is pursuing a subsequent license for the Project pursuant to the Commission's Integrated Licensing Process (ILP), as described at 18 Code of Federal Regulations (CFR) Part 5. In accordance with FERC's regulations at 18 CFR §16.9(b), the licensee must file its final application for a new license with FERC no later than February 28, 2022.

In accordance with 18 CFR §5.11 of the Commission's regulations, Appalachian developed a Revised Study Plan (RSP) for the Project that was filed with the Commission and made available to stakeholders on November 6, 2019. FERC issued the Study Plan Determination (SPD) on December 6, 2019.

On July 27, 2020, Appalachian filed an updated ILP study schedule and a request for extension of time to file the Initial Study Report (ISR) to account for Project delays resulting from the COVID-19 pandemic. The request was approved by FERC on August 10, 2020, and the filing deadline for the ISR for the Project was extended from November 17, 2020 to January 11, 2021. Appalachian conducted a virtual ISR Meeting on January 21, 2021 and filed the ISR Meeting summary with the Commission on February 5, 2021. Stakeholders provided written comments in response to Appalachian's filing of the ISR meeting summary, which are addressed in this Updated Study Report (USR) along with study methods and results.

In accordance with 18 CFR §5.15, Appalachian has conducted studies as provided in the RSP as subsequently approved and modified by the FERC. This report describes the methods and results of the Wetlands, Riparian, and Littoral Habitat Study conducted in support of preparing an application for new license for the Project.

## 2 Study Goals and Objectives

The goal of the Wetlands, Riparian, and Littoral Habitat Characterization Study is to identify and characterize the existing wetlands, waterbodies, and riparian and littoral vegetative habitats (including emergent and submerged aquatic vegetation beds) in the study area. Specific study goals and objectives are to:

- Perform a desktop characterization using the U.S. Fish and Wildlife Service (USFWS) (2019) National Wetlands Inventory (NWI), Virginia Department of Environmental Quality (VDEQ) Wetland Condition Assessment Tool (WetCAT) (VDEQ 2021), and

other resources such as Geographic Information Systems (GIS) based topographic maps, hydrography, aerial imagery, and soil surveys to identify and describe, approximate, and classify wetlands and waterbodies (i.e., streams, creeks, rivers) within the study area (including upland, littoral, and riparian zones);

- Perform a field verification survey to confirm the location, dominant vegetative community and vegetation classification identified in the desktop survey and resulting maps;
- The field verification will include identification of littoral and instream vegetation in the study area to characterize the availability of littoral, submerged, and emergent vegetative habitat;
- Document wildlife utilizing or present within observed areas during the field verification;
- Using the results of the desktop characterization and field verification, develop a GIS-based map identifying wetlands, waterbodies, and riparian, littoral, and instream vegetative community composition according to the Cowardin Classification System (Cowardin et al. 1979). The map will also identify the location and species of any invasive aquatic vegetation identified in the literature review or during the field verification effort;
- Riparian communities will be classified according to the Virginia Department of Conservation and Recreation (VDCR) Natural Communities of Virginia of Ecological Groups and Community Types Third Approximation (Version 3.3); and
- Using the results of the desktop and field verification efforts, evaluate the potential for Project effects on wetlands, riparian, and littoral habitat in the study area, and wildlife species that utilize these habitats.

### 3 Study Area

The study area for this Wetlands, Riparian, and Littoral Habitat Characterization Study includes 129.6 acres of terrestrial and aquatic habitats shown on Figure 1 including the reservoir, terrestrial areas adjacent to the study area boundary at the normal full pond elevation of the Project reservoir, the bypass reach, and the riverine section of the Roanoke River and its tributary streams within the study area.



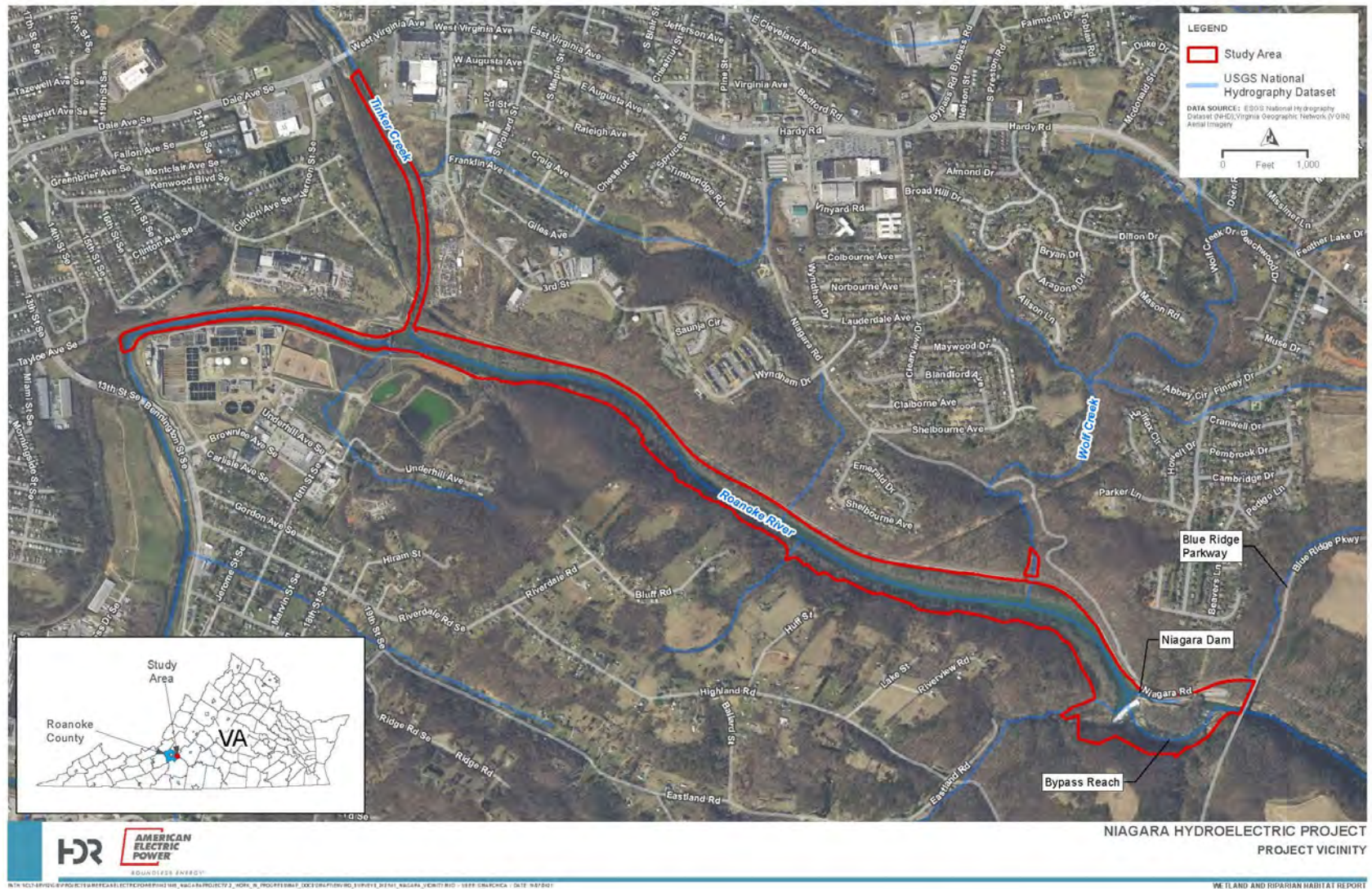


Figure 1. Study Area for Wetlands, Riparian, and Littoral Habitat Study

## 4 Background and Existing Information

Existing relevant and reasonably available information regarding wetlands in the Project vicinity is presented in Section 5.6 of the Pre-Application Document (PAD) (Appalachian 2019). Wetland, riparian, and littoral habitats within the study area are associated with the margin and near-shore areas of the impoundments. Wetlands are defined as “those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support... vegetation typically adapted for life in saturate soil conditions” (USACE 1987). The U.S. Army Corps of Engineers (USACE) and the VDEQ have jurisdiction over wetlands in Virginia. The littoral zone, in the context of a large river system, is the habitat between approximately a half-meter of depth and the depth of light penetration (Wetzel 1975). Riparian habitats are areas found along waterways such as lakes, reservoirs, rivers, and streams (NRCS 1996).

### 4.1 Wetlands and Waterbodies

Due to the relatively steep terrain along much of the Project's shorelines of the Roanoke River and Tinker Creek, there are limited areas in which wetlands may occur within the study area and would likely be confined to floodplain areas. Two wetland and deepwater types are currently mapped by the NWI within the study area: palustrine wetlands and riverine systems as defined by Cowardin et al. (1979). Palustrine wetlands are non-tidal wetlands dominated by trees, shrubs, and/or persistent plants/mosses, generally representing marsh, swamp, and small ponds. According to the NWI, the Roanoke River extending approximately one mile upstream of Niagara Dam is currently classified as a palustrine wetland with an unconsolidated bottom, with “permanently flooded” and “diked/impounded” modifiers. In addition to this area, three emergent wetlands in the floodplain, and one forested wetland associated with a shallow area of the main channel of the Roanoke River may also occur within the study area. There are no other NWI-mapped wetlands associated with the Project.

The main channel of the Roanoke River upstream of the one-mile stretch above Niagara Dam and downstream of the dam is classified as lower perennial riverine system with an unconsolidated bottom. There are also several intermittent tributary streams and one perennial tributary stream within the study area.

### 4.2 Wetland, Riparian, and Littoral Vegetation and Wildlife

The shoreline and lands surrounding the Project reservoir are mostly forested and undeveloped, except for the CSX Railroad tracks and right-of-way along the northern streambank. Around the Project reservoir, the valley walls are covered with a mixture of deciduous hardwoods and conifers. Forest cover is generally oak-chestnut with many bare rock exposures. There is also a noteworthy percentage of pine and other types of cover, such as maple, hickory, hemlock, locust, dogwood, and basswood (Appalachian 1991).

Previous surveys indicated the presence of several low, forested areas, which, based on their location several feet above the reservoir level on well-drained soil, appeared to be bottomland or riparian forest rather than forested wetland. These riparian forests were found to cover a total of approximately 20 acres (Appalachian 1991).



The majority of riparian habitat within the study area is located within the Deciduous Forest, Mixed Forest, and Developed, Low Intensity cover types (USGS 2016). In the study area, discernible riparian vegetation is located along the Roanoke River and Tinker Creek. These areas typically support forests dominated by silver maple (*Acer saccharinum*), sycamore (*Platanus occidentalis*), black walnut (*Juglans nigra*), hackberry (*Celtis occidentalis*), American elm (*Ulmus americana*), and boxelder (*Acer negundo* var. *negundo*). Herb layers in mixed floodplains/riparian areas are usually very lush with nutrient-demanding, early-season species such as Virginia bluebells (*Mertensia virginica*), Canada waterleaf (*Hydrophyllum canadense*), wild ginger (*Asarum canadense* var. *canadense*), yellow trout-lily (*Erythronium americanum* ssp. *americanum*), large solomon's-seal (*Polygonatum biflorum* var. *commutatum*), and many others (VDCR 2021).

Littoral vegetation (submerged aquatic or emergent) in the Project waters has historically been limited to a few and rooted plant species tolerant of urban contamination from upstream (Appalachian 1991). Based on the NWI maps, a review of aerial photography of the study area, and field verification, potential littoral habitats for wildlife were identified in several locations: the upstream extent of the study area where the Roanoke River decreases in depth at the furthest upstream meander within the Project Boundary, near the confluence of the Roanoke River and Tinker Creek, and in the majority of the bypass reach.

The study area also supports a number of small mammals, avifauna, reptiles, and amphibians. Over 623 species were identified as potentially occurring within a three-mile radius of the Project per the Virginia Department of Wildlife Resources (formerly the Virginia Department of Game and Inland Fisheries) (VDGIF 2017). Section 5.5 of the PAD includes specific species known to occur in the general project vicinity. Under Article 407 of the existing license Appalachian implements a Wildlife Management Plan, in part, protect riparian forest habitat at the Project. A list of wildlife observed during the field assessment is provided in Attachment 1.

The VDCR maintains a list of invasive plant species found within the State (VDCR 2017). The list includes those species that pose a threat to Virginia's forests, marshes, wetlands, and waterways. They are ranked based on the level of threat they present to natural communities and species. There are close to 100 invasive plant species in Virginia (VDCR 2017).

## 5 Methodology

An initial desktop study was carried out to identify areas likely to contain wetlands, riparian, and littoral habitat and estimate the amount of each resource area. Wetland areas and streams identified in the desktop study were field-verified, but not formally delineated (i.e., no flagging or boundary marking). The study methods proposed by Appalachian outlined below provide adequate information to assess potential Project operations-related effects to wetlands, riparian, and littoral habitats in the study area.

