

Appendix E

Water Resources

APPENDIX E:

Water Resources

The following attachments are included in this appendix to support the water resources analysis:

- Attachment 1: BWI Marshall Airport Wetland Delineation Report, CRI, February 2, 2023.
- Attachment 2: Stormwater Management Report, HNTB, February 2024.
- Attachment 3: MDE pre-application site visit meeting minutes, Draft, December 14, 2023.
- Attachment 4: MDE Nontidal Wetlands and Waterways Pre-Application Summary, December 14, 2023.

Attachment 1:

BWI Marshall Airport Wetland Delineation Report

CRI

February 2, 2023



MEMORANDUM

DATE: February 2, 2023

TO: Dan Hinder, Maryland Aviation Administration

FROM: Emma Beck, Coastal Resources, Inc.

CC: Kim Hughes, HNTB Corporation

SUBJECT: Baltimore/Washington International Thurgood Marshall Airport Line of Sight Project – Waters of the U.S., Including Wetlands, Delineation

1.0 Introduction

Coastal Resources, Inc. (CRI), sub-consultant to HNTB Corporation (HNTB), under contract to the Maryland Department of Transportation Maryland Aviation Administration (MDOT MAA), has completed a waters of the U.S., including wetlands, delineation at the Baltimore/Washington International (BWI) Thurgood Marshall Airport in Anne Arundel County, Maryland. Field investigations were conducted between October 19, 2022, and December 2, 2022. The study area is a 23.6-acre designated area north of Taxiway F and west of Runway 15R-33L in Hanover, Maryland, (**Appendix A**). Land use classifications within and adjacent to the study area include forest and commercial. The proposed project occurs within the Patapsco River, Lower North Branch watershed (MDE 8-digit 02130906), within the Coastal Plain physiographic province (MGS, 2008).

MDOT MAA is proposing to remove trees within the study area north of existing Taxiway F that have been identified as obstructions to the Federal Aviation Regulations (FAR) Part 77 airspace protective surfaces. The Part 77 obstructions were identified for removal under a recent Environmental Assessment (EA) that received a Finding of No Significant Impact/Record of Decision (FONSI/ROD) in November 2020. A portion of the trees within the study area, including Part 77 tree obstructions, will impede line-of-sight (LOS) from the existing/future Air Traffic Control Towers to the future Taxiway F end.

2.0 Methodology

The study area was field investigated to verify previously delineated boundaries and to identify and locate any new boundaries of waters of the U.S., including wetlands (WOTUS). The previous wetland delineation used during the field verification received a jurisdictional determination (JD) from the U.S. Army Corps of Engineers (USACE) in 2000 (see **Appendix F**). The original boundaries of the previously delineated features



reviewed in 2022 are depicted on the Waters of the U.S. (Including Wetlands) Delineation Map (**Appendix B**).

Prior to the field investigation, background information was reviewed, including the previous wetland delineation, United States Fish & Wildlife Service (USFWS) National Wetland Inventory and Maryland Department of Natural Resources (NWI/MDNR) wetland maps, and the Natural Resource Conservation Service (NRCS) Soil Survey Maps for Anne Arundel County, Maryland.

During the field investigation, previously delineated wetlands and new possible wetland areas were assessed in accordance with the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic Gulf and Coastal Plain Region, Version 2.0* (USACE 2010). This methodology requires interpretation of a three-parameter approach representing hydrology, vegetation, and soils, which are the main components of a wetland. Soils were sampled using three-inch diameter Dutch augers and Munsell Color charts were used to identify color (Munsell 1975). The wetland indicator status of the observed vegetation was identified using the *National Wetland Plant List* (NWPL) (Lichvar 2020). Where wetland characteristics were highly similar between systems, CRI used one wetland test plot to characterize similar systems by completing one Wetland Determination Data Form (USACE 2010). Upland test plots were also established in any areas where the wetland boundary was questionable. Any newly identified wetland boundaries or previously delineated wetland boundaries that were delineated or adjusted during the field investigation were surveyed using a Global Navigation Satellite System (GNSS) unit. Additionally, stream characteristics were recorded for each identified watercourse on a stream field datasheet (see **Appendix E**). All identified waters of the U.S., including wetlands, were classified according to a *Classification of Wetland and Deep-Water Habitats in the United States* (USFWS 1979). Each wetland and watercourse were photographed, and a photo log was compiled (see **Appendix D**). All datasheets are included in **Appendix E**.

3.0 Results

During the field investigations, eight waters of the U.S., including three streams and five wetlands were identified within the study area. The boundaries of wetlands WL1, WL3, and WL4 changed noticeably from the 2000 delineation, and one area did not meet all three wetland parameters where a previously delineated wetland was mapped. Wetland types included wetlands found on hillslopes and in depressions. Cowardin classifications included palustrine scrub-shrub (PSS) and palustrine forested (PFO). Watercourses were identified as lower perennial (R2), upper perennial (R3), intermittent (R4), and ephemeral. Data were collected at two representative wetland test plots that characterize the identified wetland types and Cowardin classifications. The locations of these resources and test plot locations are shown on the detailed maps provided in **Appendix B**. A brief narrative describing the overall nature of the delineated resources by cover type is included below. Details regarding wetland hydrology, hydrophytic vegetation, and hydric soil indicators observed at each wetland test plot can be found in the Wetland Summary Table located in **Appendix C** and on the datasheets provided in **Appendix E**. Characteristics of each watercourse can be found in **Appendix C**.

PSS Wetlands

Two PSS wetlands were delineated within the study area: WL1 and WL2. Test Plot WL1-WET characterizes these wetlands, which are classified as palustrine scrub-shrub with a seasonally saturated water regime

(PSS1B). Hydrologic indicators observed during the site visit included saturation and dry-season water table. Vegetation met the Dominance Test for Hydrophytic Vegetation, as 57 percent of vegetation within this plot is considered FAC, FACW, or OBL. Dominant species within this plot include black willow (*Salix nigra*), callery pear (*Pyrus calleryana*), red maple (*Acer rubrum*), southern arrow-wood (*Viburnum dentatum*), common persimmon (*Diospyros virginiana*), sensitive fern (*Onoclea sensibilis*), and Japanese honeysuckle (*Lonicera japonica*). Soils within this wetland are mapped as Patapsco-Fort Mott, which is not considered hydric by NRCS. However, soils in this plot met the Depleted Matrix (F3) and Redox Dark Surface (F6) hydric soil indicators.

PFO Wetlands

Three PFO wetlands were delineated within the study area: WL3, WL4, and WL5. Test Plot WL3-WET characterizes these wetlands, which are classified as palustrine forested with a temporarily flooded/seasonally saturated water regime (PFO1A/B). Hydrologic indicators observed during the site visit included surface water, dry-season water table, and geomorphic position. Vegetation met the Dominance Test for Hydrophytic Vegetation, as 86 percent of vegetation within this plot is considered FAC, FACW, or OBL. Dominant species within this plot include red maple, tuliptree (*Liriodendron tulipifera*), southern arrow-wood, New York fern (*Parathelypteris novaboracensis*), Asiatic tearthumb (*Persicaria perfoliata*), and horsebrier (*Smilax rotundifolia*). Soils within this wetland are mapped as Patapsco-Fort Mott, which is not considered hydric by NRCS. However, soils in this plot met the Redox Dark Surface (F6) hydric soil indicator.

Watercourse 1

Watercourse 1 (WC1) is Kitten Branch, a lower perennial stream with a cobble, gravel, sand, and mud substrate (R2UB1/2/3) that flows from a culvert at Taxiway F and continues north outside the study area. The channel averages 15 feet wide, with a depth of approximately three feet. During the site visit, the average water depth was 16 inches. Habitat complexity was considered low overall as significant amounts of iron flocculant were observed, however some riffle/pool sequences, a mix of substrates, overhanging vegetation, and some large woody debris were present. Bank erosion was considered moderate overall as there were some areas of severe erosion, but most banks were healed over. Approximately 60 percent of the channel was shaded by woody species.

Watercourse 2

Watercourse 2 (WC2) is an upper perennial stream with a cobble, gravel, sand, mud, and riprap substrate (R3UB1/2/3) that flows west from a culvert into WC1 and abuts WL1. The channel averages three feet wide, with a depth of approximately one and one-half feet. During the site visit, the average water depth was six inches. Habitat complexity was considered low overall as significant amounts of iron flocculant were observed, there were few riffles or shallow pools, and limited large woody debris was present. Bank erosion was considered minor overall as there were a few areas of erosion, but most banks were healed over. Approximately 40 percent of the channel was shaded by woody species.

Watercourse 3

Watercourse 3 (WC3) is an ephemeral and intermittent stream with a mud and sand substrate (R4SB4) that flows east through the study area to a culvert running under Taxiway W. WC3 outlets east of Taxiway W where it continues northeast outside the study area. The channel averages three feet wide, with a

depth of approximately one foot. During the site visit there was no surface flow, but hydric soils were present in the intermittent portion of the channel. Habitat complexity was considered low overall as the channel lacked instream habitat features, was ditched in portions of the ephemeral section, and is subject to flashy, intermittent flows. Bank erosion was considered moderate overall as the channel was incised but had no exposed banks. Approximately 80 percent of the channel was shaded by woody species.

4.0 Conclusions

A total of eight waters of the U.S., including three streams and five wetlands were identified within the study area. Disturbances to these WOTUS systems may require a permit from the USACE and Maryland Department of the Environment (MDE). All wetland boundaries are not considered final until a jurisdictional determination (JD) has been issued by the USACE.