### 5.1 Desktop Characterization of Wetland, and Riparian, and Littoral Habitats

A desktop characterization of existing and potential wetlands and waterbodies, and existing riparian and littoral vegetation was performed. For the purposes of this study, the riparian zone was defined

as terrestrial areas 100 feet from the shoreline (VDCR 2006) or to the study area boundary, whichever was closer. The littoral zone was defined as the shallow shoreline area of the Roanoke River along the stream bank and within shallow portions of the bypass reach. The littoral zone also includes instream emergent and/or submerged aquatic vegetation beds.

Information sources included the USFWS NWI, the VDEQ Wetland Condition Assessment Tool (WetCAT) (VDEQ 2021), U.S. Geological Survey (USGS) topographic maps and National Hydrography Dataset (NHD), elevation data, and Natural Resources Conservation Service (NRCS) soil surveys. The VDEQ WetCAT was used to determine NWI habitat condition within the study area (VDEQ 2021). WetCAT scores wetland types based on the habitat and water quality stressors associated with surrounding land use types; classifications include slightly stressed, somewhat stressed, somewhat severely stressed, and severely stressed.

Data collected during the desktop study were used to create preliminary habitat characterization maps that were then used to facilitate the field verification efforts.

## 5.2 Field Verification

### 5.2.1 Wetlands and Waterbodies

Potential streams and wetland areas not confirmed previously (i.e., through prior licensing studies or other sources) were field-verified by HDR Engineering, Inc. (HDR) wetland scientists between June 22<sup>nd</sup> and June 24<sup>th</sup>, 2021. HDR performed field verification of wetlands and waterbodies according to the methodologies and guidance described in USACE 1987 Wetland Delineation Manual (USACE 1987) and USACE Eastern Mountains and Piedmont Regional Supplement (Version 2.0) (USACE 2012) and USACE Regulatory Guidance Letter 05-05 Ordinary High Water Mark Identification (USACE 2005). A visual assessment and field evaluation of wetland hydrology, hydrophytic vegetation, and hydric soils was performed to identify wetlands. Wetland cover types were classified according to dominance by trees (palustrine forested), herbaceous species (palustrine emergent), open water (palustrine unconsolidated bottom), or riverine rocky outcrop/shore and are displayed on Figure 2. Ordinary high water mark indicators including bed and banks, change in sediment texture, deposition, shelving, and change in vegetation were identified in the field to assess the presence of non-wetland waterbodies and streams.

Wetland scientists used hand-held GPS units to estimate the boundaries of wetlands within the Study Area; however, wetlands and waterbodies boundaries were not formally delineated in the field (i.e., no flagging or boundary marking). For wetlands, once the approximate upland boundary of the resource was determined, field personnel identified the edges of the wetland habitat, creating a polygon. In some instances, it was determined that all or a portion of the wetland observed in the field was consistent with boundaries depicted by on the USFWS NWI as well as topography contours. In these instances, the confirmed desktop information including USFWS NHD, USFWS NWI boundaries and topography contours were used to digitize stream and wetlands boundaries in GIS. Photo documentation of representative wetland habitats is provided in Attachment 2 and USACE Wetland Determination Data Sheets are included in Attachment 5.

### 5.2.2 Littoral Zone

The four main categories of aquatic plants include algae, emergent aquatic vegetation (EAV), submerged aquatic vegetation (SAV), and floating plants. Algae are simple plants without true roots, leaves, or flowers. They are found either free floating in water or attached to other plants, bottom sediments, rocks, or other solid structures. EAV grows along water body edges, with only short portions of their stems and roots are submerged. SAV grows in deeper water and usually are attached to the bottom. They remain underwater until flowers and seeds form out of the water. Floating plants are rooted, with much of their structure, especially leaves, floating on the surface. They can also be unattached, obtaining nutrients through small rootlets that dangle in the water.

A visual assessment was performed to characterize the availability of littoral zone aquatic habitats including emergent aquatic EAV and SAV beds within the bypass reach and reservoir. Spot-check based surveys were performed to characterize the availability of littoral zone aquatic habitats including emergent and submerged aquatic vegetation beds occurring within the study area. The species and general location of invasive aquatic vegetation and evident wildlife usage observed during the field assessment were also noted.

Transect-based surveys were performed to characterize the availability of littoral zone aquatic habitats within the Study area. Four transect lines were evaluated in the reservoir. Transects were oriented parallel to the shoreline in boat accessible areas, with transects distributed to represent both shorelines.

Each transect line was approximately 100 meters (m) in length and 1.0-m<sup>2</sup> areas spaced equally along the transect line at 10-m intervals were surveyed. The survey at each of the 10-m intervals consisted of a visual presence/absence assessment for emergent or visible submerged aquatic vegetation. A vegetation sampling throw rake was also deployed at each 10-m sample point on transect lines to capture any non-visible submerged aquatic vegetation.

### 5.2.3 Riparian Zone

Data from the desktop review were used to perform the riparian habitat field verification. To facilitate the field verification of the preliminary vegetative cover maps, the riparian habitat within each vegetative community type was characterized by recording the dominant species of vegetation at three strata (tree, sapling/shrub, and herb). HDR biologists used relevant reference materials including regional field guides and plant identification mobile apps to identify plants to genus and species level. Invasive species identified during the assessment were also recorded. Field data was compared to the general vegetative community types identified in the preliminary map (developed during the desktop study) to verify their accuracy. Documented differences in the vegetation were noted and this information was used to revise the map of riparian vegetative communities. Any general signs of wildlife within the riparian zone were noted in the field and listed in Attachment 1 (Wildlife Species Observed in Niagara Study Area). Vegetative communities documented in riparian zones were categorized using VDCR Natural Communities of Virginia Ecological Groups and Community Types -Third Approximation (Version 3.3) (VDCR 2021).

## 6 Study Results

### 6.1 Wetlands and Waterbodies

Wetland cover types were classified according to Cowardin et. al (1979) and included palustrine (emergent, forested, and unconsolidated bottom) and riverine systems. These wetland and waterbodies features were verified in the field and are depicted on Figure 2 and listed in Table 1. Attachment 2 includes a photolog of representative wetland cover types. A description of the general study-related wetland information is provided below.

Approximately 61.36 acres of wetlands and waterbodies identified during the desktop study using the USFWS NWI database were verified, and an additional 12.45 acres of features were delineated in the field. A comparison of NWI-mapped and field verified wetlands is provided in Table 2. A total of 10.37 acres of wetlands were palustrine forested, and 3.33 acres were palustrine emergent, 25.94 were palustrine unconsolidated bottom, and 34.16 acres were riverine.

WetCAT data determined that there are several wetlands that are somewhat severely stressed near the mouths of Tinker and Wolf Creek, and one wetland that appears slightly stressed near the mouth of Wolf Creek. These wetlands may be considered stressed due to the flooding potential caused by the impounded Roanoke River. WetCAT scores are provided in Table 1.

**Table 1. HDR Field Verified Wetlands and Waterbodies in Project Area**

Feature ID	Cowardin Classification <sup>1</sup>	Latitude (dd)	Longitude (dd)	Area (acres)	WetCat Level
Wetland 1	PFO1A	37.26356	-79.8955	3.5	N/A
Wetland 2	PFO1A	37.26109	-79.8902	2.1	N/A
Wetland 3	PFO1A	37.25898	-79.8878	1.28	N/A
Wetland 4	PFO1A	37.25774	-79.8833	0.23	N/A
Wetland 5	PEM1C	37.25861	-79.8812	1.26	Slightly Stressed
Wetland 6	PEM1C	37.25821	-79.8783	0.29	Somewhat Severely Stressed
Wetland 7	PFO1A	37.25549	-79.8772	2.93	N/A
Wetland 8	PEM1F	37.25509	-79.8765	0.85	N/A
Stream 1	R5UBH	37.25782	-79.8836	125 (linear feet)	N/A

<sup>1</sup>PFO1A= (P) Palustrine, (FO) Forested, (1) Broad-Leaved Deciduous, (A) Temporarily Flooded

PEM1C= (P) Palustrine, (EM) Emergent, (1) Persistent, (C) Seasonally Flooded

PEM1F= (P) Palustrine, (EM) Emergent, (1) Persistent, (F) Semi permanently Flooded

R5UBH= (R) Riverine, (5) Unknown Perennial, (UB) Unconsolidated Bottom, (H) Permanently Flooded







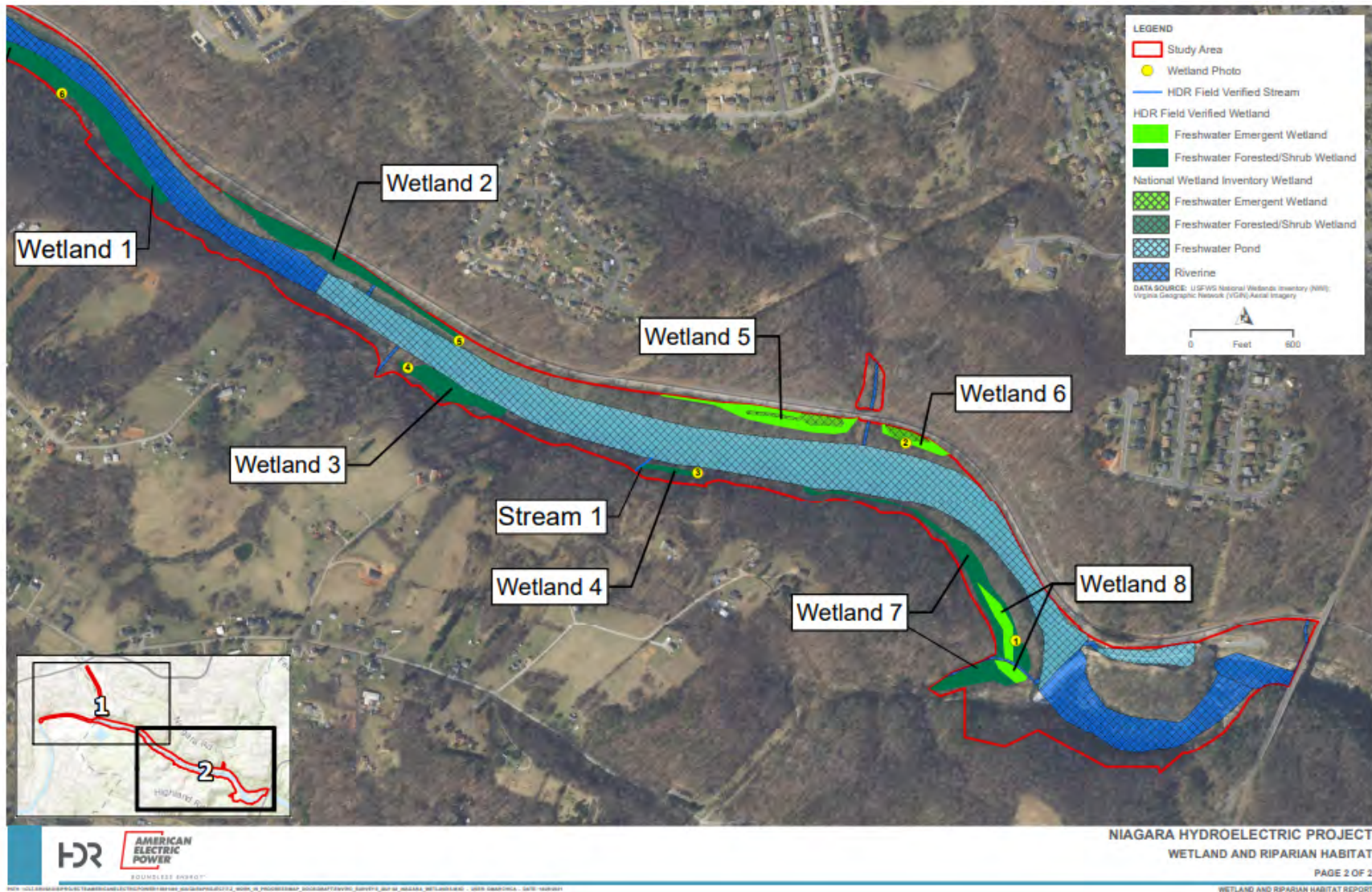


Figure 2b. Identified Wetlands in the Study Area



### 6.1.1 Palustrine Forested Wetlands

Palustrine forested wetlands (PFO) within the study area occurred primarily on the higher floodplains and point bars of the Roanoke River. The vegetation found to be dominant in majority of these wetlands were American sycamore (*Platanus occidentalis*), box elder (*Acer negundo*), black walnut (*Juglans nigra*), silver maple (*Acer saccharinum*), and tulip poplar (*Liriodendron tulipifera*). Majority of understory was comprised of spicebush, (*Lindera benzoin*), green ash (*Fraxinus pennsylvanica*) Japanese stilt grass (*Microstegium vimineum*), jewelweed (*Impatiens capensis*), false nettle (*Boehmeria cylindrica*), and wood nettle (*Laportea canadensis*). Canopy composition was moderately diverse with a cover percentage ranging from 10 to 70 percent. Saturation and high water tables were common throughout these wetlands with some standing water, typically near the toe of slope extent. Flooding in these wetlands seemed to be infrequent due to the higher elevation relative to the channels. Soils consisted mainly of silt and clay with hydric soil indicators such as depleted matrix and redox depressions.

### 6.1.2 Palustrine Emergent Wetlands

Palustrine emergent wetlands (PEM) occurred primarily as fringe wetlands and floodplain wetlands along the shorelines of the Roanoke River. The largest and most representative example of these wetlands occurs upstream of the Niagara Dam across the river from the boat take-out. The dominant herbaceous species for this wetland included Japanese stilt grass (*Microstegium viminium*), falsenettle (*Boehmeria cylindrica*), and maypop (*Passiflora incarnata*). The percent cover of vegetation in these wetlands ranged from 5 to 90 percent with low diversity and had relatively uniform cover. Saturation and high water tables were common throughout these wetlands with many had surface water, particularly at the boundary of the wetland and the stream. Substrate consisted mainly of silt and clay with hydric soil indicators such as depleted matrix and depleted below dark surface.

### 6.1.3 Palustrine Unconsolidated Bottom

Palustrine unconsolidated bottom (PUB) in the study area are permanently flooded habitats with less than 30 percent vegetative cover. This is a result of a portion of the Roanoke River being impounded. Unconsolidated bottoms are characterized by the lack of large stable surfaces for plant and animal attachment and are typically associated with limited wave and current activity. They are usually found in areas with lower energy and may be very unstable (Cowardin et al. 1979).

### 6.1.4 Riverine

Riverine habitats in the study area include the Roanoke River and associated tributaries. The Roanoke River is riverine, lower perennial on the upstream and downstream limits of the Project Area. The impounded portion of the river in between is considered riverine, lower perennial, with unconsolidated bottom and PUB according to the NWI. Tinker Creek is an upper perennial stream that flows into the Roanoke River. The habitat in Tinker Creek included several areas of scour and dominant vegetation consisted of American sycamore, boxelder, spicebush, and river oats. The dominant substrate included cobble to boulder sized rock along with bedrock. Wolf Creek and four unnamed tributaries are intermittent streambeds that flow into the Roanoke River. There are also three confluences where tributaries join the Roanoke River in which it is unknown whether they are perennial streams. The flow ranged from high gradient in the intermittent streams, Tinker Creek and

the upstream and downstream limit of the study area, to low-gradient in the impounded portion of the study area. Substrates within the impounded area were difficult to determine as depths made observations unattainable. In general, substrates of intermittent streams consisted of gravel and cobble and the streams contained eddy pools and swift currents that provided habitat for mussels and fish species.

**Table 2. Wetlands in Project Area**

Map Code	System	Subsystem	Class	Subclass	Water Regime/ Chemistry/Special Modifiers	NWI Mapped Wetlands (acres)	Additional Field Mapped Wetlands (acres)
PEM1C	Palustrine	--	Emergent	Persistent	Seasonally Flooded	0.76	1.55
PEM1F	Palustrine	--	Emergent	Persistent	Semi permanently Flooded	0.17	0.85
PFO1A	Palustrine	--	Forested	Broad-Leaved Deciduous	Temporarily Flooded	0.33	10.04
PUBHh	Palustrine (Roanoke River)	--	Unconsolidated Bottom	--	Permanently Flooded, Diked/Impounded	25.94	
R2RSA	Riverine (Roanoke River)	Lower Perennial	Rocky Shore	--	Temporarily Flooded	5.96	
R2UBH	Riverine (Roanoke River)	Lower Perennial	Unconsolidated Bottom	--	Permanently Flooded	26.46	
R2USA	Riverine (Unnamed trib to Roanoke River)	Lower Perennial	Unconsolidated Shore	--	Temporarily Flooded	0.24	
R3UBH	Riverine (Tinker Creek)	Upper Perennial	Unconsolidated Bottom	--	Permanently Flooded	0.80	
R4SBC	Riverine (Wolf Creek)	Intermittent	Streambed	--	Seasonally Flooded	0.60	
R5UBH	Riverine (Unnamed trib to Roanoke River)	Unknown Perennial	Unconsolidated Bottom	--	Permanently Flooded	0.09	0.01
<b>Total</b>						<b>61.36</b>	<b>12.45</b>

## 6.2 Littoral Zone

The littoral zone contains seasonally flooded to intermittently exposed herbaceous vegetation of boulder and cobbly depositional bars, or less frequently bedrock exposures, on the shores and islands and in the bypass reach of the Roanoke River, though some were observed at the northern extent of the study area. The substrate of this zone consisted of angular bed rock and depositional bars of sand and organic material. Pools of surface water were present throughout the littoral zone with patchy vegetation growth in areas that were above water level.

As previously described, four transect lines were evaluated in the reservoir utilizing a throw rake. No SAVs were collected in any of the four transects.

Littoral zone vegetation contains water willow, various terrestrial plants, and algae. The majority of the terrestrial plants observed in the bypass reach were located on floating islands that were likely formed from depositional bars in heavy flow events. Water willow was found to be the most abundant EAV throughout the bypass reach encompassing approximately 1.25 acres, or 2.1 percent of the submerged bottom. Water willow beds grew in low-flow pool areas close to the banks and between the rocky outcropping. Algae was sparse in the bypass reach and was primarily located in stagnant pools along the banks with low amounts of daily sunlight. Littoral vegetation beds are depicted on Figure and representative photographs are included in Attachment 3.





Page | 14

## 6.3 Riparian Zone

The riparian area consists of approximately 65 acres and is found along most of the shoreline of the Roanoke River (Figure ). The riparian regions within the study area fall closely within the VDCR Piedmont/ Mountain Floodplain Forest and Swamps community type (VDCR 2021). Dominant vegetation in the over story includes butternut (*Juglans cinerea*), black walnut, catalpa (*Catalpa speciosa*), elm (*Ulmus* spp.), American sycamore, silver maple (*Acer saccharinum*), box elder, green ash, and swamp white oak (*Quercus bicolor*). The understory typically included white mulberry (*Morus alba*), pawpaw (*Asimina triloba*), elderberry (*Sambucus nigra*), and spicebush. The herbaceous vegetation consisted of jewelweed, Japanese stiltgrass, poison ivy (*Toxicodendron radicans*), river oats (*Chasmanthium latifolium*), and wild geranium (*Geranium maculatum*). Several invasive species were noted within the riparian areas. Tree of heaven, mimosa, and amur honeysuckle (*Lonicera maackii*) were typically seen along the banks in recently disturbed area with open sunlight upstream from the Niagara Dam. Japanese knotweed was found primarily in the forested riparian area of the bypass reach and in several spots along the banks upstream of the dam. Japanese honeysuckle (*Lonicera japonica*) and Johnsongrass (*Sorghum halepense*) were seen in the herbaceous layer throughout the study area.

The majority of the riparian area appeared to be flooded on a seasonal or annual basis. The riparian areas surveyed ranged from early to mid-successional stage, with most trees at an intermediate age and height, between 20 and 70 feet. Diversity and patchiness were generally moderate. In some areas, particularly in the riparian islands, trees, limbs, and other debris washed in during high water events was abundant. Representative photographs of the Project riparian zone habitat are included in Attachment 4.

## 7 Summary and Discussion

The NWI wetland and waterway boundaries within the study area were ground-truthed and found to generally represent the correct classifications and areal extents. During field verification of the NWI wetlands, 12.45 acres of additional wetlands were identified and mapped and are illustrated on Figure 2. The wetland types in the study area appeared to reflect the natural community expectations for this location.

### 7.1 Wetland Habitat

Two major types of aquatic habitat systems occur in the study area: (1) riverine systems consisting of open-channel and unconsolidated bottom habitats, and (2) palustrine wetlands dominated by trees, shrubs, or emergent vegetation. Approximately 57 percent of the study area consists of wetlands and waterways. Wetlands, particularly when associated with riverine systems, provide important functions for wildlife and flood storage as well as serving as important recreational resources. The most commonly observed palustrine and riverine wetlands within the study area included unconsolidated bottom wetlands due the Roanoke River being impounded. Unconsolidated bottom wetlands are relatively stable features that self-regulate water flow and temperature. They can house a variety of life not suited for high-flow environments, provide recreational opportunities, and improve the overall quality of the local aquatic system.



Forested floodplain wetlands and emergent wetlands were also observed in the study area. Functions of forested floodplain wetlands are important and are most commonly associated with wildlife habitat, sediment/shoreline stabilization, and flood flow alteration. The forested floodplain wetlands within the study area receive hydrologic input during high flow events (e.g., spring freshet) and then may remain dry for several weeks to months at a time.

The largest emergent wetland habitat areas occur near the shorelines of the upper reservoir. This emergent wetland is subjected to regular water level fluctuations; however, emergent wetland species are often adapted to changes in water surface elevation. In some cases, increased diversity of emergent species can be attributed to regular changes in inundation, provided the duration, magnitude and seasonality of the water level changes are tolerable by those species.

## 7.2 Riverine Habitat

Riverine habitat occurs in the Roanoke River and associated tributaries throughout the study area. Riverine wetlands can mediate flooding by detaining water during storm events and releasing it more slowly by flow through the saturated subsurface that discharges to the river channel. Dominant water sources are overbank flow from the channel during high water events or subsurface hydraulic connections between the river channel and wetlands. Additional water sources may be groundwater discharge from surficial aquifers, overland flow from adjacent uplands and tributaries, and precipitation. The principal functions and values associated with riverine wetlands include fish habitat, production export, wildlife habitat, recreation, visual quality/aesthetics, and endangered species habitat. The nature of the Project results in the existence of an extensive open-water cover type. As with the palustrine wetland cover type, open-water areas are well represented within the study area. The upper reservoir is an example of open-water wetland cover. The upper reservoir has a relatively simple shoreline. Fringe wetlands are limited by the relatively steep banks of the upper reservoir. Principle wetland functions for the upper reservoir included fish habitat, and wildlife habitat.

## 7.3 Littoral Habitat

Littoral habitat is an important feature within aquatic systems, particularly for fish and other aquatic wildlife. Observations were undertaken to generally characterize the existence and extent of aquatic vegetation. EAV in the form of water willow beds encompassed the majority of littoral habitat in the study area. SAV was generally absent in the primarily open canopied stream reaches and significant algal growth was minimal (small patches of filamentous green algae formed on rock substrates), although in some of the slower velocity reaches it lightly covered the substrate.

## 7.4 Riparian Habitat

Riparian habitat is also present in most of the study area adjacent to the Roanoke River. All the mapped wetlands and adjacent forested areas were included in the riparian habitat classification. These areas support a wide variety of communities on the small islands, cobble and boulder laden slopes, and floodplains that formed by river flows and riverine processes. The areas contain a mixture of forests, forested wetlands, emergent wetlands, and scrub-shrub wetland habitat.

## 7.5 Invasive Plant Species

Invasive vegetation was evident throughout the study area. The majority of observed invasive vegetation (Japanese knotweed [*Reynoutria japonica*], tree of heaven [*Ailanthus altissima*], honeysuckle [*Lonicera japonica*], amur honeysuckle [*Lonicera maackii*], Johnsongrass [*Sorghum halepense*] and mimosa [*Albizia julibrissin*]) were located along the margins of the Roanoke River, along disturbed areas, and within several habitat types within and outside of the study area. These results are reflective of the region-wide invasion of these invasive and non-native species in the eastern U.S.

## 8 Project Impacts on Wetlands, Riparian, and Littoral Habitat

The Licensee does not anticipate that operation and maintenance of the Project over the new license term will have any short- or long-term, unavoidable, adverse impacts on riparian or and littoral resources. Seasonal drawdowns may result in temporary short-term impacts to wetlands identified immediately upstream of Niagara Dam but are not anticipated to result in long term adverse impacts or loss of wetlands. Wetland, riparian, and littoral habitats at the Project are reflective of current Project operations. Appalachian proposes to maintain the run-of-river mode of operation for the Project and existing measures and programs to protect wildlife habitat. There are currently no plans by the Licensee for improvements or activities at the Project that would require disturbance of wetland areas or the clearing of potentially suitable roosting habitat or trees that may support maternity colonies for protected bat species (e.g., Indiana bat and northern long-eared bat) or potential nesting habitat for bald eagles. In the event such activities were proposed to be undertaken in the future in support of Project operation, modifications, or development of new recreational facilities within the Project Boundary, Appalachian would consult or coordinate with USFWS and VDWR (for sensitive species) or the U.S. Army Corps of Engineers (for wetlands impacts) in advance of the proposed activities.

## 9 Variances from FERC-Approved Study Plan

The Wetland, Riparian, and Littoral Habitat Study was conducted in conformance with the FERC-approved RSP.

## 10 Correspondence and Consultation

No coordination with state or federal agencies was undertaken for this updated study report.