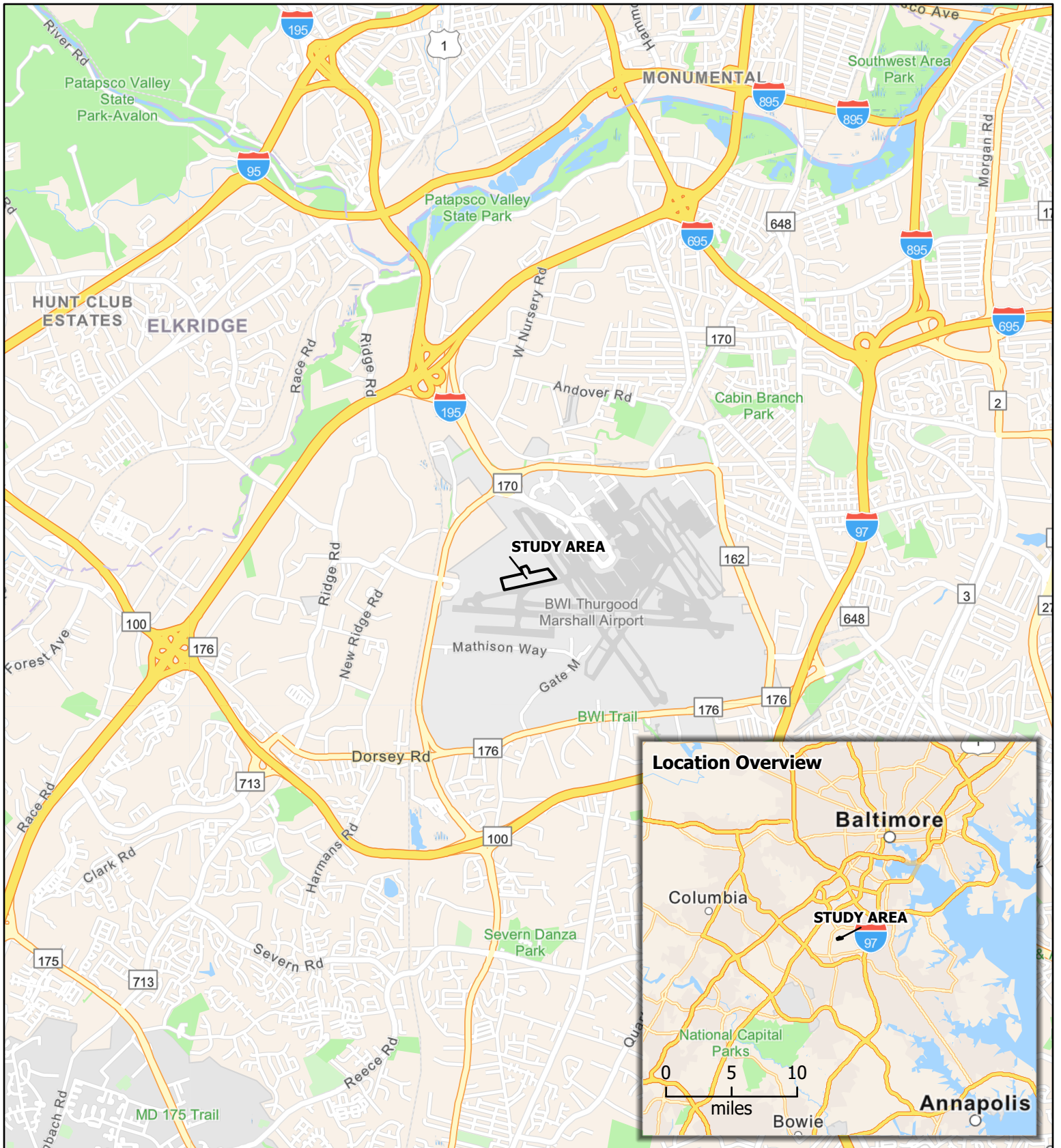
5.0 Literature Cited

- Lichvar, Robert W., M. Butterwick, N.C. Melvin, and W.N. Kirchner. 2016. *The National Wetland Plant List: 2020 Update of Wetland Ratings*. Phytoneuron 2014-41:1-42.
- MGS. 2008. *Physiographic Map of Maryland*. Available online at: www.mgd.md.gov.
- Munsell.1975. *Munsell Soil Color Charts*. MacBeth Division of Kollmorgen Instruments Corporation, Baltimore, Maryland.
- USACE. 2010. *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region, Version 2.0*. eds. JS Wakeley, RW Lichvar, and CV Noble. U.S. Army Engineer Research and Development Center. Vicksburg, MS. Report# ERDC/EL TR-10-20.
- U.S. Department of Agriculture, Natural Resources Conservation Service. 2014. Soil Survey Geographic (SSURGO) Database for Anne Arundel County, Maryland. Available online: <http://websoilsurvey.nrcs.usda.gov>
- U.S. Fish and Wildlife Service (USFWS). 1979. *Classification of Wetlands and Deepwater Habitats of the United States*. eds. Cowardin LM, Carter V, Golet FC, LaRoe ET. Washington D.C. Report #FWS/OBS-79/31.
- USFWS. 1988. *National List of Plant Species That Occur in Wetlands: Northeast (Region 1)*. ed. Reed PB. National Ecology Research Center. St. Petersburg, FL. Biological Report 88 (26.1).



APPENDIX A: VICINITY MAP

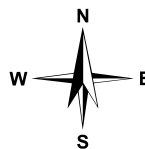




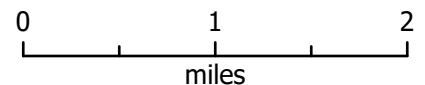
**Baltimore/Washington International
Thurgood Marshall Airport
Line of Sight Project**

**Appendix A:
Vicinity Map**

Anne Arundel County, Maryland
January 2023

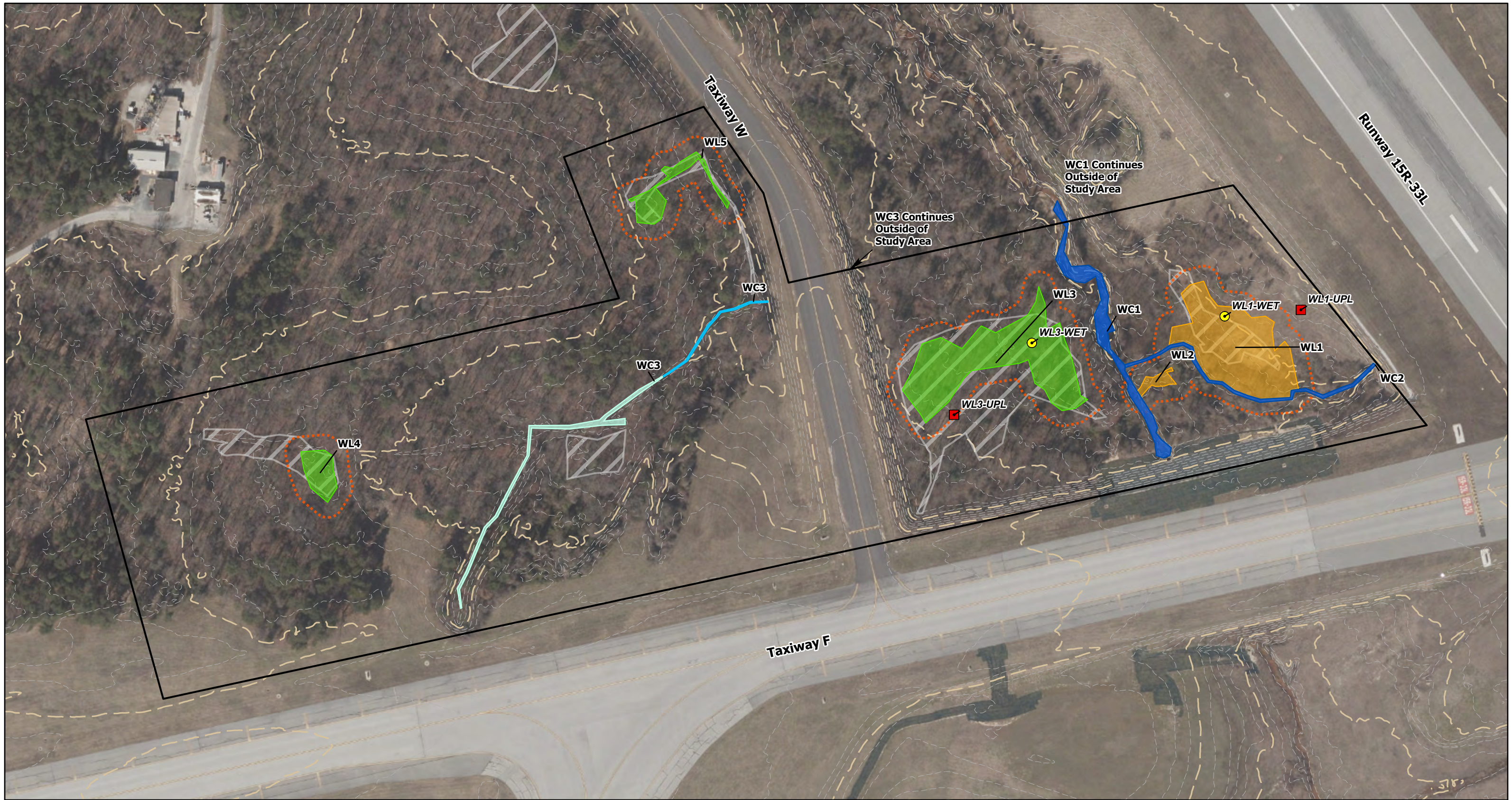


 Study Area



**APPENDIX B: WATERS OF THE U.S., INCLUDING WETLANDS
DELINEATION MAP**



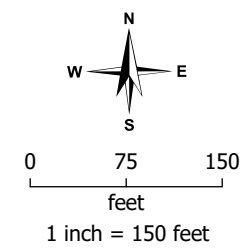


Baltimore/Washington International Thurgood Marshall Airport Line of Sight Project

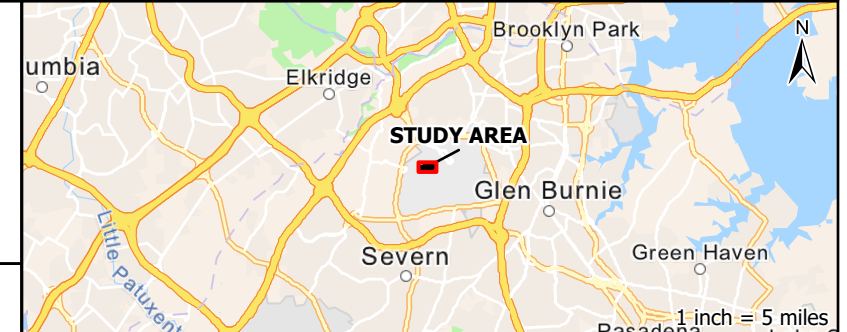
Appendix B:
Waters of the U.S. (Including Wetlands) Delineation Map
Sheet 1 of 1

Anne Arundel County, Maryland
January 2023

- Study Area
- 2' Contour
- Upland Test Plot
- Wetland Test Plot
- Wetland 25-FT Buffer
- Previously Delineated Wetland
- Ephemeral Stream
- Intermittent Stream
- Perennial Stream
- Palustrine Scrub-shrub Wetland
- Palustrine Forested Wetland



Map Center, NAD83
39.1782°, -76.6803°



Source: Large-scale map: Maryland iMAP, DoIT. Imagery flown in 2019 (Eastern Shore) and 2020 (Western Shore). Received January 2023. Small-scale map: Esri, HERE, Garmin, FAO, NOAA, USGS, OpenStreetMap contributors, and the GIS user community. Received January 2023.