## 11 Literature Cited

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# Attachment 1

Attachment 1 – Wildlife  
Species Observed in the  
Niagara Study Area

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**Table 1. Wildlife Species Observed in the Niagara Study Area**

Common Name	Latin Name
<b>Birds</b>	
Turkey vulture	<i>Cathartes aura</i>
Canada goose	<i>Branta canadensis</i>
Red-tailed hawk	<i>Buteo jamaicensis</i>
Killdeer	<i>Charadrius vociferus</i>
Mourning dove	<i>Zenaida macroura</i>
Belted kingfisher	<i>Ceryle alcyon</i>
Blue jay	<i>Cyanocitta cristata</i>
American crow	<i>Corvus brachyrhynchos</i>
American robin	<i>Turdus migratorius</i>
Northern mockingbird	<i>Mimus polyglottos</i>
Northern cardinal	<i>Cardinalis cardinalis</i>
Great blue heron	<i>Ardea herodias</i>
Osprey	<i>Pandion haliaetus</i>
Wood duck	<i>Aix sponsa</i>
<b>Mammals</b>	
White-tailed deer	<i>Odocoileus virginianus</i>
Muskrat	<i>Ondatra zibethicus</i>
Gray squirrel	<i>Sciurus carolinensis</i>
River Otter	<i>Lontra canadensis</i>
Beaver	<i>Castor canadensis</i>
<b>Amphibians</b>	
Eastern newt	<i>Notophthalmus viridescens</i>
American toad	<i>Anaxyrus americanus</i>
Spring peeper	<i>Pseudacris crucifer</i>
American bullfrog	<i>Lithobates catesbeiana</i>
Green frog	<i>Lithobates clamitans</i>
Wood frog	<i>Lithobates sylvaticus</i>
<b>Reptiles</b>	
Snapping Turtle	<i>Chelydra serpentina</i>
Copperhead	<i>Agkistrodon contortrix</i>



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# Attachment 2

Attachment 2 –  
Representative Photographs  
of Wetland Habitat

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Wetland Photo 1. Palustrine forested/ emergent wetland upstream of Niagara Dam.



Wetland Photo 2. Palustrine emergent wetland on the left bank; downstream of Wolf Creek.





Wetland Photo 3. Palustrine forested wetland on the right bank; upstream of Wolf Creek.



Wetland Photo 4. Example of palustrine forested wetland habitat upstream of Wolf Creek and Wetland Photo 3 on the right bank.





Wetland Photo 5. Example of palustrine forested wetland slightly upstream of Wolf Creek on the left bank.



Wetland Photo 6. Example of palustrine forested wetland habitat downstream of Tinker Creek on the right bank.

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# Attachment 3

Attachment 3 –  
Representative Photographs  
of Littoral Zone Habitat

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Littoral Zone Photo 1. A cluster of water willow beds within the downstream extent of the bypass reach.



Littoral Zone Photo 2. A representative photo showing the mosaic of water willow within the bypass reach looking downstream towards the tailrace and Blue Ridge Parkway Bridge.





Littoral Zone 3. A water willow bed within the central portion of the bypass reach.



Littoral Zone Photo 4. A small water willow bed in the upper half of the bypass reach.





Littoral Zone Photo 5. A fringe water willow bed along the left bank of the bypass reach.



Littoral Zone Photo 6. A large water willow bed in the upstream extent of the bypass reach facing the Niagara Dam.

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# Attachment 4

Attachment 4 –  
Representative Photographs  
of Riparian Habitat



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Riparian Photo 1. A forested riparian area adjacent to the bypass reach below Niagara dam.



Riparian Photo 2. A densely vegetated riparian area along the bank of the Roanoke River.





Riparian Photo 3. A forested riparian area dominated by sycamore and boxelder.



Riparian Photo 4. A densely vegetated riparian area along the right bank of the Roanoke River dominated by sycamore, green ash, boxelder, and paw paw.





Riparian Photo 5. A densely vegetated riparian area across the Roanoke River from the mouth of Tinker Creek. Invasive Japanese knotweed is dominant in the shrub layer with boxelder in the canopy.



Riparian Photo 6. A riparian area upstream of Tinker Creek characterized by steep slopes and dominated by boxelder and green ash.





Riparian Photo 7. An example of a riparian area at the western extent of the study area. This area is dominated by basswood and boxelder.

A decorative graphic consisting of several overlapping rectangles. A large red rectangle is on the left. A grey rectangle is at the top right. A light grey rectangle is at the bottom left. A black rectangle is at the bottom right. The text is positioned to the right of the red rectangle.

# Attachment 5

Attachment 5 – Wetland  
Determination Field Forms

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<b>U.S. Army Corps of Engineers</b> <b>WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region</b> See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R	OMB Control #: 0710-xxxx, Exp: Pending Requirement Control Symbol EXEMPT: (Authority: AR 335-15, paragraph 5-2a)
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Project/Site: Niagara Hyrdoelectric Dam City/County: Roanoke Sampling Date: 07/2021

Applicant/Owner: AEP State: VA Sampling Point: WL1

Investigator(s): J. Mace, R. Dugger Section, Township, Range: \_\_\_\_\_

Landform (hillside, terrace, etc.): floodplain Local relief (concave, convex, none): concave Slope (%): 0-1

Subregion (LRR or MLRA): LRR P, MLRA 136 Lat: 37.2631 Long: -79.8949 Datum: NAD83

Soil Map Unit Name: Hayesville channery fine sandy loam, 25 to 50 percent slopes, very stony 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.)

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

Hydrophytic Vegetation Present? Yes <u>X</u> No _____ Hydric Soil Present? Yes <u>X</u> No _____ Wetland Hydrology Present? Yes <u>X</u> No _____	<b>Is the Sampled Area within a Wetland?</b> Yes <u>X</u> No _____
Remarks: Backwater slough, overflow area from river.	

**HYDROLOGY**

<b>Wetland Hydrology Indicators:</b> <u>Primary Indicators (minimum of one is required; check all that apply)</u> <input checked="" type="checkbox"/> Surface Water (A1) <input type="checkbox"/> True Aquatic Plants (B14) <input checked="" type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input checked="" type="checkbox"/> Saturation (A3) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Other (Explain in Remarks) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> Aquatic Fauna (B13)	<u>Secondary Indicators (minimum of two required)</u> <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input checked="" type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input checked="" type="checkbox"/> FAC-Neutral Test (D5)
<b>Field Observations:</b> Surface Water Present? Yes <u>X</u> No _____ Depth (inches): <u>1</u> Water Table Present? Yes <u>X</u> No _____ Depth (inches): <u>0</u> Saturation Present? Yes <u>X</u> No _____ Depth (inches): <u>0</u> (includes capillary fringe)	<b>Wetland Hydrology Present?</b> Yes <u>X</u> No _____
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:  Remarks:	

**VEGETATION (Four Strata) – Use scientific names of plants.**

 Sampling Point: WL1

Tree Stratum (Plot size: <u>30</u> )	Absolute % Cover	Dominant Species?	Indicator Status																	
1. <u>Acer negundo</u>	60	Yes	FAC	<b>Dominance Test worksheet:</b>  Number of Dominant Species That Are OBL, FACW, or FAC: <u>7</u> (A)  Total Number of Dominant Species Across All Strata: <u>7</u> (B)  Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100.0%</u> (A/B)																
2. <u>Asimina triloba</u>	20	Yes	FAC																	
3. <u>Ulmus americana</u>	10	No	FACW																	
4. <u>Aesculus sylvatica</u>	5	No	FAC																	
5. _____																				
6. _____																				
7. _____																				
95 = Total Cover				<b>Prevalence Index worksheet:</b>  <table style="width: 100%;"> <tr> <th style="width: 50%;">Total % Cover of:</th> <th style="width: 50%;">Multiply by:</th> </tr> <tr> <td>OBL species <u>0</u></td> <td>x 1 = <u>0</u></td> </tr> <tr> <td>FACW species <u>25</u></td> <td>x 2 = <u>50</u></td> </tr> <tr> <td>FAC species <u>140</u></td> <td>x 3 = <u>420</u></td> </tr> <tr> <td>FACU species <u>0</u></td> <td>x 4 = <u>0</u></td> </tr> <tr> <td>UPL species <u>0</u></td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>165</u> (A)</td> <td><u>470</u> (B)</td> </tr> <tr> <td colspan="2" style="text-align: center;">Prevalence Index = B/A = <u>2.85</u></td> </tr> </table>	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>140</u>	x 3 = <u>420</u>	FACU species <u>0</u>	x 4 = <u>0</u>	UPL species <u>0</u>	x 5 = <u>0</u>	Column Totals: <u>165</u> (A)	<u>470</u> (B)	Prevalence Index = B/A = <u>2.85</u>	
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>140</u>	x 3 = <u>420</u>																			
FACU species <u>0</u>	x 4 = <u>0</u>																			
UPL species <u>0</u>	x 5 = <u>0</u>																			
Column Totals: <u>165</u> (A)	<u>470</u> (B)																			
Prevalence Index = B/A = <u>2.85</u>																				
50% of total cover: <u>48</u> 20% of total cover: <u>19</u>																				
<b>Sapling/Shrub Stratum (Plot size: <u>30</u> )</b>																				
1. <u>Lindera benzoin</u>	40	Yes	FAC	<b>Hydrophytic Vegetation Indicators:</b>  <u>  </u> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input checked="" type="checkbox"/> 3 - Prevalence Index is ≤3.0 <sup>1</sup> <u>  </u> 4 - Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)  <u>  </u> Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)  <sup>1</sup> Indicators of hydric soil and wetland hydrology must present, unless disturbed or problematic.																
2. <u>Aesculus sylvatica</u>	10	Yes	FAC																	
3. _____																				
4. _____																				
5. _____																				
6. _____																				
7. _____																				
8. _____																				
9. _____																				
50 = Total Cover																				
50% of total cover: <u>25</u> 20% of total cover: <u>10</u>																				
<b>Herb Stratum (Plot size: <u>5</u> )</b>																				
1. <u>Boehmeria cylindrica</u>	10	Yes	FACW	<b>Definitions of Four Vegetation Strata:</b>  <b>Tree</b> – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.  <b>Sapling/Shrub</b> – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.  <b>Herb</b> – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.  <b>Woody Vine</b> – All woody vines greater than 3.28 ft in height.																
2. <u>Impatiens capensis</u>	5	Yes	FACW																	
3. <u>Microstegium vimineum</u>	5	Yes	FAC																	
4. _____																				
5. _____																				
6. _____																				
7. _____																				
8. _____																				
9. _____																				
10. _____																				
11. _____																				
20 = Total Cover																				
50% of total cover: <u>10</u> 20% of total cover: <u>4</u>																				
<b>Woody Vine Stratum (Plot size: _____ )</b>																				
1. _____				<b>Hydrophytic Vegetation</b> Present? Yes <u>X</u> No <u>  </u>																
2. _____																				
3. _____																				
4. _____																				
5. _____																				
_____ = Total Cover																				
50% of total cover: _____ 20% of total cover: _____																				

Remarks: (Include photo numbers here or on a separate sheet.)

## SOIL

Sampling Point: WL1

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 <sup>1</sup>	Loc <sup>2</sup>		
0-10	10YR 4/2	80	7.5YR 5/8	20	C	PL/M	Loamy/Clayey	Prominent redox concentrations
10-16	10YR 5/2	90	7.5YR 5/8	10	C	M	Loamy/Clayey	Prominent redox concentrations
<sup>1</sup> Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.						<sup>2</sup> Location: PL=Pore Lining, M=Matrix.		
<b>Hydric Soil Indicators:</b>						<b>Indicators for Problematic Hydric Soils<sup>3</sup>:</b>		
<input type="checkbox"/> Histosol (A1)			<input type="checkbox"/> Polyvalue Below Surface (S8) <b>(MLRA 147, 148)</b>			<input type="checkbox"/> 2 cm Muck (A10) <b>(MLRA 147)</b>		
<input type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Thin Dark Surface (S9) <b>(MLRA 147, 148)</b>			<input type="checkbox"/> Coast Prairie Redox (A16)		
<input type="checkbox"/> Black Histic (A3)			<input type="checkbox"/> Loamy Mucky Mineral (F1) <b>(MLRA 136)</b>			<b>(MLRA 147, 148)</b>		
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Loamy Gleyed Matrix (F2)			<input checked="" type="checkbox"/> Piedmont Floodplain Soils (F19)		
<input type="checkbox"/> Stratified Layers (A5)			<input checked="" type="checkbox"/> Depleted Matrix (F3)			<b>(MLRA 136, 147)</b>		
<input type="checkbox"/> 2 cm Muck (A10) <b>(LRR N)</b>			<input type="checkbox"/> Redox Dark Surface (F6)			<input type="checkbox"/> Red Parent Material (F21)		
<input type="checkbox"/> Depleted Below Dark Surface (A11)			<input type="checkbox"/> Depleted Dark Surface (F7)			<b>(outside MLRA 127, 147, 148)</b>		
<input type="checkbox"/> Thick Dark Surface (A12)			<input checked="" type="checkbox"/> Redox Depressions (F8)			<input type="checkbox"/> Very Shallow Dark Surface (F22)		
<input type="checkbox"/> Sandy Mucky Mineral (S1)			<input type="checkbox"/> Iron-Manganese Masses (F12) <b>(LRR N,</b>			<input type="checkbox"/> Other (Explain in Remarks)		
<input type="checkbox"/> Sandy Gleyed Matrix (S4)			<b>MLRA 136)</b>					
<input type="checkbox"/> Sandy Redox (S5)			<input type="checkbox"/> Umbric Surface (F13) <b>(MLRA 122, 136)</b>			<sup>3</sup> Indicators of hydrophytic vegetation and		
<input type="checkbox"/> Stripped Matrix (S6)			<input type="checkbox"/> Piedmont Floodplain Soils (F19) <b>(MLRA 148)</b>			wetland hydrology must be present,		
<input type="checkbox"/> Dark Surface (S7)			<input type="checkbox"/> Red Parent Material (F21) <b>(MLRA 127, 147, 148)</b>			unless disturbed or problematic.		
<b>Restrictive Layer (if observed):</b>								
Type: _____								
Depth (inches): _____						Hydric Soil Present?      Yes <input checked="" type="checkbox"/> No _____		
Remarks:								

<b>U.S. Army Corps of Engineers</b> <b>WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region</b> See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R	<b>OMB Control #: 0710-xxxx, Exp: Pending</b> <b>Requirement Control Symbol EXEMPT:</b> <b>(Authority: AR 335-15, paragraph 5-2a)</b>
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Project/Site: Niagara Hyrdoelectric Dam City/County: Roanoke Sampling Date: 07/2021

Applicant/Owner: AEP State: VA Sampling Point: WL2

Investigator(s): E. Mularski, J. irvin Section, Township, Range: \_\_\_\_\_

Landform (hillside, terrace, etc.): floodplain Local relief (concave, convex, none): concave Slope (%): 0-1

Subregion (LRR or MLRA): LRR P, MLRA 136 Lat: 37.2614 Long: -79.8906 Datum: NAD83

Soil Map Unit Name: Hayesville channery fine sandy loam, 25 to 50 percent slopes, very stony 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.)

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

Hydrophytic Vegetation Present? Yes <u>X</u> No _____ Hydric Soil Present? Yes <u>X</u> No _____ Wetland Hydrology Present? Yes <u>X</u> No _____	<b>Is the Sampled Area within a Wetland?</b> Yes <u>X</u> No _____
Remarks: Drainage PFO-PEM	

**HYDROLOGY**

<b>Wetland Hydrology Indicators:</b> <u>Primary Indicators (minimum of one is required; check all that apply)</u> <input checked="" type="checkbox"/> Surface Water (A1) <input type="checkbox"/> True Aquatic Plants (B14) <input checked="" type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input checked="" type="checkbox"/> Saturation (A3) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Other (Explain in Remarks) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> Aquatic Fauna (B13)	<u>Secondary Indicators (minimum of two required)</u> <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input checked="" type="checkbox"/> FAC-Neutral Test (D5)
<b>Field Observations:</b> Surface Water Present? Yes <u>X</u> No _____ Depth (inches): <u>1</u> Water Table Present? Yes <u>X</u> No _____ Depth (inches): <u>0</u> Saturation Present? Yes <u>X</u> No _____ Depth (inches): <u>0</u> (includes capillary fringe)	<b>Wetland Hydrology Present?</b> Yes <u>X</u> No _____
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:	
Remarks:	

**VEGETATION (Four Strata) – Use scientific names of plants.**

 Sampling Point: WL2

Tree Stratum (Plot size: <u>30</u> )	Absolute % Cover	Dominant Species?	Indicator Status																	
1. <u>Acer negundo</u>	<u>30</u>	<u>Yes</u>	<u>FAC</u>	<b>Dominance Test worksheet:</b> Number of Dominant Species That Are OBL, FACW, or FAC: <u>6</u> (A) Total Number of Dominant Species Across All Strata: <u>6</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100.0%</u> (A/B)																
2. <u>Platanus occidentalis</u>	<u>10</u>	<u>Yes</u>	<u>FACW</u>																	
3. <u>Acer saccharinum</u>	<u>10</u>	<u>Yes</u>	<u>FACW</u>																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
6. _____	_____	_____	_____																	
7. _____	_____	_____	_____																	
50 = Total Cover				<b>Prevalence Index worksheet:</b> <table style="width: 100%;"> <thead> <tr> <th>Total % Cover of:</th> <th>Multiply by:</th> </tr> </thead> <tbody> <tr> <td>OBL species <u>0</u></td> <td>x 1 = <u>0</u></td> </tr> <tr> <td>FACW species <u>40</u></td> <td>x 2 = <u>80</u></td> </tr> <tr> <td>FAC species <u>90</u></td> <td>x 3 = <u>270</u></td> </tr> <tr> <td>FACU species <u>0</u></td> <td>x 4 = <u>0</u></td> </tr> <tr> <td>UPL species <u>10</u></td> <td>x 5 = <u>50</u></td> </tr> <tr> <td>Column Totals: <u>140</u> (A)</td> <td><u>400</u> (B)</td> </tr> <tr> <td colspan="2" style="text-align: center;">Prevalence Index = B/A = <u>2.86</u></td> </tr> </tbody> </table>	Total % Cover of:	Multiply by:	OBL species <u>0</u>	x 1 = <u>0</u>	FACW species <u>40</u>	x 2 = <u>80</u>	FAC species <u>90</u>	x 3 = <u>270</u>	FACU species <u>0</u>	x 4 = <u>0</u>	UPL species <u>10</u>	x 5 = <u>50</u>	Column Totals: <u>140</u> (A)	<u>400</u> (B)	Prevalence Index = B/A = <u>2.86</u>	
Total % Cover of:	Multiply by:																			
OBL species <u>0</u>	x 1 = <u>0</u>																			
FACW species <u>40</u>	x 2 = <u>80</u>																			
FAC species <u>90</u>	x 3 = <u>270</u>																			
FACU species <u>0</u>	x 4 = <u>0</u>																			
UPL species <u>10</u>	x 5 = <u>50</u>																			
Column Totals: <u>140</u> (A)	<u>400</u> (B)																			
Prevalence Index = B/A = <u>2.86</u>																				
50% of total cover: <u>25</u> 20% of total cover: <u>10</u>																				
Sapling/Shrub Stratum (Plot size: <u>30</u> )																				
1. <u>Lindera benzoin</u>	<u>10</u>	<u>Yes</u>	<u>FAC</u>																	
2. <u>Fraxinus pennsylvanica</u>	<u>10</u>	<u>Yes</u>	<u>FACW</u>																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
6. _____	_____	_____	_____																	
7. _____	_____	_____	_____																	
8. _____	_____	_____	_____																	
9. _____	_____	_____	_____																	
20 = Total Cover																				
50% of total cover: <u>10</u> 20% of total cover: <u>4</u>																				
Herb Stratum (Plot size: <u>5</u> )																				
1. <u>Microstegium vimineum</u>	<u>50</u>	<u>Yes</u>	<u>FAC</u>	<b>Hydrophytic Vegetation Indicators:</b> <u>1</u> - Rapid Test for Hydrophytic Vegetation <u>X</u> 2 - Dominance Test is >50% <u>X</u> 3 - Prevalence Index is ≤3.0 <sup>1</sup> <u>4</u> - Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet) <u>      </u> Problematic Hydrophytic Vegetation <sup>1</sup> (Explain) <sup>1</sup> Indicators of hydric soil and wetland hydrology must present, unless disturbed or problematic.																
2. <u>Boehmeria cylindrica</u>	<u>10</u>	<u>No</u>	<u>FACW</u>																	
3. <u>Passiflora incarnata</u>	<u>10</u>	<u>No</u>	<u>UPL</u>																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
6. _____	_____	_____	_____																	
7. _____	_____	_____	_____																	
8. _____	_____	_____	_____																	
9. _____	_____	_____	_____																	
10. _____	_____	_____	_____																	
11. _____	_____	_____	_____																	
70 = Total Cover																				
50% of total cover: <u>35</u> 20% of total cover: <u>14</u>																				
Woody Vine Stratum (Plot size: _____ )																				
1. _____	_____	_____	_____																	
2. _____	_____	_____	_____																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
_____ = Total Cover																				
50% of total cover: _____ 20% of total cover: _____																				
Remarks: (Include photo numbers here or on a separate sheet.)																				

**Hydrophytic Vegetation**  
 Present? Yes X No \_\_\_\_\_

## SOIL

Sampling Point: WL2**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 <sup>1</sup>	Loc <sup>2</sup>		
0-2	10YR 2/1	100					loamy/clayey	clay loam
2-18	10YR 4/2	80	7.5YR 5/6	20	C	M	loamy/clayey	clay loam

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.<sup>2</sup>Location: PL=Pore Lining, M=Matrix.**Hydric Soil Indicators:**

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Polyvalue Below Surface (S8) <b>(MLRA 147, 148)</b>
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Thin Dark Surface (S9) <b>(MLRA 147, 148)</b>
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) <b>(MLRA 136)</b>
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)
<input type="checkbox"/> Stratified Layers (A5)	<input checked="" type="checkbox"/> Depleted Matrix (F3)
<input type="checkbox"/> 2 cm Muck (A10) <b>(LRR N)</b>	<input type="checkbox"/> Redox Dark Surface (F6)
<input checked="" type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Dark Surface (F7)
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Redox Depressions (F8)
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Iron-Manganese Masses (F12) <b>(LRR N, MLRA 136)</b>
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Umbric Surface (F13) <b>(MLRA 122, 136)</b>
<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) <b>(MLRA 148)</b>
<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Red Parent Material (F21) <b>(MLRA 127, 147, 148)</b>
<input type="checkbox"/> Dark Surface (S7)	

**Indicators for Problematic Hydric Soils<sup>3</sup>:**

<input type="checkbox"/> 2 cm Muck (A10) <b>(MLRA 147)</b>
<input type="checkbox"/> Coast Prairie Redox (A16) <b>(MLRA 147, 148)</b>
<input type="checkbox"/> Piedmont Floodplain Soils (F19) <b>(MLRA 136, 147)</b>
<input type="checkbox"/> Red Parent Material (F21) <b>(outside MLRA 127, 147, 148)</b>
<input type="checkbox"/> Very Shallow Dark Surface (F22)
<input type="checkbox"/> Other (Explain in Remarks)

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.**Restrictive Layer (if observed):**Type: \_\_\_\_\_  
Depth (inches): \_\_\_\_\_Hydric Soil Present? Yes X No \_\_\_\_\_

Remarks:

<b>U.S. Army Corps of Engineers</b> <b>WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region</b> See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R	<b>OMB Control #: 0710-xxxx, Exp: Pending</b> <b>Requirement Control Symbol EXEMPT:</b> <b>(Authority: AR 335-15, paragraph 5-2a)</b>
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Project/Site: Niagara Hyrdoelectric Dam City/County: Roanoke Sampling Date: 07/2021

Applicant/Owner: AEP State: VA Sampling Point: WL3PFO

Investigator(s): J. Mace, R. Dugger Section, Township, Range: \_\_\_\_\_

Landform (hillside, terrace, etc.): floodplain Local relief (concave, convex, none): concave Slope (%): 0-1

Subregion (LRR or MLRA): LRR P, MLRA 136 Lat: 37.2590 Long: -79.8878 Datum: NAD83

Soil Map Unit Name: Hayesville channery fine sandy loam, 25 to 50 percent slopes, very stony 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.)

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

Hydrophytic Vegetation Present? Yes <u>X</u> No _____ Hydric Soil Present? Yes <u>X</u> No _____ Wetland Hydrology Present? Yes <u>X</u> No _____	<b>Is the Sampled Area within a Wetland?</b> Yes <u>X</u> No _____
Remarks: Backwater slough, overflow area from river.	