APPENDIX C: WOTUS SUMMARY TABLES



Appendix C: WOTUS Summary Tables
Baltimore/Washington International Thurgood Marshall Airport Line of Site (LOS) Project

Watercourse Summary Table								
Watercourse Number	Delineated Length/Area	Cowardin Classification	Nearest Downstream Named Stream	Use Class	Channel Characteristics			Comments
					Average Channel Width (ft)	Average Channel Depth (ft)	Average Water Depth (in)	
WC1 (Kitten Branch)	469	R2UB1/2/3	Stoney Run	I	15	3	16	Flows northwest through study area, abuts WL2, manipulated, iron flocculant
WC2	491	R3UB1/2/3	Kitten Branch	I	3	1.5	6	Flows west to WC1; abuts WL1; manipulated, iron flocculant
WC3	838	R4SB4 ephemeral	Kitten Branch	I	3	1	0	Flows east to WC1 with an ephemeral upper portion; manipulated

Wetland Summary Table								
Wetland Number	Representative Plot ID	Delineated Area (Acres)	Cowardin Classification (Wetland Type)	Hydrology	Dominant Vegetation			Soils
					Common Name	Scientific Name	Indicator Status	
WL1 WL2	WL1-WET	0.51 0.03	PSS1B (Hillslope)	Saturation, Dry-Season Water Table	Black willow Callery pear Red maple Common persimmon Southern arrow-wood Sensitive fern Japanese honeysuckle	<i>Salix nigra</i> <i>Pyrus calleryana</i> <i>Acer rubrum</i> <i>Diospyros virginiana</i> <i>Viburnum dentatum</i> <i>Onoclea sensibilis</i> <i>Lonicera japonica</i>	OBL UPL FAC FAC FAC FACW FACU	Patapsco-Fort Mott Complex Redox Dark Surface (F6) 0-8 inches of 10YR3/2 with 5YR3/4 redox concentrations, sandy clay loam
WL3 WL4 WL5	WL3-WET	0.58 0.08 0.09	PFO1A/B (Depression)	Surface Water, Dry-Season Water Table, Geomorphic Position	Red maple Tuliptree Southern arrow-wood New York fern Asiatic tearthumb Horsebrier	<i>Acer rubrum</i> <i>Liriodendron tulipifera</i> <i>Viburnum dentatum</i> <i>Parathelypteris noveboracensis</i> <i>Persicaria perfoliata</i> <i>Smilax rotundifolia</i>	FAC FACU FAC FAC FAC FAC FAC	Patapsco-Fort Mott Complex Depleted Matrix (F3) 1-6 inches of 2Y6/2 with 5YR5/8 redox concentrations, clay loam Redox Dark Surface (F6) 5-10 inches of 10YR3/1 with 7.5YR3/3 redox concentrations, loamy clay

APPENDIX D: PHOTOGRAPH LOG



Appendix D: Waters of the U.S. Photograph Log
Baltimore/Washington International Thurgood Marshall Airport Line of Site (LOS) Project

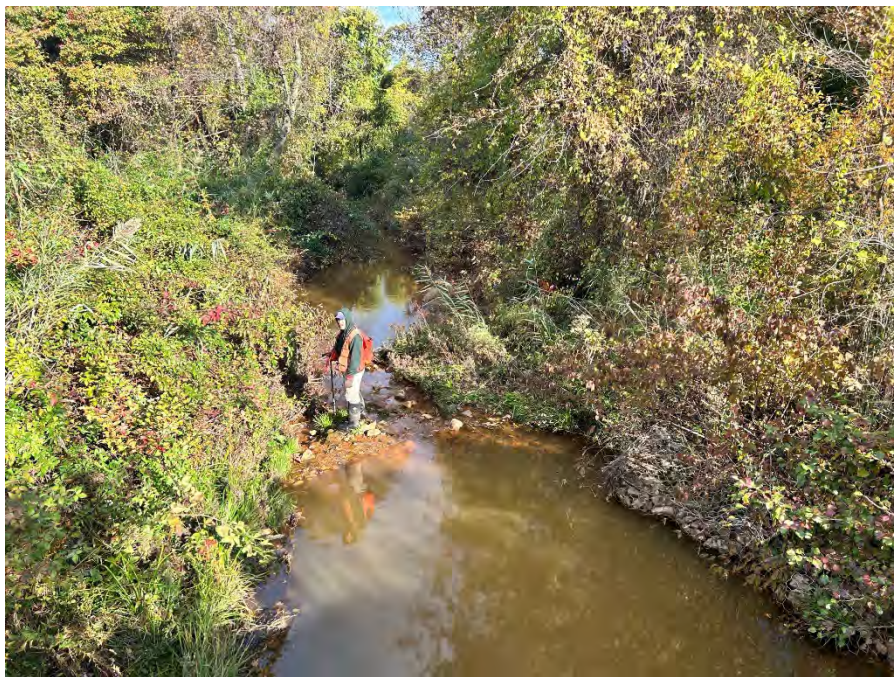


Photo 1. Looking downstream at WC1 (Kitten Branch), a perennial stream located in the central portion of the study area.



Photo 2. Looking upstream at WC1.



Photo 3. Looking downstream at WC2, a perennial stream.

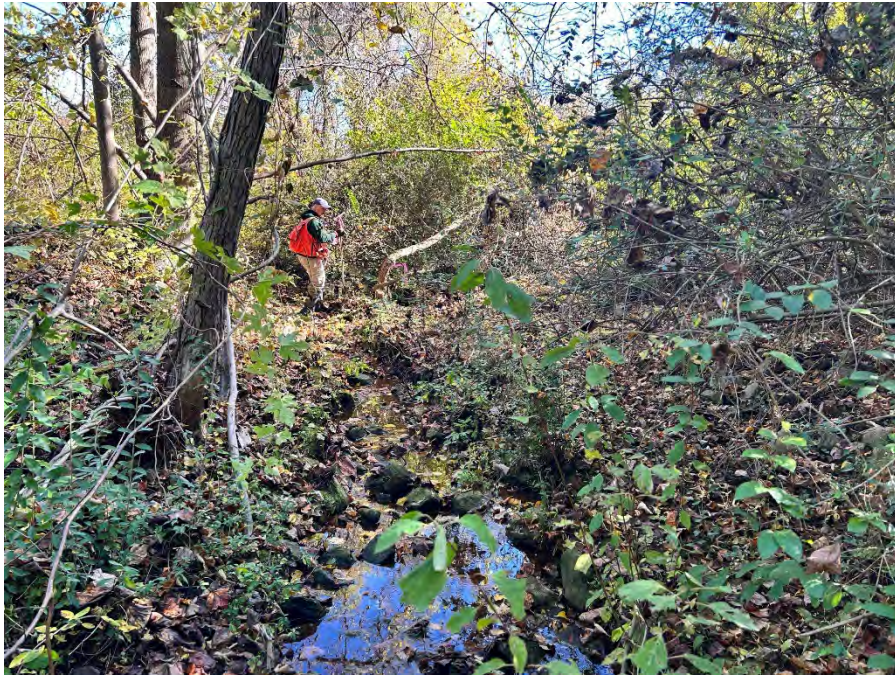


Photo 4. Looking upstream at WC2.



Photo 5. Looking upstream at the intermittent portion of WC3.



Photo 6. Looking upstream at the ephemeral portion of WC3.



Photo 7. Looking east at WL1 and representative PSS test plot WL1-WET.



Photo 8: Looking east at upland test plot WL1-UPL.



Photo 9: Looking west at WL2, a PSS wetland.



Photo 10: Looking west at WL3 and representative PFO test plot WL3-WET.



Photo 11: Looking east at upland test plot WL3-UPL.



Photo 12: Looking west at WL4, a PFO wetland.



Photo 13: Looking west at WL5, a PFO wetland.

APPENDIX E: WOTUS DATASHEETS



Non-tidal Stream Features Field Datasheet

Date: 10/19/22 Project Site: BWE LOS Stream ID: WC1

Observer(s): EB, SS Photos: Upstream: Downstream:

Flow Type:

Perennial Intermittent Ephemeral Cowardin Classification: R2UB1/2/3

Justification: Named stream (Kitten Branch), strong flow during dry period of year

Channel Characteristics:

Natural Artificial (made-made) Manipulated (man-altered)

Explain: Rip-rap + culvert at upstream end

Channel Gradient (%): 1-2 Average Bank Slope: Vertical 2:1 3:1 4:1 or greater

Channel Has (check all that apply):

- Bed and banks
- OHWM
 - clear, natural line impressed on the bank
 - changes in character of soil
 - shelving
 - vegetation matted down, bent, or absent
 - leaf litter disturbed or washed away
 - sediment deposition
 - water staining
 - the presence of litter and debris
- Discontinuous OHWM (explain): _____
- destruction of terrestrial vegetation
- the presence of wrack line
- sediment sorting
- scour
- multiple observed or predicted flow events
- abrupt change in plant community
- other (list): _____

Avg. Channel Width: 15 Depth: 3' on average Avg. Water Depth: 16"

Hydrological Connectivity: Flow direction: North

Upstream: continuous Downstream: continues Adjacent/abutting: WC2

Substrate: Bedrock Rubble Cobble Gravel Sand
 Mud Organic Vegetated Other _____

Habitat Complexity (characterize): riffle-pool sequence, w/ some deep + shallow pools
Mix of substrate + overhanging veg. Some LWD present. Overall low complexity

Bank Erosion: Severe Moderate Minor

Describe: A few areas of severe, but most of erosion healed over.

Pollutants (field observations, potential sources, stormwater outfalls, etc.): stream heavily turbid
due to run-off from airfield and associated pollutants.

Wildlife Observations: Some frogs present

Riparian Zone: facing DS

Describe (forest, residential yard, emergent wetland, etc.):

Right bank: young forest + early succession Left bank: mid-succession forest + scrub shrub.

Riparian Buffer Width: 7100' Approximate Shading by Woody Species (%): 60

Dominant species: Liriodendron tulipifera, Galatris orbiculata

Other Comments: Riparian zone overgrown w/ invasives

Non-tidal Stream Features Field Datasheet

Date: 10/19/22 Project Site: BWI LOS Stream ID: WC2

Observer(s): EB, SS Photos: Upstream: ✓ Downstream: ✓

Flow Type:

Perennial Intermittent Ephemeral Cowardin Classification: R3UB1/2/3

Justification: A 2" of flow during dry period of year

Channel Characteristics:

Natural Artificial (made-made) Manipulated (man-altered)

Explain: culvert @ US end, rip-rap throughout

Channel Gradient (%): 3-4 Average Bank Slope: Vertical 2:1 3:1 4:1 or greater

Channel Has (check all that apply):

- Bed and banks
- OHWM
 - clear, natural line impressed on the bank
 - changes in character of soil
 - shelving
 - vegetation matted down, bent, or absent
 - leaf litter disturbed or washed away
 - sediment deposition
 - water staining
 - the presence of litter and debris
- destruction of terrestrial vegetation
- the presence of wrack line
- sediment sorting
- scour
- multiple observed or predicted flow events
- abrupt change in plant community
- other (list):

Discontinuous OHWM (explain):

Avg. Channel Width: 3' Depth: 1.5' on ave Avg. Water Depth: 6"

Hydrological Connectivity: Flow direction: west

Upstream: culvert Downstream: WC1 Adjacent/abutting: WC2

Substrate: Bedrock Rubble Cobble Gravel Sand
 Mud Organic Vegetated Other

Habitat Complexity (characterize): Low complexity, few riffles, shallow pools, little LWJ.