**HYDROLOGY**

<b>Wetland Hydrology Indicators:</b> <u>Primary Indicators (minimum of one is required; check all that apply)</u> <input checked="" type="checkbox"/> Surface Water (A1) <input type="checkbox"/> True Aquatic Plants (B14) <input checked="" type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input checked="" type="checkbox"/> Saturation (A3) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Other (Explain in Remarks) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> Aquatic Fauna (B13)	<u>Secondary Indicators (minimum of two required)</u> <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input checked="" type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input checked="" type="checkbox"/> FAC-Neutral Test (D5)
<b>Field Observations:</b> Surface Water Present? Yes <u>X</u> No _____ Depth (inches): <u>3</u> Water Table Present? Yes <u>X</u> No _____ Depth (inches): <u>6</u> Saturation Present? Yes <u>X</u> No _____ Depth (inches): <u>0</u> (includes capillary fringe)	<b>Wetland Hydrology Present?</b> Yes <u>X</u> No _____
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:  Remarks:	



**VEGETATION (Four Strata) – Use scientific names of plants.**

 Sampling Point: WL3PFO

Tree Stratum (Plot size: <u>30</u> )	Absolute % Cover	Dominant Species?	Indicator Status																	
1. <u>Acer negundo</u>	<u>50</u>	<u>Yes</u>	<u>FAC</u>	<b>Dominance Test worksheet:</b>  Number of Dominant Species That Are OBL, FACW, or FAC: <u>5</u> (A)  Total Number of Dominant Species Across All Strata: <u>5</u> (B)  Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100.0%</u> (A/B)																
2. <u>Fraxinus pennsylvanica</u>	<u>20</u>	<u>Yes</u>	<u>FACW</u>																	
3. <u>Liriodendron tulipifera</u>	<u>5</u>	<u>No</u>	<u>FACU</u>																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
6. _____	_____	_____	_____																	
7. _____	_____	_____	_____																	
<u>75</u> =Total Cover				<b>Prevalence Index worksheet:</b>  <table style="width: 100%;"> <tr> <th style="width: 50%;">Total % Cover of:</th> <th style="width: 50%;">Multiply by:</th> </tr> <tr> <td>OBL species <u>0</u></td> <td>x 1 = <u>0</u></td> </tr> <tr> <td>FACW species <u>65</u></td> <td>x 2 = <u>130</u></td> </tr> <tr> <td>FAC species <u>160</u></td> <td>x 3 = <u>480</u></td> </tr> <tr> <td>FACU species <u>10</u></td> <td>x 4 = <u>40</u></td> </tr> <tr> <td>UPL species <u>0</u></td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>235</u> (A)</td> <td><u>650</u> (B)</td> </tr> <tr> <td colspan="2" style="text-align: center;">Prevalence Index = B/A = <u>2.77</u></td> </tr> </table>	Total % Cover of:	Multiply by:	OBL species <u>0</u>	x 1 = <u>0</u>	FACW species <u>65</u>	x 2 = <u>130</u>	FAC species <u>160</u>	x 3 = <u>480</u>	FACU species <u>10</u>	x 4 = <u>40</u>	UPL species <u>0</u>	x 5 = <u>0</u>	Column Totals: <u>235</u> (A)	<u>650</u> (B)	Prevalence Index = B/A = <u>2.77</u>	
Total % Cover of:	Multiply by:																			
OBL species <u>0</u>	x 1 = <u>0</u>																			
FACW species <u>65</u>	x 2 = <u>130</u>																			
FAC species <u>160</u>	x 3 = <u>480</u>																			
FACU species <u>10</u>	x 4 = <u>40</u>																			
UPL species <u>0</u>	x 5 = <u>0</u>																			
Column Totals: <u>235</u> (A)	<u>650</u> (B)																			
Prevalence Index = B/A = <u>2.77</u>																				
50% of total cover: <u>38</u>		20% of total cover: <u>15</u>																		
<b>Sapling/Shrub Stratum (Plot size: <u>30</u> )</b>																				
1. <u>Fraxinus pennsylvanica</u>	<u>40</u>	<u>Yes</u>	<u>FACW</u>	<b>Hydrophytic Vegetation Indicators:</b>  <u>1</u> - Rapid Test for Hydrophytic Vegetation <u>X</u> 2 - Dominance Test is >50% <u>X</u> 3 - Prevalence Index is ≤3.0 <sup>1</sup> <u>4</u> - Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)  <u>      </u> Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)  <sup>1</sup> Indicators of hydric soil and wetland hydrology must present, unless disturbed or problematic.																
2. <u>Lindera benzoin</u>	<u>20</u>	<u>Yes</u>	<u>FAC</u>																	
3. <u>Acer negundo</u>	<u>10</u>	<u>No</u>	<u>FAC</u>																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
6. _____	_____	_____	_____																	
7. _____	_____	_____	_____																	
8. _____	_____	_____	_____																	
9. _____	_____	_____	_____																	
<u>70</u> =Total Cover																				
50% of total cover: <u>35</u>		20% of total cover: <u>14</u>																		
<b>Herb Stratum (Plot size: <u>5</u> )</b>																				
1. <u>Laportea canadensis</u>	<u>80</u>	<u>Yes</u>	<u>FAC</u>	<b>Definitions of Four Vegetation Strata:</b>  <b>Tree</b> – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.  <b>Sapling/Shrub</b> – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.  <b>Herb</b> – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.  <b>Woody Vine</b> – All woody vines greater than 3.28 ft in height.																
2. <u>Potentilla indica</u>	<u>5</u>	<u>No</u>	<u>FACU</u>																	
3. <u>Impatiens capensis</u>	<u>5</u>	<u>No</u>	<u>FACW</u>																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
6. _____	_____	_____	_____																	
7. _____	_____	_____	_____																	
8. _____	_____	_____	_____																	
9. _____	_____	_____	_____																	
10. _____	_____	_____	_____																	
11. _____	_____	_____	_____																	
<u>90</u> =Total Cover																				
50% of total cover: <u>45</u>		20% of total cover: <u>18</u>																		
<b>Woody Vine Stratum (Plot size: _____ )</b>																				
1. _____	_____	_____	_____	<b>Hydrophytic Vegetation</b> Present?      Yes <u>X</u> No _____																
2. _____	_____	_____	_____																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
_____ =Total Cover																				
50% of total cover: _____		20% of total cover: _____																		

 Remarks: (Include photo numbers here or on a separate sheet.)  
 In nearby spots there is murdannia keisak

## SOIL

Sampling Point: WL3PFO

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 <sup>1</sup>	Loc <sup>2</sup>		
0-10	10YR 4/2	80	7.5YR 5/8	20	C	PL/M	Loamy/Clayey	Prominent redox concentrations
10-16	10YR 5/2	90	7.5YR 5/8	10	C	M	Loamy/Clayey	Prominent redox concentrations
<sup>1</sup> Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.						<sup>2</sup> Location: PL=Pore Lining, M=Matrix.		
<b>Hydric Soil Indicators:</b>						<b>Indicators for Problematic Hydric Soils<sup>3</sup>:</b>		
<input type="checkbox"/> Histosol (A1)			<input type="checkbox"/> Polyvalue Below Surface (S8) <b>(MLRA 147, 148)</b>			<input type="checkbox"/> 2 cm Muck (A10) <b>(MLRA 147)</b>		
<input type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Thin Dark Surface (S9) <b>(MLRA 147, 148)</b>			<input type="checkbox"/> Coast Prairie Redox (A16)		
<input type="checkbox"/> Black Histic (A3)			<input type="checkbox"/> Loamy Mucky Mineral (F1) <b>(MLRA 136)</b>			<b>(MLRA 147, 148)</b>		
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Loamy Gleyed Matrix (F2)			<input checked="" type="checkbox"/> Piedmont Floodplain Soils (F19)		
<input type="checkbox"/> Stratified Layers (A5)			<input checked="" type="checkbox"/> Depleted Matrix (F3)			<b>(MLRA 136, 147)</b>		
<input type="checkbox"/> 2 cm Muck (A10) <b>(LRR N)</b>			<input type="checkbox"/> Redox Dark Surface (F6)			<input type="checkbox"/> Red Parent Material (F21)		
<input type="checkbox"/> Depleted Below Dark Surface (A11)			<input type="checkbox"/> Depleted Dark Surface (F7)			<b>(outside MLRA 127, 147, 148)</b>		
<input type="checkbox"/> Thick Dark Surface (A12)			<input checked="" type="checkbox"/> Redox Depressions (F8)			<input type="checkbox"/> Very Shallow Dark Surface (F22)		
<input type="checkbox"/> Sandy Mucky Mineral (S1)			<input type="checkbox"/> Iron-Manganese Masses (F12) <b>(LRR N,</b>			<input type="checkbox"/> Other (Explain in Remarks)		
<input type="checkbox"/> Sandy Gleyed Matrix (S4)			<b>MLRA 136)</b>					
<input type="checkbox"/> Sandy Redox (S5)			<input type="checkbox"/> Umbric Surface (F13) <b>(MLRA 122, 136)</b>			<sup>3</sup> Indicators of hydrophytic vegetation and		
<input type="checkbox"/> Stripped Matrix (S6)			<input type="checkbox"/> Piedmont Floodplain Soils (F19) <b>(MLRA 148)</b>			wetland hydrology must be present,		
<input type="checkbox"/> Dark Surface (S7)			<input type="checkbox"/> Red Parent Material (F21) <b>(MLRA 127, 147, 148)</b>			unless disturbed or problematic.		
<b>Restrictive Layer (if observed):</b>								
Type: _____								
Depth (inches): _____						Hydric Soil Present?      Yes <input checked="" type="checkbox"/> No _____		
Remarks:								

<b>U.S. Army Corps of Engineers</b> <b>WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region</b> See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R	<b>OMB Control #: 0710-xxxx, Exp: Pending</b> <b>Requirement Control Symbol EXEMPT:</b> <b>(Authority: AR 335-15, paragraph 5-2a)</b>
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Project/Site: Niagara Hyrdoelectric Dam City/County: Roanoke Sampling Date: 07/2021  
 Applicant/Owner: AEP State: VA Sampling Point: WL4PFO  
 Investigator(s): J. Mace, R. Dugger Section, Township, Range: \_\_\_\_\_  
 Landform (hillside, terrace, etc.): floodplain Local relief (concave, convex, none): concave Slope (%): 0-1  
 Subregion (LRR or MLRA): LRR P, MLRA 136 Lat: 37.2577 Long: -79.8836 Datum: NAD83  
 Soil Map Unit Name: Hayesville channery fine sandy loam, 25 to 50 percent slopes, very stony 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.)

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

Hydrophytic Vegetation Present? Yes <u>X</u> No _____ Hydric Soil Present? Yes <u>X</u> No _____ Wetland Hydrology Present? Yes <u>X</u> No _____	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 60%; padding: 5px;"> <b>Is the Sampled Area within a Wetland?</b> </td> <td style="width: 40%; padding: 5px;"> <b>Yes <u>X</u> No _____</b> </td> </tr> </table>	<b>Is the Sampled Area within a Wetland?</b>	<b>Yes <u>X</u> No _____</b>
<b>Is the Sampled Area within a Wetland?</b>	<b>Yes <u>X</u> No _____</b>		
Remarks: Backwater slough, overflow area from river. More running water than WL 100 and 101			

**HYDROLOGY**

<b>Wetland Hydrology Indicators:</b> <u>Primary Indicators (minimum of one is required; check all that apply)</u> <input checked="" type="checkbox"/> Surface Water (A1) <input type="checkbox"/> True Aquatic Plants (B14) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input checked="" type="checkbox"/> Saturation (A3) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Other (Explain in Remarks) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> Aquatic Fauna (B13)	<u>Secondary Indicators (minimum of two required)</u> <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input checked="" type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input checked="" type="checkbox"/> FAC-Neutral Test (D5)		
<b>Field Observations:</b> Surface Water Present? Yes <u>X</u> No _____ Depth (inches): <u>3</u> Water Table Present? Yes _____ No _____ Depth (inches): _____ Saturation Present? Yes <u>X</u> No _____ Depth (inches): <u>0</u> (includes capillary fringe)	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 60%; padding: 5px;"> <b>Wetland Hydrology Present?</b> </td> <td style="width: 40%; padding: 5px;"> <b>Yes <u>X</u> No _____</b> </td> </tr> </table>	<b>Wetland Hydrology Present?</b>	<b>Yes <u>X</u> No _____</b>
<b>Wetland Hydrology Present?</b>	<b>Yes <u>X</u> No _____</b>		
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:			
Remarks:			

**VEGETATION (Four Strata) – Use scientific names of plants.**

 Sampling Point: WL4PFO

Tree Stratum (Plot size: <u>30</u> )	Absolute % Cover	Dominant Species?	Indicator Status																	
1. <u>Acer negundo</u>	40	Yes	FAC	<b>Dominance Test worksheet:</b>  Number of Dominant Species That Are OBL, FACW, or FAC: <u>8</u> (A)  Total Number of Dominant Species Across All Strata: <u>8</u> (B)  Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100.0%</u> (A/B)																
2. <u>Fraxinus pennsylvanica</u>	20	Yes	FACW																	
3. <u>Acer saccharinum</u>	20	Yes	FACW																	
4. _____																				
5. _____																				
6. _____																				
7. _____																				
80 = Total Cover				<b>Prevalence Index worksheet:</b>  <table style="width: 100%;"> <tr> <th style="width: 50%;">Total % Cover of:</th> <th style="width: 50%;">Multiply by:</th> </tr> <tr> <td>OBL species <u>20</u></td> <td>x 1 = <u>20</u></td> </tr> <tr> <td>FACW species <u>80</u></td> <td>x 2 = <u>160</u></td> </tr> <tr> <td>FAC species <u>85</u></td> <td>x 3 = <u>255</u></td> </tr> <tr> <td>FACU species <u>0</u></td> <td>x 4 = <u>0</u></td> </tr> <tr> <td>UPL species <u>0</u></td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>185</u> (A)</td> <td><u>435</u> (B)</td> </tr> <tr> <td colspan="2" style="text-align: center;">Prevalence Index = B/A = <u>2.35</u></td> </tr> </table>	Total % Cover of:	Multiply by:	OBL species <u>20</u>	x 1 = <u>20</u>	FACW species <u>80</u>	x 2 = <u>160</u>	FAC species <u>85</u>	x 3 = <u>255</u>	FACU species <u>0</u>	x 4 = <u>0</u>	UPL species <u>0</u>	x 5 = <u>0</u>	Column Totals: <u>185</u> (A)	<u>435</u> (B)	Prevalence Index = B/A = <u>2.35</u>	
Total % Cover of:	Multiply by:																			
OBL species <u>20</u>	x 1 = <u>20</u>																			
FACW species <u>80</u>	x 2 = <u>160</u>																			
FAC species <u>85</u>	x 3 = <u>255</u>																			
FACU species <u>0</u>	x 4 = <u>0</u>																			
UPL species <u>0</u>	x 5 = <u>0</u>																			
Column Totals: <u>185</u> (A)	<u>435</u> (B)																			
Prevalence Index = B/A = <u>2.35</u>																				
50% of total cover: <u>40</u> 20% of total cover: <u>16</u>																				
<b>Sapling/Shrub Stratum (Plot size: <u>30</u> )</b>																				
1. <u>Asimina triloba</u>	15	Yes	FAC	<b>Hydrophytic Vegetation Indicators:</b>  <u>  </u> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input checked="" type="checkbox"/> 3 - Prevalence Index is ≤3.0 <sup>1</sup> <u>  </u> 4 - Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)  <u>  </u> Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)  <sup>1</sup> Indicators of hydric soil and wetland hydrology must present, unless disturbed or problematic.																
2. <u>Lindera benzoin</u>	10	Yes	FAC																	
3. <u>Sambucus nigra</u>	10	Yes	FAC																	
4. _____																				
5. _____																				
6. _____																				
7. _____																				
8. _____																				
9. _____																				
35 = Total Cover																				
50% of total cover: <u>18</u> 20% of total cover: <u>7</u>																				
<b>Herb Stratum (Plot size: <u>5</u> )</b>																				
1. <u>Persicaria hydropiper</u>	20	Yes	OBL	<b>Definitions of Four Vegetation Strata:</b>  <b>Tree</b> – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.  <b>Sapling/Shrub</b> – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.  <b>Herb</b> – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.  <b>Woody Vine</b> – All woody vines greater than 3.28 ft in height.																
2. <u>Boehmeria cylindrica</u>	20	Yes	FACW																	
3. <u>Impatiens capensis</u>	10	No	FACW																	
4. <u>Microstegium vimineum</u>	10	No	FAC																	
5. <u>Echinochloa walteri</u>	10	No	FACW																	
6. _____																				
7. _____																				
8. _____																				
9. _____																				
10. _____																				
11. _____																				
70 = Total Cover																				
50% of total cover: <u>35</u> 20% of total cover: <u>14</u>																				
<b>Woody Vine Stratum (Plot size: _____ )</b>																				
1. _____				<b>Hydrophytic Vegetation</b> Present? Yes <u>X</u> No _____																
2. _____																				
3. _____																				
4. _____																				
5. _____																				
_____ = Total Cover																				
50% of total cover: _____ 20% of total cover: _____																				

 Remarks: (Include photo numbers here or on a separate sheet.)  
 In nearby spots there is murdannia keisak

## SOIL

Sampling Point: WL4PFO

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 <sup>1</sup>	Loc <sup>2</sup>		
0-16	10YR 4/2	90	7.5YR 5/8	10	C	PL/M	Loamy/Clayey	Prominent redox concentrations
					<sup>1</sup> Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.			
					<sup>2</sup> Location: PL=Pore Lining, M=Matrix.			
<b>Hydric Soil Indicators:</b>					<b>Indicators for Problematic Hydric Soils<sup>3</sup>:</b>			
<input type="checkbox"/> Histosol (A1)			<input type="checkbox"/> Polyvalue Below Surface (S8) ( <b>MLRA 147, 148</b> )			<input type="checkbox"/> 2 cm Muck (A10) ( <b>MLRA 147</b> )		
<input type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Thin Dark Surface (S9) ( <b>MLRA 147, 148</b> )			<input type="checkbox"/> Coast Prairie Redox (A16)		
<input type="checkbox"/> Black Histic (A3)			<input type="checkbox"/> Loamy Mucky Mineral (F1) ( <b>MLRA 136</b> )			<b>(MLRA 147, 148)</b>		
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Loamy Gleyed Matrix (F2)			<input checked="" type="checkbox"/> Piedmont Floodplain Soils (F19)		
<input type="checkbox"/> Stratified Layers (A5)			<input checked="" type="checkbox"/> Depleted Matrix (F3)			<b>(MLRA 136, 147)</b>		
<input type="checkbox"/> 2 cm Muck (A10) ( <b>LRR N</b> )			<input type="checkbox"/> Redox Dark Surface (F6)			<input type="checkbox"/> Red Parent Material (F21)		
<input type="checkbox"/> Depleted Below Dark Surface (A11)			<input type="checkbox"/> Depleted Dark Surface (F7)			<b>(outside MLRA 127, 147, 148)</b>		
<input type="checkbox"/> Thick Dark Surface (A12)			<input checked="" type="checkbox"/> Redox Depressions (F8)			<input type="checkbox"/> Very Shallow Dark Surface (F22)		
<input type="checkbox"/> Sandy Mucky Mineral (S1)			<input type="checkbox"/> Iron-Manganese Masses (F12) ( <b>LRR N,</b>			<input type="checkbox"/> Other (Explain in Remarks)		
<input type="checkbox"/> Sandy Gleyed Matrix (S4)			<b>MLRA 136)</b>					
<input type="checkbox"/> Sandy Redox (S5)			<input type="checkbox"/> Umbric Surface (F13) ( <b>MLRA 122, 136</b> )					
<input type="checkbox"/> Stripped Matrix (S6)			<input type="checkbox"/> Piedmont Floodplain Soils (F19) ( <b>MLRA 148</b> )					
<input type="checkbox"/> Dark Surface (S7)			<input type="checkbox"/> Red Parent Material (F21) ( <b>MLRA 127, 147, 148</b> )					
<b>Restrictive Layer (if observed):</b>								
Type: _____								
Depth (inches): _____								
						<b>Hydric Soil Present?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		
Remarks:     								

<b>U.S. Army Corps of Engineers</b> <b>WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region</b> See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R	OMB Control #: 0710-xxxx, Exp: Pending Requirement Control Symbol EXEMPT: (Authority: AR 335-15, paragraph 5-2a)
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Project/Site: Niagara Hyrdoelectric Dam City/County: Roanoke Sampling Date: 07/2021  
 Applicant/Owner: AEP State: VA Sampling Point: WL5-6  
 Investigator(s): E. Mularski, J. irvin Section, Township, Range: \_\_\_\_\_  
 Landform (hillside, terrace, etc.): floodplain Local relief (concave, convex, none): concave Slope (%): 0-1  
 Subregion (LRR or MLRA): LRR P, MLRA 136 Lat: 37.2588 Long: -79.8826 Datum: NAD83  
 Soil Map Unit Name: Hayesville channery fine sandy loam, 25 to 50 percent slopes, very stony 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.)

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

Hydrophytic Vegetation Present? Yes <u>X</u> No _____ Hydric Soil Present? Yes <u>X</u> No _____ Wetland Hydrology Present? Yes <u>X</u> No _____	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 60%; padding: 5px;"> <b>Is the Sampled Area within a Wetland?</b> </td> <td style="width: 40%; padding: 5px;">         Yes <u>X</u> No _____       </td> </tr> </table>	<b>Is the Sampled Area within a Wetland?</b>	Yes <u>X</u> No _____
<b>Is the Sampled Area within a Wetland?</b>	Yes <u>X</u> No _____		
Remarks: Drainage PFO-PEM			

**HYDROLOGY**

<b>Wetland Hydrology Indicators:</b> <u>Primary Indicators</u> (minimum of one is required; check all that apply) <input checked="" type="checkbox"/> Surface Water (A1) <input type="checkbox"/> True Aquatic Plants (B14) <input checked="" type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input checked="" type="checkbox"/> Saturation (A3) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Other (Explain in Remarks) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> Aquatic Fauna (B13)	<u>Secondary Indicators</u> (minimum of two required) <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input checked="" type="checkbox"/> FAC-Neutral Test (D5)		
<b>Field Observations:</b> Surface Water Present? Yes <u>X</u> No _____ Depth (inches): <u>6</u> Water Table Present? Yes <u>X</u> No _____ Depth (inches): <u>0</u> Saturation Present? Yes <u>X</u> No _____ Depth (inches): <u>0</u> (includes capillary fringe)	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 60%; padding: 5px;"> <b>Wetland Hydrology Present?</b> </td> <td style="width: 40%; padding: 5px;">         Yes <u>X</u> No _____       </td> </tr> </table>	<b>Wetland Hydrology Present?</b>	Yes <u>X</u> No _____
<b>Wetland Hydrology Present?</b>	Yes <u>X</u> No _____		
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:			
Remarks:			



**VEGETATION (Four Strata) – Use scientific names of plants.**

 Sampling Point: WL5-6

<u>Tree Stratum</u> (Plot size: <u>30</u> )	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Acer negundo</u>	<u>30</u>	<u>Yes</u>	<u>FAC</u>
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
<u>30</u> =Total Cover			
50% of total cover: <u>15</u>	20% of total cover: <u>6</u>		

<u>Sapling/Shrub Stratum</u> (Plot size: <u>30</u> )	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Lindera benzoin</u>	<u>10</u>	<u>Yes</u>	<u>FAC</u>
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
8. _____	_____	_____	_____
9. _____	_____	_____	_____
<u>10</u> =Total Cover			
50% of total cover: <u>5</u>	20% of total cover: <u>2</u>		

<u>Herb Stratum</u> (Plot size: <u>5</u> )	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Grass sp.</u>	<u>40</u>	<u>Yes</u>	_____
2. <u>Boehmeria cylindrica</u>	<u>10</u>	<u>No</u>	<u>FACW</u>
3. <u>Microstegium vimineum</u>	<u>10</u>	<u>No</u>	<u>FAC</u>
4. <u>Phalaris arundinacea</u>	<u>10</u>	<u>No</u>	<u>FACW</u>
5. <u>Reynoutria japonica</u>	<u>5</u>	<u>No</u>	<u>FACU</u>
6. _____	_____	_____	_____
7. _____	_____	_____	_____
8. _____	_____	_____	_____
9. _____	_____	_____	_____
10. _____	_____	_____	_____
11. _____	_____	_____	_____
<u>75</u> =Total Cover			
50% of total cover: <u>38</u>	20% of total cover: <u>15</u>		

<u>Woody Vine Stratum</u> (Plot size: _____ )	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
_____ =Total Cover			
50% of total cover: _____	20% of 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: 66.7% (A/B)

**Prevalence Index worksheet:**

Total % Cover of:	Multiply by:
OBL species <u>0</u>	x 1 = <u>0</u>
FACW species <u>20</u>	x 2 = <u>40</u>
FAC species <u>50</u>	x 3 = <u>150</u>
FACU species <u>5</u>	x 4 = <u>20</u>
UPL species <u>0</u>	x 5 = <u>0</u>
Column Totals: <u>75</u> (A)	<u>210</u> (B)
Prevalence Index = B/A = <u>2.80</u>	

**Hydrophytic Vegetation Indicators:**

- ☐ 1 - Rapid Test for Hydrophytic Vegetation  
☒ 2 - Dominance Test is >50%  
☒ 3 - Prevalence Index is ≤3.0<sup>1</sup>  
☐ 4 - Morphological Adaptations<sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)  
☐ Problematic Hydrophytic Vegetation<sup>1</sup> (Explain)

<sup>1</sup>Indicators of hydric soil and wetland hydrology must present, unless disturbed or problematic.

**Definitions of Four Vegetation Strata:**
**Tree** – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

**Sapling/Shrub** – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

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

**Woody Vine** – All woody vines greater than 3.28 ft in height.

**Hydrophytic Vegetation**

 Present? Yes X No \_\_\_\_\_

Remarks: (Include photo numbers here or on a separate sheet.)