Bank Erosion: Severe Moderate Minor

Describe: few areas of erosion, mostly beaded over

Pollutants (field observations, potential sources, stormwater outfalls, etc.): High turbidity + orange

floc in channel, potential pollutants from airport runoff

Wildlife Observations: Raccoon

Riparian Zone: (DS)

Describe (forest, residential yard, emergent wetland, etc.):

Right bank: scrub-shrub Left bank: scrub shrub

Riparian Buffer Width: 60' Approximate Shading by Woody Species (%): 40

Dominant species: Liriodendron tulipifera, Salix nigra, Lonicera japonica

Other Comments: Myrica australis

Non-tidal Stream Features Field Datasheet

Date: 10/25/22 Project Site: BW1 LOS Stream ID: WC3
 Observer(s): EB, LE Photos: Upstream: Downstream:

Flow Type:

Perennial Intermittent Ephemeral Cowardin Classification: R4SB4

Justification: Small stream w/ no flow, hydric soils in intermittent portion

Channel Characteristics:

Natural Artificial (made-made) Manipulated (man-altered)

Explain: Channel most likely man-made or manipulated to direct surface runoff

Channel Gradient (%): 5% Average Bank Slope: Vertical 2:1 3:1 4:1 or greater

Channel Has (check all that apply):

- Bed and banks
- OHWM
 - clear, natural line impressed on the bank
 - changes in character of soil
 - shelving
 - vegetation matted down, bent, or absent
 - leaf litter disturbed or washed away
 - sediment deposition
 - water staining
 - the presence of litter and debris
- destruction of terrestrial vegetation
- the presence of wrack line
- sediment sorting
- scour
- multiple observed or predicted flow events
- abrupt change in plant community
- other (list): _____

Discontinuous OHWM (explain): _____

Avg. Channel Width: 3' Depth: 1' Avg. Water Depth: 0"

Hydrological Connectivity: Flow direction: E

Upstream: None Downstream: Outside SA Adjacent/abutting: WL5

Substrate: Bedrock Rubble Cobble Gravel Sand
 Mud Organic Vegetated Other _____

Habitat Complexity (characterize): Poor, lacks instream habitat features + subject to flashy, intermittent flows

Bank Erosion: Severe Moderate Minor

Describe: Incised channel but no raw/exposed banks

Pollutants (field observations, potential sources, stormwater outfalls, etc.): Airfield runoff

Wildlife Observations: None

Riparian Zone:

Describe (forest, residential yard, emergent wetland, etc.):

Right bank: Forest Left bank: Forest

Riparian Buffer Width: 100' Approximate Shading by Woody Species (%): 80

Dominant species: LTM, NYSY, VIDE, SMRD, ACRU

Other Comments: _____

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: BWI LOS Project, City/County: Anne Arundel Sampling Date: 10/19/22
 Applicant/Owner: MAA State: MD Sampling Point: WLI-WET
 Investigator(s): EB, SS Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): convex Slope (%): 5
 Subregion (LRR or MLRA): MLRA 149A Lat: 39.178575 Long: -76.677151 Datum: NAD83(2011)
 Soil Map Unit Name: Patapsco-Fort Mott complex, 5-10% slopes NWI classification: N/A
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? N Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? N (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____
Remarks: <p align="center" style="font-size: 1.2em;">plot #5-East Plot characterizes slope wetland abutting WC2. P551B</p>	

HYDROLOGY

<p>Wetland Hydrology Indicators:</p> <p><u>Primary Indicators (minimum of one is required; check all that apply)</u></p> <input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> Aquatic Fauna (B13) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Marl Deposits (B15) (LRR U) <input checked="" type="checkbox"/> Saturation (A3) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Other (Explain in Remarks) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Water-Stained Leaves (B9)	<p><u>Secondary Indicators (minimum of two required)</u></p> <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 checked="" 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"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> FAC-Neutral Test (D5) <input type="checkbox"/> Sphagnum moss (D8) (LRR T, U)
<p>Field Observations:</p> Surface Water Present? Yes <input checked="" type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): <u>None</u> Water Table Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>16"</u> Saturation Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>0"</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> 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: WLI-WET

Tree Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Salix nigra</u>	<u>8</u>	<input checked="" type="checkbox"/>	<u>OBL</u>
2. <u>Populus celteryana</u>	<u>8</u>	<input checked="" type="checkbox"/>	<u>UPL</u>
3. <u>Acer rubrum</u>	<u>12</u>	<input checked="" type="checkbox"/>	<u>FAC</u>
4.			
5.			
6.			
7.			
8.			

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 57 (A/B)

50% of total cover: 14 20% of total cover: 5.6

50% of total cover: 28 = Total Cover

Sapling/Shrub Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Viburnum dentatum</u>	<u>15</u>	<input checked="" type="checkbox"/>	<u>FAC</u>
2. <u>Rubus sp</u>	<u>10</u>		<u>N/A</u>
3. <u>Sambucus nigra</u>	<u>2</u>		<u>FACW</u>
4. <u>Diospyros virginiana</u>	<u>25</u>	<input checked="" type="checkbox"/>	<u>FAC</u>
5. <u>Populus celteryana</u>	<u>5</u>		<u>UPL</u>
6.			
7.			
8.			

Prevalence Index worksheet:

Total % Cover of: _____ Multiply by: _____

OBL species _____ x 1 = _____

FACW species 1 x 2 = _____

FAC species _____ x 3 = 1

FACU species _____ x 4 = _____

UPL species _____ x 5 = _____

Column Totals: 1 (A) _____ (B)

Prevalence Index = B/A = _____

50% of total cover: 28.5 20% of total cover: 11.4

50% of total cover: 57 = Total Cover

Herb Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Impatiens capensis</u>	<u>1</u>	<input checked="" type="checkbox"/>	<u>FACW</u>
2. <u>Oxycoccus sensibilis</u>	<u>15</u>	<input checked="" type="checkbox"/>	<u>FACW</u>
3. <u>Solidago altissima</u>	<u>5</u>		<u>FACU</u>
4. <u>Lonicera japonica</u>	<u>10</u>	<input checked="" type="checkbox"/>	<u>FACU</u>
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			

Hydrophytic Vegetation Indicators:

1 - Rapid Test for Hydrophytic Vegetation

2 - Dominance Test is >50%

3 - Prevalence Index is ≤3.0¹

Problematic Hydrophytic Vegetation¹ (Explain)

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

50% of total cover: 15.5 20% of total cover: 6.2

50% of total cover: 31 = Total Cover

Woody Vine Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>None</u>			
2.			
3.			
4.			
5.			

50% of total cover: _____ 20% of total cover: _____

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 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 No

Remarks: (If observed, list morphological adaptations below).

SOIL

Sampling Point: WLI-WET

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-8	10M 3/2	95	5M 3/4	5	C	M	SaCL	
8-12	2.5M 5/3	60	7.5M 5/6	5	C	M	SaCL	
	10M 4/1	35						
12-14+	2.5M 5/3	90	7.5M 5/6	10	C	M	SaCL	

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)		Indicators for Problematic Hydric Soils ³ :	
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Polyvalue Below Surface (S8) (LRR S, T, U)	<input type="checkbox"/> 1 cm Muck (A9) (LRR O)	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Thin Dark Surface (S9) (LRR S, T, U)	<input type="checkbox"/> 2 cm Muck (A10) (LRR S)	
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (LRR O)	<input type="checkbox"/> Reduced Vertic (F18) (outside MLRA 150A,B)	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (LRR P, S, T)	
<input type="checkbox"/> Stratified Layers (A5)	<input type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Anomalous Bright Loamy Soils (F20) (MLRA 153B)	
<input type="checkbox"/> Organic Bodies (A6) (LRR P, T, U)	<input checked="" type="checkbox"/> Redox Dark Surface (F6)	<input type="checkbox"/> Red Parent Material (TF2)	
<input type="checkbox"/> 5 cm Mucky Mineral (A7) (LRR P, T, U)	<input type="checkbox"/> Depleted Dark Surface (F7)	<input type="checkbox"/> Very Shallow Dark Surface (TF12)	
<input type="checkbox"/> Muck Presence (A8) (LRR U)	<input type="checkbox"/> Redox Depressions (F8)	<input type="checkbox"/> Other (Explain in Remarks)	
<input type="checkbox"/> 1 cm Muck (A9) (LRR P, T)	<input type="checkbox"/> Marl (F10) (LRR U)		
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Ochric (F11) (MLRA 151)		
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Iron-Manganese Masses (F12) (LRR O, P, T)		
<input type="checkbox"/> Coast Prairie Redox (A16) (MLRA 150A)	<input type="checkbox"/> Umbric Surface (F13) (LRR P, T, U)		
<input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR O, S)	<input type="checkbox"/> Delta Ochric (F17) (MLRA 151)		
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Reduced Vertic (F18) (MLRA 150A, 150B)		
<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 149A)		
<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Anomalous Bright Loamy Soils (F20) (MLRA 149A, 153C, 153D)		
<input type="checkbox"/> Dark Surface (S7) (LRR P, S, T, U)			

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

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

Hydric Soil Present? Yes No

Remarks:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: BWI LOS Project City/County: AA Co. Sampling Date: 10/19/22
 Applicant/Owner: MAA State: MD Sampling Point: WLI-LPL
 Investigator(s): SS, EB Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 10%
 Subregion (LRR or MLRA): MLRA 149A Lat: 39.178575 Long: -76.677151 Datum: NAD83(2011)
 Soil Map Unit Name: Patapsco-Fort Matt complex, 5-10% slopes NWI classification: N/A
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? N Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? N (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 _____ No <input checked="" type="checkbox"/> Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/>
Remarks: <u>PH 6-E</u>	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required, check all that apply)</u> ___ Surface Water (A1) ___ Aquatic Fauna (B13) ___ High Water Table (A2) ___ Marl Deposits (B15) (LRR U) ___ Saturation (A3) ___ Hydrogen Sulfide Odor (C1) ___ Water Marks (B1) ___ Oxidized Rhizospheres along Living Roots (C3) ___ Sediment Deposits (B2) ___ Presence of Reduced Iron (C4) ___ Drift Deposits (B3) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Algal Mat or Crust (B4) ___ Thin Muck Surface (C7) ___ Iron Deposits (B5) ___ Other (Explain in Remarks) ___ Inundation Visible on Aerial Imagery (B7) ___ Water-Stained Leaves (B9)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Sparsely Vegetated Concave Surface (B8) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ FAC-Neutral Test (D5) ___ Sphagnum moss (D8) (LRR T, U)
Field Observations: Surface Water Present? Yes _____ No _____ Depth (inches): _____ Water Table Present? Yes _____ No _____ Depth (inches): _____ Saturation Present? Yes _____ No _____ Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: 	
Remarks:	

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

Sampling Point: WLI-UPL

Tree Stratum (Plot size: 30')

	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>None</u>			
2.			
3.			
4.			
5.			
6.			
7.			
8.			

_____ = Total Cover
50% of total cover: _____ 20% of total cover: _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 25.2 (A/B)

Sapling/Shrub Stratum (Plot size: 30')

	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Pyrus calleryana</u>	<u>8</u>	<input checked="" type="checkbox"/>	<u>UPL</u>
2. <u>Populus deltoides</u>	<u>5</u>	<input checked="" type="checkbox"/>	<u>FAC</u>
3.			
4.			
5.			
6.			
7.			
8.			

_____ = Total Cover
50% of total cover: 6.5 20% of total cover: 2.6

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____	(A) _____ (B) _____

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

1 - Rapid Test for Hydrophytic Vegetation

2 - Dominance Test is >50%

3 - Prevalence Index is ≤3.0¹

Problematic Hydrophytic Vegetation¹ (Explain)

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

Herb Stratum (Plot size: 15')

	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Solidago altissima</u>	<u>55</u>	<input checked="" type="checkbox"/>	<u>FACU</u>
2. <u>Eichharia crinitifolia</u>	<u>5</u>		<u>FAC</u>
3. <u>Solidago rugosa</u>	<u>3</u>		<u>FAC</u>
4. <u>Lonicera japonica</u>	<u>15</u>		<u>FACU</u>
5. <u>Leptodermis dimorpha</u>	<u>40</u>	<input checked="" type="checkbox"/>	<u>FACU</u>
6. <u>Toxicodendron radicans</u>	<u>3</u>		<u>FAC</u>
7.			
8.			
9.			
10.			
11.			
12.			

_____ = Total Cover
50% of total cover: 60.5 20% of total cover: 24.2

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 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.

Woody Vine Stratum (Plot size: 30')

	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>None</u>			
2.			
3.			
4.			
5.			

_____ = Total Cover
50% of total cover: _____ 20% of total cover: _____

Hydrophytic Vegetation Present? Yes _____ No

Remarks: (If observed, list morphological adaptations below).

SOIL

Sampling Point: WLI-WPL

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-8	10YR 3/3	100					LS	
8-12+	10YR 5/4	99	10YR 4/6	1	C	M	LS	

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)	Indicators for Problematic Hydric Soils ³ :
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Polyvalue Below Surface (S8) (LRR S, T, U)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Thin Dark Surface (S9) (LRR S, T, U)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (LRR O)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)
<input type="checkbox"/> Stratified Layers (A5)	<input type="checkbox"/> Depleted Matrix (F3)
<input type="checkbox"/> Organic Bodies (A6) (LRR P, T, U)	<input type="checkbox"/> Redox Dark Surface (F6)
<input type="checkbox"/> 5 cm Mucky Mineral (A7) (LRR P, T, U)	<input type="checkbox"/> Depleted Dark Surface (F7)
<input type="checkbox"/> Muck Presence (A8) (LRR U)	<input type="checkbox"/> Redox Depressions (F8)
<input type="checkbox"/> 1 cm Muck (A9) (LRR P, T)	<input type="checkbox"/> Marl (F10) (LRR U)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Ochric (F11) (MLRA 151)
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Iron-Manganese Masses (F12) (LRR O, P, T)
<input type="checkbox"/> Coast Prairie Redox (A16) (MLRA 150A)	<input type="checkbox"/> Umbric Surface (F13) (LRR P, T, U)
<input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR O, S)	<input type="checkbox"/> Delta Ochric (F17) (MLRA 151)
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Reduced Vertic (F18) (MLRA 150A, 150B)
<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 149A)
<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Anomalous Bright Loamy Soils (F20) (MLRA 149A, 153C, 153D)
<input type="checkbox"/> Dark Surface (S7) (LRR P, S, T, U)	

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

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

Hydric Soil Present? Yes _____ No

Remarks:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: BWI LOS Project City/County: AA Co Sampling Date: 10/25/22
 Applicant/Owner: MAA State: MD Sampling Point: WL3-WET
 Investigator(s): EB, LE Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 27
 Subregion (LRR or MLRA): MLRA 149A Lat: 39.17843 Long: -76.678714 Datum: NAD83 (2011)
 Soil Map Unit Name: Patapsco-Fort Mott complex, 5-10% slopes NWI classification: N/A
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? N Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? N (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____
Remarks: <div style="font-size: 1.2em; font-family: cursive;"> PH1-W PFO1A/B </div>	

HYDROLOGY

Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
<u>Primary Indicators (minimum of one is required; check all that apply)</u>	
<input checked="" type="checkbox"/> Surface Water (A1) _____ <input type="checkbox"/> High Water Table (A2) _____ <input type="checkbox"/> Saturation (A3) _____ <input type="checkbox"/> Water Marks (B1) _____ <input type="checkbox"/> Sediment Deposits (B2) _____ <input type="checkbox"/> Drift Deposits (B3) _____ <input type="checkbox"/> Algal Mat or Crust (B4) _____ <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"/> 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 checked="" type="checkbox"/> Dry-Season Water Table (C2) _____ <input type="checkbox"/> Crayfish Burrows (C8) _____ <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) _____ <input checked="" type="checkbox"/> Geomorphic Position (D2) _____ <input type="checkbox"/> Shallow Aquitard (D3) _____ <input type="checkbox"/> FAC-Neutral Test (D5) _____ <input type="checkbox"/> Sphagnum moss (D8) (LRR T, U) _____
Field Observations: Surface Water Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>0.5"*</u> Water Table Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>22"</u> Saturation Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>18"</u> (includes capillary fringe)	
Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:	
Remarks: <div style="font-size: 1.2em; font-family: cursive;"> *Surface water present in approximately 5% of plot. Light precipitation in past 12 hours PDSI for NE region currently </div>	

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

Sampling Point: WL3-WET

Tree Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. <i>Acer rubrum</i>	30	✓	FAC	Number of Dominant Species That Are OBL, FACW, or FAC: <u>6</u> (A)
2. <i>Liriodendron tulipifera</i>	8	✓	FACU	Total Number of Dominant Species Across All Strata: <u>7</u> (B)
3. _____	_____	_____	_____	Percent of Dominant Species That Are OBL, FACW, or FAC: <u>86%</u> (A/B)
4. _____	_____	_____	_____	Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
38 = Total Cover 50% of total cover: <u>19</u> 20% of total cover: <u>7.6</u>				
Sapling/Shrub Stratum (Plot size: <u>30'</u>)				
1. <i>Liriodendron tulipifera</i>	15	✓	FACU	
2. <i>Lonicera japonica</i>	10		FAC	
3. <i>Viburnum dentatum</i>	20	✓	FACW	
4. <i>Kuhnia pennsylvanica</i>	5		FAC	
5. <i>Sambucus nigra</i>	5		FACW	
6. <i>Clethra alnifolia</i>	5		FACW	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
60 = Total Cover 50% of total cover: <u>30</u> 20% of total cover: <u>12</u>				
Herb Stratum (Plot size: <u>15'</u>)				
1. <i>Parathelypteris novaboracensis</i>	20	✓	FAC	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 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.
2. <i>Lonicera japonica</i>	8		FACU	
3. <i>Persicaria perfoliata</i>	15	✓	FAC	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
43 = Total Cover 50% of total cover: <u>21.5</u> 20% of total cover: <u>8.6</u>				
Woody Vine Stratum (Plot size: <u>30'</u>)				
1. <i>Smilax rotundifolia</i>	15	✓	FAC	Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
2. <i>Toxicodendron radicans</i>	3		FAC	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
18 = Total Cover 50% of total cover: <u>9</u> 20% of total cover: <u>3.6</u>				
Remarks: (If observed, list morphological adaptations below).				

SOIL

Sampling Point: WL3-WET

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-1	2.5YR3/3	75					C	
	5YR4/4	15						
1-5	2.5Y/2	95	5YR5/8	5	C	PL, M	LC	
5-10	10YR3/1	95	7.5YR3/3	5	C	M	LC	
10-18+	10YR2/1	100					SALC	much presence

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Polyvalue Below Surface (S8) (LRR S, T, U)	<input type="checkbox"/> 1 cm Muck (A9) (LRR O)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Thin Dark Surface (S9) (LRR S, T, U)	<input type="checkbox"/> 2 cm Muck (A10) (LRR S)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (LRR O)	<input type="checkbox"/> Reduced Vertic (F18) (outside MLRA 150A,B)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (LRR P, S, T)
<input type="checkbox"/> Stratified Layers (A5)	<input checked="" type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Anomalous Bright Loamy Soils (F20)
<input type="checkbox"/> Organic Bodies (A6) (LRR P, T, U)	<input checked="" type="checkbox"/> Redox Dark Surface (F6)	(MLRA 153B)
<input type="checkbox"/> 5 cm Mucky Mineral (A7) (LRR P, T, U)	<input type="checkbox"/> Depleted Dark Surface (F7)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Muck Presence (A8) (LRR U)	<input type="checkbox"/> Redox Depressions (F8)	<input type="checkbox"/> Very Shallow Dark Surface (TF12)
<input type="checkbox"/> 1 cm Muck (A9) (LRR P, T)	<input type="checkbox"/> Marl (F10) (LRR U)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Ochric (F11) (MLRA 151)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Iron-Manganese Masses (F12) (LRR O, P, T)	³ Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.
<input type="checkbox"/> Coast Prairie Redox (A16) (MLRA 150A)	<input type="checkbox"/> Umbric Surface (F13) (LRR P, T, U)	
<input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR O, S)	<input type="checkbox"/> Delta Ochric (F17) (MLRA 151)	
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Reduced Vertic (F18) (MLRA 150A, 150B)	
<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 149A)	
<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Anomalous Bright Loamy Soils (F20) (MLRA 149A, 153C, 153D)	
<input type="checkbox"/> Dark Surface (S7) (LRR P, S, T, U)		

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

Hydric Soil Present? Yes No

Remarks:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: BWI LOS Project City/County: AA Co Sampling Date: 10/25/22
 Applicant/Owner: MAA State: MD Sampling Point: W/L3-UPL
 Investigator(s): EB, LE Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 5%
 Subregion (LRR or MLRA): MLRA 149A Lat: 39.178106 Long: -76.679168 Datum: NAD 83 (2011)
 Soil Map Unit Name: Patapsco-Fort Mott complex, 5-10% slopes NWI classification: N/A
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? N Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? N (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 _____ No <input checked="" type="checkbox"/> Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/>
Remarks: <u>Ph2-E</u>	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> <input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> Aquatic Fauna (B13) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Marl Deposits (B15) (LRR U) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Other (Explain in Remarks) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Water-Stained Leaves (B9)	<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"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> FAC-Neutral Test (D5) <input type="checkbox"/> Sphagnum moss (D8) (LRR T, U)
Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:	
Remarks:	

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

Sampling Point: W13-UPL

Tree Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Liriodendron tulipifera</u>	<u>40</u>	<input checked="" type="checkbox"/>	<u>FACU</u>
2. <u>Acer rubrum</u>	<u>30</u>	<input checked="" type="checkbox"/>	<u>FAC</u>
3. <u>Nyssa sylvatica</u>	<u>10</u>		<u>FAC</u>
4. _____			
5. _____			
6. _____			
7. _____			
8. _____			

80 = Total Cover
 50% of total cover: 40 20% of total cover: 16

Sapling/Shrub Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Ilex opaca</u>	<u>8</u>	<input checked="" type="checkbox"/>	<u>FAC</u>
2. <u>Chionanthus virginicus</u>	<u>15</u>	<input checked="" type="checkbox"/>	<u>FACU</u>
3. <u>Viburnum dentatum</u>	<u>5</u>		<u>FAC</u>
4. <u>Lindera benzoin</u>	<u>3</u>		<u>FACW</u>
5. <u>Claytonia virginica</u>	<u>5</u>		<u>FACW</u>
6. _____			
7. _____			
8. _____			

36 = Total Cover
 50% of total cover: 18 20% of total cover: 7.2

Herb Stratum (Plot size: <u>15'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Lonicera japonica</u>	<u>10</u>	<input checked="" type="checkbox"/>	<u>FACU</u>
2. <u>Quercus alba</u>	<u>3</u>		<u>FACU</u>
3. <u>Privet sp.</u>	<u>3</u>		<u>NIA</u>
4. <u>Hedera helix</u>	<u>25</u>	<input checked="" type="checkbox"/>	<u>FACU</u>
5. <u>Fraxinus pennsylvanica</u>	<u>3</u>		<u>FACW</u>
6. _____			
7. _____			
8. _____			
9. _____			
10. _____			
11. _____			
12. _____			

44 = Total Cover
 50% of total cover: 22 20% of total cover: 8.8

Woody Vine Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>NONE</u>			
2. _____			
3. _____			
4. _____			
5. _____			
6. _____			
7. _____			
8. _____			
9. _____			
10. _____			
11. _____			
12. _____			

_____ = 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: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 33% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

- Hydrophytic Vegetation Indicators:**
- 1 - Rapid Test for Hydrophytic Vegetation
 - 2 - Dominance Test is >50%
 - 3 - Prevalence Index is ≤3.0¹
 - Problematic Hydrophytic Vegetation¹ (Explain)
- ¹Indicators of hydric soil and wetland hydrology must be 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 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 _____ No

Remarks: (If observed, list morphological adaptations below).

SOIL

Sampling Point: WL3-UPL

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-6	10YR3/3	100					SaLC	
6-10	10YR3/2	40					SaL	
	10YR4/3	60						
10-14	2.5Y6/6	100					Lsa	

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)	Indicators for Problematic Hydric Soils ³ :
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Polyvalue Below Surface (S8) (LRR S, T, U)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Thin Dark Surface (S9) (LRR S, T, U)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (LRR O)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)
<input type="checkbox"/> Stratified Layers (A5)	<input type="checkbox"/> Depleted Matrix (F3)
<input type="checkbox"/> Organic Bodies (A6) (LRR P, T, U)	<input type="checkbox"/> Redox Dark Surface (F6)
<input type="checkbox"/> 5 cm Mucky Mineral (A7) (LRR P, T, U)	<input type="checkbox"/> Depleted Dark Surface (F7)
<input type="checkbox"/> Muck Presence (A8) (LRR U)	<input type="checkbox"/> Redox Depressions (F8)
<input type="checkbox"/> 1 cm Muck (A9) (LRR P, T)	<input type="checkbox"/> Marl (F10) (LRR U)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Ochric (F11) (MLRA 151)
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Iron-Manganese Masses (F12) (LRR O, P, T)
<input type="checkbox"/> Coast Prairie Redox (A16) (MLRA 150A)	<input type="checkbox"/> Umbric Surface (F13) (LRR P, T, U)
<input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR O, S)	<input type="checkbox"/> Delta Ochric (F17) (MLRA 151)
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Reduced Vertic (F18) (MLRA 150A, 150B)
<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 149A)
<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Anomalous Bright Loamy Soils (F20) (MLRA 149A, 153C, 153D)
<input type="checkbox"/> Dark Surface (S7) (LRR P, S, T, U)	

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

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

Hydric Soil Present? Yes _____ No

Remarks:

APPENDIX F: 2000 USACE Jurisdictional Determination





DEPARTMENT OF THE ARMY
BALTIMORE DISTRICT, U.S. ARMY CORPS OF ENGINEERS
P.O. BOX 1715
BALTIMORE, MD 21203-1715

REPLY TO
ATTENTION OF

JUN 15 2000

Operations Division

Subject: CENAB-OP-RMN (MAA/BWI/AOA/JD) 00-62835-12

Maryland Aviation Administration
Attn: Ms. Barbara Grey
PO Box 8766
BWI Airport, Maryland 21240-0766



Dear Ms. Grey:

I am replying to your request for a jurisdictional determination (JD) and verification of the delineation of waters of the United States, including jurisdictional wetlands, for the Aircraft Operations Area located at Baltimore/Washington International Airport.

A field inspection was conducted on March 11, 2000. This inspection indicated that the delineation of waters of the United States, including jurisdictional wetlands, on the drawing enclosed with your request accurate with the changes noted on the enclosed maps dated June 8, 2000. Those areas indicated as waters of the United States, including non-tidal wetlands are regulated by this office pursuant to Section 404 of the Clean Water Act. Enclosed is a document that outlines the basis of our determination of jurisdiction over these areas.

Please note that on March 28, 2000, an administrative appeals process was established for JDs. Enclosed is a JD appeals form that can be used if you believe the JD you received warrants further review. You may accept this JD, submit new information seeking reconsideration of the JD or appeal the JD. If you accept the JD, you do not need to notify the Corps. A JD will be reconsidered if you submit new information or data to the Baltimore District Engineer (DE) within 60 days from the date of this letter. If you decide to appeal the approved JD, please submit the attached form within 60 days from the date of this letter to our Division Engineer at the following address:

Commander, U.S. Army Corps of Engineers
North Atlantic Division
Building 301
Fort Hamilton Military Community
Brooklyn, NY 11252-7600.

If we do not hear from you within 60 days, we will consider this JD accepted by you. This approved JD is valid for five years

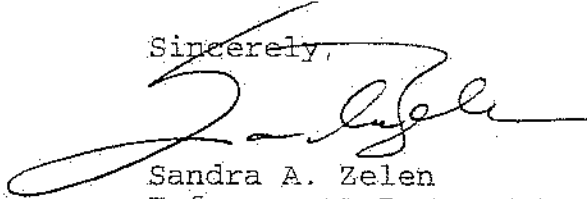
cc: [Handwritten notes]

from the date of issuance unless new information warrants a revision before the expiration date.

You are reminded that any grading or filling of waters of the United States, including jurisdictional wetlands, is subject to Department of the Army authorization. State and local authorizations may also be required to conduct activities in the locations. In addition, the Interstate Land Sales Full Disclosure Act may require that prospective buyers be made aware, by the seller, of the Federal authority over any waters of the United States, including jurisdictional wetlands, being purchased.

If you have any questions concerning this matter, please call Mr. Steve Elinsky of this office at (410) 962-4503.

Sincerely,

A handwritten signature in black ink, appearing to read 'Sandra A. Zelen', written over the word 'Sincerely,'.

Sandra A. Zelen
Enforcement Program Manager

Enclosure

BASIS OF JURISDICTIONAL DETERMINATION

Applicant: Maryland Aviation Administration
File No.: 200062835

Date: June 8, 2000

1. The jurisdictional determination outlined in the attached letter was based on the following:

- A. There are no Waters of the United States present at the site.
- B. The Waters of the United States present at the site are currently used, or were used in the past, or may be susceptible to use in interstate of foreign commerce. This includes waters which are subject to the ebb and flow of the tide.
- C. The Waters of the United States at the site are interstate waters, including interstate wetlands.
- D. The Waters of the United States at the site are other waters such as intrastate lakes, rivers, streams (including intermittent streams, mudflats, sand flats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes or natural ponds containing a nexus to interstate commerce).

The nexus to interstate commerce consists of:

- recreational or other purposes
- fish or shellfish
- industrial or commercial purposes
- habitat for migratory birds or game birds or wildlife
- commercial saleable timber products
- sand, gravel, oil, gas or other commodities of commerce
- other _____

E. The Waters of the United States present at the site contain impoundments of waters otherwise defined as Waters of the United States


F. The Waters of the United States present at the site are part of a tributary system to waters identified in B-E above.

G. The Waters of the United States present at the site are part of the territorial seas.

H. There are wetlands present at the site which are adjacent to waters identified in B-G above.

2. The lateral extent of the Waters of the United States, including wetlands at the site identified on the accompanying map was based on one or more of the following:

- A. The presence of wetlands has been determined by the U.S. Army Corps of Engineers 1987 Wetlands Delineation Manual and guidance supporting the manual.
- B. Wetland parameters including hydrology, hydric soils and hydrophytic vegetation.
- C. Ordinary high water mark, mean high water mark, high tide line, mean high tide line.



Project Manager

NOTIFICATION OF ADMINISTRATIVE APPEAL OPTIONS AND PROCESS AND REQUEST FOR APPEAL

Applicant: Maryland Aviation Administration	File Number: 200062835	Date: June 15, 2000
Attached is:		See Section Below
INITIAL PROFFERED PERMIT (Standard Permit or Letter of Permission)	A	
PROFFERED PERMIT (Standard Permit or Letter of Permission)	B	
PERMIT DENIAL	C	
APPROVED JURISDICTIONAL DETERMINATION	D	
PRELIMINARY JURISDICTIONAL DETERMINATION	E	

SECTION I- The following identifies your rights and options regarding an administrative appeal of the above decision. Additional information may be found at <http://usace.army.mil/inet/functions/cw/cecwo/reg> or Corps regulations at 33 CFR Part 331.

A: INITIAL PROFFERED PERMIT: You may accept or object to the permit.

- **ACCEPT:** If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations (JD) associated with the permit.
- **OBJECT:** If you object to the permit (Standard or LOP) because of certain terms and conditions therein, you may request that the permit be modified accordingly. You must complete Section II of this form and return the form to the district engineer. Your objections must be received by the district engineer within 60 days of the date of this notice, or you will forfeit your right to appeal the permit in the future. Upon receipt of your letter, the district engineer will evaluate your objections and may: (a) modify the permit to address all of your concerns, (b) modify the permit to address some of your objections, or (c) not modify the permit having determined that the permit should be issued as previously written. After evaluating your objections, the district engineer will send you a proffered permit for your reconsideration, as indicated in Section B below.

B: PROFFERED PERMIT: You may accept or appeal the permit.

- **ACCEPT:** If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- **APPEAL:** If you choose to decline the proffered permit (Standard or LOP) because of certain terms and conditions therein, you may appeal the declined permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

C: PERMIT DENIAL: You may appeal the denial of a permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

D: APPROVED JURISDICTIONAL DETERMINATION: You may accept or appeal the approved JD or provide new information.

- **ACCEPT:** You do not need to notify the Corps to accept an approved JD. Failure to notify the Corps within 60 days of the date of this notice, means that you accept the approved JD in its entirety, and waive all rights to appeal the approved JD.
- **APPEAL:** If you disagree with the approved JD, you may appeal the approved JD under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

E: PRELIMINARY JURISDICTIONAL DETERMINATION: You do not need to respond to the Corps regarding the preliminary JD. The Preliminary JD is not appealable. If you wish, you may request an approved JD (which may be appealed), by contacting the Corps district for further instruction. Also you may provide new information for further consideration by the Corps to reevaluate the JD.

SECTION II - REQUEST FOR APPEAL or OBJECTIONS TO AN INITIAL PROFFERED PERMIT

REASONS FOR APPEAL OR OBJECTIONS: (Describe your reasons for appealing the decision or your objections to an initial proffered permit in clear concise statements. You may attach additional information to this form to clarify where your reasons or objections are addressed in the administrative record.)

ADDITIONAL INFORMATION: The appeal is limited to a review of the administrative record, the Corps memorandum for the record of the appeal conference or meeting, and any supplemental information that the review officer has determined is needed to clarify the administrative record. Neither the appellant nor the Corps may add new information or analyses to the record. However, you may provide additional information to clarify the location of information that is already in the administrative record.

POINT OF CONTACT FOR QUESTIONS OR INFORMATION:

If you have questions regarding this decision and/or the appeal process you may contact:
Sandy Zelen
Regulatory Branch Baltimore District
P.O. Box 1715
Baltimore, MD 21203-1715
(410) 962-6028 or 3670

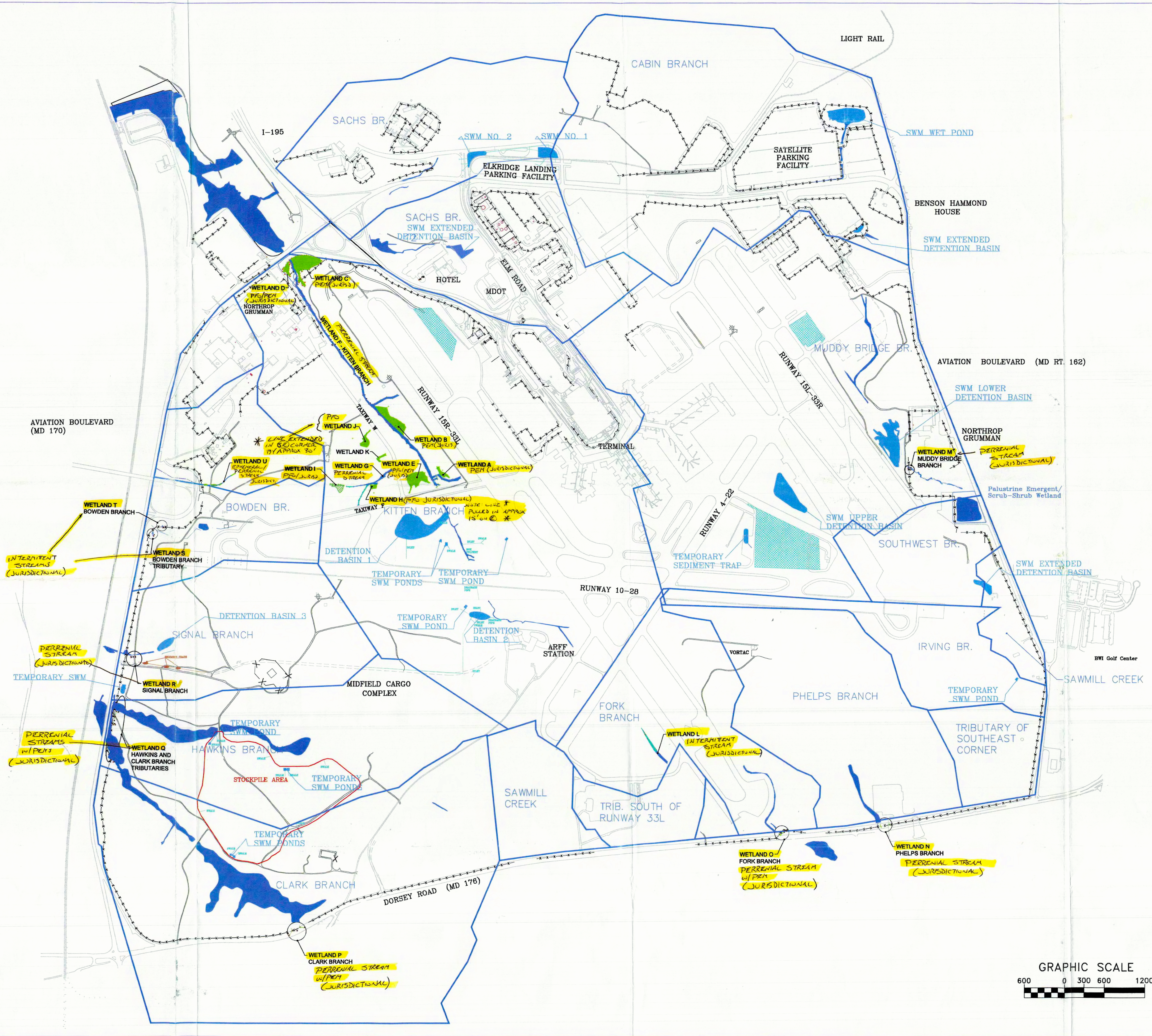
If you only have questions regarding the appeal process you may also contact:
North Atlantic Division
CON-OPS Division, Regulatory Branch
Building 301
Fort Hamilton Military Community
Brooklyn, NY 11252-7600
(718) 491-8728

RIGHT OF ENTRY: Your signature below grants the right of entry to Corps of Engineers personnel, and any government consultants, to conduct investigations of the project site during the course of the appeal process. You will be provided a 15 day notice of any site investigation, and will have the opportunity to participate in all site investigations.

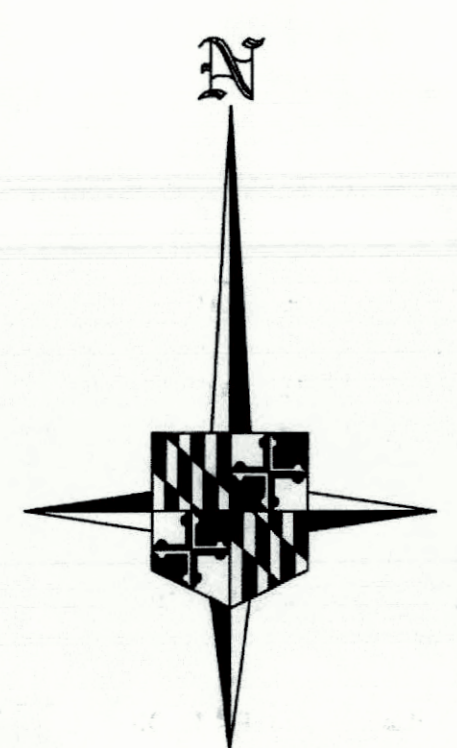
Signature of appellant or agent.

Date:

Telephone number:



- LEGEND**
- JURISDICTIONAL WATERS OF THE U.S.
 - NON-JURISDICTIONAL EPHEMERAL CHANNEL
 - STORMWATER MANAGEMENT PONDS
 - COE JURISDICTIONAL WETLANDS
 - MDE JURISDICTIONAL WETLANDS
 - DECKING FACILITIES
 - SECURITY FENCE
 - DRAINAGE AREA BOUNDARY
 - X WETLAND AT STREAM/FENCE CROSSING



BWI BALTIMORE/WASHINGTON INTERNATIONAL AIRPORT		MARYLAND DEPARTMENT OF TRANSPORTATION MARYLAND AVIATION ADMINISTRATION OFFICE OF PLANNING AND ENGINEERING	
JOB DESCRIPTION AOA WETLAND INVESTIGATION			
SHEET TITLE EXHIBIT 7 - WETLAND LOCATION MAP			
DESIGNED EKS	DRAWN SJC/PM	CONTRACT NO. 970503	
APPROVED JM/RW	CHECKED LH	DATE APRIL 2000	

JURISDICTIONAL DETERMINATION
VERIFICATION MAP
FOR: MM/BW/1001/SD
CENAB-OP-R.M. 120062835-R
COE SIGNATURE: *SMO* DATE: 6-8-00
U.S. ARMY ENGINEER DISTRICT, BALTIMORE
NOTE: CHANGES MADE TO WETLANDS PERM ON 3/11/00 DURING SD

Attachment 2:
Stormwater Management Report
HNTB
February 2024

**Draft Environmental Assessment for
Proposed Airport Traffic Control Tower and Associated Improvements at BWI Marshall Airport**

TABLE OF CONTENTS		<u>Page</u>
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2	Proposed Development by Watershed	2
2.1	ATCT, FAA Staffing Offices, and Hotel	2
2.2	Part 77 and LOS Obstruction Removal	3
2.3	Supplemental ATCT Upgrades.....	3
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Stormwater Management

1 Introduction

BWI Marshall Airport is located within two watersheds: the Baltimore Harbor watershed (Maryland 8-digit watershed number 02130903) and the Patapsco River Lower North Branch watershed (Maryland 8-digit watershed number 02130906). The Airport sits on a low peak in the landscape. Several small intermittent and ephemeral streams have their sources on the Airport, draining radially from the center. Most of the headwaters of these streams have been graded over or incorporated into the Airport drainage system as the Airport has developed and expanded over the years.

Portions of the site draining to the west are collected in Stony Run and Piny Run, which flows north into the non-tidal portion of the Lower North Branch of the Patapsco River. Portions draining to the north are collected in Cabin Branch which flows eastward into the tidal Patapsco River, which is part of the Baltimore Harbor watershed. Drainage to the south and east are collected in Sawmill Creek which also flows into the tidal Patapsco River, part of the Baltimore Harbor watershed.

BWI Marshall Airport is broken into subwatersheds named after the streams and tributaries which collect runoff from that area. The proposed projects analyzed as part of the Proposed Action Alternative in this Environmental Assessment (EA) fall within two subwatersheds: Kitten Branch and Muddy Bridge Branch.

- **Kitten Branch** drainage area includes the terminal area, western sides of Runways 15R-33L and 10-28, surrounding paved taxiways and a forested area north of Runway 10-28. Kitten Branch is within the Patapsco River Lower North Branch watershed and drains to Stony Run.
- **Muddy Bridge Branch** drainage area includes the northeast portion of the airport, including Runway 15L-33R and portions of the main terminal. Muddy Bridge Branch is within the Baltimore Harbor watershed and drains to Sawmill Creek.

MAA has developed and maintains the *BWI Marshall Airport Stormwater Institutional Management Plan* (IMP). The IMP includes an Existing Conditions and Future Conditions report, which analyze stormwater runoff quantities by subwatershed. The latest Existing Conditions IMP was approved in January 2015. The Future Conditions report provides conceptual best management practice (BMP) designs for future proposed projects to meet Maryland stormwater regulations for quality and quantity. The latest Future Conditions IMP was approved in June 2017. As part of the IMP, MAA maintains water quality credit tables by subwatershed at BWI Marshall. Many subwatersheds have water quality credits available which could be used to meet stormwater management requirements for future projects. The water quality credit summary tables are constantly updated as new projects are designed. **Table 1** summarizes the water quality credits available within Kitten Branch and Muddy Bridge Branch as of 12/7/23.

**Draft Environmental Assessment for
Proposed Airport Traffic Control Tower and Associated Improvements at BWI Marshall Airport**

Table 1
Water Quality Credits Available by Watershed

Subwatershed	Water Quality Credits (acres)	Excess Capacity ¹ (acres)
Muddy Bridge Branch	24.43	--
Kitten Branch	28.01	2.12

Notes: ¹Excess capacity (acres)
Kitten Branch: 1.7 (IT60), 0.69 (Pond B7)

Source: MDE approved water quality credit tables as of 12/7/23.

2 Proposed Development by Watershed

The sub-sections that follow review the potential stormwater management needed to meet MDE regulations for the proposed projects, including consideration of the viability of water quality control using various environmental site design (ESD) practices and best management practices (BMP). Ultimately water quality and quantity control to meet MDE regulations will be a requirement to receive approval of each project.

Stormwater treatment requirements for the projects are determined in accordance with MDE's *Stormwater Management Guidelines for State and Federal Projects*. Redevelopment projects require treatment of the first 1" of rainfall for 50% of the redeveloped area and new development requires treatment of 100% of the net impervious surface. Treatment requirements are based on preliminary engineering estimates of changes in impervious areas and limits of disturbance. Concepts for stormwater quality and quantity management are discussed by project, including use of ESD practices, structural BMPs, and water quality credits. Per MDE regulations, proposed projects on existing impervious surfaces are considered maintenance if they would not alter the existing grading or drainage patterns. Subject to MDE review, redevelopment of existing pavement may qualify as maintenance and would be exempt from stormwater management requirements.

2.1 ATCT, FAA Staffing Offices, and Hotel

The footprint for the proposed ATCT, FAA staffing offices, and hotel, as part of the C-D Connector and ATCT Program, are located within both Kitten Branch and Muddy Bridge Branch.

- **Kitten Branch:** The existing terminal building between Concourses C and D, and the C-D apron area immediately adjacent drain west through stormwater pipes in Kitten Branch. These stormwater pipes outfall into open drainage swales southwest of the intersection of Runways 10-28 and 15R-33L, before draining into Pond B7 and ultimately into the headwaters of Kitten Branch.
- **Muddy Bridge Branch:** Concourse D and the majority of the C-D apron area drains southeast through stormwater pipes in Muddy Bridge Branch. These stormwater pipes outfall into Pond B15 which ultimately drains into Pond B12 before draining into open swales to the point of investigation (POI).

While the proposed projects are located entirely within existing impervious area, the projects would more than likely alter drainage patterns due the layout of the existing drainage system and its location at the watershed border of Kitten Branch and Muddy Bridge Branch. Therefore, 50% of the redeveloped impervious surface would require stormwater treatment.

**Draft Environmental Assessment for
Proposed Airport Traffic Control Tower and Associated Improvements at BWI Marshall Airport**

While design has not been completed, a conservative assumption would be that the proposed C-D Connector and ATCT Program projects (with adjacent apron reconstruction included) would include a footprint of approximately 2.5 acres, or 108,900 SF. As a redevelopment project, this would result in an impervious area requiring treatment (IART) of 1.25 acres.

Due to the lack of available space for ESD or structural BMPs in the terminal and apron area, water quality credits would likely need to be used to meet treatment requirements. Both Kitten Branch (28.01 acres) and Muddy Bridge Branch (24.43 acres) have adequate water quality credits available.

Additionally, assuming the project results in a shift in drainage boundaries, stormwater design would also require an update to the watershed models (TR-55 and TR-20) to show that an increase in watershed area does not result in adverse effects to downstream BMPs and the watershed POI. However, if existing drainage patterns are maintained, and subject to MDE review, redeveloped impervious may not require updates to the watershed models.

2.2 Part 77 and LOS Obstruction Removal

The Part 77 and LOS obstruction removal project includes removal of vegetative obstructions in the forested area north of Runway 10-28 and west of Runway 15R-33L. Provided that the tree removal would not include grading that alters drainage divides, the project would not be subject to MDE stormwater management requirements.

2.3 Supplemental ATCT Upgrades

The supplemental ATCT upgrades are internal to the existing ramp tower structure, would not result in ground disturbance and therefore would not be subject to MDE stormwater management requirements.

2.4 Connection to Airfield Lighting Vault

The construction of a utility duct bank connecting the airfield lighting vault (ALV) to the end of Concourse D would be within Muddy Bridge Branch. This project would likely qualify for a MDE stormwater 3.3A waiver which typically applies to maintenance projects, landscaping projects, and underground utility projects where the disturbed area will be returned to existing condition and will result in no hydrologic change.¹

3 Summary

While the proposed projects analyzed in this EA would not result in any increase in impervious areas, stormwater management and erosion and sediment controls would still be required in accordance with MDE regulations. Due to the location of the terminal area projects, stormwater management requirements would likely be met through use of available water quality credits.

The projects do not directly impact any existing stormwater BMPs, however impacts on downstream BMPs would need to be assessed during stormwater design for projects that may alter drainage boundaries.

¹ MDE Stormwater Management and Erosion & Sediment Control Guideline for State and Federal Projects, February 2015, Section 3.3.A,
<https://mde.maryland.gov/programs/water/StormwaterManagementProgram/Documents/SWM%20and%20ESC%20Guidelines%20for%20State%20and%20Federal%20Projects%20FEB%202015.pdf>

Attachment 3:

MDE pre-application site visit meeting minutes

December 14, 2023



COASTAL RESOURCES INC.

Ecological Consultants

Baltimore/Washington Thurgood Marshall International Airport Air Traffic Control Tower and Taxiway F Part 77 Obstructions and Line-of-Sight Project

Meeting Date: December 14, 2023

Location: BWI – Thurgood Marshall Airport

Meeting Purpose: Joint Permit Application Pre-Application Meeting Minutes

Attendees		
Name	Affiliation	E-mail
April Sparkman	USACE	april.e.sparkmand@usace.army.mil
Cheryl Kerr	MDE	cheryl.kerr@maryland.gov
Jeff Thompson	MDE	jeffrey.thompson@maryland.gov
Hanifah Parker-Morrison	MDE	hanifah.parker-morrison@maryland.gov
Dan Hinder	MAA	dhinder@bwiairport.com
Emma Beck	CRI	emmab@cri.biz

Meeting Summary

Maryland Aviation Administration (MAA) met with the US Army Corps of Engineers (USACE) and Maryland Department of the Environment (MDE) to discuss the proposed Part 77 and Line-of-Sight (LOS) obstruction removal project associated with the new Air Traffic Control Tower (ATCT) and relocation of Taxiway F included in the new Environmental Assessment to be submitted in 2024.

Maps of the proposed impacts were distributed and the work to be completed was described. There are two areas north of Taxiway F and east and west of Taxiway W where trees will be removed. In the area east of Taxiway W, individual trees identified as Part 77 obstructions will be felled with chainsaws and left to decay where they land. West of Taxiway W, the area will be cleared of all woody vegetation with the exception of the forested wetland where MAA would only remove the trees identified as obstructions.

USACE asked if any earth disturbance would be done during this project. MAA stated there would not. USACE explained that MAA would not need a permit from USACE to complete this work. However, if MAA wanted a letter from USACE stating that a permit is not required, they would provide one once the JPA is submitted.

After reviewing the mapping, MDE stated that based on the mapping, impacts to the forested wetlands could likely be a conversion impact. CRI asked how to determine if the percent cover of trees removed within the wetland would result in a conversion impact. After reviewing the project area in the field, MDE recommended determining the basal area within the forested wetlands without counting the trees proposed for removal. If the basal area within the wetland

BWI Airport Part 77 and LOS Obstructions Pre-Application Meeting Summary

remains greater than or equal to 60 square feet, the wetlands are considered stocked forests and would not be considered a conversion impact.

On December 18, 2023, CRI completed the basal areas and calculated an average basal area of 77 square feet, not including the trees proposed for removal, within the wetland east of Taxiway W. However, the basal area within the wetland west of Taxiway W equaled 30 square feet when the trees proposed for removal were not included, which would result in a conversion impact of 3,485 square feet. Because this impact is less than 5,000 square feet, mitigation is not required. MAA emailed MDE on December 18th asking to confirm that the project would still qualify for a letter of authorization. MDE's response is pending.

Attachment 4:

MDE Nontidal Wetlands and Waterways

Pre-Application Summary

December 14, 2023



Nontidal Wetlands and Waterways Pre-Application Summary

1. **AI#:**

2. **Date:** / / **Time:** :

3. **Summary prepared by:**

4. **Attendees:** Dan Hinder, MAA
Emma Beck, Coastal Resources, Inc.
April Sparkman, US-ACOE (present for meeting and not for field)
Hanifah Parker-Morison, Waterway Construction, MDE
Jeff Thompson, Chief-Nontidal Wetlands, MDE

5. **Property owner name:**

6. **Address or Site Location/Description** (directions, if no physical address is available):

7. **Project purpose:**

8. **Plans provided:** Yes No

9. **State regulated resources found:** Yes No

NTW Type: PEM PSS PFO Landscape Mgmt Area Ag
NTW Buffer Critical Area Tidally Influenced
Waters of the State: Stream Floodplain

11. **Delineation provided:** Yes No

12. **Avoidance/Minimization Discussed? Recap:**

13. **Project, as described, would require Authorization:** Yes No

If Yes, type of State authorization required:

Permit Letter of Authorization Authorization to Proceed

If Yes, project (as described or shown on plans) under the MDSPGP would be:

Category A Category B Individual Permit

* U.S. ACE categorization is a preliminary determination only and may change upon receipt of application or further consultation with the U.S. ACE staff or other resource agencies

14. **Recommended Action** (check all that apply):

Consult with Corps Submit Application Schedule follow-up meeting

No action required Other

Pre-App Site Visit Comments:

The proposed selective tree removal under Part 77 obstructions to remove trees penetrating flight safety zones will not change the component of the forest stands of the PFO nontidal wetlands with the exception PFO nontidal wetland WL4 based on a basal area survey. Tree removal of trees in WL4 will convert the nontidal wetland from PFO status to PSS status. The area of this wetland is 0.08 acres (3,485 square feet) and will require authorization by the State and an MDSPGP-6 authorization by the Corps (issued by the State for the Corps). Please submit 7-copies of the Joint Permit Application for review by the Department.

Maryland Department of the Environment Reviewer Contact Information:

Name Email

Telephone () -

*This document is a summary of the items discussed. Please note that this information is based on MDE staff preliminary cursory review at the time of the preapplication meeting. MDE staff will perform a full review of the project and all available information at the time of the application submission. Additional information may be required.

Applicant/Consultant Signature:

DHinder

Digitally signed by DHinder
DN: DC=mdstate, DC=mdot, DC=ad, DC=maa, OU=maa, OU=HBP, CN=DHinder,
E=DHinder@bwiaiaiport.com
Reason: I am the author of this document
Location: your signing location here
Date: 2024-03-04 14:16:59
Font: PhantomPDF Version: 9.7.0