## SOIL

Sampling Point: WL5-6

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 <sup>1</sup>	Loc <sup>2</sup>		
0-3	10YR 2/1	100					loamy/clayey	clay loam
3-20	10YR 4/1	80	7.5YR 5/6	20	C	PL/M	loamy/clayey	clay loam

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

<b>Hydric Soil Indicators:</b> <input type="checkbox"/> Histosol (A1) <input type="checkbox"/> Histic Epipedon (A2) <input type="checkbox"/> Black Histic (A3) <input type="checkbox"/> Hydrogen Sulfide (A4) <input type="checkbox"/> Stratified Layers (A5) <input type="checkbox"/> 2 cm Muck (A10) ( <b>LRR N</b> ) <input checked="" type="checkbox"/> Depleted Below Dark Surface (A11) <input type="checkbox"/> Thick Dark Surface (A12) <input type="checkbox"/> Sandy Mucky Mineral (S1) <input type="checkbox"/> Sandy Gleyed Matrix (S4) <input type="checkbox"/> Sandy Redox (S5) <input type="checkbox"/> Stripped Matrix (S6) <input type="checkbox"/> Dark Surface (S7)	<input type="checkbox"/> Polyvalue Below Surface (S8) ( <b>MLRA 147, 148</b> ) <input type="checkbox"/> Thin Dark Surface (S9) ( <b>MLRA 147, 148</b> ) <input type="checkbox"/> Loamy Mucky Mineral (F1) ( <b>MLRA 136</b> ) <input type="checkbox"/> Loamy Gleyed Matrix (F2) <input checked="" type="checkbox"/> Depleted Matrix (F3) <input type="checkbox"/> Redox Dark Surface (F6) <input type="checkbox"/> Depleted Dark Surface (F7) <input type="checkbox"/> Redox Depressions (F8) <input type="checkbox"/> Iron-Manganese Masses (F12) ( <b>LRR N, MLRA 136</b> ) <input type="checkbox"/> Umbric Surface (F13) ( <b>MLRA 122, 136</b> ) <input type="checkbox"/> Piedmont Floodplain Soils (F19) ( <b>MLRA 148</b> ) <input type="checkbox"/> Red Parent Material (F21) ( <b>MLRA 127, 147, 148</b> )	<b>Indicators for Problematic Hydric Soils<sup>3</sup>:</b> <input type="checkbox"/> 2 cm Muck (A10) ( <b>MLRA 147</b> ) <input type="checkbox"/> Coast Prairie Redox (A16) ( <b>MLRA 147, 148</b> ) <input type="checkbox"/> Piedmont Floodplain Soils (F19) ( <b>MLRA 136, 147</b> ) <input type="checkbox"/> Red Parent Material (F21) ( <b>outside MLRA 127, 147, 148</b> ) <input type="checkbox"/> Very Shallow Dark Surface (F22) <input type="checkbox"/> Other (Explain in Remarks)
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<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

<b>Restrictive Layer (if observed):</b> Type: _____ Depth (inches): _____	Hydric Soil Present?      Yes <u>X</u> No _____
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Remarks:

<b>U.S. Army Corps of Engineers</b> <b>WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region</b> See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R	<b>OMB Control #: 0710-xxxx, Exp: Pending</b> <b>Requirement Control Symbol EXEMPT:</b> <b>(Authority: AR 335-15, paragraph 5-2a)</b>
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Project/Site: Niagara Hyrdoelectric Dam City/County: Roanoke Sampling Date: 07/2021

Applicant/Owner: AEP State: VA Sampling Point: WL 7-8PEQ/PEM

Investigator(s): J. Mace, R. Dugger Section, Township, Range: \_\_\_\_\_

Landform (hillside, terrace, etc.): floodplain Local relief (concave, convex, none): concave Slope (%): 0-1

Subregion (LRR or MLRA): LRR P, MLRA 136 Lat: 37.2551 Long: -79.8763 Datum: NAD83

Soil Map Unit Name: Hayesville channery fine sandy loam, 25 to 50 percent slopes, very stony 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.)

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

Hydrophytic Vegetation Present? Yes <u>X</u> No _____ Hydric Soil Present? Yes <u>X</u> No _____ Wetland Hydrology Present? Yes <u>X</u> No _____	<b>Is the Sampled Area within a Wetland?</b> Yes <u>X</u> No _____
Remarks: Center is dominated by reed canary grass and maple and willow. Fed by streams and nearby stream	

**HYDROLOGY**

<b>Wetland Hydrology Indicators:</b> <u>Primary Indicators (minimum of one is required; check all that apply)</u> <input checked="" type="checkbox"/> Surface Water (A1) <input type="checkbox"/> True Aquatic Plants (B14) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input checked="" type="checkbox"/> Saturation (A3) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Other (Explain in Remarks) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> Aquatic Fauna (B13)	<u>Secondary Indicators (minimum of two required)</u> <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input checked="" type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input checked="" type="checkbox"/> FAC-Neutral Test (D5)
<b>Field Observations:</b> Surface Water Present? Yes <u>X</u> No _____ Depth (inches): <u>1</u> Water Table Present? Yes _____ No _____ Depth (inches): _____ Saturation Present? Yes <u>X</u> No _____ Depth (inches): <u>0</u> (includes capillary fringe)	<b>Wetland Hydrology Present?</b> Yes <u>X</u> No _____
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:  Remarks:	

**VEGETATION (Four Strata) – Use scientific names of plants.**

 Sampling Point: WL7-8PFO/PEM

Tree Stratum (Plot size: <u>30</u> )	Absolute % Cover	Dominant Species?	Indicator Status																	
1. <u>Acer rubrum</u>	<u>40</u>	<u>Yes</u>	<u>FAC</u>	<b>Dominance Test worksheet:</b> Number of Dominant Species That Are OBL, FACW, or FAC: <u>6</u> (A) Total Number of Dominant Species Across All Strata: <u>6</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100.0%</u> (A/B)																
2. <u>Fraxinus pennsylvanica</u>	<u>20</u>	<u>Yes</u>	<u>FACW</u>																	
3. <u>Ulmus americana</u>	<u>10</u>	<u>No</u>	<u>FACW</u>																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
6. _____	_____	_____	_____																	
7. _____	_____	_____	_____																	
<u>70</u> =Total Cover				<b>Prevalence Index worksheet:</b> <table style="width: 100%;"> <tr> <th>Total % Cover of:</th> <th>Multiply by:</th> </tr> <tr> <td>OBL species <u>0</u></td> <td>x 1 = <u>0</u></td> </tr> <tr> <td>FACW species <u>90</u></td> <td>x 2 = <u>180</u></td> </tr> <tr> <td>FAC species <u>80</u></td> <td>x 3 = <u>240</u></td> </tr> <tr> <td>FACU species <u>25</u></td> <td>x 4 = <u>100</u></td> </tr> <tr> <td>UPL species <u>0</u></td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>195</u> (A)</td> <td><u>520</u> (B)</td> </tr> <tr> <td colspan="2" style="text-align: center;">Prevalence Index = B/A = <u>2.67</u></td> </tr> </table>	Total % Cover of:	Multiply by:	OBL species <u>0</u>	x 1 = <u>0</u>	FACW species <u>90</u>	x 2 = <u>180</u>	FAC species <u>80</u>	x 3 = <u>240</u>	FACU species <u>25</u>	x 4 = <u>100</u>	UPL species <u>0</u>	x 5 = <u>0</u>	Column Totals: <u>195</u> (A)	<u>520</u> (B)	Prevalence Index = B/A = <u>2.67</u>	
Total % Cover of:	Multiply by:																			
OBL species <u>0</u>	x 1 = <u>0</u>																			
FACW species <u>90</u>	x 2 = <u>180</u>																			
FAC species <u>80</u>	x 3 = <u>240</u>																			
FACU species <u>25</u>	x 4 = <u>100</u>																			
UPL species <u>0</u>	x 5 = <u>0</u>																			
Column Totals: <u>195</u> (A)	<u>520</u> (B)																			
Prevalence Index = B/A = <u>2.67</u>																				
50% of total cover: <u>35</u> 20% of total cover: <u>14</u>																				
<b>Sapling/Shrub Stratum (Plot size: <u>30</u> )</b>																				
1. <u>Fraxinus pennsylvanica</u>	<u>10</u>	<u>Yes</u>	<u>FACW</u>	<b>Hydrophytic Vegetation Indicators:</b> <u>1</u> - Rapid Test for Hydrophytic Vegetation <u>X</u> 2 - Dominance Test is >50% <u>X</u> 3 - Prevalence Index is ≤3.0 <sup>1</sup> <u>4</u> - Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet) <u>      </u> Problematic Hydrophytic Vegetation <sup>1</sup> (Explain) <sup>1</sup> Indicators of hydric soil and wetland hydrology must present, unless disturbed or problematic.																
2. <u>Lindera benzoin</u>	<u>10</u>	<u>Yes</u>	<u>FAC</u>																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
6. _____	_____	_____	_____																	
7. _____	_____	_____	_____																	
8. _____	_____	_____	_____																	
9. _____	_____	_____	_____																	
<u>20</u> =Total Cover																				
50% of total cover: <u>10</u> 20% of total cover: <u>4</u>																				
<b>Herb Stratum (Plot size: <u>5</u> )</b>																				
1. <u>Boehmeria cylindrica</u>	<u>40</u>	<u>Yes</u>	<u>FACW</u>	<b>Definitions of Four Vegetation Strata:</b> <b>Tree</b> – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. <b>Sapling/Shrub</b> – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. <b>Herb</b> – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. <b>Woody Vine</b> – All woody vines greater than 3.28 ft in height.																
2. <u>Microstegium vimineum</u>	<u>30</u>	<u>Yes</u>	<u>FAC</u>																	
3. <u>Mitchella repens</u>	<u>15</u>	<u>No</u>	<u>FACU</u>																	
4. <u>Reynoutria japonica</u>	<u>10</u>	<u>No</u>	<u>FACU</u>																	
5. <u>Echinochloa walteri</u>	<u>10</u>	<u>No</u>	<u>FACW</u>																	
6. <u>Juncus sp.</u>	<u>5</u>	<u>No</u>	_____																	
7. _____	_____	_____	_____																	
8. _____	_____	_____	_____																	
9. _____	_____	_____	_____																	
10. _____	_____	_____	_____																	
11. _____	_____	_____	_____																	
<u>110</u> =Total Cover																				
50% of total cover: <u>55</u> 20% of total cover: <u>22</u>																				
<b>Woody Vine Stratum (Plot size: _____ )</b>																				
1. _____	_____	_____	_____	<b>Hydrophytic Vegetation</b> Present? Yes <u>X</u> No _____																
2. _____	_____	_____	_____																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
_____ =Total Cover																				
50% of total cover: _____ 20% of total cover: _____																				

 Remarks: (Include photo numbers here or on a separate sheet.)  
 Vitis rotundifolia and asiatic bittersweet nearby

## SOIL

Sampling Point: WL7-8PFO/PEM

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 <sup>1</sup>	Loc <sup>2</sup>		
0-18	10YR 3/1	80	7.5YR 5/8	10	C	PL	Loamy/Clayey	Prominent redox concentrations
			10YR 6/1	10	D	M		silt loam

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

<b>Hydric Soil Indicators:</b> <input type="checkbox"/> Histosol (A1) <input type="checkbox"/> Histic Epipedon (A2) <input type="checkbox"/> Black Histic (A3) <input type="checkbox"/> Hydrogen Sulfide (A4) <input type="checkbox"/> Stratified Layers (A5) <input type="checkbox"/> 2 cm Muck (A10) ( <b>LRR N</b> ) <input type="checkbox"/> Depleted Below Dark Surface (A11) <input type="checkbox"/> Thick Dark Surface (A12) <input type="checkbox"/> Sandy Mucky Mineral (S1) <input type="checkbox"/> Sandy Gleyed Matrix (S4) <input type="checkbox"/> Sandy Redox (S5) <input type="checkbox"/> Stripped Matrix (S6) <input type="checkbox"/> Dark Surface (S7)	<input type="checkbox"/> Polyvalue Below Surface (S8) ( <b>MLRA 147, 148</b> ) <input type="checkbox"/> Thin Dark Surface (S9) ( <b>MLRA 147, 148</b> ) <input type="checkbox"/> Loamy Mucky Mineral (F1) ( <b>MLRA 136</b> ) <input type="checkbox"/> Loamy Gleyed Matrix (F2) <input checked="" type="checkbox"/> Depleted Matrix (F3) <input checked="" type="checkbox"/> Redox Dark Surface (F6) <input checked="" type="checkbox"/> Depleted Dark Surface (F7) <input checked="" type="checkbox"/> Redox Depressions (F8) <input type="checkbox"/> Iron-Manganese Masses (F12) ( <b>LRR N, MLRA 136</b> ) <input checked="" type="checkbox"/> Umbric Surface (F13) ( <b>MLRA 122, 136</b> ) <input type="checkbox"/> Piedmont Floodplain Soils (F19) ( <b>MLRA 148</b> ) <input type="checkbox"/> Red Parent Material (F21) ( <b>MLRA 127, 147, 148</b> )	<b>Indicators for Problematic Hydric Soils<sup>3</sup>:</b> <input type="checkbox"/> 2 cm Muck (A10) ( <b>MLRA 147</b> ) <input type="checkbox"/> Coast Prairie Redox (A16) ( <b>MLRA 147, 148</b> ) <input checked="" type="checkbox"/> Piedmont Floodplain Soils (F19) ( <b>MLRA 136, 147</b> ) <input type="checkbox"/> Red Parent Material (F21) ( <b>outside MLRA 127, 147, 148</b> ) <input type="checkbox"/> Very Shallow Dark Surface (F22) <input type="checkbox"/> Other (Explain in Remarks)
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<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

<b>Restrictive Layer (if observed):</b> Type: _____ Depth (inches): _____	<b>Hydric Soil Present?</b> Yes <u>X</u> No _____
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Remarks: