US Army Corps
of Engineers
Baltimore District

METROPOLITAN WASHINGTON, DISTRICT OF COLUMBIA COASTAL STORM RISK MANAGEMENT FEASIBILITY STUDY

INTEGRATED FEASIBILITY REPORT & ENVIRONMENTAL ASSESSMENT

APPENDIX G:

ENVIRONMENTAL AND CULTURAL RESOURCES

November 2023

METROPOLITAN WASHINGTON, DISTRICT OF COLUMBIA COASTAL STORM RISK MANAGEMENT FEASIBILITY STUDY

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Please note: The County of Fairfax, Virginia provided a letter on 29 March 2022 supporting the proposed levee and floodwall improvements in Belle Haven. Representatives of the County attended in-person and virtual public meetings in June 2002 during which community members expressed their views and opposition on the project in the Belle View neighborhood. Comments were also received and reviewed during the public comment period. Subsequent to the public comment period, alternate options for alignment of the proposed coastal storm risk reduction features were explored. No substantially different alignment of proposed coastal storm risk reduction features were found to be acceptable. County of Fairfax representatives also engaged leaders of the affected community and elected officials in an outreach effort to gain support and promote flood risk management. Community opposition to the Recommended Plan remained consistent throughout this process. Therefore, as stated in an email received March 13, 2023, “Fairfax County will not support the project as proposed at the present time, and thus will not be providing the USACE with a letter of intent." Measures for coastal storm risk reduction in the Belle Haven community will not be pursued further through this feasibility study.

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METROPOLITAN WASHINGTON, DISTRICT OF COLUMBIA COASTAL STORM RISK MANAGEMENT FEASIBILITY STUDY

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APPENDIX G1: COASTAL ZONE MANAGEMENT ACT CONSISTENCY DETERMINATION

Metropolitan Washington, District of Columbia,
Coastal Storm Risk Management Feasibility Study
Federal Consistency Documentation
April 2023
Prepared by the U.S. Army Corps of Engineers, Baltimore District

This document provides the Commonwealth of Virginia with the U.S. Army Corps of Engineers' (USACE) Consistency Determination under the Coastal Zone Management Act, Section 307(c)(1) and 15 CFR Part 930, subpart C, for the proposed flood risk management measures at the Arlington Water Pollution Control Plant (WPCP) located in Arlington County, Virginia. The information in this Consistency Determination is provided pursuant to 15 CFR §930.39.

Description of Proposed Action

The U.S. Army Corps of Engineers, Baltimore District (USACE) proposes to construct a 1,160-linear-foot floodwall at the Arlington WPCP in Arlington County along the left bank of Four Mile Run between Four Mile Run and the Arlington WPCP. A closure structure would be located on the east side of the floodwall across South Eads Street. The east end of the floodwall would tie into the bank just past South Eads Street. The floodwall would wrap around the Arlington WPCP to the west to a stop log closure structure located on South Glebe Road (Figure 1). Two new pump stations would be added to remove water behind the floodwall during a storm event. Construction would take approximately 18 months.

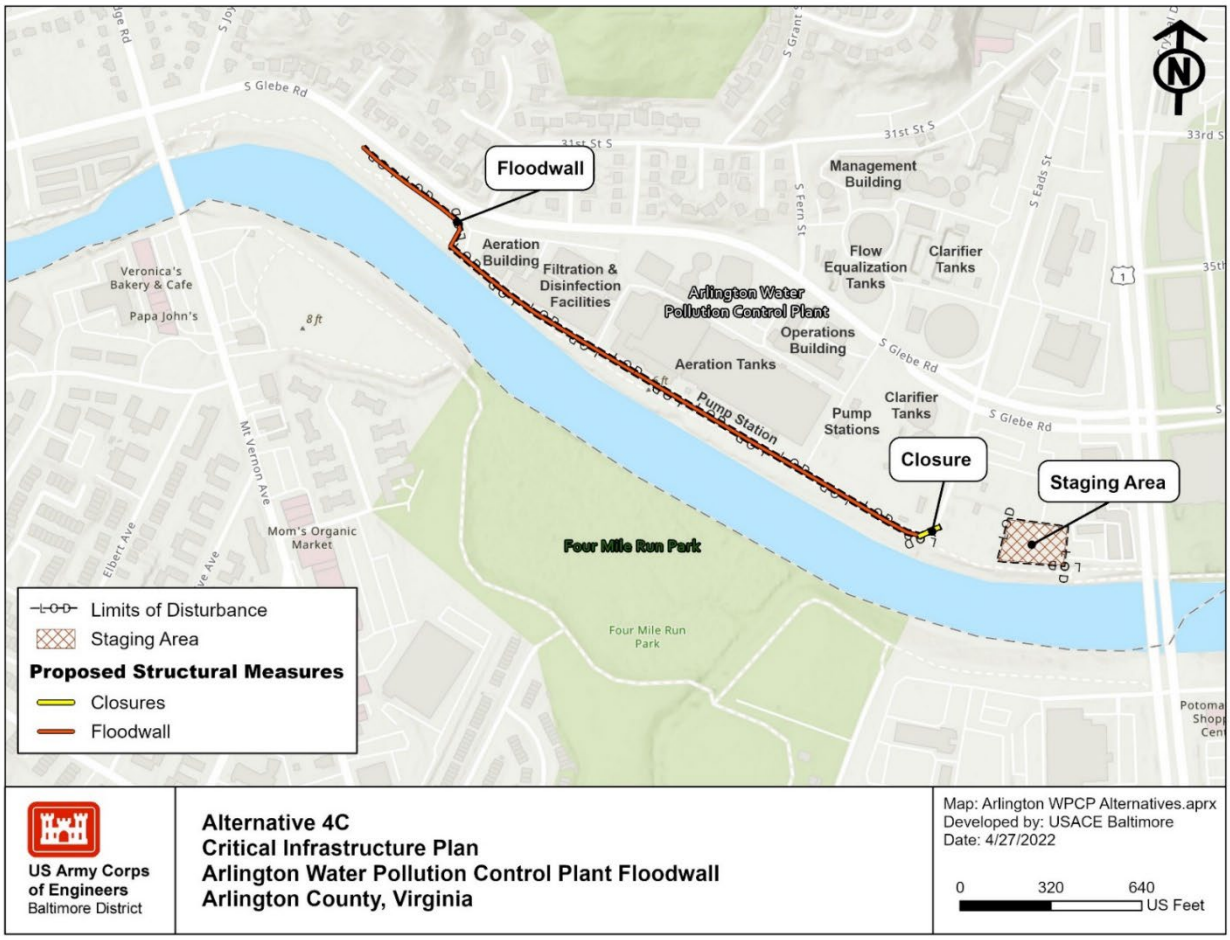


Figure 1. Proposed Floodwall at the Arlington WPCP

Assessment of Probable Effects

Implementation of the proposed floodwall at the Arlington WPCP may result in temporary and minor effects to natural and physical environmental resources during construction. No long-term effects are expected. The USACE has determined that construction of the proposed flood risk management measures affects the land and water uses or natural resources of Virginia in the following manner:

- Construction of the floodwall may result in temporary and minor indirect effects to wetlands. Sediment and erosion controls would be used to minimize the amount of sediment that may be carried into wetlands during construction.
- Approximately 20 trees may need to be removed to construct the floodwall. The exact number of trees to be removed will be determined during the Pre-Construction, Engineering and Design Phase (PED). Planting new trees in a different location in the study area may be an option to offset the effects of any tree removal required for the proposed project.
- Contaminated groundwater and/or soil may be present in the construction area, due to the presence of several gas station and dry cleaning sites. Further investigations would be needed to confirm that no groundwater or soil contamination is present in the footprint

of the construction site. Any associated clean-up of hazardous, toxic, and radioactive waste (HTRW) would be the responsibility of the non-Federal sponsor, Arlington County.

- The floodwall may adversely affect aesthetics; however, this affect would not be significant because the area is highly developed, and the facility is industrial. It was noted during the public comment period that this area of Four Mile Run was part of a "living shoreline" enhancement approximately six years ago. Components of this project included public art installed on the metal fence surrounding the WPCP, a public art bench (imported from the Netherlands) located along this fence, an observation platform, as well as fish murals painted occasionally along the pedestrian trail. These items, as well as the shoreline itself, are all likely to be impacted by construction of the proposed floodwall and would be protected/relocated. USACE would identify and coordinate any relocations with the non-Federal sponsor during PED.
- Users of the existing pedestrian trail may be temporarily affected during construction of the floodwall. The portion of the existing path in between the Arlington WPCP and Four Mile Run may need to be temporarily closed in order to construct the floodwall (a period of 18 months). USACE would identify and coordinate any closures of the pedestrian path with the non-Federal sponsor during PED.

Virginia's Coastal Zone Management Program (CZMP) Enforceable Polices
Effects of the proposed action on each applicable enforceable policy are discussed below:

- **Tidal and Non-Tidal Wetlands**

A wetland delineation was performed by USACE in July 2021 adjacent to Four Mile Run on the south side of the Arlington WPCP. Wetland types including palustrine emergent and riverine systems were identified and delineated. Further details regarding the wetland delineation are located in the Metropolitan Washington District of Columbia Coastal Storm Risk Management Feasibility Study Wetland Delineation Report (Appendix G of the Feasibility Report/Environmental Assessment (EA)).

Existing wetlands run along the north side of Four Mile Run adjacent to the Arlington WPCP. The wetlands are located outside of the footprint of the proposed floodwall, the proposed construction limits of disturbance (LOD), and the proposed staging area (Figure 2). The wetlands are located at the bottom of the bank adjacent to the shoreline of Four Mile Run. The floodwall would be constructed at the top of the bank. Therefore, the floodwall proposed at the Arlington WPCP would have no direct effects on wetlands. Construction of the floodwall may result in temporary and minor indirect effects to wetlands. This would be a negligible (immeasurable) effect that would only occur during the construction period (18 months). Sediment and erosion controls would be used to minimize the amount of sediment that may be carried into wetlands during construction.

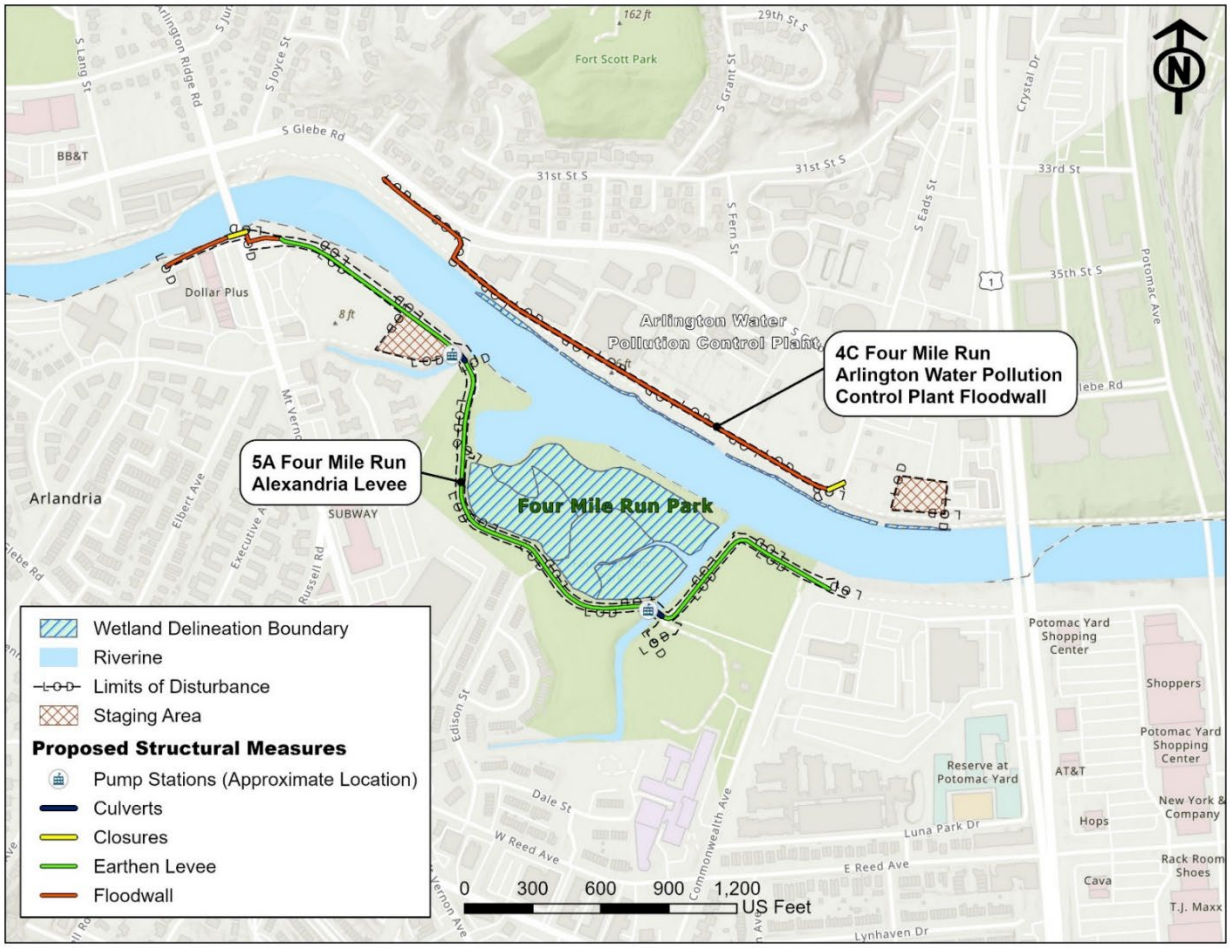


Figure 2. Proposed Floodwall and the Location of Wetlands and Riverine Systems at Four Mile Run

- **Subaqueous Lands**

Construction of the Arlington WPCP floodwall would not directly affect the subaqueous lands of Four Mile Run. Sediment may be carried into Four Mile Run during construction. This would be a negligible (immeasurable) effect that would only occur during the construction period (18 months). Sediment and erosion controls would be used to minimize the amount of sediment that may be carried into water during construction. No submerged aquatic vegetation will be effected by the project.

- **Wildlife and Inland Fisheries**

Threatened and Endangered Species

Construction of the proposed floodwall would have no effect on federal or state-listed threatened and endangered species due to the lack of suitable habitat conditions and/or the lack of documented observances in the locations where the effects are likely to occur.

It is likely that the monarch butterfly, an Endangered Species Act candidate species, would be present in the proposed construction area during the monarch's migration season (mid to late September). Construction would not directly affect the monarch butterfly and would not affect the monarch's specific host plant, milkweed.

Refer to the USACE document: *Section 7 of the Endangered Species Act No Effect Determination for Terrestrial and Freshwater Species, Metropolitan Washington District of Columbia Coastal Storm Risk Management Feasibility Study* located in Appendix G of the Draft Feasibility Report/EA for an evaluation of potential effects to threatened and endangered species.

Migratory Birds

Due to noise and construction activities, birds would likely avoid the area during construction. Birds that inhabit Four Mile Run and nearby wetlands could experience temporary disturbance during construction. No migratory bird breeding habitat is known to occur in or adjacent to the construction LOD. No direct or long-term effects to migratory birds are expected. Up to 20 trees that could potentially provide migratory bird habitat may need to be removed to construct the floodwall. The exact number of trees to be removed will be determined during PED. Planting new trees in a different location in the study area may be an option to offset the effects to migratory birds from tree removal. Removal of trees (both live and dead trees) and saplings and shrubs would be avoided to the greatest extent practicable.

Dams and Fish Passage

Construction of the Arlington WPCP floodwall would have no effect on fish passage.

- **Point Source Air Pollution**

Air pollution generated by construction equipment would be temporary and minor. The proposed actions are exempt from the General Conformity Rules in Section 176c of the Clean Air Act. Annual emission totals and aggregated study emission totals for criteria pollutants are not anticipated to exceed all other USEPA de minimis thresholds. Therefore, no mitigation measures are required. For the Ozone Transport Region, the actions associated with construction would fall below the applicable de minimis emission thresholds for maintenance and nonattainment of 50 tpy for VOCs and 100 tpy of NOx. Refer to the *Air Conformity Assessment, District of Columbia Coastal Storm Risk Management Study* located in Appendix G of the Draft Feasibility Report/EA. The proposed floodwall would have no long-term effects on air quality.

- **NonPoint Source Water Pollution**

Construction of the floodwall would have a temporary and negligible effects on water quality. Sediment and erosion controls would be used to minimize the amount of sediment that may be carried into Four Mile Run during construction.

Summary of Findings

Based upon the information, data, and analysis summarized above, USACE finds that construction of the proposed floodwall at the Arlington WPCP is consistent to the maximum extent practicable with the enforceable policies of the Virginia CZMP.

Pursuant to 15 CFR Section 930.41, the Virginia CZMP has 60 days from the receipt of this letter in which to concur with or object to this Consistency Determination, or to request an extension under 15 CFR section 930.41(b). Virginia's concurrence will be presumed if its response is not received by the USACE on the 60th day from receipt of this determination. The State's response should be sent to:

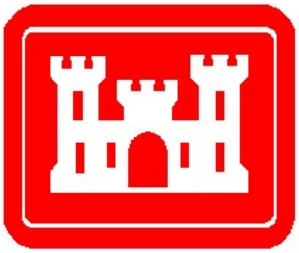
U.S. Army Corps of Engineers, Baltimore District
Attn: Kristina May, Biologist
Planning Division
2 Hopkins Plaza
Baltimore, MD 21201
kristina.k.may@usace.army.mil

METROPOLITAN WASHINGTON, DISTRICT OF COLUMBIA COASTAL STORM RISK MANAGEMENT FEASIBILITY STUDY

INTEGRATED FEASIBILITY REPORT & ENVIRONMENTAL ASSESSMENT

APPENDIX G2: CLEAN AIR ACT AIR CONFORMITY ANALYSIS

AIR CONFORMITY ASSESSMENT
DISTRICT OF COLUMBIA
COASTAL STORM RISK MANAGEMENT STUDY



Prepared by

U.S. Army Corps of Engineers
Baltimore District
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Baltimore, Maryland 21201

March 2022

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LIST OF ABBREVIATIONS & ACRONYMS

kW	kilowatts
hr	hour
g/kWh	grams per kilowatt-hour
CAA	Clean Air Act
CO	Carbon Monoxide
CSRM	Coastal Storm Risk Management Study
DC	District of Columbia
MOVES3	Motor Vehicle Emissions Simulator (version 3)
NAA	Nonattainment Area
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NO_2	Nitrogen Dioxide
O^3	Ozone
OTR	Ozone Transport Region
PM_{10}	Particulate Matter – 10 microns
$PM_{2.5}$	Particulate Matter – 2.5 microns
Pb	Lead
SIP	State Implementation Plan
SO_2	Sulfur Dioxide
USEPA	US Environmental Protection Agency
VOC	Volatile Organic Compounds
WPCP	Water Pollution Control Plant

1 INTRODUCTION

This conformity analysis is submitted to support the National Environmental Policy Act (NEPA) assessment for the District of Columbia (DC) Coastal Storm Risk Management Study (CSRM). The DC CSRM currently consists of four alternatives: Reagan International Airport, Arlington Water Pollution Control Plant (WPCP), Four Mile Run, and Belle Haven.

1.1 Reagan International Airport

Reagan International Airport is located in Arlington County, Virginia. Construction activities associated with this alternative include the construction of an earthen levee with heavy duty pavement on top of existing perimeter road, concrete I-wall and T-wall, 1-inch concrete wall, sidewalk and asphalt repairs, a 1.5-inch concrete curb, and an aluminum stop log closure. It is anticipated that the construction duration of this project will take six years, two years per phase for a total of three phases.

- Phase 1, Year 1: October 1, 2026 – January 3, 2028
- Phase 1, Year 2: January 4, 2028 – February 23, 2029
- Phase 2, Year 3: February 24, 2029 – February 14, 2030
- Phase 2, Year 4: February 15, 2030 – February 12, 2031
- Phase 3, Year 5: February 12, 2031 – February 4, 2032
- Phase 3, year 6: February 4, 2032 – January 26, 2033

The work for this alternative will take place at night for 8 hours per day. It is anticipated that 32 crew members will arrive in personal vehicles each day for 1,548 days of work.

1.2 Arlington WPCP

The Arlington WPCP is located in Arlington County, Virginia. Construction activities associated with this alternative include the construction of a concrete I-wall, concrete curb, sidewalk and asphalt repairs, and an aluminum stop log closure. It is anticipated that the construction duration of this project will take 18 months with no phasing starting on October 1, 2026, and continuing until March 22, 2028. Work is anticipated to be conducted during the day for 12 hours per day. It is anticipated that 27 crew members will arrive in personal vehicles each day for 387 days of work.

1.3 Four Mile Run

Four Mile Run is located in Fairfax County, Virginia. Construction activities associated with this alternative include the concrete box culvert with pump station, earthen levee with light duty on top of existing road, concrete I-wall, removal of existing 10-foot concrete floodwall replaced with a concrete T-wall, sidewalk and asphalt repair, and aluminum stop log closure at Mount Vernon

Avenue Bridge. It is anticipated that the construction duration of this project will take three years, one year for phase one and two years for phase two.

- Phase 1, Year 1: October 1, 2026 – September 24, 2027
- Phase 2, Year 2: September 24, 2027 – September 13, 2028
- Phase 2, Year 3: September 13, 2028 – July 31, 2029

Work is anticipated to be conducted during the day for 12 hours per day. It is anticipated that 30 crew members will arrive in personal vehicles each day for 774 days of work.

1.4 Belle Haven

Belle Haven is located in Fairfax County, Virginia. Construction activities associated with this alternative include the construction of a concrete box culvert with pump station, earthen levee, concrete I-wall and T-wall, sidewalk and asphalt repair, and aluminum stop log closure. It is anticipated that the construction duration of this project will take four years, one year for phase one and three years for phase three.

- Phase 1, Year 1: October 1, 2026 – September 24, 2027
- Phase 2, Year 2: September 24, 2027 – September 13, 2028
- Phase 2, Year 3: September 13, 2028 – August 31, 2029
- Phase 2, Year 4: August 31, 2029 – October 15, 2030

The work for this alternative is anticipated to be conducted during the day for 12 hours per day. It is anticipated that 34 crew members arriving in personal vehicles each day for 1,032 days of work.

2 BACKGROUND

2.1 General Conformity Regulations

General Conformity is the process required by Section 176(c) of the *Clean Air Act (CAA)*, which establishes the framework for improving air quality to protect public health and the environment. The goal of general conformity is to ensure that actions conducted or sponsored by federal agencies are consistent with State air quality goals. These air quality goals are tied to states meeting the National Ambient Air Quality Standards (NAAQS), requirements that are established by the U.S. Environmental Protection Agency (USEPA) and are designed to protect human health and the environment. Each state develops a State Implementation Plan (SIP), which includes the state's strategy for attaining or maintaining the NAAQS, the modeling that demonstrates attainment or maintenance, and the various rules, regulations, and programs that provide the necessary air pollutant emissions reductions.

General Conformity rules of the *CAA* apply to all non-transportation related projects, excluding exempt actions which would cause only de minimis levels, are presumed to conform, or are specifically identified in the regulations as exempt. The General Conformity program is an emissions-based system which requires federal agencies taking or sponsoring an action in certain areas to ensure that increased air pollution emissions from that action conform with the current, approved SIP. This includes estimating both direct and indirection emissions that are likely to occur.

Six criteria pollutants that can injure health, harm the environment, and cause property damage are evaluated by the USEPA to determine air quality in an area. NAAQS for each of the criteria pollutants set permissible levels for these criteria pollutants in outdoor air. If the air quality in a geographic area meets or does better than the national standard, it is called an attainment area. The General Conformity regulations only apply in nonattainment and maintenance areas. A nonattainment area is an area designated by the USEPA as not meeting a NAAQS. A maintenance area is an area that was once designated as nonattainment but is currently meeting and maintaining the standard. The USEPA promulgated de minimis emissions levels for each of the NAAQS pollutants. If the total direct and indirect emissions from an action are less than the de minimis levels, the action is exempt from General Conformity rules. The de minimis levels are based on an area's designation and classification and are outlined in **Table 2-1**. Emissions from the total action are used to determine if they exceed the de minimis levels.

2.2 Attainment Status

The USEPA designates the Washington, DC-MD-VA region, which includes both Arlington and Fairfax Counties, as a marginal nonattainment area for ozone (O^3) under the 8-hour standard. The Washington, DC-MD-VA region is designated in attainment of the NAAQS for all other criteria pollutants.

Table 2-1 De Minimis Emission Levels

Pollutant	Precursor	Designation	Classification/Location	De minimis level (tons/year)
O_3	VOC or NO_x	Nonattainment	Serious	50
			Severe	25
			Extreme	10
			Other, outside an OTR	100
	VOC		Other, inside an OTR	50
	NO_x		Other, inside an OTR	100
CO	-		All NAAs	100
SO_2	-		All NAAs	100
NO_2			All NAAs	100
PM_{10}	-		Moderate	100
			Serious	70
$PM_{2.5}$	Direct Emissions		All NAAs	100
	SO_2			100
	NO_x[a]			100
	VOC or NH_3[b]			100
Pb	-		All NAAs	25
O_3	VOC or NO_x	Maintenance	All Maintenance Areas	100
	VOC		Outside OTR	100
	VOC		Inside OTR	50
CO, SO_2, NO_2, PM_{10}	-		All Maintenance Areas	100
$PM_{2.5}$	Direct Emissions		All Maintenance Areas	100
	SO_2			100
	NO_x			100
	VOC			100
Pb	-		All Maintenance Areas	25

Notes:
O_3 Ozone
CO Carbon Monoxide
SO_2 Sulfur Dioxide
NO_2 Nitrogen Dioxide
PM_{10} Particulate Matter – 10 microns
$PM_{2.5}$ Particulate Matter – 2.5 microns
VOC Volatile Organic Compounds
NO_x Nitrogen Oxides
NH_3 Ammonia
NAA Nonattainment Areas
OTR Ozone Transport Region
[a] Unless determined not to be a significant precursor
[b] If determined to be a significant precursor

3 PURPOSE AND OBJECTIVES

The purpose of this conformity analysis is to ensure that the alternative actions conducted as part of the DC CSRM are consistent with State air quality goals for the attainment and maintenance of the NAAQS in accordance with Section 176(c) of the *CAA*. The objective is to evaluate emission rates for the project alternatives to determine whether de minimis thresholds of the General Conformity Rule will be met and detail the results of the evaluation.

4 ASSESSMENT OF STUDY EMISSION RATES

Direct and indirect pollutant emissions were estimated from earthwork, commercial, and construction equipment anticipated for use during the implementation of the DC CSRM alternatives. The equipment, total operational hours, and phase in which the equipment would be used was provided by the study team. Equipment operational hours were distributed per year based on the planning unit construction phase (as described in **Section 1**), and percentage of phase occurring in the elected years. The equipment and operational hours per year used in this analysis are included in **Table 4-1**. Pollutant emissions were estimated based on the operational hours per equipment for each planning unit and aggregated per year for comparison to de minimis thresholds.

4.1 MOTOR VEHICLE EMISSIONS SIMULATOR

The USEPA Motor Vehicle Emissions Simulator, version three (MOVES3) was used to estimate emission factors through a range of user-defined parameters based on the study location and provided construction information. Separate MOVES3 runs were completed based on the alternative locations in Arlington County and Fairfax County, Virginia.

The study alternatives are scheduled to begin construction on October 1, 2026. Therefore, emission factors were modeled for a 12-month period in 2026 and applied to all succeeding years. Post processing scripts were run on the MOVES3 output databases to model emission factors in grams per hour for each equipment type. To remain conservative, the highest emission factor in the 12-month model period was used to calculate pollutant emissions for each alternative equipment.

Operational hours per year (see **Table 4-1**) were multiplied by the highest emission factor in the 12-month period to determine pollutant emissions for each equipment type. Pollutant emission totals per year are included in **Table 4-2**. Emission totals for the aggregated study years are included in **Table 4-3**.

4.2 Port Emissions: Tugboats

MOVES cannot be used to model emissions from locomotive, commercial marine, or aviation engines. Therefore, pollutant emissions from the tugboats associated with the Reagan Internal Airport planning unit were estimated using the following equation:

Emission (grams[g]) = Power (kilowatt [kW]) x Load Factor (unitless) x Activity (hour [h]) x Emission Factor (g/kWh)

The propulsion and auxiliary power for the tugboats is based on the average installed powers listed in Table G.1 of the *USEPA Port Emissions Inventory Guidance: Methodologies for Estimating Port-Related and Goods Movement Mobile Source Emissions* (USEPA, 2020). The associated load and emission factors were determined based on Table 4.4 and Table H.6, respectively, of the reference document (USEPA, 2020). As seen in Table H.6, emission factors for the criteria pollutants decrease with increasing model years likely attributable to newer, more efficient engines. Therefore, as a conservative value, 2010 was assumed as the model year for the tugboat engine.

The tugboat operational information is included in **Table 4-4**. Total calculated pollutant emissions are included in the yearly summary table, **Table 4-2,** and aggregated emissions in **Table 4-3**.

4.3 Greenhouse Gas Emissions

In addition to criteria pollutants, emissions were also estimated for the greenhouse gas (GHG) - carbon dioxide (CO_2). The same processes detailed in Sections 4.1 and 4.2 for calculating criteria pollutant emissions were followed to for the GHG emission estimate. Based on Table H.7 of the *USEPA Port Emissions Inventory Guidance: Methodologies for Estimating Port-Related and Goods Movement Mobile Source Emissions,* an emission factor of 679.47 grams per kilowatt-hour (g/kWh) was used to estimate CO_2 emissions from the tugboats anticipated for use under the Reagan International Airport alternative (USEPA, 2020).

The total calculated CO_2 emissions are included in the yearly summary table, **Table 4-5**.

Table 4-1 Operational Equipment

Equipment per Planning Unit	Annual Operation (hours/year) 2026	2027	2028	2029	2030	2031	2032	2033
Reagan International Airport Equipment								
Asphalt Trucks	0	0	0	0	0	0	445	35
Concrete Trucks	859	3,444	3,453	500	0	0	0	0
Flat Bed Trucks	200	801	803	116	0	0	0	0
Cranes (75 ton and 1 over 75 ton)	0	0	0	1,791	2,101	236	0	0
Company Owned Trucks	433	1,737	1,742	1,737	1,737	1,737	167	0
Tug Boats	0	0	0	14	2	0	0	0
Dump Trucks	192	772	774	772	772	772	74	0
Truck w/ 3-Ton Capacity Towed Trailer	24	96	97	96	96	96	9	0
Truck w/ 20-ton Capacity Towed Trailer	48	193	194	193	193	193	19	0
16.5 C.Y. trucks	96	386	387	386	386	386	37	0
1 C.Y. bucket, hydraulic excavators	192	772	774	772	772	772	74	0
300 H.P. dozer	96	386	387	386	386	386	37	0
300 H.P dozer with vibrating roller for compaction	0	0	0	0	213	244	23	0
6" centrifugal pump	192	772	774	772	772	772	74	0
Backhoe with tamper	0	0	0	0	213	244	23	0
Landscaping trucks, seeding and grading	0	0	0	0	0	0	74	6
Cycle hauling, 8 C.Y. truck	0	0	0	104	122	14	0	0
Arlington Water Pollution Control Plant								
Asphalt trucks	0	720	0	-	-	-	-	-
Concrete Trucks	1,376	5,504	1,376	-	-	-	-	-
Company Owned Trucks	65	258	65	-	-	-	-	-
Flatbed Truck for Materials	90	360	30	-	-	-	-	-
Truck w/ 3-ton Capacity Towed trailer	11	45	4	-	-	-	-	-
Truck w/ 20-ton capacity towed trailer	11	45	4	-	-	-	-	-
16.5 C.Y. trucks	240	960	240	-	-	-	-	-
Security Vehicles	1,468	5,872	1,468	-	-	-	-	-
Trucks with Flagmen	245	979	245	-	-	-	-	-
1 C.Y. Bucket, Hydraulic Excavators	1,161	4,644	387	-	-	-	-	-
300 H.P. Dozer	290	1,161	97	-	-	-	-	-
6" Centrifugal Pump	516	2,064	516	-	-	-	-	-
Landscaping Trucks, Seeding and Grading	0	80	0	-	-	-	-	-
Cycle Hauling, 8 C.Y. Truck	581	2,322	194	-	-	-	-	-
Cranes (75 ton and 1 over 75 ton)	837	3,348	279	-	-	-	-	-
Loader for Backfill of Pump Station Foundation	0	120	0	-	-	-	-	-
Four Mile Run								
Traffic Controls	1,653	6,557	6,575	3,791	-	-	-	-
Pump, 20,000 GPM	51	203	204	118	-	-	-	-
Chain Saws and Chipper	0	132	487	281	-	-	-	-
1/2 C.Y. Excavator	275	1,093	1,096	632	-	-	-	-
12 C.Y Dump Truck	92	364	365	211	-	-	-	-
Truck w/ 3-ton capacity Towed Trailer	92	364	365	211	-	-	-	-
Truck w/ 20-ton Capacity Towed Trailer	92	364	365	211	-	-	-	-
16.5 C.Y. Trucks	128	508	510	294	-	-	-	-
1 C.Y. Bucket, Hydraulic Excavators	184	729	731	421	-	-	-	-
6" Centrifugal Pump	275	1,093	1,096	632	-	-	-	-
300 H.P. Dozer	275	1,093	1,096	632	-	-	-	-
Backhoe with Tamper	0	18	65	38	-	-	-	-
Landscaping Trucks, Seeding and Grading	0	0	27	53	-	-	-	-
1/2 CY. Hydraulic Backhoe	138	546	548	316	-	-	-	-
Asphalt Trucks	0	0	247	473	-	-	-	-
Concrete Trucks	367	1,457	1,461	842	-	-	-	-
Loader for Backfill	0	33	87	0	-	-	-	-
Belle Haven								
16.5 C.Y. Trucks	240	951	954	951	748	-	-	-
300 H.P. Dozer	240	951	954	951	748	-	-	-
Asphalt Trucks	0	0	0	217	503	-	-	-
6" Centrifugal Pump	240	951	954	951	748	-	-	-
300 H.P. Dozer	160	634	636	634	499	-	-	-
Backhoe with Tamper	0	0	112	248	0	-	-	-
1 C.Y. Bucket, Hydraulic Excavator	480	1,902	1,908	1,902	1,496	-	-	-
12 C.Y Dump Truck	89	354	355	235	0	-	-	-
Truck w/ 3-ton Capacity Towed Trailer	120	476	477	476	374	-	-	-
Truck w/ 20-ton Capacity Towed Trailer	134	531	532	352	0	-	-	-
Trucks with Flagmen	240	951	954	951	748	-	-	-
Concrete Trucks	320	1,268	1,272	1,268	997	-	-	-
Chain Saws and Chipper	0	0	208	692	544	-	-	-
Cycle hauling, 8 C.Y. Truck	240	951	954	951	748	-	-	-
Pump, 30,000 GPM	74	295	207	0	0	-	-	-
Loader for Backfill	0	33	87	0	0	-	-	-
1/2 C.Y. Excavator	120	476	477	476	374	-	-	-
1/2 C.Y. Hydraulic Backhoe	124	494	495	327	0	-	-	-
3/8 C.Y. Excavator	124	494	495	327	0	-	-	-
Total Operating Hours per Year	**15,790**	**64,108**	**41,640**	**28,701**	**16,291**	**5,851**	**1,056**	**41**

Table 4-2 Emission Totals per Year from Study Equipment

Pollutant		Planning Unit Emissions (tons)				Total Emissions (tons)
		Reagan	Arlington WPCP	Four Mile Run	Belle Haven	
2026	CO	2.09	3.37	1.15	2.99	9.60
	NOx	0.40	1.46	1.28	0.32	3.47
	SO2	0.00	0.00	0.00	0.00	0.00
	VOC	0.08	0.15	0.08	0.07	0.37
	PM2.5	0.01	0.02	0.02	0.01	0.06
	PM10	0.01	0.02	0.02	0.01	0.06
2027	CO	8.39	14.57	5.00	5.15	33.12
	NOx	1.61	5.86	5.11	1.28	13.85
	SO2	0.00	0.01	0.01	0.00	0.02
	VOC	0.32	0.62	0.33	0.27	1.54
	PM2.5	0.03	0.10	0.08	0.03	0.23
	PM10	0.03	0.10	0.08	0.04	0.25
2028	CO	8.41	2.77	6.59	5.87	23.65
	NOx	1.61	1.35	5.15	1.31	9.42
	SO2	0.00	0.00	0.01	0.00	0.01
	VOC	0.32	0.12	0.37	0.28	1.10
	PM2.5	0.03	0.02	0.08	0.03	0.16
	PM10	0.03	0.02	0.08	0.04	0.18
2029	CO	3.65	-	4.29	7.30	15.24
	NOx	1.78	-	2.97	1.28	6.03
	SO2	0.00	-	0.00	0.00	0.01
	VOC	0.17	-	0.23	0.30	0.69
	PM2.5	0.04	-	0.04	0.03	0.11
	PM10	0.04	-	0.05	0.04	0.13
2030	CO	2.80	-	-	5.45	8.24
	NOx	1.59	-	-	0.91	2.51
	SO2	0.00	-	-	0.00	0.00
	VOC	0.15	-	-	0.21	0.36
	PM2.5	0.03	-	-	0.02	0.05
	PM10	0.03	-	-	0.03	0.06
2031	CO	2.64	-	-	-	2.64
	NOx	8.33	-	-	-	8.33
	SO2	0.00	-	-	-	0.00
	VOC	0.14	-	-	-	0.14
	PM2.5	0.02	-	-	-	0.02
	PM10	0.03	-	-	-	0.03
2032	CO	0.94	-	-	-	0.94
	NOx	0.14	-	-	-	0.14
	SO2	0.00	-	-	-	0.00
	VOC	0.03	-	-	-	0.03
	PM2.5	0.00	-	-	-	0.00
	PM10	0.00	-	-	-	0.00
2033	CO	0.05	-	-	-	0.05
	NOx	0.00	-	-	-	0.00
	SO2	0.00	-	-	-	0.00
	VOC	0.00	-	-	-	0.00
	PM2.5	0.00	-	-	-	0.00
	PM10	0.00	-	-	-	0.00

Table 4-3 Emission Study Totals

Pollutant	Total Emissions (tons)	De minimis Threshold[1] (tons)
CO	93.48	100
NOx	43.75	100
SO2	0.05	100
VOC	4.23	100
PM2.5	0.64	100
PM10	0.70	100

Notes:

[1] De minimis threshold values for maintenance areas

Table 4-4 Tugboat Operational Information

Equipment	Power (kW)	Load Factor	Emission Factors (g/kWh)				
			CO	NOx	VOC	PM2.5	PM10
Tugboat							
Propulsion[1]	3,512	0.5	2	8.33	0.1411	0.2995	0.3088
Auxillary[1]	285	0.43	0.9299	5.9624	0.2472	0.1465	0.151

Notes:

[1]Factors from the USEPA Port Emissions Inventory Guidance

Table 4-5 Carbon Dioxide Emission Totals

	CO2 Emissions (tons)				Total Emissions (tons)
	Reagan	Arlington WPCP	Four Mile Run	Belle Haven	
2026	158	650	520	178	1,506
2027	634	2,606	2,065	708	6,012
2028	636	548	2,081	716	3,980
2029	692	-	1,201	704	2,597
2030	712	-	-	520	1,232
2031	604	-	-	-	604
2032	60	-	-	-	60
2033	0	-	-	-	0
Total	**3,496**	**3,803**	**5,867**	**2,826**	**15,992**

5 CONCLUSIONS

Ozone precursors, volatile organic compounds (VOCs) and oxides of nitrogen (NO_x) are below the USEPA threshold of 100 tons per year for all maintenance areas. All other annual emission totals and aggregated study emission totals for criteria pollutants are not anticipated to exceed all other USEPA de minimis thresholds; therefore, no mitigation measures are required.

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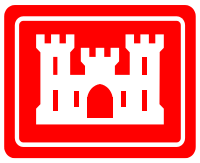
METROPOLITAN WASHINGTON, DISTRICT OF COLUMBIA COASTAL STORM RISK MANAGEMENT FEASIBILITY STUDY

INTEGRATED FEASIBILITY REPORT & ENVIRONMENTAL ASSESSMENT

APPENDIX G3: WETLAND DELINEATION REPORT

Metropolitan Washington District of Columbia
Coastal Storm Risk Management Feasibility Study
Wetland Delineation Report



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APPENDICES

1.0 INTRODUCTION

1.1 STUDY PURPOSE

The purpose of the Metropolitan Washington District of Columbia Coastal Storm Risk Management Feasibility Study (DC Coastal Study) is to reduce coastal flood risk to vulnerable populations, properties, infrastructure, and environmental and cultural resources considering future climate and sea level change scenarios to support resilient communities in northern Virginia (VA). Currently, a focused array of structural and non-structural alternatives are being considered: No Action; Critical Infrastructure Plan for Reagan National Airport; Critical Infrastructure Plan for the Arlington Water Pollution Control Plant (WPCP); Floodwall/Levee Plan for Alexandria Four Mile Run; Floodwall/Levee Plan for Belle Haven; a non-structural plan; and a combination of these alternatives.

1.2 REPORT PURPOSE

The purpose of this report is to document the methodology used, and the amount and location of wetlands located within the approximate limits of disturbance (LOD) of the DC Coastal study area. A preliminary site visit was conducted on July 14, 2020, to determine the presence of wetlands in the locations of the study alternatives. Based on this site visit, it was determined that a wetland delineation was needed for several locations due to the presence of wetlands within the LOD. On July 27 and 28, 2021, a site visit was conducted, and a routine wetland delineation was performed of the Four-Mile Run and Belle Haven study areas in accordance with the 1987 *Corps of Engineers Wetland Delineation Manual* and the 2010 *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region (Version 2.0).*

1.3 STUDY AREA

Two study areas were investigated for the purpose of this report; one study area located in Fairfax County, VA (Belle Haven), and one study area located in Arlington/Alexandria, VA (Four Mile Run) (**Appendix A, Figure 1**). The Belle Haven study area is zoned as R-3 Residential District according to Fairfax County Planning and Zoning (Fairfax Department of Planning, 2021). The Belle Haven study area includes the Floodwall/Levee Plan for Belle Haven alternative. The Four Mile Run study area is zoned as Public Open Space (POS) according to Alexandria Zoning (Alexandria, 2021) and lays within the Four Mile Run Park. The Four Mile Run study area includes the Critical Infrastructure Plan for the Arlington WPCP and the Floodwall/Levee Plan for Alexandria Four Mile Run alternatives. Both study areas are within the U.S. Geological Survey (USGS) 8-digit Middle Potomac-Anacostia-Occoquan Watershed (02070010).

2.0 METHODS

2.1 DATA COLLECTION AND ANALYSIS

Wetland information and Geographic Information System Mapping (GIS) data were collected from various sources for preliminary analysis and identification of wetland areas within the study areas. Additionally, USGS topographic quadrangles (USGS, 2019), U.S. Department of Agriculture (USDA) web soil surveys (USDA, 2021), Federal Emergency Management Agency

floodplain mapping (FEMA, 2010 & 2014), and U.S. Fish and Wildlife Service's (USFWS) National Wetland Inventory (NWI) on-line maps (USFWS, 2020) were accessed. The results of the delineation and data compilation are presented in the appendices.

2.2 GLOBAL POSITIONING SYSTEM (GPS) METHODOLOGY

The field survey was completed using a handheld Global Positioning System (GPS). The objective of the GPS survey was to collect location data for each wetland and upland boundary. This survey horizontally references the North American Datum of 1983 (NAD83). This data was then transferred into ArcGIS Pro for analysis and mapping.

2.3 WETLAND DELINEATION

Wetlands are defined by the presence of three parameters: hydrophytic vegetation, hydric soils, and wetland hydrology -all three parameters are identified and documented within the wetland sample plot when applicable. Methods for determining if each of the three parameters met are described in the 1987 *Corps of Engineers Wetland Delineation Manual* and the 2010 *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region* (Version 2.0). The delineation was conducted on July 27 and July 28, 2021 by a team of biologists from USACE – Baltimore District, Planning Division. At least one wetland sample plot was taken for each wetland, and one upland sample plot was taken for each wetland or shared between adjacent wetlands. Wetland and upland sample plots vary in size (5-ft – 15-ft radius) depending on the vegetative stratum. All delineated wetlands are classified into a system and subsystem according to the *Classification of Wetlands and Deep-Water Habitats of the United States* (Cowardin et al., 1979). Photographs were taken throughout the investigation and can be found in Appendix B. Wetland Delineation Data Forms for the representative wetland and upland sample plots are presented in Appendix C.

3.0 FINDINGS

3.1 PUBLISHED INFORMATION

The Alexandria Topographic 7.5' x 7.5' Quadrangles depicts two mapped waterways within the Belle Haven study area LOD (**Figure 2A**). The Alexandria Quadrangle depicts three mapped waterways within the Four Mile Run study area (**Figure 2B**). All mapped Waters of the U.S. (WUS) identified on the quadrangles and within the study areas are direct tributaries to the Potomac River.

The NWI wetland datasets identify freshwater emergent wetlands, freshwater forested/shrub wetlands, and riverine wetlands within the Belle Haven study area and the Four Mile Run study area (USFWS, 2021) (**Figures 3A & 3B**).

The FEMA floodplain mapping for Fairfax County, VA (FEMA, 2010) depicts the entire Belle Haven study area within the 100-year floodplain (FIRM Panel # 51059C0320E (**Figure 3A**). The FEMA floodplain mapping for the City of Alexandria, VA and Arlington County, VA (FEMA,

2011 & 2013) depicts portions of the Four Mile Run study area within the 100-year floodplain (FIRM Panels # 5155190033E & 51013C0081C) (**Figure 3B**). The associated waterways within the mapped floodplain include Four Mile Run and other unnamed tributaries to the Potomac River.

Fairfax County's Open Geospatial Data (Fairfax, 2021) indicates that the Belle Haven study area is located within a Resource Protection Area (RPA) (RPA, 1993). The RPA is located outside of the LOD for the Belle Haven Floodwall/Levee Plan alternative. Additionally, the Arlington County Official GIS Open Data Portal displays an RPA buffer around Four Mile Run (Arlington, 2021). Portions of the RPA are located within the LOD of the Critical Infrastructure Plan for the Arlington WPCP and the Floodwall/Levee Plan for Alexandria Four Mile Run alternatives. An RPA is a regulated waterbody and associated corridors of environmentally sensitive land that are alongside or near shorelines of streams, rivers, and other waterways which drain into the Potomac River and eventually to the Chesapeake Bay (Fairfax, 2021) (**Figures 3A & 3B**).

The Web Soil Survey for Fairfax County and Arlington County, VA (USDA-NRCS, 2021) indicates that seven soil survey units occur within the study areas. Of these, two units located within the Belle Haven study area are considered hydric – Mattapex Loam and Honga peat. (**Figures 4A & 4B**). The soil survey units are summarized in **Table 3-1**.

Table 3-1. Soil Survey (Belle Haven and Four Mile Run)

Soil Name	Map Symbol	K-Factor Rating* (whole soil)	Hydric Rating
Belle Haven			
Grist Mill sandy Loam, 0 to 25 percent slopes	40	.24	Not Hydric (0%)
Mattapex loam, 2 to 7 percent slopes	77B	.49	Hydric (1 to 32%)
Honga peat, 0 to 1 percent slopes, very frequently flooded, tidal	60A	Not Rated	Hydric (100%)
Urban Land	95	Not Rated	Not Hydric (0%)
Four Mile Run			
Grist Mill sandy Loam, 0 to 25 percent slopes	40	.24	Not Hydric (0%)
Udorthents, loamy	13	Not Rated	Not Hydric (0%)
Urban Land	95	Not Rated	Not Hydric (0%)
Urban land-Kingstowne complex	100	Not Rated	Not Hydric (0%)
Woodstown sandy loam, 2 to 7 percent slopes	109B	.20	Not Hydric (0%)

*K-Factor indicates the susceptibility of a soil to sheet and rill erosion by water. The estimates are based primarily on percentage of silt, sand, and organic matter and on soil structure and saturated hydraulic conductivity. Values of K range from 0.02 to 0.69 – the higher the value, the more susceptible the soil is to sheet and rill erosion by water (USDA-NRCS, 2021).

3.1.1 VEGETATION

For purposes of wetland delineation, many plants are assigned an indicator status (**Table 3-2**) by the USFWS, which is used to determine the probability of that species occurring in wetlands. No plant species observed in the study areas are listed as rare, threatened, or endangered at either a federal or state level.

Table 3-2. Plant Indicator Status

Indicator Status	Abbreviation	% Chance of Occurrence in Wetlands
Obligate species – occur almost always in wetlands under natural conditions.	OBL	99
Facultative Wetland species – usually occur in wetlands but occasionally found in non-wetlands.	FACW	67-99
Facultative species – equally likely to occur in wetlands and non-wetlands.	FAC	34-66
Facultative Upland Species – Usually occur in non-wetlands but occasionally found in wetlands.	FACU	1-33
Upland species – occur almost always in non-wetlands under natural conditions in the regions specified. May occur in wetlands in another region.	UPL	1

USFWS, 2020

3.2 WETLAND AND WATERWAY FINDINGS

Belle Haven Study Area Wetlands and Waterways

Figure 5A shows the delineated boundaries of each wetland and waterway described below.

Wetlands 1 and 2 (PEM)

Wetland 1 and Wetland 2 were delineated as palustrine emergent (PEM) wetlands, bisected by an upland forest. Both wetlands extend south to southeast outside of the study area boundary. The two wetlands are located south of Wakefield Drive and west of the George Washington Memorial Parkway. Both wetlands are located in RPA 1993 according to Fairfax County Planning and Zoning (Fairfax, 2021).

Primary hydrologic indicators observed in Wetland 1 and Wetland 2 include high-water table and saturation. Surface water was representative within the broader wetland complexes but was not present in the radius of either sampling area. Secondary indicators consisted of crayfish burrows and geomorphic position. The wetlands are tidally influenced and thus, receive their hydrologic properties through the local tidal regime.

The dominance test for hydrophytic vegetation was met for Wetland 1 and Wetland 2. Dominant species in the sapling/shrub stratum for Wetland 1 include green ash (*Fraxinus pennsylvanica*, FACW), and in the herbaceous stratum, broadleaf cattail (*Typha latifolia*, OBL) was the dominant species. Dominant species in the sapling/shrub stratum for Wetland 2 included silky dogwood (*Cornus amomum*, FACW). Dominant vegetation in the herbaceous stratum includes broadleaf

cattail, and halberdleaf tearthumb (*Polygonum arifolium*, OBL). The soil profile for both wetlands met the depleted matrix (F3) indicator.

Waterways 1 and 2

Waterways 1 and 2 are located south of Wakefield Drive and south of the Old Town Driving School. Both waterways carry a perennial flow regime, originate outside of the study area, and intersect Wetland 1 and Wetland 2, respectively. Waterway 1 flows from north to south and is directed by a concrete channel before discharging into Wetland 1. Once the waterway reaches Wetland 1, the substrate transitions to silt, sand, and muck. Waterway 2 shares similar characteristics, although not originated by a concrete channel, it has been altered into a straight channel before it reaches Wetland 2. Both waterways receive hydrology through adjacent waterways, localized urban runoff, and groundwater. The banks of both systems are relatively flat and vegetated with native wetland species. Waterways 1 and 2 eventually discharge through the Dyke Marsh Wildlife Preserve and into the Potomac River, a traditional navigable water (TNW).

Waterway 3

Waterway 3 is located in the western portion of the study area, adjacent to the Westgrove Dog Park. The waterway flows from west to east and contained hydrology at the time of the field investigation (July 27, 2021). The waterway appears to be perennial; however, the origin is unknown. The waterway crosses underneath a residential sidewalk through a small culvert and eventually discharges into Wetland 1. The substrate consists of sand, silt, and small cobbles and gravel. Waterway 3 receives hydrology through runoff and groundwater influences. The banks are approximately 0.5 to 3-foot in height. Waterway 3 eventually discharges through the Dyke Marsh Wildlife Preserve and into the Potomac River, a TNW.

Four Mile Run Study Area Wetlands and Waterways

Five wetlands were delineated within the Four Mile Run study area: three PEM wetlands and two palustrine forested wetlands (PFO). Wetlands 3 through 6 are part of one main wetland complex and were divided between different classifications depending on vegetative cover. An elevated walking trail (Four Mile Run Park Trail) bounds the entire wetland complex within a bowl-like feature. **Figure 5B shows the delineated boundaries of each wetland and waterway described below.**

Wetland 3 (PEM)

Wetland 3 is located within the bounds of the Four Mile Run walking trail. The wetland borders Wetland 4 (PFO) and Wetland 6 (PFO). Primary hydrologic indicators observed in Wetland 3 include saturation, inundation visible on aerial imagery, and hydrogen sulfide odor. Secondary hydrologic indicators include drainage patterns and geomorphic position. Wetland 3 is tidally influenced and receives hydrology from Four Mile Run and adjacent urban runoff.

The dominance test for hydrophytic vegetation was met for Wetland 3. Dominant species in the sapling/shrub stratum include silky dogwood. Dominant vegetation in the herbaceous stratum includes broadleaf cattail and green arrow arum. During the field investigation, an abundance of standing dead green ash trees were observed in the vicinity of the sampling point. The soil profile for Wetland 3 met the depleted matrix (F3) indicator.

Wetland 4 (PFO)

Wetland 4 is located within the bounds of the Four Mile Run walking trail and is adjacent to a playground. The wetland borders Wetland 3 (PEM) and Wetland 5 (PEM). Primary hydrologic indicators observed in Wetland 4 include surface water, high water table, and saturation. Secondary hydrologic indicators include drainage patterns and geomorphic position. Wetland 4 is tidally influenced and receives hydrology from Four Mile Run and adjacent urban runoff.

The dominance test for hydrophytic vegetation was met for Wetland 4. Dominant vegetation in the tree stratum includes red maple (*Acer rubrum*, FAC). Pin Oak (*Quercus palustris*, FACW) and green ash are the dominant species within the sapling/shrub stratum. In the herbaceous stratum, Lizard's tail (*Saururus cernuus*, OBL) populates most of the herbaceous layer by covering more than half the sampling area. The soil profile for Wetland 4 met the depleted matrix (F3) indicator.

Wetland 5 (PEM)

Wetland 5 is located within the bounds of the Four Mile Run walking trail and borders Wetland 4 (PFO) and Wetland 6 (PFO). Primary hydrologic indicators include high-water table, saturation, and inundation visible on aerial imagery. Secondary indicators include drainage patterns and crayfish burrows. Wetland 5 is tidally influenced and receives hydrology from Four Mile Run and adjacent urban runoff.

The dominance test for hydrophytic vegetation was met for Wetland 5. Dominant vegetation in the tree stratum includes American elm (*Ulmus americana*, FAC), Cottonwood (*Populus deltoides*, FAC), and green ash. Most of the tree species are rooted outside of the wetland sample plot but provide the benefit of shading portions of the wetland through overhanging branches. Dominant vegetation in the herbaceous stratum consists of green arrow arum. Broadleaf cattail and Common Reed (*Phragmites australis*, FACW) were observed dominating most of Wetland 5 but were not prevalent in the wetland sample plot. The soil profile for Wetland 5 met the depleted matrix (F3) indicator.

Wetland 6 (PFO)

Wetland 6 is located within the bounds of the Four Mile Run walking trail and borders Wetland 3 (PEM) and Wetland 5 (PEM). Primary hydrologic indicators include surface water, high-water table, and saturation. Secondary indicators include drainage patterns and geomorphic position. Wetland 6 is tidally influenced and receives additional hydrology from urban runoff, and an adjacent, unnamed tributary to Four Mile Run.

The dominance test for hydrophytic vegetation was met for Wetland 6. Dominant vegetation in the tree and sapling/shrub stratum consists of green ash and spicebush (*Lindera benzoin*, FACW).

In the herbaceous stratum, dominant species include Jewelweed (*Impatiens capensis*, FACW), and white grass (*Leersia virginica*, FACW). Poison ivy (*Toxicodendron radicans*, FAC) dominate the woody vine stratum. The soil profile for Wetland 6 met the depleted matrix (F3) indicator.

Wetland 7 (PEM)

Wetland 7 is located north of Four Mile Run and is technically located in Arlington – Four Mile Run is the political boundary between the City of Alexandria and Arlington County. The Arlington Water Pollution Control Plant and an electrical substation are located directly north of Wetland 7. The wetland complex is a long, narrow, linear system that is bounded by Four Mile Run and steep upland slopes. The wetland runs almost the entirety of the study area and does possess small, upland inclusions throughout but are not large enough in size to separate the wetland system. Primary hydrologic indicators consist of saturation and geomorphic position.

The dominance test for hydrophytic vegetation was met for Wetland 7. Dominant vegetation in the herbaceous stratum consists of pickerelweed (*Pontederia cordata*, OBL), Pennsylvania smartweed (*Persicaria pensylvanica*, FACW), climbing hempvine (*Mikania scandens*, FACW) and halberdleaf tearthumb. The soil profile for Wetland 7 met the depleted matrix (F3) indicator.

Waterway 4 (Four Mile Run)

Waterway 4 (Four Mile Run) is located north of Four Mile Run Park and south of the Arlington WPCP. Waterway 4 is a perennial waterway that flows from northwest to southeast and originates outside of the study area. The waterway receives hydrology through tidal influence, groundwater, adjacent waterways, and localized runoff. The substrate of the waterway is mostly silt and sand, and the banks are vegetated and flat directly adjacent to the waterway. Waterway 4 discharges directly into the Potomac River, a TNW.

Waterway 5

Waterway 5 is located south of Four Mile Run Park and is a perennial waterway that flows from west to east, changes directions, and then flows from south to north. The waterway receives hydrology from localized runoff, groundwater and adjacent waterways. The waterway originates from a culvert underneath Edison St, flows east through a concrete channel, then turns north and eventually discharges into Waterway 4 (Four Mile Run), which drains into the Potomac River, a TNW. The substrate varies from concrete, to silt, sand, and mud. The banks of waterway 5 vary in height and range from 0.5-foot to approximately 4-feet.

Waterway 6

Waterway 6 is located north of the Four Mile Run Park Trail and flows from west to east. The waterway originates from within Wetlands 5 and 6 and receives hydrology from groundwater, adjacent waterways and localized runoff. The substrate consists of mostly sand and silt and the banks of Waterway 6 are relatively flat and vegetated. Waterway 6 discharges into Waterway 5, which drains into Waterway 4 (Four Mile Run), which terminates at the Potomac River, a TNW.

Waterway 7 (Sunnyside Stream)

Waterway 7 is located west of Four Mile Run Park Trail and east of Four Mile Run Road. The waterway originates outside of the study area and flows from west to east. Waterway 7 receives hydrology from groundwater, localized runoff, and adjacent waterways. The substrate consists of silt, sand, small cobbles and boulders. The banks range in height from 3 to 5-feet. Waterway 7 discharges directly into Waterway 4 (Four Mile Run), which drains into the Potomac River, a TNW.

Miscellaneous culverts

There are several outfalls draining directly into Four Mile Run from north of the river. These outfalls were not characterized as separate waterway systems, rather, they were grouped as part of Waterway 4. One of the outfalls comes directly from the Arlington WPCP as treated wastewater.

4.0 CONCLUSIONS

Several wetlands and waterways were identified and delineated by USACE – Baltimore District, Planning Division. These delineations were preliminary, not jurisdictional, and were performed on July 27 and 28, 2021. The table below provides proposed impacts to wetlands within the Four Mile Run study area. No wetland impacts will occur within the Belle Haven study area. Furthermore, no impacts will occur to waterways within either study area.

Table 3-3. Four Mile Run Wetland Impacts

Four Mile Run Wetland Impacts			
Wetland Name	**Wetland Type**	**SF**	**AC**
Wetland 4	PFO	10,759	0.2
Wetland 5	PEM	1,455	0.0
Wetland 6	PFO	3,577	0.1
Wetland 7	PEM	3,352	0.1
Total		***19,143***	***0.44***

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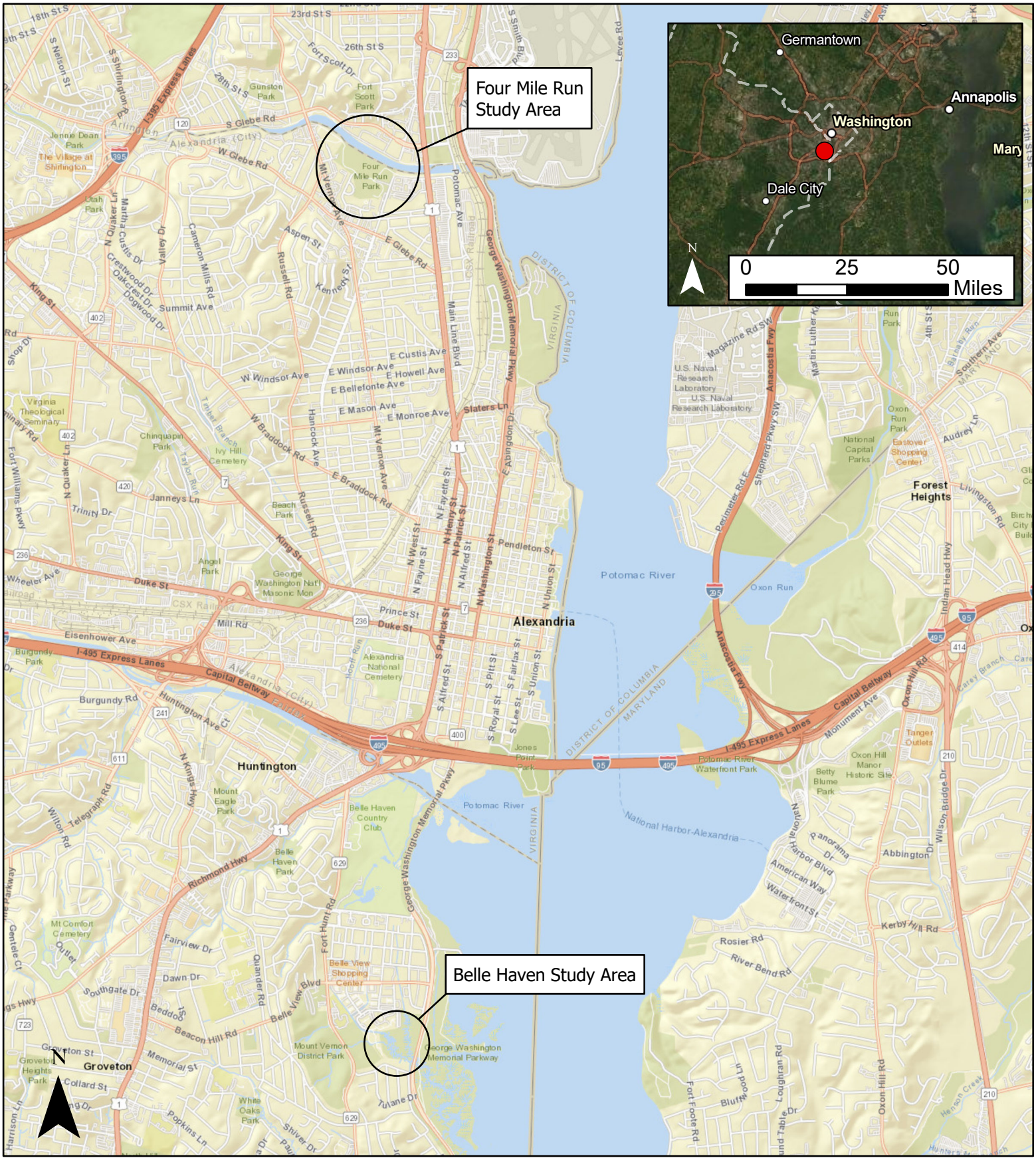
APPENDIX A
Figures



Metropolitan Washington CSRM Feasibility Study Wetland Delineation Report

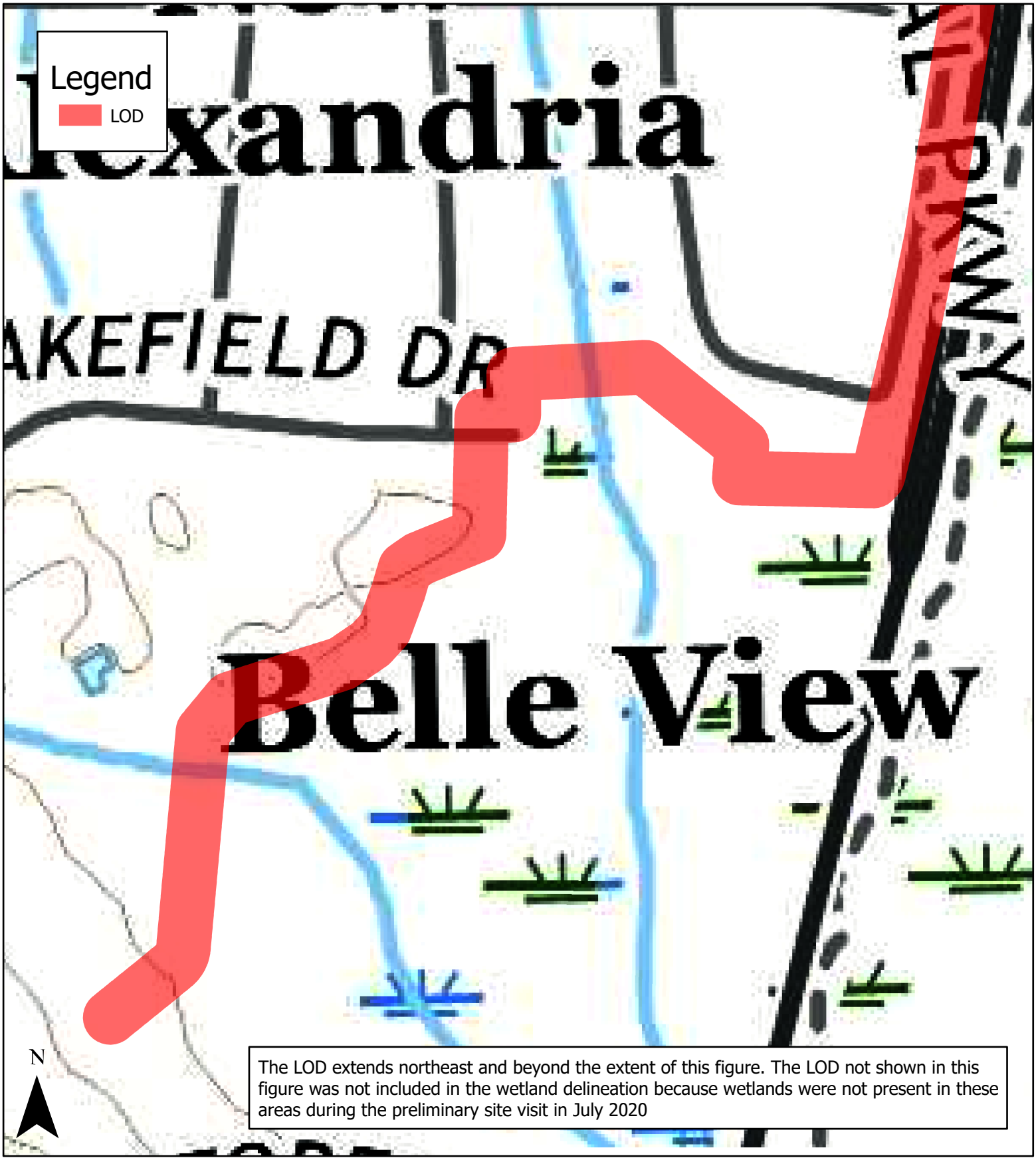
Figure 1: Vicinity Map

US Army Corps of Engineers - Baltimore District

0 0.5 1 Miles

Source: ESRI

Date: October 2021



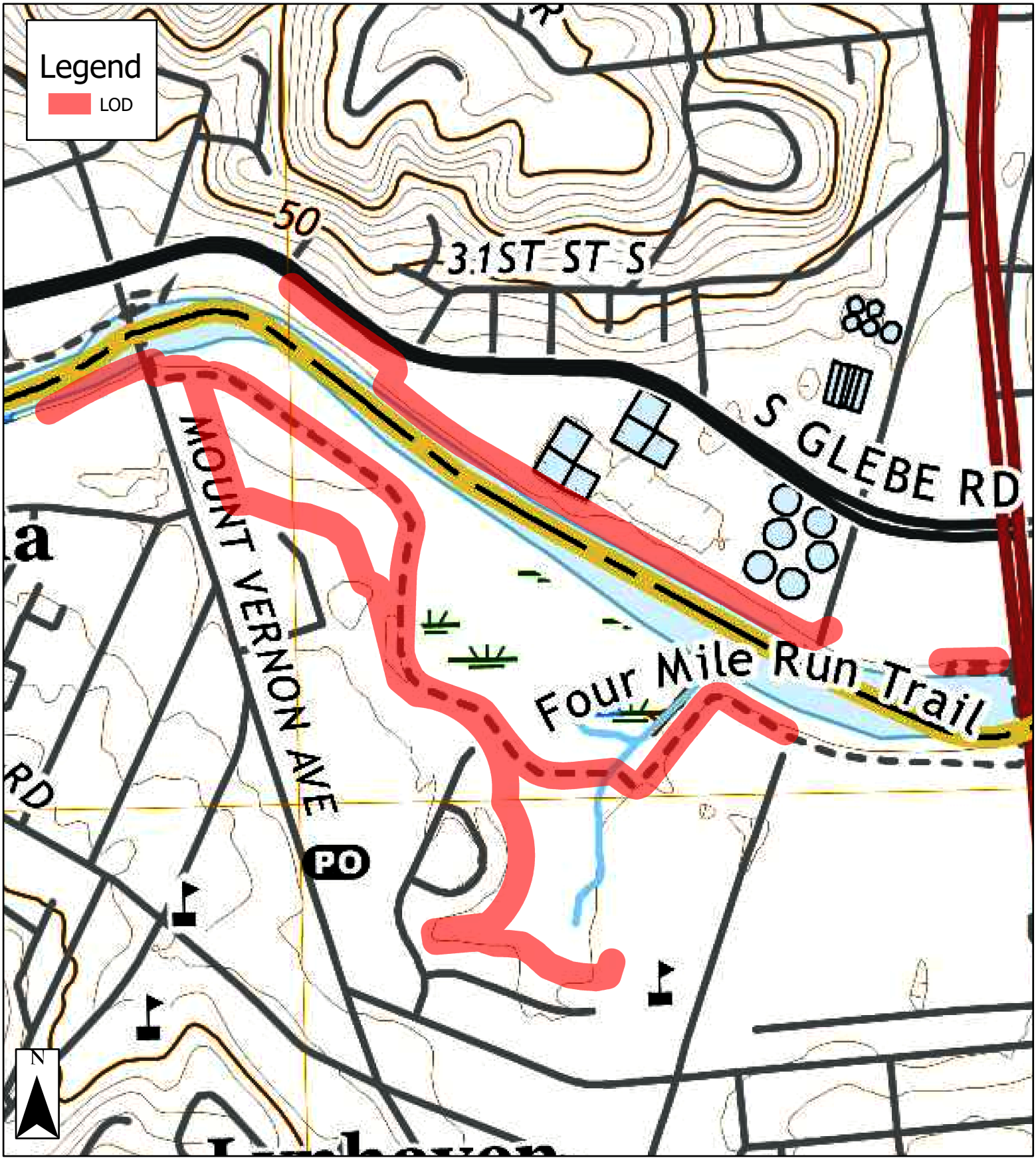
Metropolitan Washington District of Columbia Wetland Delineation Report (Belle Haven)

Figure 2A:
USGS 7.5'
Quadrangle

US Army Corps of Engineers - Baltimore District

0 250 500 Feet

Source: USGS Alexandria 7.5' Quadrangle
Date: October 2021



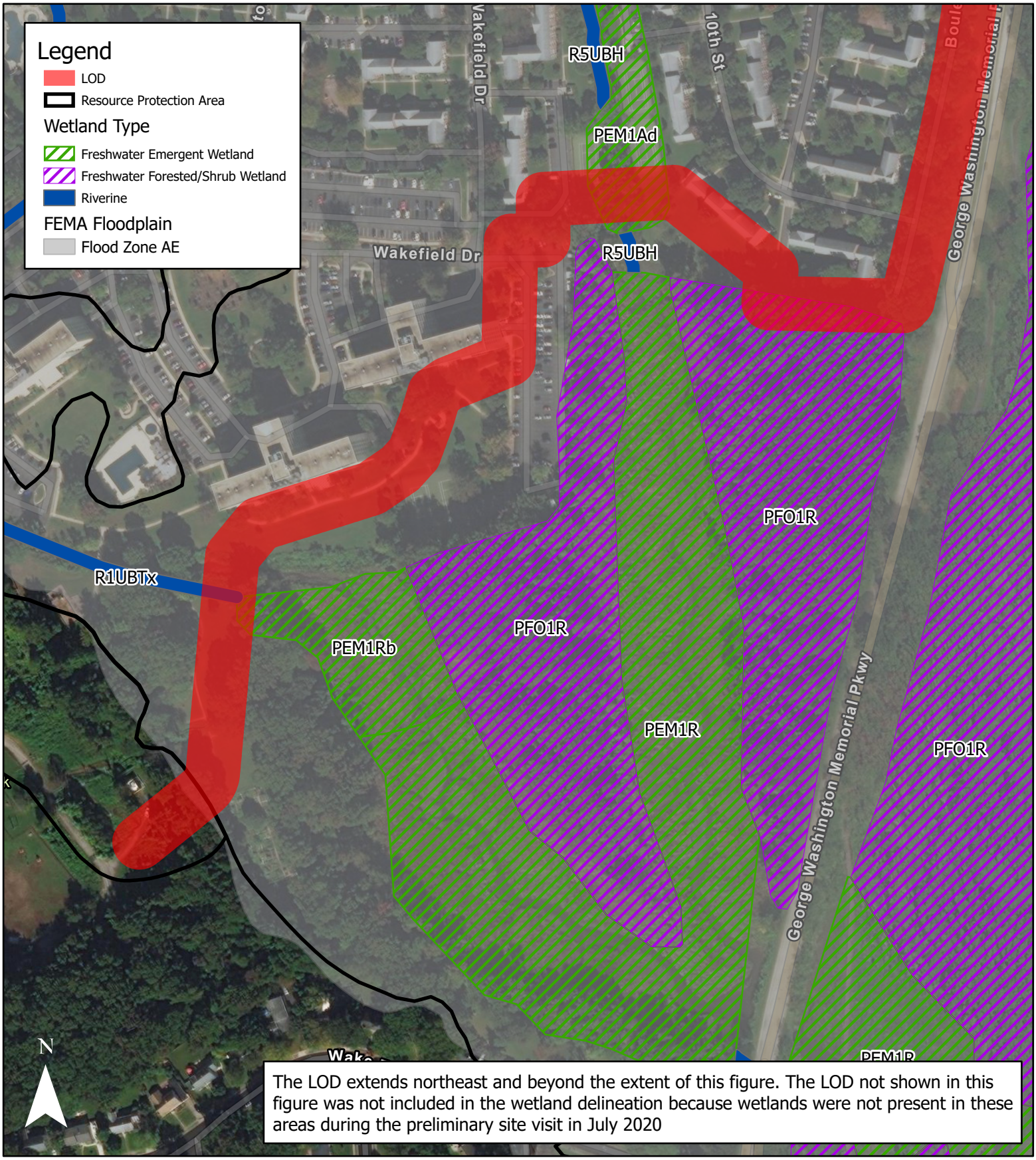
Metropolitan Washington District of Columbia Wetland Delineation Report (Four Mile Run)

Figure 2B:
USGS 7.5'
Quadrangle

US Army Corps of Engineers - Baltimore District

0 500 1,000
Feet

Source: USGS Alexandria 7.5' Quadrangle
Date: October 2021



Metropolitan Washington District of Columbia Wetland Delineation Report (Belle Haven)

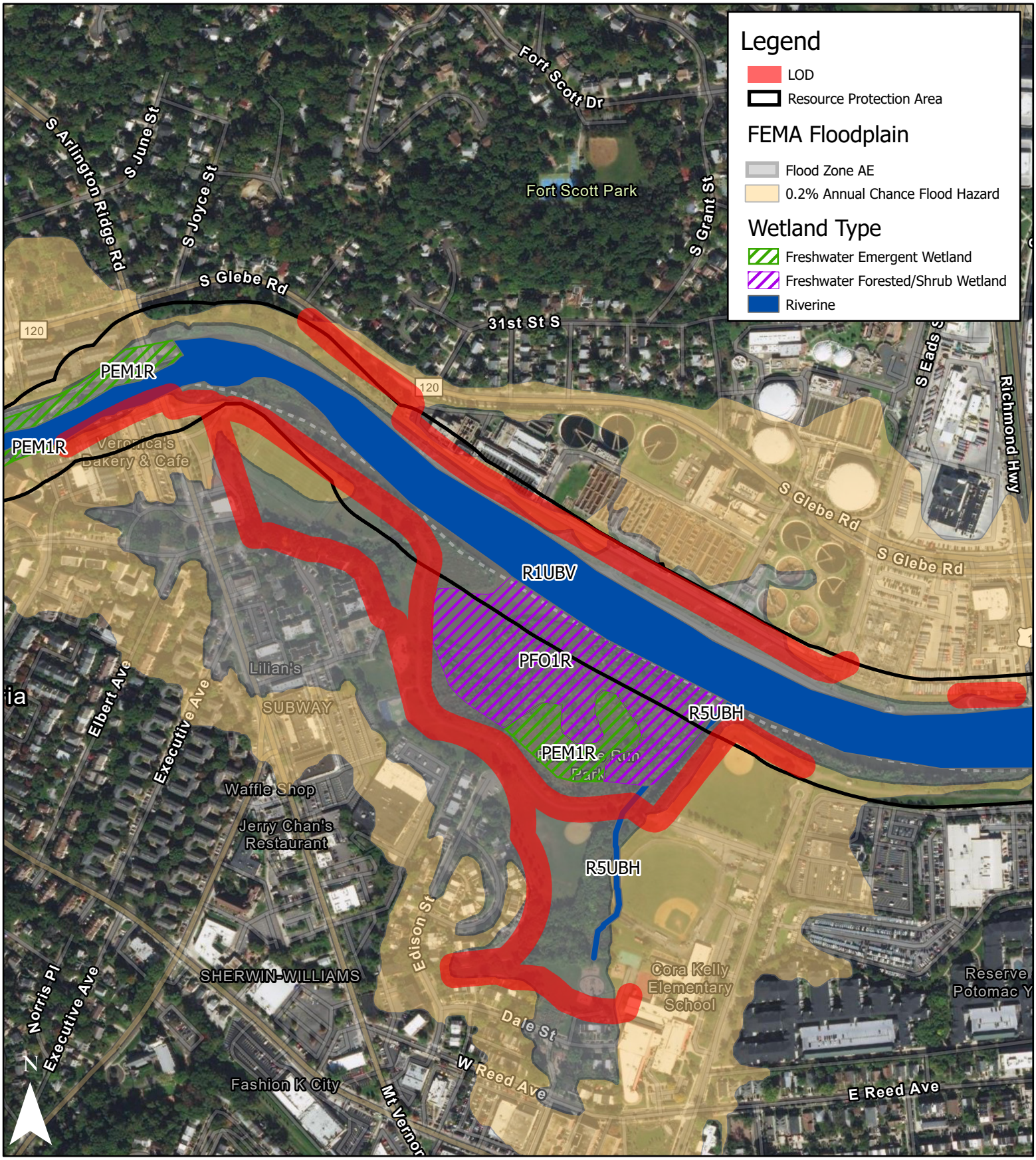
Figure 3A: Published Water Resources

US Army Corps of Engineers - Baltimore District

0 250 500 Feet

Source: ESRI, NWI, USFWS, Fairfax Co. GIS, FEMA

Date: October 2021



Metropolitan Washington District of Columbia Wetland Delineation (Four Mile Run)

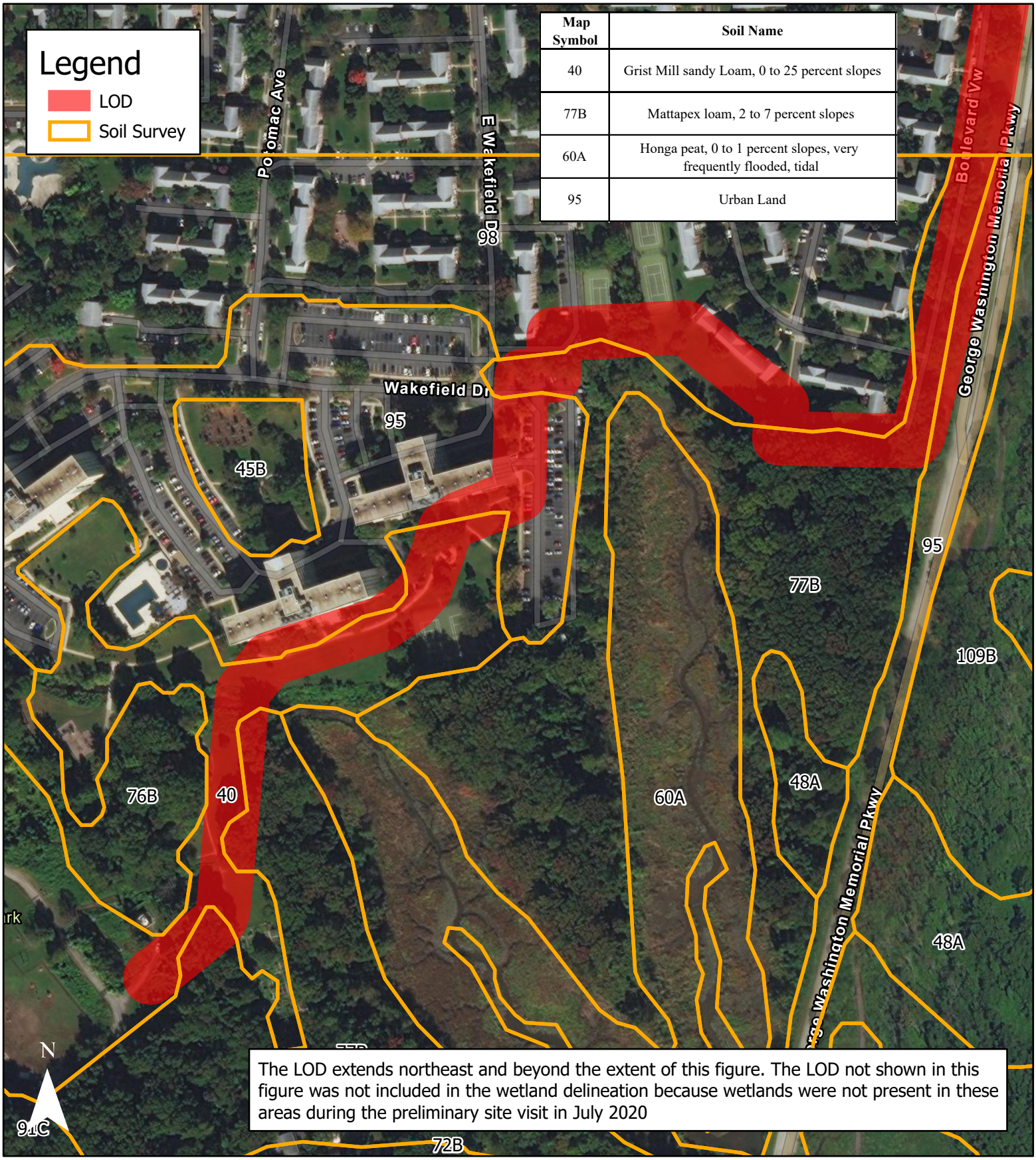
Figure 3B: Published Water Resources

US Army Corps of Engineers - Baltimore District

0 500 1,000 Feet

Source: ESRI, NWI, USFWS, City of Alexandria GIS, FEMA

Date: October 2021



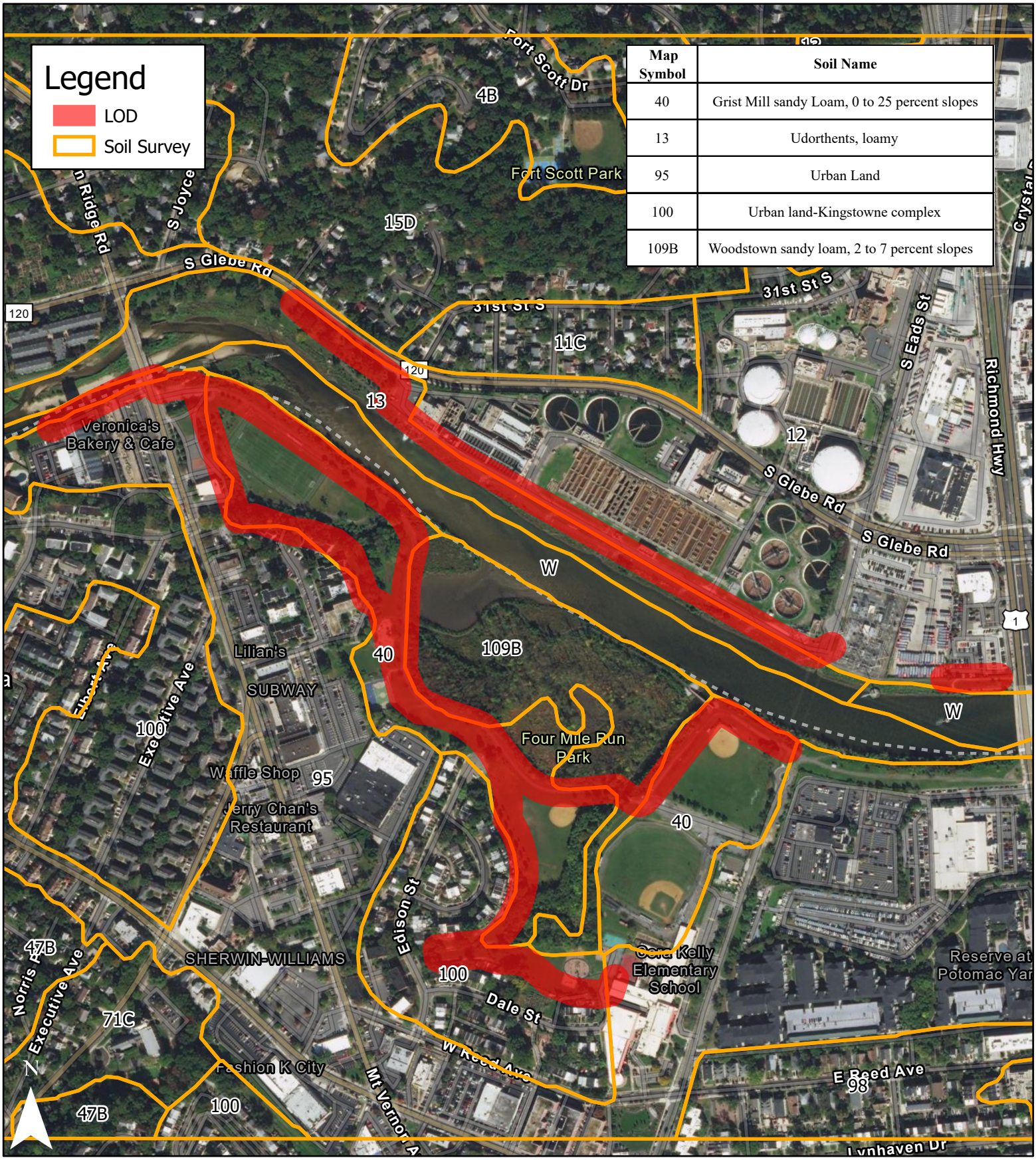
Metropolitan Washington District of Columbia Wetland Delineation Report (Belle Haven)

Figure 4A:
Soil Survey

US Army Corps of Engineers - Baltimore District

0 250 500 Feet

Source: ESRI, USDA-NRCS
Date: October 2021



Metropolitan Washington District of Columbia Wetland Delineation Report (Four Mile Run)

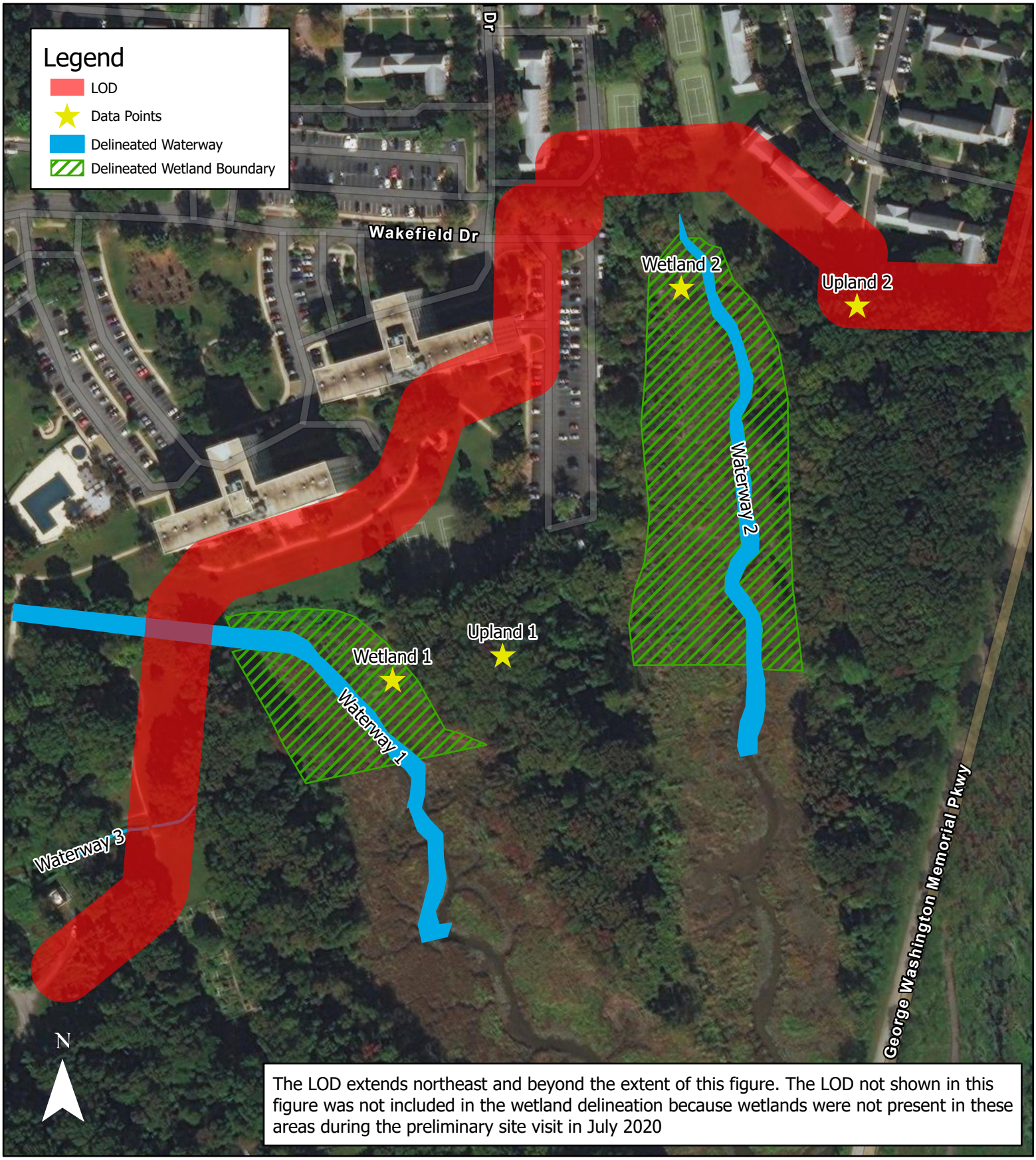
Figure 4B:
Soil Survey

US Army Corps of Engineers - Baltimore District

0 500 1,000 Feet

Source: ESRI, USDA-NRCS

Date: October 2021



Metropolitan Washington District of Columbia Wetland Delineation Report (Belle Haven)

Figure 5A:
Delineated Features

US Army Corps of Engineers - Baltimore District

0 200 400 Feet

Source: ESRI, Fairfax Co. GIS

Date: October 2021

Metropolitan Washington District of Columbia Wetland Delineation Report (Four Mile Run)

Figure 5B:
Delineated Features

US Army Corps of Engineers - Baltimore District

0 400 800 Feet

Source: ESRI, Fairfax Co. GIS

Date: October 2021

APPENDIX B
Photograph Documentation

Belle Haven Photo Log

Photo 1: Wetland 1 overview facing south

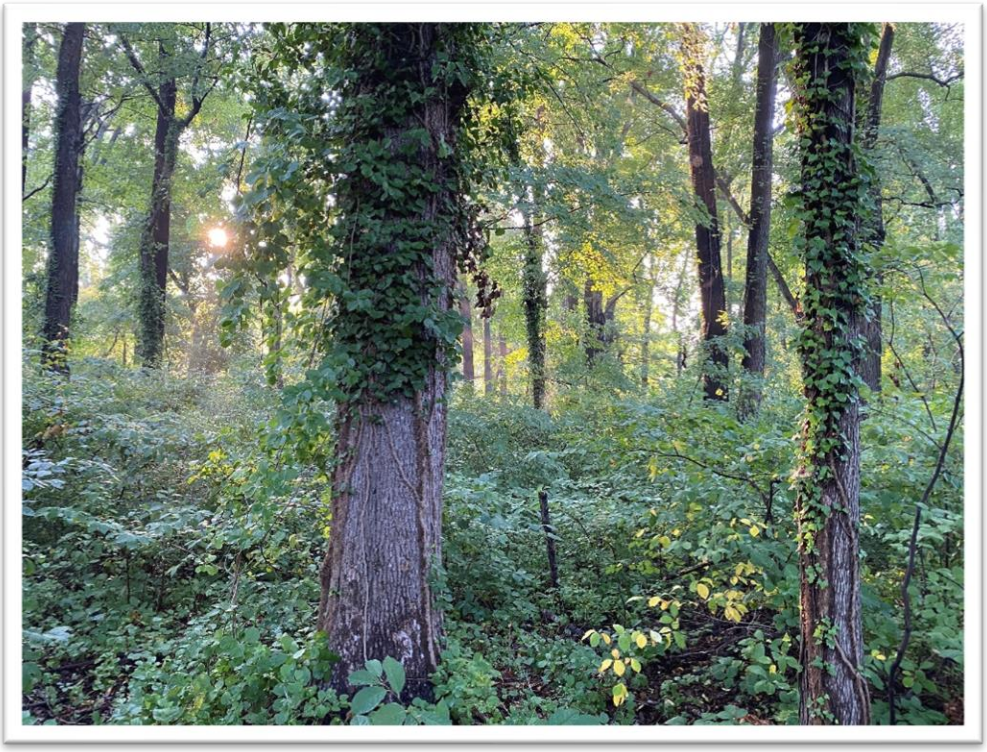


Photo 2: Upland 1 overview facing west

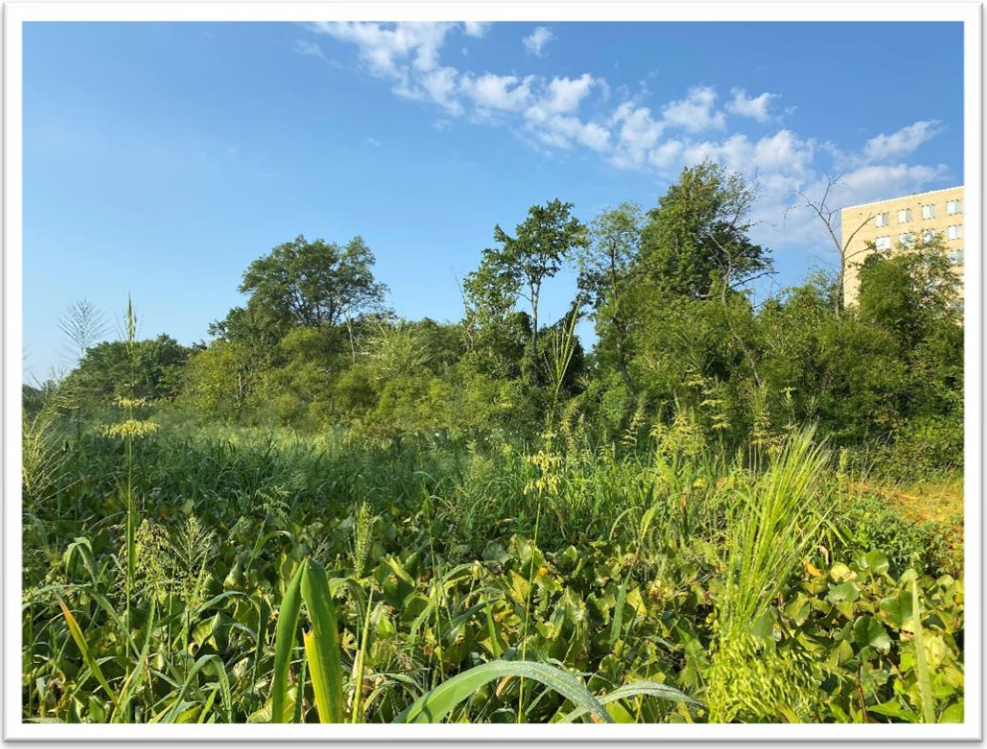


Photo 3: Wetland 2 overview facing southwest

Photo 4: Upland 2 overview facing west

Photo 5: Wetland 3 overview facing southwest

Photo 6: Upland 3 overview facing east

Photo 7: Wetland 4 overview facing east

Photo 8: Upland 4/5/6 overview facing northeast

Photo 9: Wetland 5 overview facing northwest

Photo 10: Wetland 6 overview facing east

Photo 11: Wetland 7 overview facing east

Photo 12: Wetland 7 overview facing east

Photo 13: Wetland 7 overview facing south overlooking Four Mile Run and Wetland 5 and Wetland 6

Photo 14: Wetland 7 overview facing east

Photo 15: Wetland 7 overview facing east

APPENDIX C
Routine Wetland Data Forms

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Belle Haven Wetland Delineation City/County: Fairfax Sampling Date: 2021-07-27

Applicant/Owner: USACE - Baltimore District State: VA Sampling Point: Upland 1

Investigator(s): C. Johnson, M. Spindler Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): Flat Local relief (concave, convex, none): None Slope (%): 1-2%

Subregion (LRR or MLRA): MLRA 149A Lat: 38.770884 Long: -77.055439 Datum: NAD83

Soil Map Unit Name: 77B - Mattapex loam, 2 to 7 percent slopes NWI classification: Upland

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 X	No _____	**Is the Sampled Area within a Wetland?** **Yes** _____ **No** X
Hydric Soil Present?	Yes _____	No X	
Wetland Hydrology Present?	Yes _____	No X	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ 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 X	Depth (inches): _____
Water Table Present?	Yes _____	No X	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes _____	No X	Depth (inches): _____

Wetland Hydrology Present? **Yes** _____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

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

Sampling Point: Upland 1

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. *Acer rubrum*	60	Yes	FAC
2. *Liquidambar styraciflua*	20	Yes	FAC
3.			
4.			
5.			
6.			
7.			
8.			
	80	= Total Cover	
50% of total cover: 40	20% of total cover: 16		
Sapling/Shrub Stratum (Plot size: 15')			
1. *Acer rubrum*	30	Yes	FAC
2. *Lindera benzoin*	40	Yes	FACW
3. *Viburnum dentatum*	10	No	FAC
4.			
5.			
6.			
7.			
8.			
	80	= Total Cover	
50% of total cover: 40	20% of total cover: 16		
Herb Stratum (Plot size: 5')			
1. *Fraxinus pennsylvanica*	10	No	FACW
2. *Sanicula marilandica*	15	No	FACU
3. *Toxicodendron radicans*	5	No	FAC
4. *Lonicera japonica*	5	No	FACU
5. *Lindera benzoin*	30	Yes	FACW
6. *Viburnum dentatum*	20	Yes	FAC
7. *Campsis radicans*	5	No	FAC
8. *Parthenocissus quinquefolia*	5	No	FAC
9.			
10.			
11.			
12.			
	95	= Total Cover	
50% of total cover: 47.5	20% of total cover: 19		
Woody Vine Stratum (Plot size: 30')			
1. *Hedera helix*	20	Yes	FACU
2. *Celastrus orbiculatus*	30	Yes	FACU
3.			
4.			
5.			
	50	= Total Cover	
50% of total cover: 25	20% of total cover: 10		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 6 (A)

Total Number of Dominant Species Across All Strata: 8 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 75 (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 ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators 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 X

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

SOIL

Sampling Point: Upland 1

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-2	10YR 5/4	100					Silty Loam	
2-15	10YR 6/3	100					Silty Loam	

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

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

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]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** _____ **No** X

Remarks:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Belle Haven Wetland Delineation City/County: Fairfax Sampling Date: 2021-07-27

Applicant/Owner: USACE - Baltimore District State: VA Sampling Point: Upland 2

Investigator(s): C. Johnson, M. Spindler Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): Flat Local relief (concave, convex, none): None Slope (%): 1-2%

Subregion (LRR or MLRA): MLRA 149A Lat: 38.772356 Long: -77.053397 Datum: NAD83

Soil Map Unit Name: 77B - Mattapex loam, 2 to 7 percent slopes NWI classification: Upland

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 X	No _____	**Is the Sampled Area within a Wetland?** **Yes** _____ **No** X
Hydric Soil Present?	Yes _____	No X	
Wetland Hydrology Present?	Yes _____	No X	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ 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 X	Depth (inches): _____
Water Table Present?	Yes _____	No X	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes _____	No X	Depth (inches): _____

Wetland Hydrology Present? **Yes** _____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

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

Sampling Point: Upland 2

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. *Liquidambar styraciflua*	80	Yes	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	80 = Total Cover		
50% of total cover: 40	20% of total cover: 16		
Sapling/Shrub Stratum (Plot size: 15')			
1. *Sassafras albidum*	10	Yes	FAC
2. *Lindera benzoin*	25	Yes	FACW
3. *Viburnum dentatum*	10	Yes	FAC
4. *Robinia pseudoacacia*	5	No	UPL
5.			
6.			
7.			
8.			
	50 = Total Cover		
50% of total cover: 25	20% of total cover: 10		
Herb Stratum (Plot size: 5')			
1. *Toxicodendron radicans*	15	Yes	FAC
2. *Lonicera japonica*	15	Yes	FACU
3. *Lindera benzoin*	10	No	FACW
4. *Parthenocissus quinquefolia*	10	No	FACU
5. *Hedera Helix*	15	Yes	FACU
6. *Lysimachia ciliata*	15	Yes	FACW
7.			
8.			
9.			
10.			
11.			
12.			
	80 = Total Cover		
50% of total cover: 40	20% of total cover: 16		
Woody Vine Stratum (Plot size: 30')			
1. *Hedera helix*	20	Yes	FACU
2. *Celastrus orbiculatus*	40	Yes	FACU
3.			
4.			
5.			
	60 = Total Cover		
50% of total cover: 30	20% of total cover: 12		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 6 (A)

Total Number of Dominant Species Across All Strata: 9 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 66 (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 ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators 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 X No

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

SOIL

Sampling Point: Upland 2

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 4/2	100					Silty Loam	
4-12	10YR 6/8	100					Silty Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

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

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]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** _____ **No** X

Remarks:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Four Mile Run Wetland Delineation City/County: Fairfax Sampling Date: 2021-07-27

Applicant/Owner: USACE - Baltimore District State: VA Sampling Point: Upland 3

Investigator(s): C. Johnson, M. Spindler Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): Flat Local relief (concave, convex, none): None Slope (%): 1-2%

Subregion (LRR or MLRA): MLRA 149A Lat: 38.842547 Long: -77.060741 Datum: NAD83

Soil Map Unit Name: 40 - Grist Mill sandy loam, 0 to 25 percent slopes NWI classification: Upland

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 _____	No X	**Is the Sampled Area within a Wetland?** **Yes** _____ **No** X
Hydric Soil Present?	Yes _____	No X	
Wetland Hydrology Present?	Yes _____	No X	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ 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 X	Depth (inches): _____
Water Table Present?	Yes _____	No X	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes _____	No X	Depth (inches): _____

Wetland Hydrology Present? **Yes** _____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

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

Sampling Point: Upland 3

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Herb Stratum (Plot size: 5')			
1. *Toxicodendron radicans*	5	No	FAC
2. *Solidago* sp.	45	Yes	N/A
3. *Ulmus* sp.	5	No	N/A
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	55 = Total Cover		
50% of total cover: 27.5	20% of total cover: 11		
Woody Vine Stratum (Plot size: 30')			
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: 0 (A)

Total Number of Dominant Species Across All Strata: 0 (B)

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

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
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 ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators 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** X

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

SOIL

Sampling Point: Upland 3

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 4/2	100					Silty Loam	
4-8	10YR 6/4	100					Silty Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

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

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: Roots/gravel

Depth (inches): 8

Hydric Soil Present? **Yes** _____ **No** X

Remarks:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Four Mile Run Wetland Delineation City/County: Fairfax Sampling Date: 2021-07-28

Applicant/Owner: USACE - Baltimore District State: VA Sampling Point: Upland 4/5/6

Investigator(s): C. Johnson, M. Spindler Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): None Slope (%): 5-10%

Subregion (LRR or MLRA): MLRA 149A Lat: 38.840541 Long: -77.059696 Datum: NAD83

Soil Map Unit Name: 40 - Grist Mill sandy loam, 0 to 25 percent slopes NWI classification: Upland

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 X	No _____	**Is the Sampled Area within a Wetland?** **Yes** _____ **No** X
Hydric Soil Present?	Yes _____	No X	
Wetland Hydrology Present?	Yes _____	No X	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ 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 X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? **Yes** _____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

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

Sampling Point: Upland 4/5/6

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. *Populus deltoides*	20	Yes	FAC
2. *Juglans nigra*	10	Yes	UPL
3. *Acer rubrum*	15	Yes	FAC
4. *Ulmus rubra*	5	No	FAC
5.			
6.			
7.			
8.			
	50	= Total Cover	
50% of total cover: 25		20% of total cover: 10	
Sapling/Shrub Stratum (Plot size: 15')			
1. *Morus alba*	10	Yes	FACU
2. *Pyrus calleryana*	15	Yes	NI
3.			
4.			
5.			
6.			
7.			
8.			
	25	= Total Cover	
50% of total cover: 12.5		20% of total cover: 5	
Herb Stratum (Plot size: 5')			
1. *Ampelopsis brevipedunculata*	40	Yes	NI
2. *Toxicodendron radicans*	20	Yes	FAC
3. *Lespedeza cuneata*	10	No	FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	70	= Total Cover	
50% of total cover: 35		20% of total cover: 14	
Woody Vine Stratum (Plot size: 30')			
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: 3 (A)

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 60 (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 ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators 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** X **No** ____

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

SOIL

Sampling Point: Upland 4/5/6

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-3	10YR 4/6	100					Silty Loam	
3-12	10YR 7/8	100					Silty Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

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

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]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** _____ **No** X

Remarks:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Four Mile Run Wetland Delineation City/County: Fairfax Sampling Date: 2021-07-28

Applicant/Owner: USACE - Baltimore District State: VA Sampling Point: Upland 7

Investigator(s): C. Johnson, M. Spindler Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): None Slope (%): 5-10%

Subregion (LRR or MLRA): MLRA 149A Lat: 38.840541 Long: -77.059696 Datum: NAD83

Soil Map Unit Name: Udorthents, loamy NWI classification: Upland

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 _____	No X	**Is the Sampled Area within a Wetland?** **Yes** _____ **No** X
Hydric Soil Present?	Yes _____	No X	
Wetland Hydrology Present?	Yes _____	No X	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ 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 X	Depth (inches): _____
Water Table Present?	Yes _____	No X	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes _____	No X	Depth (inches): _____

Wetland Hydrology Present? **Yes** _____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

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

Sampling Point: Upland 7

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Herb Stratum (Plot size: 5')			
1. *Ampelopsis brevipedunculata*	10	No	NI
2. *Vicia americana*	40	Yes	FACU
3. *Solidago* sp.	20	Yes	NI
4. *Cirsium canadensis*	15	No	FACU
5. *Asteraceae* sp.	10	No	NI
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	95 = Total Cover		
50% of total cover: 47.5	20% of total cover: 19		
Woody Vine Stratum (Plot size: 30')			
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: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

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

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
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 ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators 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 X

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

SOIL

Sampling Point: Upland 7

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-2	10YR 3/4	100					Silt Loam	
2-6	10YR 4/6	60					Silt Loam	
	10YR 6/8	40					Silt Loam	
6-10	10YR 6/8	100					Silt Loam	

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

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

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: Gravel

Depth (inches): 10

Hydric Soil Present? **Yes** _____ **No** X

Remarks:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Belle View Wetland Delineation City/County: Fairfax Sampling Date: 2021-07-27

Applicant/Owner: USACE - Baltimore District State: VA Sampling Point: Wetland 1

Investigator(s): C. Johnson, M. Spindler Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 1-2%

Subregion (LRR or MLRA): MLRA 149A Lat: 38.770560 Long: -77.055992 Datum: NAD83

Soil Map Unit Name: Honga peat, 0 to 1 percent slopes, very frequently flooded, tidal NWI classification: PEM

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 X No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X No _____	
Wetland Hydrology Present?	Yes X No _____	

Remarks:

Wetland 1 is tidally influenced and surrounded by forested uplands east and west of the system. Wetland 1 is dominated by Typha latifolia, and contains several beneficial functions and values such as habitat, sediment trapping/retention, floodflow alteration, and aesthetics.

HYDROLOGY

Wetland Hydrology Indicators:

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

- ☐ Surface Water (A1)
- ☑ High Water Table (A2)
- ☑ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ 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 X Depth (inches): _____

Water Table Present? Yes X No _____ Depth (inches): 1"

Saturation Present? (includes capillary fringe) Yes X No _____ Depth (inches): 1/2"

Wetland Hydrology Present? Yes X 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: Wetland 1

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		

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

Sapling/Shrub Stratum (Plot size: 15')			
1. *Fraxinus pennsylvanica*	5	Yes	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	5 = Total Cover		

50% of total cover: 2.5 20% of total cover: 0.5

Herb Stratum (Plot size: 5')			
1. *Typha latifolia*	80	Yes	OBL
2. *Impatiens capensis*	20	No	FACW
3. *Peltandra virginica*	10	No	OBL
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	110 = Total Cover		

50% of total cover: 55 20% of total cover: 22

Woody Vine Stratum (Plot size:)			
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: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (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 ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators 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** X **No**

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

SOIL

Sampling Point: Wetland 1

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-2	10YR 2/1	100					Silty Clay	
2-15	10YR 5/1	95	7.5YR 5/8	5	C	M	Silty Clay	

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

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

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☑ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]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:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Belle View Wetland Delineation City/County: Fairfax Sampling Date: 2021-07-27

Applicant/Owner: USACE - Baltimore District State: VA Sampling Point: Wetland 2

Investigator(s): C. Johnson, M. Spindler Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 1-2%

Subregion (LRR or MLRA): MLRA 149A Lat: 38.772088 Long: -77.054275 Datum: NAD83

Soil Map Unit Name: Honga peat, 0 to 1 percent slopes, very frequently flooded, tidal NWI classification: PEM

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 X No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X No _____	
Wetland Hydrology Present?	Yes X No _____	

Remarks:

Wetland 2 is tidally influenced and surrounded by forested uplands to the east and medium-density housing to the west. Wetland 2 contains several beneficial functions and values such as habitat, sediment trapping/retention, floodflow alteration, and aesthetics.

HYDROLOGY

Wetland Hydrology Indicators:

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

- ☐ Surface Water (A1)
- ☑ High Water Table (A2)
- ☑ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ 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 X	Depth (inches): _____
Water Table Present?	Yes X	No _____	Depth (inches): 5"
Saturation Present? (includes capillary fringe)	Yes X	No _____	Depth (inches): 2"

Wetland Hydrology Present? Yes X 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: Wetland 2

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Sapling/Shrub Stratum (Plot size: 15')			
1. *Cornus amomum*	10	Yes	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	10 = Total Cover		
50% of total cover: 5	20% of total cover: 2		
Herb Stratum (Plot size: 5')			
1. *Typha latifolia*	55	Yes	OBL
2. *Impatiens capensis*	10	No	FACW
3. *Eutrochium maculatum*	10	No	OBL
4. *Polygonum arifolium*	20	Yes	OBL
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	95 = Total Cover		
50% of total cover: 47.5	20% of total cover: 19		
Woody Vine Stratum (Plot size:)			
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: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (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 ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators 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** X **No**

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

SOIL

Sampling Point: Wetland 2

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-2	10YR 4/2	100					Silty Clay	
2-10	10YR 4/1	100					Silty Clay	
10-15	10YR 4/1	95	7.5YR 5/8	5	C	M	Silty Clay	

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

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

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☑ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]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:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Four Mile Run Wetland Delineation City/County: Arlington Sampling Date: 2021-07-27

Applicant/Owner: USACE - Baltimore District State: VA Sampling Point: Wetland 3

Investigator(s): C. Johnson, M. Spindler Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 1-2%

Subregion (LRR or MLRA): MLRA 149A Lat: 38.841676 Long: -77.059358 Datum: NAD83

Soil Map Unit Name: Woodstown sandy loam, 2 to 7 percent slopes NWI classification: PEM

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 X No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X No _____	
Wetland Hydrology Present?	Yes X No _____	

Remarks:

Wetland 3 (PEM) is a tidally influenced system. The wetland contains a moderate amount of standing dead Fraxinus pennsylvanica trees. The wetland complex provides some beneficial functions and values including habitat, floodflow attenuation, and sediment trapping.

HYDROLOGY

Wetland Hydrology Indicators:

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

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☑ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☑ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☑ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ 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 X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes X No _____ Depth (inches): 6"

Wetland Hydrology Present? Yes X 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: Wetland 3

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		

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

Sapling/Shrub Stratum (Plot size: 15')			
1. *Cornus amomum*	10	Yes	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	10 = Total Cover		

50% of total cover: 5 20% of total cover: 2

Herb Stratum (Plot size: 5')			
1. *Typha latifolia*	25	Yes	OBL
2. *Lythrum salicaria*	15	No	OBL
3. *Cicuta maculata*	10	No	OBL
4. *Polygonum arifolium*	35	Yes	OBL
5. *Toxicodendron radicans*	15	No	FAC
6. *Leersia virginica*	5	No	FACW
7.			
8.			
9.			
10.			
11.			
12.			
	105 = Total Cover		

50% of total cover: 52.5 20% of total cover: 21

Woody Vine Stratum (Plot size:)			
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: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (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 ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators 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** X **No**

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

SOIL

Sampling Point: Wetland 3

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-3	10YR 2/1	100					Silty Clay	
3-12	10YR 4/2	30					Silty Clay	
	10YR 5/1	60	10YR 6/8	10	C	M	Silty Clay	

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

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

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☑ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]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:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Four Mile Run Wetland Delineation City/County: Arlington Sampling Date: 2021-07-27

Applicant/Owner: USACE - Baltimore District State: VA Sampling Point: Wetland 4

Investigator(s): C. Johnson, M. Spindler Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 1-2%

Subregion (LRR or MLRA): MLRA 149A Lat: 38.841253 Long: -77.060629 Datum: NAD83

Soil Map Unit Name: Woodstown sandy loam, 2 to 7 percent slopes NWI classification: PFO

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 X No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X No _____	
Wetland Hydrology Present?	Yes X No _____	

Remarks:

Wetland 4 (PFO) is a tidally influenced system. The system is dominated by Saururus cernuus. The wetland complex provides some beneficial functions and values including habitat, floodflow attenuation, and sediment trapping.

HYDROLOGY

Wetland Hydrology Indicators:

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

- ☑ Surface Water (A1)
- ☑ High Water Table (A2)
- ☑ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ 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 X	No _____	Depth (inches): 1/2"
Water Table Present?	Yes X	No _____	Depth (inches): 1"
Saturation Present? (includes capillary fringe)	Yes X	No _____	Depth (inches): 1/2"

Wetland Hydrology Present? Yes X 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: Wetland 4

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. *Acer rubrum*	40	Yes	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	40 = Total Cover		
50% of total cover: 20	20% of total cover: 8		
Sapling/Shrub Stratum (Plot size: 15')			
1. *Quercus palustris*	10	Yes	FACW
2. *Fraxinus pennsylvanica*	15	Yes	FACW
3.			
4.			
5.			
6.			
7.			
8.			
	25 = Total Cover		
50% of total cover: 12.5	20% of total cover: 5		
Herb Stratum (Plot size: 5')			
1. *Saururus cernuus*	55	Yes	OBL
2. *Fraxinus pennsylvanica*	15	No	FACW
3. *Smilax rotundifolia*	10	No	FAC
4. *Toxicodendron radicans*	15	No	FAC
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	95 = Total Cover		
50% of total cover: 52.5	20% of total cover: 21		
Woody Vine Stratum (Plot size:)			
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: 4 (A)

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (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 ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators 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** X **No**

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

SOIL

Sampling Point: Wetland 4

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-2	10YR 5/2	100					Silty Clay	
2-10	10YR 4/2	80	7.5YR 5/8	20	C	M	Silty Clay	
10-15	10YR 5/1	90	7.5YR 5/8	10	C	M	Silty Clay	

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

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

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☑ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]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:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Four Mile Run Wetland Delineation City/County: Arlington Sampling Date: 2021-07-27

Applicant/Owner: USACE - Baltimore District State: VA Sampling Point: Wetland 5

Investigator(s): C. Johnson, M. Spindler Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 1-2%

Subregion (LRR or MLRA): MLRA 149A Lat: 38.840327 Long: -77.059169 Datum: NAD83

Soil Map Unit Name: Grist Mill sandy loam, 0 to 25 percent slopes NWI classification: PEM

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 X No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X No _____	
Wetland Hydrology Present?	Yes X No _____	

Remarks:

Wetland 5 (PEM) is a tidally influenced system, dominated by Typha latifolia. The wetland complex provides some beneficial functions and values including habitat, floodflow attenuation, and sediment trapping.

HYDROLOGY

Wetland Hydrology Indicators:

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

- ☐ Surface Water (A1)
- ☑ High Water Table (A2)
- ☑ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☑ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ 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 X Depth (inches): _____

Water Table Present? Yes X No _____ Depth (inches): 1"

Saturation Present? (includes capillary fringe) Yes X No _____ Depth (inches): 1"

Wetland Hydrology Present? Yes X 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: Wetland 5

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. *Ulmus americana*	5	Yes	FAC
2. *Populus deltoides*	5	Yes	FAC
3. *Fraxinus pennsylvanica*	5	Yes	FAC
4.			
5.			
6.			
7.			
8.			
	15	= Total Cover	
50% of total cover: 7.5	20% of total cover: 3		

Sapling/Shrub Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
		= Total Cover	
50% of total cover:	20% of total cover:		

Herb Stratum (Plot size: 5')			
1. *Peltandra virginica*	55	Yes	OBL
2. *Typha latifolia*	15	No	OBL
3. *Polygonum arifolium*	10	No	OBL
4. *Impatiens capensis*	15	No	FACW
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	95	= Total Cover	
50% of total cover: 52.5	20% of total cover: 21		

Woody Vine Stratum (Plot size:)			
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: 4 (A)

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (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 ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators 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** X **No**

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

SOIL

Sampling Point: Wetland 5

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-2	10YR 2/1	100					Silty Clay	
2-4	10YR 3/2	100					Silty Clay	
4-16	10YR 5/1	90	5YR 5/8	10	C	M	Silty Clay	

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

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

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☑ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]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:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Four Mile Run Wetland Delineation City/County: Alexandria Sampling Date: 2021-07-28

Applicant/Owner: USACE - Baltimore District State: VA Sampling Point: Wetland 6

Investigator(s): C. Johnson, M. Spindler Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 1-2%

Subregion (LRR or MLRA): MLRA 149A Lat: 38.840218 Long: -77.058379 Datum: NAD83

Soil Map Unit Name: Woodstown sandy loam, 2 to 7 percent slopes NWI classification: PFO

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 X No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X No _____	
Wetland Hydrology Present?	Yes X No _____	

Remarks:

Wetland 6 is a tidally influenced system. The wetland complex provides some beneficial functions and values including habitat, floodflow attenuation, and sediment trapping.

HYDROLOGY

Wetland Hydrology Indicators:

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

- ☑ Surface Water (A1)
- ☑ High Water Table (A2)
- ☑ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ 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 X	No _____	Depth (inches): 1"
Water Table Present?	Yes X	No _____	Depth (inches): 2"
Saturation Present? (includes capillary fringe)	Yes X	No _____	Depth (inches): Surface

Wetland Hydrology Present? Yes X 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: Wetland 6

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. *Fraxinus pennsylvanica*	20	Yes	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	20 = Total Cover		
50% of total cover: 10	20% of total cover: 4		
Sapling/Shrub Stratum (Plot size: 15')			
1. *Fraxinus pennsylvanica*	10	Yes	FACW
2. *Lindera benzoin*	15	Yes	FACW
3.			
4.			
5.			
6.			
7.			
8.			
	25 = Total Cover		
50% of total cover: 12.5	20% of total cover: 5		
Herb Stratum (Plot size: 5')			
1. *Impatiens capensis*	30	Yes	FACW
2. *Solidago* sp.	15	No	N/A
3. *Leersia virginica*	25	Yes	FACW
4. *Peltandra virginica*	20	No	OBL
5. *Toxicodendron radicans*	15	No	FAC
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	105 = Total Cover		
50% of total cover: 52.5	20% of total cover: 21		
Woody Vine Stratum (Plot size: 5')			
1. *Toxicodendron radicans*	15	Yes	FAC
2.			
3.			
4.			
5.			
	15 = Total Cover		
50% of total cover: 7.5	20% of total cover: 3		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 6 (A)

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (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 ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators 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** X **No** ____

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

SOIL

Sampling Point: Wetland 6

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-2	10YR 3/1	100					Silt Loam	
2-4	10YR 4/2	95	7.5YR 5/8	5	C	M	Silt Loam	
4-16	10YR 5/1	90	7.5YR 5/8	10	C	M	Silty Clay	

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

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

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☑ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]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:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Four Mile Run Wetland Delineation City/County: Arlington Sampling Date: 2021-07-28

Applicant/Owner: USACE - Baltimore District State: VA Sampling Point: Wetland 7

Investigator(s): C. Johnson, M. Spindler Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 1-2%

Subregion (LRR or MLRA): MLRA 149A Lat: 38.840988 Long: -77.054048 Datum: NAD83

Soil Map Unit Name: Udorthents, loamy NWI classification: PEM

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 X	No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X	No _____	
Wetland Hydrology Present?	Yes X	No _____	

Remarks:

Wetland 7 (PEM) is a tidally influenced system. The system is a long, linear wetland complex that borders Four Mile Run which serves as the hydrological source of the wetland. The wetland complex provides some beneficial functions and values including habitat, floodflow attenuation, and sediment trapping. There are some upland inclusions within the length of the wetland, but they are rather small and inconsistent.

HYDROLOGY

Wetland Hydrology Indicators:

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

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☑ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ 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 X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes X No _____ Depth (inches): 4"

Wetland Hydrology Present? Yes X 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: Wetland 7

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Sapling/Shrub Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Herb Stratum (Plot size: 5')			
1. *Pontederia cordata*	15	Yes	OBL
2. *Bolboschoenus maritimus*	10	No	OBL
3. *Persicaria pensylvanica*	25	Yes	FACW
4. *Polygonum arifolium*	20	Yes	OBL
5. *Mikania scandens*	15	Yes	FACW
6. *Hibiscus grandiflorus*	5	No	OBL
7.			
8.			
9.			
10.			
11.			
12.			
	90 = Total Cover		
50% of total cover: 45	20% of total cover: 18		
Woody Vine Stratum (Plot size:)			
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: 4 (A)

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (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 ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators 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** X **No**

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

SOIL

Sampling Point: Wetland 7

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 5/1	90	7.5YR 5/8	10	C	M	Sandy Loam	

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

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

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☑ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: Gravel

Depth (inches): 8"

Hydric Soil Present? **Yes** X **No** _____

Remarks:

APPENDIX D
Cowardin Classification Key

WETLANDS AND DEEPWATER HABITATS CLASSIFICATION

Marine System

System	Subsystem	Class	Subclass
M - Marine	1 - Subtidal	RB – Rock Bottom	1 Bedrock 2 Rubble
		UB – Unconsolidated Bottom	1 Cobble-Gravel 2 Sand 3 Mud
		AB – Aquatic Bed	1 Algal 3 Rooted Vascular
		RF – Reef	1 Coral 3 Worm
	2 - Intertidal	AB – Aquatic Bed	1 Algal 3 Rooted Vascular
		RF – Reef	1 Coral 3 Worm
		RS – Rocky Shore	1 Bedrock 2 Rubble
		US – Unconsolidated Shore	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic

Estuarine System

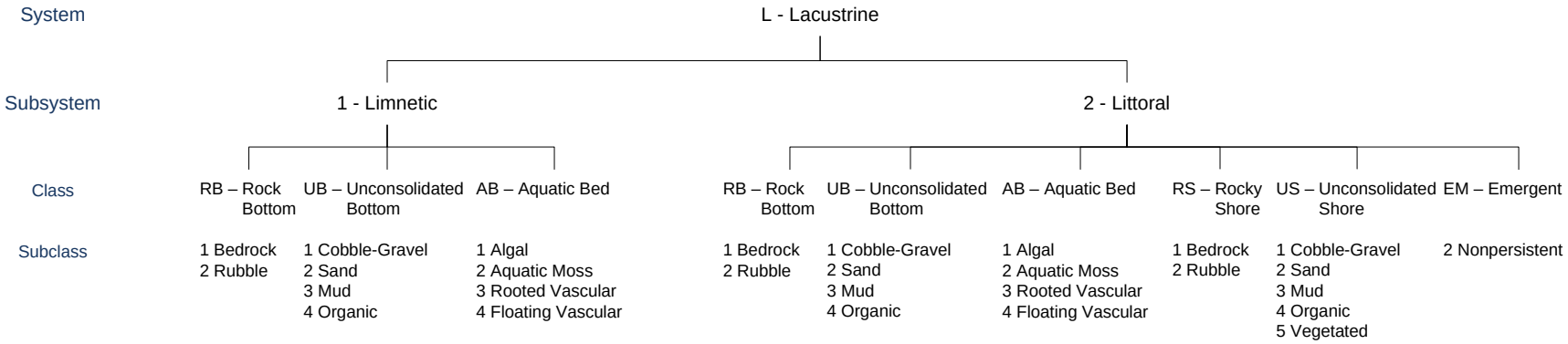
System	Subsystem	Class	Subclass
E - Estuarine	1 - Subtidal	RB – Rock Bottom	1 Bedrock 2 Rubble
		UB – Unconsolidated Bottom	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic
		AB – Aquatic Bed	1 Algal 3 Rooted Vascular 4 Floating Vascular
		RF – Reef	2 Mollusk 3 Worm
	2 - Intertidal	AB – Aquatic Bed	1 Algal 3 Rooted Vascular 4 Floating Vascular
		RF – Reef	2 Mollusk 3 Worm
		SB – Streambed	1 Bedrock 2 Rubble 3 Cobble-Gravel 4 Sand 5 Mud 6 Organic
		RS – Rocky Shore	1 Bedrock 2 Rubble
		US – Unconsolidated Shore	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic
		EM – Emergent	1 Persistent 2 Non-persistent 5 *Phragmites australis*
		SS – Scrub-Shrub	1 Broad-Leaved Deciduous 2 Needle-Leaved Deciduous 3 Broad-Leaved Evergreen 4 Needle-Leaved Evergreen 5 Dead 6 Deciduous 7 Evergreen
		FO – Forested	1 Broad-Leaved Deciduous 2 Needle-Leaved Deciduous 3 Broad-Leaved Evergreen 4 Needle-Leaved Evergreen 5 Dead 6 Deciduous 7 Evergreen

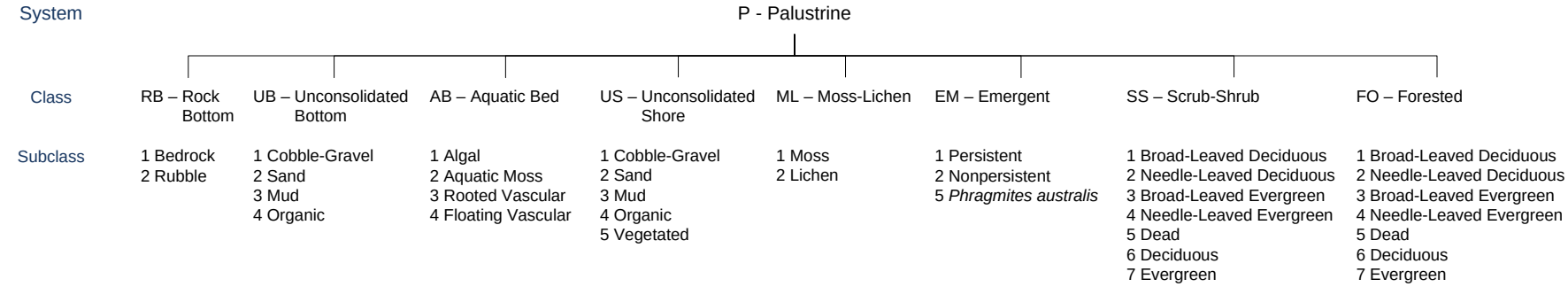
Riverine System

System	Subsystem	Class	Subclass
R - Riverine	1 - Tidal	RB** – Rock Bottom	1 Bedrock 2 Rubble
		UB – Unconsolidated Bottom	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic
		SB** – Streambed	1 Bedrock 2 Rubble 3 Cobble-Gravel 4 Sand 5 Mud 6 Organic 7 Vegetated
		AB – Aquatic Bed	1 Algal 2 Aquatic Moss 3 Rooted Vascular 4 Floating Vascular
		RS – Rocky Shore	1 Bedrock 2 Rubble
		US – Unconsolidated Shore	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic 5 Vegetated
		EM – Emergent	2 Nonpersistent
	2 – Lower Perennial		
	3 – Upper Perennial		
	4* - Intermittent		
	5* – Unknown Perennial		

* **Intermittent** is limited to the **Streambed** Class;
Unknown Perennial is limited to **Unconsolidated Bottom** Class code **R5UB** only
** **Rock Bottom** is not permitted for the **Lower Perennial** Subsystem;
Streambed is limited to **Tidal** and **Intermittent** Subsystems

WETLANDS AND DEEPWATER HABITATS CLASSIFICATION





MODIFIERS

In order to more adequately describe the wetland and deepwater habitats, one or more of the water regime, water chemistry, soil, or special modifiers may be applied at the class or lower level in the hierarchy. The farmed modifier may also be applied to the ecological system.

Water Regime			Special Modifiers	Water Chemistry			Soil
Nontidal	**Saltwater Tidal**	**Freshwater Tidal**		**Coastal Halinity**	**Inland Salinity**	**pH Modifiers for all Fresh Water**	
A Temporarily Flooded	L Subtidal	S Temporarily Flooded-Tidal	b Beaver	1 Hyperhaline	7 Hypersaline	a Acid	g Organic
B Saturated	M Irregularly Exposed	R Seasonally Flooded-Tidal	d Partly Drained/Ditched	2 Euhaline	8 Eusaline	t Circumneutral	n Mineral
C Seasonally Flooded	N Regularly Flooded	T Semipermanently Flooded-Tidal	f Farmed	3 Mixohaline (Brackish)	9 Mixosaline	i Alkaline	
E Seasonally Flooded/ Saturated	P Irregularly Flooded	V Permanently Flooded-Tidal	h Diked/Impounded	4 Polyhaline	0 Fresh		
F Semipermanently Flooded			r Artificial	5 Mesohaline			
G Intermittently Exposed			s Spoil	6 Oligohaline			
H Permanently Flooded			x Excavated	0 Fresh			
J Intermittently Flooded							
K Artificially Flooded							

METROPOLITAN WASHINGTON, DISTRICT OF COLUMBIA COASTAL STORM RISK MANAGEMENT FEASIBILITY STUDY

INTEGRATED FEASIBILITY REPORT & ENVIRONMENTAL ASSESSMENT

APPENDIX G4: CULTURAL RESOURCES COORDINATION

Agency/Stakeholder	Format	Date	Description
USACE to VA SHPO	email	October 21, 2021	Formal letter emailed to VA SHPO initiating Section 106 consultation and describing the focused array of alternatives.
USACE to NPS	email	October 21, 2021	Formal letter emailed to NPS informing them of the project and describing the focused array of alternatives.
USACE to VA SHPO	email	March 10, 2022	Formal letter emailed to VA SHPO informing them of the TSP and requesting assistance with the development of a programmatic agreement.
USACE to NPS	email	March 10, 2022	Formal letter emailed to NPS initiating Section 106 consultation, informing them of the TSP, and requesting assistance with the development of a programmatic agreement.
USACE to NCPC	email	March 10, 2022	Formal letter emailed to NCPC initiating Section 106 consultation, informing them of the TSP, and requesting assistance with the development of a programmatic agreement.
USACE to CFA	email	March 10, 2022	Formal letter emailed to CFA initiating Section 106 consultation, informing them of the TSP, and requesting assistance with the development of a programmatic agreement.
USACE to Arlington County	email	March 10, 2022	Formal letter emailed to Arlington County initiating Section 106 consultation, informing

Agency/Stakeholder	Format	Date	Description
			them of the TSP, and requesting assistance with the development of a programmatic agreement.
USACE to the City of Alexandria	email	March 10, 2022	Formal letter emailed to the City of Alexandria initiating Section 106 consultation, informing them of the TSP, and requesting assistance with the development of a programmatic agreement.
USACE to Fairfax County	email	March 10, 2022	Formal letter emailed to Fairfax County initiating Section 106 consultation, informing them of the TSP, and requesting assistance with the development of a programmatic agreement.
USACE to Catawba Indian Nation	letter	March 10, 2022	Formal letter mailed to the Catawba Indian Nation initiating Section 106 consultation, informing them of the TSP, and requesting assistance with the development of a programmatic agreement.
USACE to Chickahominy Indian Tribe	email	March 10, 2022	Formal letter emailed to the Chickahominy Indian Tribe initiating Section 106 consultation, informing them of the TSP, and requesting assistance with the development of a programmatic agreement.
USACE to Chickahominy Tribe Eastern Division	email	March 10, 2022	Formal letter emailed to the Chickahominy Indian Tribe Eastern Division initiating Section 106 consultation, informing

Agency/Stakeholder	Format	Date	Description
			them of the TSP, and requesting assistance with the development of a programmatic agreement.
USACE to Delaware Nation	email	March 10, 2022	Formal letter emailed to the Delaware Nation initiating Section 106 consultation, informing them of the TSP, and requesting assistance with the development of a programmatic agreement.
USACE to Monacan Indian Nation	email	March 10, 2022	Formal letter emailed to the Monacan Indian Nation initiating Section 106 consultation, informing them of the TSP, and requesting assistance with the development of a programmatic agreement.
USACE to Nansemond Indian Nation	email	March 10, 2022	Formal letter emailed to the Nansemond Indian Nation initiating Section 106 consultation, informing them of the TSP, and requesting assistance with the development of a programmatic agreement.
USACE to Pamunkey Indian Tribe	email	March 10, 2022	Formal letter emailed to the Pamunkey Indian Tribe initiating Section 106 consultation, informing them of the TSP, and requesting assistance with the development of a programmatic agreement.
USACE to Rappahannock Indian Tribe	email	March 10, 2022	Formal letter emailed to the Rappahannock Indian Tribe initiating Section 106 consultation, informing

Agency/Stakeholder	Format	Date	Description
			them of the TSP, and requesting assistance with the development of a programmatic agreement.
USACE to Upper Mattaponi Tribe	email	March 10, 2022	Formal letter emailed to the Upper Mattaponi Tribe initiating Section 106 consultation, informing them of the TSP, and requesting assistance with the development of a programmatic agreement.
City of Alexandria to USACE	email	March 11, 2022	Email from the City of Alexandria Historic Preservation Division stating they would like to participate as a consulting party for the project.
Alexandria Archaeology to USACE	email	March 11, 2022	Email from Alexandria Archaeology requesting to be a consulting party for the project.
CFA to USACE	email	March 14, 2022	CFA responding to USACE stating they would like to participate in the project as a consulting party.
Fairfax County to USACE	email	March 15, 2022	Fairfax County responding to USACE stating they would like to become a consulting party and participate in the development of the programmatic agreement.
Arlington County to USACE	email	March 17, 2022	Arlington County responding to USACE stating they would like to become a consulting party.
Delaware Nation to USACE	email	March 23, 2022	Formal letter emailed to USACE accepting the invitation for

Agency/Stakeholder	Format	Date	Description
			consultation for the project.
NPS to USACE	email	March 28, 2022	Formal letter emailed to USACE requesting to be an invited signatory to the project's programmatic agreement and requesting a status on overall Section 106 consultation to date.
Fairfax County to USACE	email	April 18, 2022	Fairfax County responding to USACE stating that the Fairfax County Architectural Review Board voted to request to become a consulting party for the project.
VA SHPO to USACE	email	April 19, 2022	VA SHPO responding to USACE stating that a programmatic agreement would be appropriate for this project.
City of Alexandria to USACE	email	April 19, 2022	City of Alexandria responding to USACE stating they no longer need to be a consulting party due to the screening of Alternative 5b1.
Alexandria Archaeology to USACE	email	April 22, 2022	Email from Alexandria Archaeology expressing continued interest in being a consulting party after the screening of Alternative 5b1.
USACE and NCPC	virtual meeting	May 3, 2022	USACE and NCPC met virtually to discuss project alternative's and delineate NCPC's interest in the project as a consulting party.
Fairfax County Historic Commission to USACE	Email	July 30, 2022	Formal letter emailed to USACE requesting to be a consulting party. The Commission also

Agency/Stakeholder	Format	Date	Description
			expressed the importance of preserving, or minimizing impacts to, the original Mount Vernon Memorial Highway.
USACE to Alexandria Archaeology, CFA, Fairfax County, Arlington County, Delaware Nation, NPS, VA SHPO, NCPC, and Fairfax County History Commission	Email	November 23, 2022	Email to consulting parties sending the preliminary draft PA for review and comment.
CFA to USACE	Email	November 28, 2022	Email to USACE stating that since the project alternatives have been refined such that they are outside of CFA's jurisdiction, they no longer need to be a consulting party.
Alexandria Archaeology to USACE	Email	December 1, 2022	Email to USACE stating they have no comments on the draft programmatic agreement at this time.
Fairfax County to USACE	Email	December 23, 2022	Email to USACE submitting revisions and comments on the draft programmatic agreement. Specifically, they requested the inclusion of the Fairfax County Architectural Review Board as a consulting party.
VA SHPO to USACE	Email	February 1, 2023	Email submitting revisions and comments on the draft programmatic agreement.
ACHP to USACE	Email	February 1, 2023	Formal letter emailed stating they will not be participating in consultation for the project.

Agency/Stakeholder	Format	Date	Description
VA SHPO to USACE	Email	July 7, 2023	Concurred with the USACE finding of no adverse effects.

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS,
BALTIMORE DISTRICT
2 HOPKINS PLAZA
BALTIMORE, MARYLAND 21201

21 October 2021

Julie Langan
State Historic Preservation Officer
Department of Historic Resources
2801 Kensington Avenue
Richmond, Virginia 23221

Dear Ms. Langan:

The purpose of this letter is to initiate consultation with your office in accordance with Section 106 of the National Historic Preservation Act, as amended, and its implementing regulations at 36 CFR Part 800, regarding the Metropolitan Washington, District of Columbia Coastal Storm Risk Management Feasibility Study being conducted by the U.S. Army Corps of Engineers, Baltimore District (USACE). The purpose of the project is to reduce coastal flood risk to vulnerable areas in northern Virginia (Enclosure 1) and is being authorized under the Middle Potomac River Watershed Authority of May 2001. The original project scope consisted of an initial array of eight draft alternatives that aim to accomplish this purpose; however, only five draft alternatives are being considered at this time.

Alternative 1 is the no action alternative. Under this alternative, no flood risk measures would be implemented for the project. Alternatives 2 and 3 have been eliminated from consideration.

Alternative 4 is defined as the critical infrastructure plan and is divided into three sub-alternatives (4a – 4c). These focus on three locations, including along the George Washington Memorial Parkway (GWMP (4a)), Ronald Reagan Washington National Airport (4b), and the Arlington Water Pollution Control Plant (WPCP (4c)). Alternative 4a has been eliminated from consideration. Alternative 4b (Enclosure 2a) includes the construction of concrete floodwalls at three locations along Ronald Reagan Washington National Airport's perimeter road. Alternative 4b also includes raising the perimeter road's elevation. Alternative 4c (Enclosure 2b) consists of a floodwall and temporary closure along Four Mile Run at the Arlington WPCP.

Alternative 5 is defined as the floodwall/levee plan and is divided into three sub-alternatives (5a – 5c); however, Alternative 5b (Old Town Alexandria) has been eliminated from consideration. The two remaining locations include Arlandria Four Mile Run (5a) and Belle Haven (5c). Alternative 5a (Enclosure 3a) includes construction of a floodwall, levee, and temporary closures near Four Mile Run Park and along Four Mile Run. Alternative 5c (Enclosure 3b) includes construction of floodwalls and levees at three locations in Belle Haven, along with two temporary closures.

Alternative 6 is defined as the non-structural plan and includes floodproofing and elevating approximately 400 buildings in Belle Haven (Enclosure 4a), floodproofing and elevating approximately 50 buildings at Four Mile Run (Enclosure 4b), floodproofing and elevating approximately 70 buildings at Occoquan Bay (Enclosure 4c), and floodproofing and elevating 250 buildings in Old Town Alexandria (Enclosure 4d).

Non-structural measures could also be proposed in other isolated locations (Enclosure 5). Floodproofing may include wet flood proofing (e.g., utility elevation, creating openings for water to enter and exit) or dry floodproofing (e.g., sealing a structure to make it watertight, installing deployable flood barriers over doors/windows). It is important to note that the non-structural plans are still being developed and may be further refined as the study progresses.

In addition to the alternatives described above, Alternatives 7 and 8 are combinations of those proposed above; however, Alternative 7 has been eliminated from consideration. Alternative 8 is a combination of Alternatives 4, 5, and 6.

The area of potential effect (APE) for the project may be defined as the area of direct construction impacts and the areas within which the undertaking may directly or indirectly cause alterations to the character or use of historic properties, including visual effects. The viewsheds of any nearby historic properties would also be included in the APE. A preliminary examination of the APE was completed using the Virginia Cultural Resources Information System (VCRIS). The VCRIS indicated that numerous historic properties are located in and around the project areas.

We look forward to consulting with your office regarding the nature and scope of possible additional investigations to identify historic properties in the project areas, and to assess potential effects to those properties. As they become available, we will provide you with more detailed site plans illustrating the location and boundaries of all proposed ground-disturbing activities. In the interim, we ask that your office review the enclosed information and assist us in identifying and assessing the project's effects on historic properties. If you have any questions about the project, please contact Ethan A. Bean at (410) 962-2173 or ethan.a.bean@usace.army.mil.

Sincerely,

Daniel M. Bierly, P.E.
Chief, Civil Project Development Branch
Planning Division

Enclosures

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS,
BALTIMORE DISTRICT
2 HOPKINS PLAZA
BALTIMORE, MARYLAND 21201

21 October 2021

Allison Young
Section 106 Regional Coordinator
National Park Service
National Capital Area DOI Region 1

Dear Ms. Young:

The purpose of this letter is to initiate consultation with your office in accordance with Section 106 of the National Historic Preservation Act, as amended, and its implementing regulations at 36 CFR Part 800, regarding the Metropolitan Washington, District of Columbia Coastal Storm Risk Management Feasibility Study being conducted by the U.S. Army Corps of Engineers, Baltimore District (USACE). The purpose of the project is to reduce coastal flood risk to vulnerable areas in northern Virginia (Enclosure 1) and is being authorized under the Middle Potomac River Watershed Authority of May 2001. The original project scope consisted of an initial array of eight draft alternatives that aim to accomplish this purpose; however, only five draft alternatives are being considered at this time.

Alternative 1 is the no action alternative. Under this alternative, no flood risk measures would be implemented for the project. Alternatives 2 and 3 have been eliminated from consideration.

Alternative 4 is defined as the critical infrastructure plan and is divided into three sub-alternatives (4a – 4c). These focus on three locations, including along the George Washington Memorial Parkway (GWMP (4a)), Ronald Reagan Washington National Airport (4b), and the Arlington Water Pollution Control Plant (WPCP (4c)). Alternative 4a has been eliminated from consideration. Alternative 4b (Enclosure 2a) includes the construction of concrete floodwalls at three locations along Ronald Reagan Washington National Airport's perimeter road. Alternative 4b also includes raising the perimeter road's elevation. Alternative 4c (Enclosure 2b) consists of a floodwall and temporary closure along Four Mile Run at the Arlington WPCP.

Alternative 5 is defined as the floodwall/levee plan and is divided into three sub-alternatives (5a – 5c); however, Alternative 5b (Old Town Alexandria) has been eliminated from consideration. The two remaining locations include Arlandria Four Mile Run (5a) and Belle Haven (5c). Alternative 5a (Enclosure 3a) includes construction of a floodwall, levee, and temporary closures near Four Mile Run Park and along Four Mile Run. Alternative 5c (Enclosure 3b) includes construction of floodwalls and levees at three locations in Belle Haven, along with two temporary closures.

Alternative 6 is defined as the non-structural plan and includes floodproofing and elevating approximately 400 buildings in Belle Haven (Enclosure 4a), floodproofing and elevating approximately 50 buildings at Four Mile Run (Enclosure 4b), floodproofing and elevating approximately 70 buildings at Occoquan Bay (Enclosure 4c), and floodproofing and elevating 250 buildings in Old Town Alexandria (Enclosure 4d).

Non-structural measures could also be proposed in other isolated locations (Enclosure 5). Floodproofing may include wet flood proofing (e.g., utility elevation, creating openings for water to enter and exit) or dry floodproofing (e.g., sealing a structure to make it watertight, installing deployable flood barriers over doors/windows). It is important to note that the non-structural plans are still being developed and may be further refined as the study progresses.

In addition to the alternatives described above, Alternatives 7 and 8 are combinations of those proposed above; however, Alternative 7 has been eliminated from consideration. Alternative 8 is a combination of Alternatives 4, 5, and 6.

The area of potential effect (APE) for the project may be defined as the area of direct construction impacts and the areas within which the undertaking may directly or indirectly cause alterations to the character or use of historic properties, including visual effects. The viewsheds of any nearby historic properties would also be included in the APE. A preliminary examination of the APE was completed using the Virginia Cultural Resources Information System (VCRIS). The VCRIS indicated that numerous historic properties are located in and around the project areas.

We look forward to consulting with your office regarding the nature and scope of possible additional investigations to identify historic properties in the project areas, and to assess potential effects to those properties. As they become available, we will provide you with more detailed site plans illustrating the location and boundaries of all proposed ground-disturbing activities. In the interim, we ask that your office review the enclosed information and assist us in identifying and assessing the project's effects on historic properties. If you have any questions about the project, please contact Ethan A. Bean at (410) 962-2173 or ethan.a.bean@usace.army.mil.

Sincerely,

Daniel M. Bierly, P.E.
Chief, Civil Project Development Branch
Planning Division

Enclosures

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS,
BALTIMORE DISTRICT
2 HOPKINS PLAZA
BALTIMORE, MARYLAND 21201

Julie Langan
Director and State Historic Preservation Officer
Virginia Department of Historic Resources
2801 Kensington Avenue
Richmond, Virginia 23221

March 10, 2022

Dear Ms. Langan:

The purpose of this letter is to continue consultation with your office in accordance with Section 106 of the National Historic Preservation Act (NHPA), as amended, and its implementing regulations at 36 CFR Part 800, regarding the Metropolitan Washington, District of Columbia Coastal Storm Risk Management Feasibility Study being conducted by the U.S. Army Corps of Engineers, Baltimore District (USACE). The purpose of the project is to reduce coastal flood risk to vulnerable areas in northern Virginia (Enclosure 1) and is being authorized under the Middle Potomac River Watershed Authority of May 2001. The original project scope consisted of an initial array of eight draft alternatives that aimed to accomplish this purpose; however, only one draft alternative is being considered at this time.

Alternative 1 is the no action alternative. Under this alternative, no flood risk measures would be implemented for the project. Alternatives 2, 3, 4, 5, 6, and 7 have been eliminated from consideration as stand-alone alternatives because they are not economically beneficial. Alternative 8 has been chosen as the tentatively selected plan and consists of a combination of Alternative 4c (Arlington Water Pollution Control Plant), Alternative 5b1 (Alexandria Deployable Floodwall), and Alternative 5c (Belle Haven Levee and Floodwall).

Alternative 4c (Enclosure 2) consists of a floodwall and temporary closure structures along Four Mile Run at the Arlington Water Pollution Control Plant. Alternative 5b1 (Enclosure 3) consists of a temporary floodwall that would be deployed ahead of storm events. Alternative 5c (Enclosure 4) consists of the construction of floodwalls, deployable closures, a levee, and pump stations in Belle Haven.

Since the study recommendations are still preliminary, effects to historic properties cannot be assessed at this time. To satisfy the requirements under Section 106 of the NHPA, USACE is proposing to develop a programmatic agreement (PA) pursuant to 36 CFR 800.14 (b)(ii). The purpose of the PA would be to allow the draft Integrated Feasibility Report and Environmental Assessment to move forward, while stipulating archaeological and architectural investigation requirements during Pre-Construction, Engineering, and Design of the project when more detailed plans and limits of disturbance can be obtained. USACE requests that your office assist with the development of the PA as a signatory pursuant to 36 CFR 800.6 (c)(1).

Thank you for your assistance with this project. We look forward to continued consultation with your office on the Metropolitan Washington, District of Columbia Coastal Storm Risk Management Feasibility Study. We ask that your office review the enclosed information and notify us as to whether you concur with the development of a PA for this project. If you have any questions about the project, please contact Ethan A. Bean at (410) 962 -2173 or ethan.a.bean@usace.army.mil.

Sincerely,

Daniel M. Bierly, P.E.
Chief, Civil Project Development Branch
Planning Division

Enclosures

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS,
BALTIMORE DISTRICT
2 HOPKINS PLAZA
BALTIMORE, MARYLAND 21201

Charles Cuvelier, Superintendent
George Washington Memorial Parkway
National Park Service
700 George Washington Memorial Parkway
McLean, VA 22101

March 10, 2022

Dear Mr. Cuvelier:

The purpose of this letter is to initiate consultation with your office in accordance with Section 106 of the National Historic Preservation Act (NHPA), as amended, and its implementing regulations at 36 CFR Part 800, regarding the Metropolitan Washington, District of Columbia Coastal Storm Risk Management Feasibility Study being conducted by the U.S. Army Corps of Engineers, Baltimore District (USACE). The purpose of the project is to reduce coastal flood risk to vulnerable areas in northern Virginia (Enclosure 1) and is being authorized under the Middle Potomac River Watershed Authority of May 2001. The original project scope consisted of an initial array of eight draft alternatives that aimed to accomplish this purpose; however, only one draft alternative is being considered at this time.

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Alternative 4c (Enclosure 2) consists of a floodwall and temporary closure structures along Four Mile Run at the Arlington Water Pollution Control Plant. Alternative 5b1 (Enclosure 3) consists of a temporary floodwall that would be deployed ahead of storm events. Alternative 5c (Enclosure 4) consists of the construction of floodwalls, deployable closures, a levee, and pump stations in Belle Haven.

Since the study recommendations are still preliminary, effects to historic properties cannot be assessed at this time. To satisfy the requirements under Section 106 of the NHPA, USACE is proposing to develop a programmatic agreement (PA) pursuant to 36 CFR 800.14 (b)(ii). The purpose of the PA would be to allow the draft Integrated Feasibility Report and Environmental Assessment to move forward, while stipulating archaeological and architectural investigation requirements during Pre-Construction, Engineering, and Design of the project when more detailed plans and limits of disturbance can be obtained. USACE requests that your office assist with the development of the PA as a signatory pursuant to 36 CFR 800.6 (c)(1).

Thank you for your assistance with this project. We look forward to continued consultation with your office on the Metropolitan Washington, District of Columbia Coastal Storm Risk Management Feasibility Study. We ask that your office review the enclosed information and notify us as to whether you wish to participate in the development of a PA for this project. If you have any questions about the project, please contact Ethan A. Bean at (410) 962-2173 or ethan.a.bean@usace.army.mil.

Sincerely,

Daniel M. Bierly, P.E.
Chief, Civil Project Development Branch
Planning Division

Enclosures

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS,
BALTIMORE DISTRICT
2 HOPKINS PLAZA
BALTIMORE, MARYLAND 21201

Diane Sullivan
Director, Urban Design and Plan Review
National Capital Planning Commission
401 9th Street, Suite 500N
Washington, D.C. 20004

March 10, 2022

Dear Ms. Sullivan:

The purpose of this letter is to initiate consultation with your office in accordance with Section 106 of the National Historic Preservation Act (NHPA), as amended, and its implementing regulations at 36 CFR Part 800, regarding the Metropolitan Washington, District of Columbia Coastal Storm Risk Management Feasibility Study being conducted by the U.S. Army Corps of Engineers, Baltimore District (USACE). The purpose of the project is to reduce coastal flood risk to vulnerable areas in northern Virginia (Enclosure 1) and is being authorized under the Middle Potomac River Watershed Authority of May 2001. The original project scope consisted of an initial array of eight draft alternatives that aimed to accomplish this purpose; however, only one draft alternative is being considered at this time.

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Since the study recommendations are still preliminary, effects to historic properties cannot be assessed at this time. To satisfy the requirements under Section 106 of the NHPA, USACE is proposing to develop a programmatic agreement (PA) pursuant to 36 CFR 800.14 (b)(ii). The purpose of the PA would be to allow the draft Integrated Feasibility Report and Environmental Assessment to move forward, while stipulating archaeological and architectural investigation requirements during Pre-Construction, Engineering, and Design of the project when more detailed plans and limits of disturbance can be obtained. USACE requests that your office assist with the development of the PA as a signatory pursuant to 36 CFR 800.6 (c)(1).

Thank you for your assistance with this project. We look forward to continued consultation with your office on the Metropolitan Washington, District of Columbia Coastal Storm Risk Management Feasibility Study. We ask that your office review the enclosed information and notify us as to whether you wish to participate in the development of a PA for this project. If you have any questions about the project, please contact Ethan A. Bean at (410) 962-2173 or ethan.a.bean@usace.army.mil.

Sincerely,

Daniel M. Bierly, P.E.
Chief, Civil Project Development Branch
Planning Division

Enclosures

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS,
BALTIMORE DISTRICT
2 HOPKINS PLAZA
BALTIMORE, MARYLAND 21201

Thomas Luebke
Secretary, U.S. Commission of Fine Arts
401 F Street NW, Suite 312
Washington, D.C. 20001

March 10, 2022

Dear Mr. Luebke:

The purpose of this letter is to initiate consultation with your office in accordance with Section 106 of the National Historic Preservation Act (NHPA), as amended, and its implementing regulations at 36 CFR Part 800, regarding the Metropolitan Washington, District of Columbia Coastal Storm Risk Management Feasibility Study being conducted by the U.S. Army Corps of Engineers, Baltimore District (USACE). The purpose of the project is to reduce coastal flood risk to vulnerable areas in northern Virginia (Enclosure 1) and is being authorized under the Middle Potomac River Watershed Authority of May 2001. The original project scope consisted of an initial array of eight draft alternatives that aimed to accomplish this purpose; however, only one draft alternative is being considered at this time.

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Alternative 4c (Enclosure 2) consists of a floodwall and temporary closure structures along Four Mile Run at the Arlington Water Pollution Control Plant. Alternative 5b1 (Enclosure 3) consists of a temporary floodwall that would be deployed ahead of storm events. Alternative 5c (Enclosure 4) consists of the construction of floodwalls, deployable closures, a levee, and pump stations in Belle Haven.

Since the study recommendations are still preliminary, effects to historic properties cannot be assessed at this time. To satisfy the requirements under Section 106 of the NHPA, USACE is proposing to develop a programmatic agreement (PA) pursuant to 36 CFR 800.14 (b)(ii). The purpose of the PA would be to allow the draft Integrated Feasibility Report and Environmental Assessment to move forward, while stipulating archaeological and architectural investigation requirements during Pre-Construction, Engineering, and Design of the project when more detailed plans and limits of disturbance can be obtained. USACE requests that your office assist with the development of the PA as a signatory pursuant to 36 CFR 800.6 (c)(1).

Thank you for your assistance with this project. We look forward to continued consultation with your office on the Metropolitan Washington, District of Columbia Coastal Storm Risk Management Feasibility Study. We ask that your office review the enclosed information and notify us as to whether you wish to participate in the development of a PA for this project. If you have any questions about the project, please contact Ethan A. Bean at (410) 962-2173 or ethan.a.bean@usace.army.mil.

Sincerely,

Daniel M. Bierly, P.E.
Chief, Civil Project Development Branch
Planning Division

Enclosures

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS,
BALTIMORE DISTRICT
2 HOPKINS PLAZA
BALTIMORE, MARYLAND 21201

Cynthia Liccese-Torres
Program Coordinator
Arlington County Historic Preservation Program
2100 Clarendon Blvd., Suite 700
Arlington, VA 22201

March 10, 2022

Dear Ms. Liccese-Torres:

The purpose of this letter is to initiate consultation with your office in accordance with Section 106 of the National Historic Preservation Act (NHPA), as amended, and its implementing regulations at 36 CFR Part 800, regarding the Metropolitan Washington, District of Columbia Coastal Storm Risk Management Feasibility Study being conducted by the U.S. Army Corps of Engineers, Baltimore District (USACE). The purpose of the project is to reduce coastal flood risk to vulnerable areas in northern Virginia (Enclosure 1) and is being authorized under the Middle Potomac River Watershed Authority of May 2001. The original project scope consisted of an initial array of eight draft alternatives that aimed to accomplish this purpose; however, only one draft alternative is being considered at this time.

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Thank you for your assistance with this project. We look forward to continued consultation with your office on the Metropolitan Washington, District of Columbia Coastal Storm Risk Management Feasibility Study. We ask that your office review the enclosed information and notify us as to whether you wish to participate in the development of a PA for this project. If you have any questions about the project, please contact Ethan A. Bean at (410) 962-2173 or ethan.a.bean@usace.army.mil.

Sincerely,

Daniel M. Bierly, P.E.
Chief, Civil Project Development Branch
Planning Division

Enclosures

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS,
BALTIMORE DISTRICT
2 HOPKINS PLAZA
BALTIMORE, MARYLAND 21201

Gretchen Bulova
Director, Office of Historic Alexandria
220 North Washington Street
Alexandria, VA 22314

March 10, 2022

Dear Ms. Bulova:

The purpose of this letter is to initiate consultation with your office in accordance with Section 106 of the National Historic Preservation Act (NHPA), as amended, and its implementing regulations at 36 CFR Part 800, regarding the Metropolitan Washington, District of Columbia Coastal Storm Risk Management Feasibility Study being conducted by the U.S. Army Corps of Engineers, Baltimore District (USACE). The purpose of the project is to reduce coastal flood risk to vulnerable areas in northern Virginia (Enclosure 1) and is being authorized under the Middle Potomac River Watershed Authority of May 2001. The original project scope consisted of an initial array of eight draft alternatives that aimed to accomplish this purpose; however, only one draft alternative is being considered at this time.

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Thank you for your assistance with this project. We look forward to continued consultation with your office on the Metropolitan Washington, District of Columbia Coastal Storm Risk Management Feasibility Study. We ask that your office review the enclosed information and notify us as to whether you wish to participate in the development of a PA for this project. If you have any questions about the project, please contact Ethan A. Bean at (410) 962-2173 or ethan.a.bean@usace.army.mil.

Sincerely,

Daniel M. Bierly, P.E.
Chief, Civil Project Development Branch
Planning Division

Enclosures

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS,
BALTIMORE DISTRICT
2 HOPKINS PLAZA
BALTIMORE, MARYLAND 21201

Barbara Byron, Director
Fairfax County Historic Preservation and
Heritage Resources
12055 Government Center Parkway
Fairfax, VA 22035

March 10, 2022

Dear Ms. Byron:

The purpose of this letter is to initiate consultation with your office in accordance with Section 106 of the National Historic Preservation Act (NHPA), as amended, and its implementing regulations at 36 CFR Part 800, regarding the Metropolitan Washington, District of Columbia Coastal Storm Risk Management Feasibility Study being conducted by the U.S. Army Corps of Engineers, Baltimore District (USACE). The purpose of the project is to reduce coastal flood risk to vulnerable areas in northern Virginia (Enclosure 1) and is being authorized under the Middle Potomac River Watershed Authority of May 2001. The original project scope consisted of an initial array of eight draft alternatives that aimed to accomplish this purpose; however, only one draft alternative is being considered at this time.

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Thank you for your assistance with this project. We look forward to continued consultation with your office on the Metropolitan Washington, District of Columbia Coastal Storm Risk Management Feasibility Study. We ask that your office review the enclosed information and notify us as to whether you wish to participate in the development of a PA for this project. If you have any questions about the project, please contact Ethan A. Bean at (410) 962-2173 or ethan.a.bean@usace.army.mil.

Sincerely,

Daniel M. Bierly, P.E.
Chief, Civil Project Development Branch
Planning Division

Enclosures

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS,
BALTIMORE DISTRICT
2 HOPKINS PLAZA
BALTIMORE, MARYLAND 21201

Chief William Harris
Catawba Indian Nation
1536 Tom Steven Road
Rock Hill, SC 29730

March 10, 2022

Dear Chief Harris:

The purpose of this letter is to initiate consultation with your office in accordance with Section 106 of the National Historic Preservation Act (NHPA), as amended, and its implementing regulations at 36 CFR Part 800, regarding the Metropolitan Washington, District of Columbia Coastal Storm Risk Management Feasibility Study being conducted by the U.S. Army Corps of Engineers, Baltimore District (USACE). The purpose of the project is to reduce coastal flood risk to vulnerable areas in northern Virginia (Enclosure 1) and is being authorized under the Middle Potomac River Watershed Authority of May 2001. The original project scope consisted of an initial array of eight draft alternatives that aimed to accomplish this purpose; however, only one draft alternative is being considered at this time.

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Daniel M. Bierly, P.E.
Chief, Civil Project Development Branch
Planning Division

Enclosures

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS,
BALTIMORE DISTRICT
2 HOPKINS PLAZA
BALTIMORE, MARYLAND 21201

Chief Stephen Adkins
Chickahominy Indian Tribe
8200 Lott Cary Road
Providence Forge, VA 23140

March 10, 2022

Dear Chief Adkins:

The purpose of this letter is to initiate consultation with your office in accordance with Section 106 of the National Historic Preservation Act (NHPA), as amended, and its implementing regulations at 36 CFR Part 800, regarding the Metropolitan Washington, District of Columbia Coastal Storm Risk Management Feasibility Study being conducted by the U.S. Army Corps of Engineers, Baltimore District (USACE). The purpose of the project is to reduce coastal flood risk to vulnerable areas in northern Virginia (Enclosure 1) and is being authorized under the Middle Potomac River Watershed Authority of May 2001. The original project scope consisted of an initial array of eight draft alternatives that aimed to accomplish this purpose; however, only one draft alternative is being considered at this time.

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Sincerely,

Daniel M. Bierly, P.E.
Chief, Civil Project Development Branch
Planning Division

Enclosures

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS,
BALTIMORE DISTRICT
2 HOPKINS PLAZA
BALTIMORE, MARYLAND 21201

Chief Gerald Stewart
Chickahominy Tribe Eastern Division
2895 Mount Pleasant Road
Providence Forge, VA 23140

March 10, 2022

Dear Chief Stewart:

The purpose of this letter is to initiate consultation with your office in accordance with Section 106 of the National Historic Preservation Act (NHPA), as amended, and its implementing regulations at 36 CFR Part 800, regarding the Metropolitan Washington, District of Columbia Coastal Storm Risk Management Feasibility Study being conducted by the U.S. Army Corps of Engineers, Baltimore District (USACE). The purpose of the project is to reduce coastal flood risk to vulnerable areas in northern Virginia (Enclosure 1) and is being authorized under the Middle Potomac River Watershed Authority of May 2001. The original project scope consisted of an initial array of eight draft alternatives that aimed to accomplish this purpose; however, only one draft alternative is being considered at this time.

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Sincerely,

Daniel M. Bierly, P.E.
Chief, Civil Project Development Branch
Planning Division

Enclosures

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS,
BALTIMORE DISTRICT
2 HOPKINS PLAZA
BALTIMORE, MARYLAND 21201

Deborah Dotson, President
Delaware Nation
P.O. Box 825
Anadarko, OK 73005

March 10, 2022

Dear Ms. Dotson:

The purpose of this letter is to initiate consultation with your office in accordance with Section 106 of the National Historic Preservation Act (NHPA), as amended, and its implementing regulations at 36 CFR Part 800, regarding the Metropolitan Washington, District of Columbia Coastal Storm Risk Management Feasibility Study being conducted by the U.S. Army Corps of Engineers, Baltimore District (USACE). The purpose of the project is to reduce coastal flood risk to vulnerable areas in northern Virginia (Enclosure 1) and is being authorized under the Middle Potomac River Watershed Authority of May 2001. The original project scope consisted of an initial array of eight draft alternatives that aimed to accomplish this purpose; however, only one draft alternative is being considered at this time.

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Sincerely,

Daniel M. Bierly, P.E.
Chief, Civil Project Development Branch
Planning Division

Enclosures

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS,
BALTIMORE DISTRICT
2 HOPKINS PLAZA
BALTIMORE, MARYLAND 21201

Chief Kenneth Branham
Monacan Indian Nation
111 Highview Drive
Madison Heights, VA 24572

March 10, 2022

Dear Chief Branham:

The purpose of this letter is to initiate consultation with your office in accordance with Section 106 of the National Historic Preservation Act (NHPA), as amended, and its implementing regulations at 36 CFR Part 800, regarding the Metropolitan Washington, District of Columbia Coastal Storm Risk Management Feasibility Study being conducted by the U.S. Army Corps of Engineers, Baltimore District (USACE). The purpose of the project is to reduce coastal flood risk to vulnerable areas in northern Virginia (Enclosure 1) and is being authorized under the Middle Potomac River Watershed Authority of May 2001. The original project scope consisted of an initial array of eight draft alternatives that aimed to accomplish this purpose; however, only one draft alternative is being considered at this time.

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Chief, Civil Project Development Branch
Planning Division

Enclosures

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS,
BALTIMORE DISTRICT
2 HOPKINS PLAZA
BALTIMORE, MARYLAND 21201

Chief Earl Bass
Nansemond Indian Nation
1001 Pembroke Lane
Suffolk, VA 23434

March 10, 2022

Dear Chief Bass:

The purpose of this letter is to initiate consultation with your office in accordance with Section 106 of the National Historic Preservation Act (NHPA), as amended, and its implementing regulations at 36 CFR Part 800, regarding the Metropolitan Washington, District of Columbia Coastal Storm Risk Management Feasibility Study being conducted by the U.S. Army Corps of Engineers, Baltimore District (USACE). The purpose of the project is to reduce coastal flood risk to vulnerable areas in northern Virginia (Enclosure 1) and is being authorized under the Middle Potomac River Watershed Authority of May 2001. The original project scope consisted of an initial array of eight draft alternatives that aimed to accomplish this purpose; however, only one draft alternative is being considered at this time.

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Daniel M. Bierly, P.E.
Chief, Civil Project Development Branch
Planning Division

Enclosures

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS,
BALTIMORE DISTRICT
2 HOPKINS PLAZA
BALTIMORE, MARYLAND 21201

Chief Robert Gray
Pamunkey Indian Tribe
1054 Pocahontas Trail
King William, VA 23086

March 10, 2022

Dear Chief Gray:

The purpose of this letter is to initiate consultation with your office in accordance with Section 106 of the National Historic Preservation Act (NHPA), as amended, and its implementing regulations at 36 CFR Part 800, regarding the Metropolitan Washington, District of Columbia Coastal Storm Risk Management Feasibility Study being conducted by the U.S. Army Corps of Engineers, Baltimore District (USACE). The purpose of the project is to reduce coastal flood risk to vulnerable areas in northern Virginia (Enclosure 1) and is being authorized under the Middle Potomac River Watershed Authority of May 2001. The original project scope consisted of an initial array of eight draft alternatives that aimed to accomplish this purpose; however, only one draft alternative is being considered at this time.

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Chief, Civil Project Development Branch
Planning Division

Enclosures

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS,
BALTIMORE DISTRICT
2 HOPKINS PLAZA
BALTIMORE, MARYLAND 21201

Chief G. Anne Richardson
Rappahannock Tribe
5036 Indian Neck Road
Indian Neck, VA 23148

March 10, 2022

Dear Chief Richardson:

The purpose of this letter is to initiate consultation with your office in accordance with Section 106 of the National Historic Preservation Act (NHPA), as amended, and its implementing regulations at 36 CFR Part 800, regarding the Metropolitan Washington, District of Columbia Coastal Storm Risk Management Feasibility Study being conducted by the U.S. Army Corps of Engineers, Baltimore District (USACE). The purpose of the project is to reduce coastal flood risk to vulnerable areas in northern Virginia (Enclosure 1) and is being authorized under the Middle Potomac River Watershed Authority of May 2001. The original project scope consisted of an initial array of eight draft alternatives that aimed to accomplish this purpose; however, only one draft alternative is being considered at this time.

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Chief, Civil Project Development Branch
Planning Division

Enclosures

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS,
BALTIMORE DISTRICT
2 HOPKINS PLAZA
BALTIMORE, MARYLAND 21201

Chief W. Frank Adams
Upper Mattaponi Tribe
13476 King William Road
King William, VA 23086

March 10, 2022

Dear Chief Adams:

The purpose of this letter is to initiate consultation with your office in accordance with Section 106 of the National Historic Preservation Act (NHPA), as amended, and its implementing regulations at 36 CFR Part 800, regarding the Metropolitan Washington, District of Columbia Coastal Storm Risk Management Feasibility Study being conducted by the U.S. Army Corps of Engineers, Baltimore District (USACE). The purpose of the project is to reduce coastal flood risk to vulnerable areas in northern Virginia (Enclosure 1) and is being authorized under the Middle Potomac River Watershed Authority of May 2001. The original project scope consisted of an initial array of eight draft alternatives that aimed to accomplish this purpose; however, only one draft alternative is being considered at this time.

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Sincerely,

Daniel M. Bierly, P.E.
Chief, Civil Project Development Branch
Planning Division

Enclosures

From:	Susan H. Hellman
To:	Bean, Ethan A CIV USARMY CENAB (USA); Eleanor Breen; Metallo, Amber C CIV USARMY CENAB (USA)
Subject:	[URL Verdict: Neutral][Non-DoD Source] FW: [EXTERNAL]Section 106 Review – Metropolitan Washington, D.C. Coastal Storm Risk Management Feasibility Study
Date:	Friday, March 11, 2022 1:04:17 PM
Attachments:	USACE to City of Alexandria DC Coastal Mar 2022.pdf Enclosure 1 DC Coastal Study Area.pdf Enclosure 2 Alternative 4c Arlington WPCP.pdf Enclosure 3 Alternative 5b1 Alexandria Deployable Floodwall.pdf Enclosure 4 Alternative 5c Belle Haven.pdf

Good afternoon,

The Historic Preservation Division of the City of Alexandria Department of Planning & Zoning would like to be a consulting party. Please send all future correspondence to me at this email.

Thank you,

Susan Hellman
(she/her)
Urban Planner - Historic Preservation
Department of Planning & Zoning | City of Alexandria
301 King Street | Suite 2100 | Alexandria, VA 22314
703.746.3818
Teleworking for now

From: Preservation <Preservation@alexandriava.gov>
Sent: Friday, March 11, 2022 7:26 AM
To: Susan H. Hellman <susan.hellman@alexandriava.gov>
Subject: FW: [EXTERNAL]Section 106 Review – Metropolitan Washington, D.C. Coastal Storm Risk Management Feasibility Study

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From: Bean, Ethan A CIV USARMY CENAB (USA) <ETHAN.A.BEAN@usace.army.mil>
Sent: Thursday, March 10, 2022 5:09 PM
To: Preservation <Preservation@alexandriava.gov>; Eleanor Breen <Eleanor.Breen@alexandriava.gov>
Cc: Metallo, Amber C CIV USARMY CENAB (USA) <Amber.C.Metallo@usace.army.mil>
Subject: [EXTERNAL]Section 106 Review – Metropolitan Washington, D.C. Coastal Storm Risk Management Feasibility Study

> Some people who received this message don't often get email from ethan.a.bean@usace.army.mil. Learn why this is important

Good afternoon,

Please find attached for your review information regarding the Metropolitan Washington Coastal Storm Risk Management Feasibility Study being conducted in northern Virginia. We are assessing alternatives that would reduce coastal flood risk to vulnerable areas in the Washington, D.C.

From:	Eleanor Breen
To:	Susan H. Hellman; Bean, Ethan A CIV USARMY CENAB (USA); Metallo, Amber C CIV USARMY CENAB (USA)
Subject:	[URL Verdict: Neutral][Non-DoD Source] RE: [EXTERNAL]Section 106 Review – Metropolitan Washington, D.C. Coastal Storm Risk Management Feasibility Study
Date:	Friday, March 11, 2022 1:46:21 PM

Hello, the Alexandria Archaeology Division of the Office of Historic Alexandria would like to be included as a consulting party as well. Thank you, Eleanor Breen

Eleanor Breen, PhD, RPA
City Archaeologist
Office of Historic Alexandria/Alexandria Archaeology
105 N. Union Street, #327
Alexandria, VA 22314
703.746.4399

From: Susan H. Hellman <susan.hellman@alexandriava.gov>
Sent: Friday, March 11, 2022 12:59 PM
To: ethan.a.bean@usace.army.mil; Eleanor Breen <Eleanor.Breen@alexandriava.gov>; amber.c.metallo@usace.army.mil
Subject: FW: [EXTERNAL]Section 106 Review – Metropolitan Washington, D.C. Coastal Storm Risk Management Feasibility Study

Good afternoon,

The Historic Preservation Division of the City of Alexandria Department of Planning & Zoning would like to be a consulting party. Please send all future correspondence to me at this email.

Thank you,

Susan Hellman
(she/her)
Urban Planner - Historic Preservation
Department of Planning & Zoning | City of Alexandria
301 King Street | Suite 2100 | Alexandria, VA 22314
703.746.3818
Teleworking for now

From: Preservation <Preservation@alexandriava.gov>
Sent: Friday, March 11, 2022 7:26 AM
To: Susan H. Hellman <susan.hellman@alexandriava.gov>
Subject: FW: [EXTERNAL]Section 106 Review – Metropolitan Washington, D.C. Coastal Storm Risk Management Feasibility Study

From:	Daniel Fox
To:	Bean, Ethan A CIV USARMY CENAB (USA)
Cc:	Metallo, Amber C CIV USARMY CENAB (USA)
Subject:	[Non-DoD Source] Re: Section 106 Review – Metropolitan Washington, D.C. Coastal Storm Risk Management Feasibility Study
Date:	Monday, March 14, 2022 1:24:30 PM

Hi Ethan, thanks for contacting CFA. We would like to participate as a consulting party.
Best regards,
Dan

--
Daniel Fox, Sr. Advisor
U.S. Commission of Fine Arts

From: Bean, Ethan A CIV USARMY CENAB (USA) <ETHAN.A.BEAN@usace.army.mil>
Date: Thursday, March 10, 2022 at 5:16 PM
To: Daniel Fox <dfox@cfa.gov>
Cc: Metallo, Amber C CIV USARMY CENAB (USA) <Amber.C.Metallo@usace.army.mil>
Subject: Section 106 Review – Metropolitan Washington, D.C. Coastal Storm Risk Management Feasibility Study

Good afternoon,

Please find attached for your review information regarding the Metropolitan Washington Coastal Storm Risk Management Feasibility Study being conducted in northern Virginia. We are assessing alternatives that would reduce coastal flood risk to vulnerable areas in the Washington, D.C. Metropolitan area. Please let me know if you are interested in consulting on this project, or if you have any questions or comments.

Respectfully,
Ethan Bean

Ethan A. Bean
Cultural Resources Specialist
History Program Co-Manager
U.S. Army Corps of Engineers
Baltimore District
(410) 962-2173

From:	Dressel, Denice
To:	Bean, Ethan A CIV USARMY CENAB (USA)
Cc:	Metallo, Amber C CIV USARMY CENAB (USA); Arseneau, Laura
Subject:	[URL Verdict: Neutral][Non-DoD Source] RE: Section 106 Review – Metropolitan Washington, D.C. Coastal Storm Risk Management Feasibility Study
Date:	Tuesday, March 15, 2022 2:23:03 PM

Mr. Bean,

Thank you for the opportunity to review the preliminary study recommendations for the Metropolitan Washington, District of Columbia Coastal Storm Risk Management Feasibility Study. It is my understanding from the accompanying letter and graphics that the construction of floodwalls, deployable closures, a levee, and pump stations between the Belle Haven subdivision and the George Washington Memorial Pkwy, in Fairfax County is being proposed. It is also my understanding that a Programmatic Agreement is being prepared to allow the draft Integrated Feasibility Report and Environmental Assessment to move forward while stipulating archaeological and architectural investigation requirements during Pre-Construction, Engineering, and Design of the project when more detailed plans and limits of disturbance can be obtained.

Fairfax County would like to become a consulting party in the Section 106 review of the Army Corp's D.C. Coastal Storm Risk Management Feasibility Study and participate in the development of the programmatic agreement.

Please keep me informed of any changes to the project, provide any information on current project timelines, and include me on any future project meetings.

Thank you,

Denice Dressel, MAHP (she/her/hers)
Principal Preservation Planner, Heritage Resources
ARB Administrator/History Commission Liaison
Fairfax County Department of Planning and Development
O: (703) 324-1383
https://www.fairfaxcounty.gov/planning-development/historic

From: Bean, Ethan A CIV USARMY CENAB (USA) <ETHAN.A.BEAN@usace.army.mil>
Sent: Thursday, March 10, 2022 5:07 PM
To: Dressel, Denice <Denice.Dressel@fairfaxcounty.gov>; DPZ Mail for PD <DPDMail@fairfaxcounty.gov>
Cc: Metallo, Amber C CIV USARMY CENAB (USA) <Amber.C.Metallo@usace.army.mil>
Subject: Section 106 Review – Metropolitan Washington, D.C. Coastal Storm Risk Management Feasibility Study

From: Lorin Farris
To: Bean, Ethan A CIV USARMY CENAB (USA)
Subject: [Non-DoD Source] Fwd: Section 106 Review – Metropolitan Washington, D.C. Coastal Storm Risk Management Feasibility Study
Date: Thursday, March 17, 2022 1:20:55 PM

Good afternoon Ethan,
Thank you for including the Arlington County Historic Preservation Program in your communications concerning the Metropolitan Washington, D.C. Coastal Storm Risk Management Feasibility Study. Our program is interested in consulting on this project. We do not have any questions at this time. Also, you do not need to include Cynthia Liccese-Torres in future correspondents, as I do the bulk of our Section 106 projects.
Thanks,
Lorin Farris

Lorin V. Farris (pronouns: she/her)
Historic Preservation Planner
Department of Community Planning, Housing & Development
2100 Clarendon Boulevard, Suite 700
Arlington County, VA
lfarris@arlingtonva.us
703 228 3549

CPHD Mission Statement - Promoting the improvement, conservation and revitalization of Arlington's physical and social environment.

From: Cynthia Liccese-Torres <Cliccese@arlingtonva.us>
Sent: Thursday, March 10, 2022 6:24 PM
To: Lorin Farris <lfarris@arlingtonva.us>
Subject: FYA: Fwd: Section 106 Review – Metropolitan Washington, D.C. Coastal Storm Risk Management Feasibility Study

Cynthia Liccese-Torres
Historic Preservation Supervisor
Arlington County Government

Sent from my iPhone

From: Bean, Ethan A CIV USARMY CENAB (USA) <ETHAN.A.BEAN@usace.army.mil>
Sent: Thursday, March 10, 2022 5:10:20 PM
To: Cynthia Liccese-Torres <Cliccese@arlingtonva.us>
Cc: Metallo, Amber C CIV USARMY CENAB (USA) <Amber.C.Metallo@usace.army.mil>
Subject: Section 106 Review – Metropolitan Washington, D.C. Coastal Storm Risk Management

The Delaware Nation
Historic Preservation Department
31064 State Highway 281
Anadarko, OK 73005
Phone (405)247-2448

March 23, 2022

To Whom It May Concern:

The Delaware Nation Historic Preservation Department received correspondence regarding the following referenced project(s).

Project(s): Metropolitan Washington, D.C. Coastal Storm Risk Management Feasibility Study

Our office is committed to protecting tribal heritage, culture and religion with particular concern for archaeological sites potentially containing burials and associated funerary objects. The Lenape people occupied the area indicated in your letter during and prior to European contact until their eventual removal to our present locations. **We would like to accept your invitation for consultation. We do not have any comments on the project at this time, but please keep us in the loop if a Programmatic Agreement is developed.**

Please note that Delaware Nation, the Delaware Tribe of Indians, and the Stockbridge Munsee Community are the only Federally Recognized Delaware/Lenape entities in the United States and consultation for Lenape homelands must be made with only the designated staff of these three Nations (and/or other federally recognized tribal nations who may have overlapping areas of interest). We appreciate your cooperation in contacting the Delaware Nation Historic Preservation Office to conduct proper Section 106 consultation. Should you have any questions, feel free to contact our offices at 405-247-2448 ext. 1403.

Erin N. Paden

Erin Paden
Director of Historic Preservation
Delaware Nation
31064 State Highway 281
Anadarko, OK 73005
Ph. 405-247-2448 ext. 1403
epaden@delawarenation-nsn.gov

United States Department of the Interior

NATIONAL PARK SERVICE
George Washington Memorial Parkway
700 George Washington Memorial Parkway
McLean, VA 22101

IN REPLY REFER TO:
1.A.2 GWMP USACOE Flood Control

March 28, 2022

Daniel M. Bierly, P.E.
Chief, Civil Project Development Branch - Planning Division
Department of Army - Corps of Engineers, Baltimore District
2 Hopkins Plaza
Baltimore, Maryland 21201

ATTN: Ethan A. Bean

Dear Mr. Bierly:

The National Park Service (NPS) George Washington Memorial Parkway (GWMP) is in receipt of your March 10, 2022, letter regarding the Metropolitan Washington, District of Columbia Coastal Storm Risk Management Feasibility Study undertaking which makes a request for assistance by NPS GWMP in developing and serving as a signatory for a Programmatic Agreement (PA) to help satisfy federal agency responsibilities under Section 106 of the National Historic Preservation Act (NHPA). The NPS GWMP has been in discussions with the US Army Corps of Engineers (USACOE) regarding this project and flood control measures for some years and has expressed concerns about potential Adverse Effects to historic properties under our management, particularly the original Mount Vernon Memorial Highway (MVMH) portion of the George Washington Memorial Parkway.

The NPS GWMP would like to participate in this endeavor, more formally as a consulting party/invited signatory to the PA. We also would like to understand your current status of communications with the relevant State Historic Preservation Office, the Virginia Department of Historic Resources, and whether a suggestion has been made for the USACOE to serve as a Lead Federal Agency for the undertaking if there is a determination of the need for a NPS action.

The NPS-GWMP looks forward to working with USACOE on this undertaking and fulfilling federal agency responsibilities under NHPA Section 106 while ensuring the avoidance of Adverse Effects to the MVMH and other historic properties under our administration. If there are any questions regarding this correspondence, contact the head of our Resource Management Division Maureen Joseph (maureen_joseph@nps.gov) or Cultural Resources Program Manager Matthew Virta (matthew_virta@nps.gov).

Sincerely,

Charles Cuvelier Date: 2022.03.31 14:27:36 -04'00'

Charles Cuvelier
Superintendent

Cc: Maureen Joseph, GWMP
Matthew Virta, GWMP

From: Dressel, Denice
To: Bean, Ethan A CIV USARMY CENAB (USA)
Cc: Metallo, Amber C CIV USARMY CENAB (USA)
Subject: [URL Verdict: Neutral][Non-DoD Source] RE: Section 106 Review – Metropolitan Washington, D.C. Coastal Storm Risk Management Feasibility Study
Date: Monday, April 18, 2022 8:01:57 AM

Good Morning, Mr. Bean,

At its April 14, 2022 meeting, the Fairfax County Architectural Review Board voted to request to become a Consulting Party to the Section 106 Review of the Metropolitan Washington, D.C. Coastal Storm Risk Management Feasibility Study for which a Programmatic Agreement is currently being drafted.

Confirmation of receipt is requested.

Thank you,

Denice Dressel, MAHP (she/her/hers)
Principal Preservation Planner, Heritage Resources
ARB Administrator/History Commission Liaison
Fairfax County Department of Planning and Development
O: (703) 324-1383
https://www.fairfaxcounty.gov/planning-development/historic

From: Bean, Ethan A CIV USARMY CENAB (USA) <ETHAN.A.BEAN@usace.army.mil>
Sent: Thursday, March 10, 2022 5:07 PM
To: Dressel, Denice <Denice.Dressel@fairfaxcounty.gov>; DPZ Mail for PD <DPDMail@fairfaxcounty.gov>
Cc: Metallo, Amber C CIV USARMY CENAB (USA) <Amber.C.Metallo@usace.army.mil>
Subject: Section 106 Review – Metropolitan Washington, D.C. Coastal Storm Risk Management Feasibility Study

Good afternoon,

Please find attached for your review information regarding the Metropolitan Washington Coastal Storm Risk Management Feasibility Study being conducted in northern Virginia. We are assessing alternatives that would reduce coastal flood risk to vulnerable areas in the Washington, D.C. Metropolitan area. Please let me know if you are interested in consulting on this project, or if you have any questions or comments.

Respectfully,
Ethan Bean

From: Henderson, Samantha
To: Bean, Ethan A CIV USARMY CENAB (USA)
Subject: Re: [Non-DoD Source] Re: Metropolitan Washington, D.C. Coastal Storm Risk Management Feasibility Study
Date: Tuesday, April 19, 2022 1:18:56 PM

Thanks for the update. I did have Marc look at this and I think his initial thoughts were similar to our earlier comments that a PA would be appropriate. With the Alexandria Alternative out of consideration that was probably the location with the most significant potential effects to historic properties but if I recall there would likely be a need for identification efforts around Belle Haven. The only CSRM PA that I have worked on is the Norfolk one. I can ask around and see if others in our division have thoughts on other PAs that might form a good template. Since you have narrowed down the Alternatives it sounds like it could be a fairly straightforward Agreement.

On Tue, Apr 19, 2022 at 12:02 PM Bean, Ethan A CIV USARMY CENAB (USA) <ETHAN.A.BEAN@usace.army.mil> wrote:

> Hey Sam,
>
> I wanted to provide an update on our Washington, D.C. CSRM Feasibility Study. The only change to the project at this time is that the deployable floodwall in the City of Alexandria (Alternative 5b1) is no longer under consideration. Only the Arlington Water Pollution Control Plant (Alternative 4c) and Belle Haven (Alternative 5c) alternatives remain in the tentatively selected plan.
>
> As far as project timeframes, the draft Integrated Feasibility Report (IFR) and Environmental Assessment (EA) will undergo a 30-day public review period beginning May 27th. The currently proposed time for a finalized IFR/EA is September 2023.
>
> Was your architectural historian able to look at this and provide any comments? Also, can you send me any CSRM project PA templates you have? I only have one from Norfolk and another from Rhode Island.
>
> Thanks,
>
> Ethan
>
> ---
>
> Ethan A. Bean

From: Susan H. Hellman
To: Bean, Ethan A CIV USARMY CENAB (USA); Eleanor Breen
Subject: [Non-DoD Source] RE: [EXTERNAL]Section 106 Review – Metropolitan Washington, D.C. Coastal Storm Risk Management Feasibility Study
Date: Tuesday, April 19, 2022 2:45:06 PM

Good afternoon,

Based on the fact that the Alexandria deployable flood wall is no longer under consideration, the Historic Preservation Division of the City of Alexandria Department of Planning & Zoning does not need to be a consulting party. While the Arlington Water Pollution Control Plant may affect Alexandria, it will not affect either or our local historic districts, so I do not need to be involved.

Any idea/reason as to why the Alexandria wall is no longer under consideration?

Thanks very much for asking.

Best,

Susan Hellman
(she/her)
Urban Planner - Historic Preservation
Department of Planning & Zoning | City of Alexandria
301 King Street | Suite 2100 | Alexandria, VA 22314
703.746.3818
Teleworking for now

From: Bean, Ethan A CIV USARMY CENAB (USA) <ETHAN.A.BEAN@usace.army.mil>
Sent: Tuesday, April 19, 2022 12:01 PM
To: Susan H. Hellman <susan.hellman@alexandriava.gov>; Eleanor Breen <Eleanor.Breen@alexandriava.gov>
Subject: RE: [EXTERNAL]Section 106 Review – Metropolitan Washington, D.C. Coastal Storm Risk Management Feasibility Study

Good morning,

Thank you for responding to our request to be a consulting party on the Metropolitan Washington, D.C. Coastal Storm Risk Management Feasibility Study. The only change to the project at this time is that the deployable floodwall in the City of Alexandria (Alternative 5b1) is no longer under consideration. Only the Arlington Water Pollution Control Plant (Alternative 4c) and Belle Haven (Alternative 5c) alternatives remain in the tentatively selected plan.

With this information are you still interested in consulting on this project or aiding in the development of a programmatic agreement?

As far as project timeframes, the draft Integrated Feasibility Report (IFR) and Environmental

From: Eleanor Breen
To: Bean, Ethan A CIV USARMY CENAB (USA); Susan H. Hellman
Cc: Benjamin Skolnik
Subject: [Non-DoD Source] RE: [EXTERNAL]Section 106 Review – Metropolitan Washington, D.C. Coastal Storm Risk Management Feasibility Study
Date: Friday, April 22, 2022 2:38:34 PM

Dear Ethan, Alexandria Archaeology would like to continue on as a consulting party. There may be submerged/buried resources along the county/city border that might be adversely affected by this undertaking that we'd like to comment on. Thanks, Eleanor

Eleanor Breen, PhD, RPA
City Archaeologist
Office of Historic Alexandria/Alexandria Archaeology
105 N. Union Street, #327
Alexandria, VA 22314
703.746.4399

From: Bean, Ethan A CIV USARMY CENAB (USA) <ETHAN.A.BEAN@usace.army.mil>
Sent: Wednesday, April 20, 2022 7:19 AM
To: Susan H. Hellman <susan.hellman@alexandriava.gov>; Eleanor Breen <Eleanor.Breen@alexandriava.gov>
Subject: RE: [EXTERNAL]Section 106 Review – Metropolitan Washington, D.C. Coastal Storm Risk Management Feasibility Study

Susan,

Thanks for the response. The alternative was screened out because the costs outweighed the potential benefits. Since it would have been a lengthy deployable floodwall, I believe there were also concerns about how that would be installed before any storms.

Thanks,
Ethan

Ethan A. Bean
Cultural Resources Specialist
History Program Co-Manager
U.S. Army Corps of Engineers
Baltimore District
(410) 962-2173

From: Susan H. Hellman <susan.hellman@alexandriava.gov>
Sent: Tuesday, April 19, 2022 2:45 PM

February 1, 2023

Ethan A. Bean
Archaeologist
U.S. Army Corps of Engineers
Baltimore District
2 Hopkins Plaza, Baltimore, MD 21201

Ref: *Metropolitan Washington District of Columbia Coastal Storm Risk Management Feasibility Study*
Arlington and Fairfax Counties, Virginia
ACHP Project Number: 019137

Dear Mr. Bean:

On January 17, 2023, the Advisory Council on Historic Preservation (ACHP) received your notification and supporting documentation regarding the potential adverse effects of the referenced undertaking on a property or properties listed or eligible for listing in the National Register of Historic Places. Based upon the information you provided, we have concluded that Appendix A, *Criteria for Council Involvement in Reviewing Individual Section 106 Cases*, of Section 106 of the National Historic Preservation Act (NHPA) and its implementing regulations, "Protection of Historic Properties" (36 CFR Part 800), does not apply to this undertaking. Accordingly, we do not believe our participation in the consultation to resolve adverse effects is needed.

However, if we receive a request for participation from the Virginia State Historic Preservation Officer (SHPO), Tribal Historic Preservation Officer, affected Indian tribe, a consulting party, or other party, we may reconsider this decision. Should the undertaking's circumstances change, consulting parties cannot come to consensus, or you need further advisory assistance to conclude the consultation process, please contact us.

Pursuant to 36 CFR § 800.6(b)(1)(iv), you will need to file the final Section 106 agreement document (Agreement), developed in consultation with the Virginia SHPO and any other consulting parties, and related documentation with the ACHP at the conclusion of the consultation process. The filing of the Agreement and supporting documentation with the ACHP is required in order to complete the requirements of Section 106 of the NHPA.

Thank you for providing us with your notification of adverse effect. If you have any questions or require our further assistance, please contact Christopher Daniel at (202) 517-0223 or by e-mail at

cdaniel@achp.gov and reference the ACHP Project Number above.

Sincerely,

Artisha Thompson
Historic Preservation Technician
Office of Federal Agency Programs

From: Henderson, Samantha (DHR)
To: Bean, Ethan A CIV USARMY CENAB (USA)
Subject: [URL Verdict: Neutral][Non-DoD Source] Metropolitan Washington DC CSRM Study (DHR File No. 2021-0250)
Date: Friday, July 7, 2023 12:11:27 PM

Dear Mr. Bean:

The Department of Historic Resources (DHR) has received for our review and comment updated information regarding the Metropolitan Washington DC Coastal Storm Risk Management Study. DHR understands that the scope of this study and the proposed activities associated with it have been reduced to include only Alternative 4C, the construction of a floodwall at the Arlington Water Pollution Control Plant. Based on the information provided, DHR concurs with the U.S. Army Corps of Engineers' determination that the historic properties in the area of potential effects will not be adversely affected by the undertaking.

Implementation of the undertaking in accordance with the finding of no adverse effect as documented fulfills the federal agency's responsibilities under Section 106 of the National Historic Preservation Act. If for any reason the undertaking is not or cannot be conducted as proposed in the finding, consultation under Section 106 must be reopened.

Thank you for your consideration of historic resources. Please contact me if you have any questions or if we may provide any further assistance.

Regards,

Samantha Henderson
Project Review Archaeologist
Review and Compliance Division
Virginia Department of Historic Resources
(she/her/hers)

804-482-6088
Samantha.henderson@dhr.virginia.gov
www.dhr.virginia.gov
2801 Kensington Ave, Richmond, VA, 23225

Previous Cultural Resources Investigations

Report Title	Author/Date	Description/Results	Associated Alternative (within 0.5 miles)	Report Number	Notes
Historic and Archaeological Survey Report of the Washington National Airport	Parsons Management Consultants 1989	Phase I architectural and archaeological survey of the Washington National Airport. The architectural survey documented all buildings and structures within the airport property, while the archaeological survey consisted of background research and subsurface testing of proposed development. The architectural survey identified fifteen structures or groups of structures located within the airport as contributing resources to its historical integrity. The archaeological survey identified two areas as having the potential to yield significant precontact and historic archaeological resources. One area is near the NRHP-eligible Abingdon Ruins. The other area(s) are those portions of the airport complex's airside that have not been disturbed by airport development (grading, utility/infrastructure placement, fill, etc.).	Reagan Airport	AR-008	The alternative follows previously disturbed areas (roadways/graded areas) so archaeological potential should be low.; the surveyed area encompasses the entirety of the airport.

Report Title	Author/Date	Description/Results	Associated Alternative (within 0.5 miles)	Report Number	Notes
Archaeology of the Abingdon Plantation Site (44AR18), Ronald Reagan Washington National Airport, Arlington County, Virginia	Greenhorne & O'Mara, Inc. 1999	Phase III excavations of the eighteenth-century Abingdon Plantation Site prior to construction of the South and Middle/North parking structures at Ronald Reagan Washington National Airport. Investigations concluded that while most of the site has been extensively disturbed, intact eighteenth-century deposits are present within limited portions of the site.	Reagan Airport	AR-046	The ruins are outside of the alternative alignment.
Phase I Archeological Investigations of the I-95/395 HOV/Bus/HOT Lanes Project, Arlington, Fairfax, Prince William, and Stafford Counties, and the City of Alexandria, Virginia	Thunderbird Archeology 2007	Phase I excavations of proposed I-95/395 transportation route and toll lane expansions. The survey identified twenty archaeological sites, including eight precontact sites, eight historic sites, and four multi-component sites. Of the twenty sites, only two (one precontact and one historic) were recommended as potentially eligible for the NRHP.	Reagan Airport	ST-153	The survey and potentially eligible archaeological sites are outside the alternative alignments (more than 0.5 miles).
Addendum to the Phase I Archeological Investigations of the I-95/395 HOV/Bus/HOT Lanes Project, Arlington, Fairfax, Prince William, and Stafford Counties, and the City of Alexandria, Virginia	Thunderbird Archeology 2008	An addendum to the proposed I-95/395 transportation route and toll lane expansions. This survey expanded the APE in six areas throughout the project. The expanded areas were noted as having been previously disturbed or exhibiting low archaeological potential, so there was	Reagan Airport	PW-321	the expanded areas are outside of the project alternative.

Report Title	Author/Date	Description/Results	Associated Alternative (within 0.5 miles)	Report Number	Notes
		no additional subsurface testing.			
Phase Ia Archeological Overview and Phase II Historic Architectural Significance Evaluation for the Four Mile Run Bus Garage, Arlington County, Virginia	John Milner Associates 1992	Phase Ia background research and architectural significance evaluation for a proposed remodeling of the Four Mile Run car barn and park creation. The study indicated that the project area had low archaeological potential due to topography and previous transportation-related construction. The Four Mile Run car barn was also recommended not eligible for the NRHP.	Reagan Airport and Arlington WPCP and four mile run	AR-063	The study area and resources are outside the project alternatives.
Final Report, An Intensive Archeological Survey of the Lower Four Mile Run Area, Alexandria and Arlington County, Virginia	Stephen Gluckman 1973	Background research and survey of the Four Mile Run area ahead of a proposed flood control project. No archaeological materials were recovered and the study noted that previous construction and flooding had disturbed much, if not all, of the project area.	Reagan Airport and Arlington WPCP and four mile run	AX-014	The study area is outside of the Ronald Reagan Airport, but just south of the Water Pollution Control Plant, along the existing Four Mile Run levee. Archaeological potential in this area is low, as noted by the 1973 survey.
Phase I Archaeological Survey Report, Potomac Yard Metrorail Station Project, City of Alexandria, Virginia and Arlington County, Virginia	AECOM Transportation 2013	Phase I survey for a proposed Metrorail station in the Potomac Yard Section of the City of Alexandria. The survey documented three archaeological sites (two historic and one multi-component) and	Reagan Airport and four mile run	AX-143	The survey area and identified archaeological sites are outside the project alternatives.

Report Title	Author/Date	Description/Results	Associated Alternative (within 0.5 miles)	Report Number	Notes
		recommended avoidance or additional testing to evaluate their eligibility for the NRHP.			
Addendum to the Phase I Archaeological Survey Report, Potomac Yard Metrorail Station Project, City of Alexandria, Virginia, and Arlington County, Virginia	AECOM Transportation 2016	An addendum to the proposed Metrorail station in the Potomac Yard Section of the City of Alexandria. This survey expanded the APE to include updates to project alternatives. The expanded areas were noted as having low archaeological potential and were not surveyed.	Reagan Airport	AX-167	the expanded areas are outside of the project alternative.
Supplemental Historic Architectural Survey of the Revised Area of Potential Effect for the Woodrow Wilson Bridge Improvement Project, I-95/I-495 from Telegraph Road to MD 210, Virginia, Maryland, and the District of Columbia	URS Greiner Woodward	Supplemental architectural survey for the Woodrow Wilson Bridge Improvement Project that includes a revised APE and design changes. The survey documented that the NRHP-eligible resources George Washington National Masonic Memorial and Union Station were within the revised APE and the proposed project's effects to these resources would need to be assessed.	belle haven and alexandria	AX-068	The expanded areas and resources mentioned are outside of the project alternatives.
Woodrow Wilson Bridge Improvement Study, Integrated Cultural Resources Technical Report, Architectural/Historic Resources Identification and Determination of Effect Report and Phase Ia and Ib Terrestrial and Underwater	Parsons Engineering Science, Inc. 1996	Architectural and Archaeological survey of proposed improvements to Woodrow Wilson Bridge river crossings and the interchanges at Telegraph Road, US 1, I-295, and MD 210. The survey documented that there would be adverse effects to both	belle haven and alexandria	AX-052	The surveyed area and identified resources are outside of the Belle Haven alternative, but the majority of the Alexandria alternative falls within the surveyed area.

Report Title	Author/Date	Description/Results	Associated Alternative (within 0.5 miles)	Report Number	Notes
Archaeological Investigations		architectural and archaeological resources and that additional investigations would be needed.			
Historical and Archaeological Investigation of Roberdeau's Wharf at Harborside, Alexandria, Virginia	Engineering Science, Inc. 1990	Historical and archaeological investigations of a proposed development property. The survey documented a multi-component archaeological site, and revealed the remains of an eighteenth century wharf surface, portions of a brick furnace and coal bin, and various structures related to an electric power plant.	Alexandria	AX-024	The Alexandria alternative falls within the surveyed area. Intact portions of the archaeological site (44AX0119) may be preserved under the existing townhouses.
Windmill Hill Park, City of Alexandria, Virginia, Documentary Study and Phase I Archeological Investigation	Thunderbird Archeology 2016	Phase I archaeological investigation for planned park improvements. One architectural resource was identified, the Windmill Hill Park Bulkhead; however, it was recommended not eligible for the NRHP. No archaeological resources were identified.	Alexandria	AX-186	The Alexandria alternative is immediately north, but outside of, the surveyed area.
Archeological Investigations at the Elliot House, 323 Fairfax Street, Alexandria, Virginia	Thunderbird Archeology 2004	Phase III excavations in the rear and north yards of the Elliot House. The survey documented one nineteenth to twentieth century archaeological site associated with various improvements to the house. All features were completely excavated	Alexandria	AX-090	The Alexandria alternative is outside of the surveyed area.

Report Title	Author/Date	Description/Results	Associated Alternative (within 0.5 miles)	Report Number	Notes
		and no further work was recommended.			
Archaeological Survey of a Proposed Bike Path, Foot Path, and Soccer Fields at Jones Point Park, Alexandria, Virginia	Louis Berger & Associates, Inc. 1985	Phase I archaeological investigation for proposed improvements at Jones Point Park. The survey documented historic deposits associated with Virginia Shipbuilding Corporation and prehistoric deposits under modern fill. While the proposed project would not disturb the prehistoric deposits, it was recommended that they should be studied in the future to determine their significance.	Alexandria	AX-174	The Alexandria alternative is outside of the surveyed area.
Phase I Reconnaissance Survey of Route I-95	Virginia Department of Highways and Transportation 1980	Phase I archaeological investigation for proposed improvements to I-95 to include additional lanes and ramp space. The survey documented an archaeological site associated with the St. Mary's Catholic Church and Cemetery, but no additional investigations were recommended for the project.	Alexandria	AX-011	The Alexandria alternative is outside of the surveyed area.
Phase Ib Archeological Survey for the Woodrow Wilson Bridge Improvement Study	John Milner Associates, Inc. 1991	Phase I archaeological investigation for proposed improvements to the Woodrow Wilson Bridge. No previously unrecorded	Alexandria	AX-041	The Alexandria alternative is outside of the surveyed area.

Report Title	Author/Date	Description/Results	Associated Alternative (within 0.5 miles)	Report Number	Notes
		archaeological sites were identified and no additional work on terrestrial sites was recommended			
Addendum to the Phase Ib Archeological Survey, Woodrow Wilson Bridge Improvement Study	John Milner Associates, Inc. 1992	An addendum to the Phase I archaeological investigation for proposed improvements to the Woodrow Wilson Bridge. This survey further investigated the area around the Jones Point U.S. Army Reserve Training Headquarters and documented one historic archaeological site. Further testing of this site was recommended to determine its eligibility for the NRHP.	Alexandria	AX-064	The Alexandria alternative is outside of the surveyed area and identified archaeological site.
Phase I Archaeological Survey of Area A and Phase II Evaluation of Site 44AX52, Jones Point Park, George Washington Memorial Parkway, National Park Service	Potomac Crossing Consultants 2010	Phase I and II investigations within Jones Point Park as part of proposed improvements to the Woodrow Wilson Bridge. One historic site and a multi-component site were documented and both were recommended as potentially eligible for the NRHP.	Alexandria	AX-131	The Alexandria alternative is outside of the surveyed area and identified archaeological sites.
Phase I Cultural Resource Investigation of Proposed Improvements to State Route 123/Ox Road, Fairfax County, Virginia	Louis Berger & Associates, Inc. 1995	Phase I archaeological and architectural investigations along State Route 123 for proposed road widening. Twenty-three archaeological sites were identified (sixteen prehistoric and seven historic). Six of these were recommended as potentially eligible for	Occoquan	FX-269	The Occoquan non-structural alternative is outside of the surveyed area and identified archaeological and architectural resources.

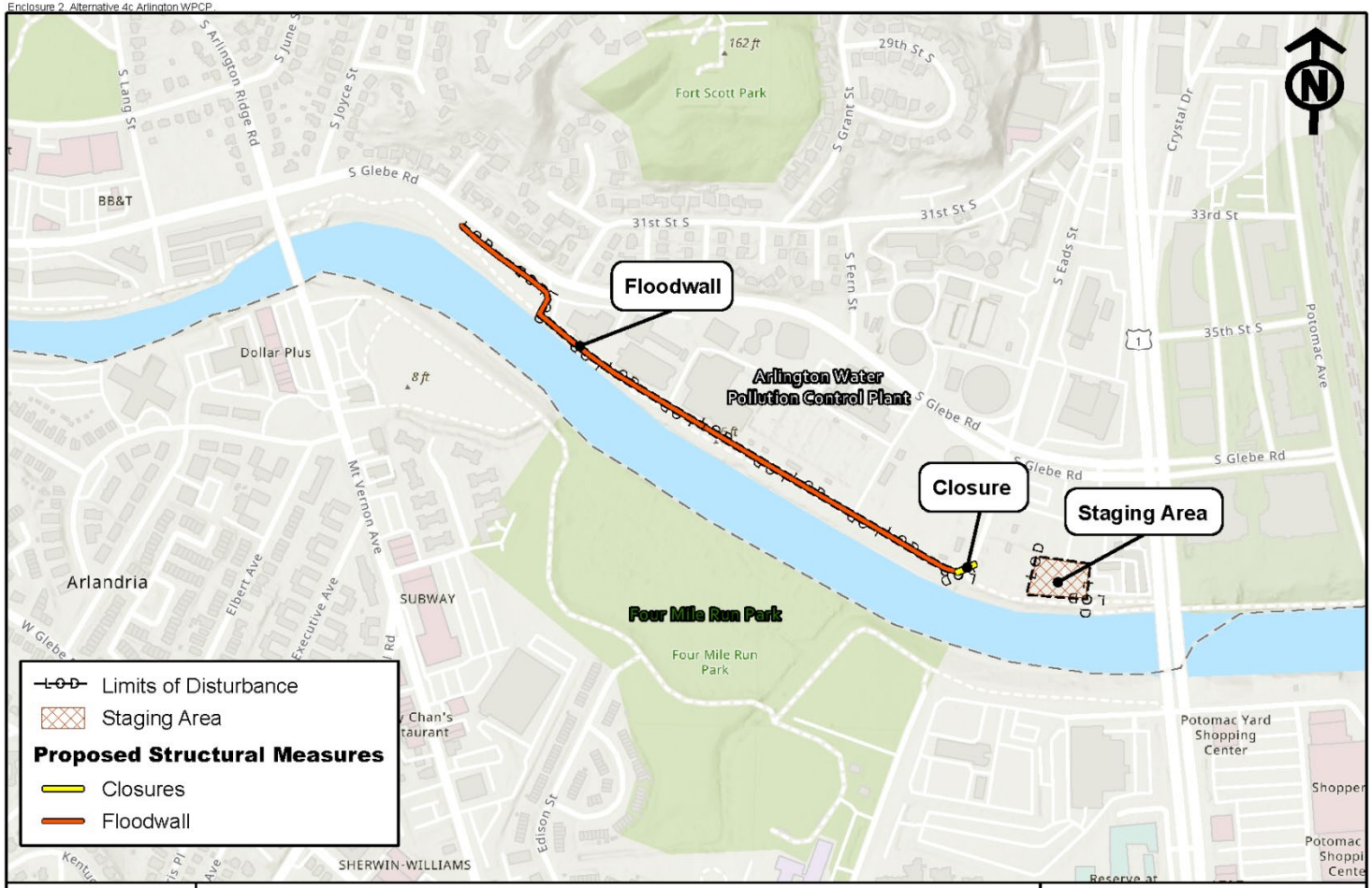
Report Title	Author/Date	Description/Results	Associated Alternative (within 0.5 miles)	Report Number	Notes
		the NRHP. The architectural survey identified three properties potentially eligible for the NRHP.			
Cultural Resource Evaluation on the Grounds of the Former Medium Security Facility, District of Columbia Detention Center, Lorton, Virginia	Louis Berger & Associates, Inc. 1998	Archaeological survey and historic structure assessment for the proposed construction of a new water treatment facility. The survey concluded that no significant archaeological sites were present; however, eight architectural resources were documented as contributing resources to the District of Columbia Workhouse and Reformatory Historic District.	Occoquan	FX-344	The Occoquan non-structural alternative is outside of the surveyed area and identified architectural resources.
Documentary Study and Archaeological Evaluation of 333 North Royal and 316 Princess Streets for North Royal Townhomes, Alexandria, Virginia	John Milner Associates, Inc. 2013	Archaeological investigations for the proposed North Royal Townhomes development. The survey documented more recent fill deposits and no evidence of significant archaeological sites.	Alexandria	AX-188	The Alexandria alternative is outside of the surveyed area.
Archeological Testing for 511, 513, and 515 Oronoco Street, Alexandria, Virginia	R. Christopher Goodwin & Associates, Inc. 2018	Phase Ib archaeological testing for proposed property redevelopment. The survey recommended that the area had a low archaeological potential due to modern grading and occupation. No significant archaeological sites were documented.	Alexandria	AX-185	The Alexandria alternative is outside of the surveyed area.

Report Title	Author/Date	Description/Results	Associated Alternative (within 0.5 miles)	Report Number	Notes
Archaeological Investigations of the Robert Portner Brewing Company Site (44AX0196), Alexandria, Virginia	Parsons Engineering Science 2002	Phase I and II investigations of the mid-nineteenth to twentieth century Portner's Brewery Site. Documented features include those associated with an 1868 brewhouse, and 1894 brewhouse, and a north beer vault. NRHP eligibility recommendations are not included in the report.	Alexandria	AX-085	The Alexandria alternative is outside of the surveyed area.
Old Town North Property, City of Alexandria, Results of Archaeological Monitoring	Thunderbird Archeology 2013	Archaeological monitoring of the Old Town North property for proposed development. The monitoring documented an early to mid-twentieth century archaeological site.	Alexandria	AX-147	The Alexandria alternative is outside of the surveyed area.

APPENDIX A

Area of Potential Effects

Enclosure 2, Alternative 4c Arlington WPCP



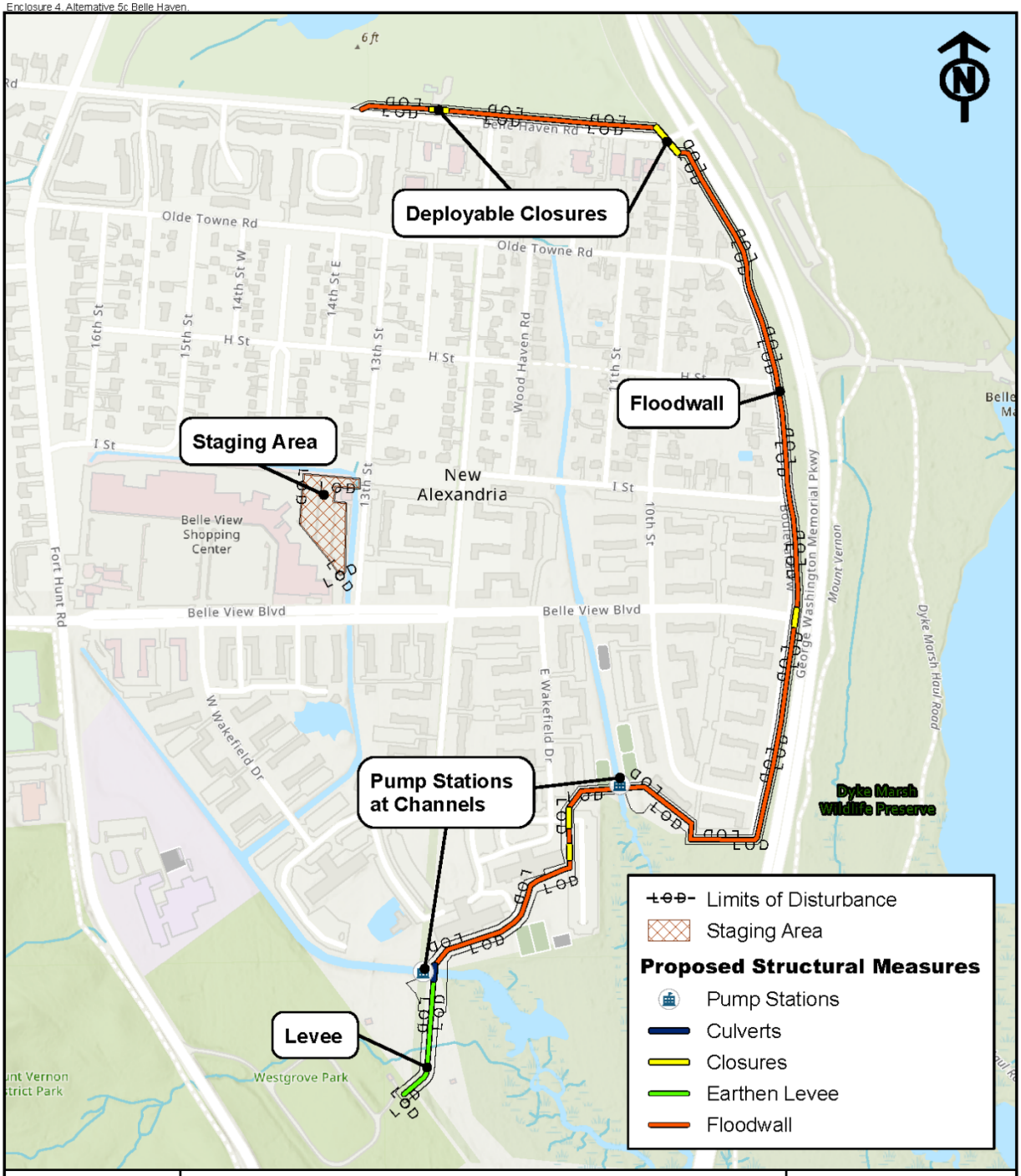
US Army Corps of Engineers
Baltimore District

Alternative 4C
Critical Infrastructure Plan
Arlington Water Pollution Control Plant Floodwall
Arlington County, Virginia

Map: Arlington WPCP Alternatives.aprx
Developed by: USACE Baltimore
Date: 1/31/2022

0 400 800
US Feet

Enclosure 4, Alternative 5c Belle Haven



US Army Corps of Engineers
Baltimore District

Alternative 5C
Floodwall/Levee Plan
Greater Belle Haven Neighborhood
Fairfax County, Virginia

Map: Belle Haven Alternatives.aprx
Developed by: USACE Baltimore
Date: 1/31/2022

0 300 600
US Feet

APPENDIX B

Procedures for Post-Review Discoveries

PROCEDURES FOR POST REVIEW DISCOVERIES

Post Review Discoveries

If previously unidentified historic properties or unanticipated effects to historic properties are discovered during contract activities, the contractor shall immediately halt all activity within a minimum fifty (50) meter (one hundred sixty-four [164] feet) radius of the discovery, notify the USACE Project Manager and the USACE Archaeologist of the discovery and implement interim measures to protect the discovery from looting and vandalism. Work in all other areas not the subject of discovery may continue without interruption.

Immediately upon receipt of the notification from the contractor (see subparagraph immediately above), the USACE Archaeologist shall:

1. Inspect the site to determine the extent of the discovery and ensure that the Undertaking in that area is halted; and,

2. Clearly mark the area of the discovery; and,

3. Implement additional measures, as appropriate, to protect the discovery from looting and vandalism; and,

4. Determine the extent of the discovery and provide recommendations regarding its National Register of Historic Places (NRHP) eligibility and treatment; and,

5. Notify the USACE Project Manager, the SHPO and other consulting parties of the discovery describing the measures that have been implemented to comply with this Post Review Discovery procedure.

Upon receipt of the information required in subparagraphs 1 – 5 above, the USACE shall provide the SHPO and other consulting parties with an assessment of the NRHP eligibility of the discovery and the measures proposed to resolve adverse effects. In making the evaluation, the USACE, in consultation with the SHPO, may assume the discovery to be eligible for the NRHP for the purposes of Section 106 pursuant to 36 CFR Part 800.13(c). The SHPO and other consulting parties shall respond to the USACE's assessment within forty-eight (48) hours of receipt.

The USACE shall take into account the SHPO and other consulting parties' recommendations on eligibility and treatment of the discovery and shall provide the SHPO and other consulting parties with a report on the actions when implemented. The Undertaking may proceed in area of the discovery, once the USACE has determined that the actions undertaken to address the discovery pursuant to this Stipulation are complete.

Treatment of Human Remains

The USACE shall make all reasonable efforts to avoid disturbing gravesites, including those containing Native American human remains and associated funerary objects. If human remains and/or associated funerary objects are encountered during the course of the Undertaking, the USACE shall immediately halt the Undertaking in the area and contact the USACE Archaeologist and the appropriate city Police Department.

The USACE shall treat all human remains in a manner consistent with the ACHPS's Policy Statement Regarding Treatment of Burial Sites, Human Remains and Funerary Objects (February 23, 2007; http://www.achp.gov\docs\hrpolivy0207.pdf)

The USACE shall make a good faith effort to ensure that the general public is excluded from viewing any Native American burial site or associated funerary objects. The Signatories to this PA agree to release no photographs of any Native American burial site or associated funerary objects to the press or general public. The USACE shall notify the Delaware Nation, the Pamunkey Indian Tribe, and other appropriate federally-recognized Tribe(s) if their interest(s) have been established, when Native American burials, human skeletal remains, or funerary objects are encountered during the Undertaking. Following consultation by the USACE, the SHPO, and identified Tribes with cultural affiliation, the USACE shall ensure that the proper steps are taken regarding the remains. This could include the delivery of any Native American human skeletal remains and associated funerary objects recovered pursuant to this PA to the appropriate Tribe.

If the remains are determined to be historic and not Native American, USACE shall consult with the SHPO and other appropriate consulting parties prior to any excavation by providing a treatment plan including the following information:

- The name of the property or archaeological site and specific location from which the recovery is proposed. If the recovery is from a known archaeological site, a state-issued site number must be included.
- Indication of whether a waiver of public notice is requested and why. If a waiver is not requested, a copy of the public notice to be published in a newspaper having general circulation in the Mathews County area for a minimum of four weeks prior to recovery.
- A copy of the curriculum vitae of the skeletal biologist who will perform the analysis of the remains.
- A statement that the treatment of human skeletal remains and associated artifacts will be respectful.
- An expected timetable for excavation, osteological analysis, preparation of a final report, and final disposition of remains.
- A statement of the goals and objectives of the removal of human remains (to include both excavation and osteological analysis).
- If a disposition other than reburial is proposed, a statement of justification for that decision.

The USACE Archaeologist shall submit the draft treatment plan to the SHPO and appropriate consulting parties for review and comment. All comments received within thirty (30) calendar

days shall be addressed in the final treatment plan. Upon receipt of final approval in writing from the USACE Archaeologist, the treatment plan shall be implemented prior to those Undertaking activities that could affect the burial(s).

The USACE Archaeologist shall notify the USACE Project Manager and the SHPO in writing once the fieldwork portion of the removal of human remains is complete. The Undertaking in the area may proceed following this notification while the technical report is in preparation. The USACE Archaeologist may approve the implementation of Undertaking-related ground disturbing activities in the area of the discovery while the technical report is in preparation.

The USACE Archaeologist shall ensure that a draft report of the results of the recovery is prepared within one (1) year of the notification that archaeological fieldwork has been completed and submitted to the SHPO and other appropriate consulting parties for review and comment. All comments received within thirty (30) calendar days of receipt shall be addressed in the final report. When the final report has been approved by the USACE Archaeologist, two (2) copies of the document, bound and on acid-free paper and one (1) electronic copy in Adobe (R) Portable Document Format (.pdf) shall be provided to the SHPO.

The USACE Archaeologist shall notify the USACE Project Manager and the SHPO within fifteen (15) calendar days of final disposition of the human remains.

APPENDIX C

Contact Information

U.S. Army Corps of Engineers, Baltimore District

Ethan Bean
Cultural Resources Specialist
U.S. Army Corps of Engineers
Baltimore District (NAB)
2 Hopkins Plaza
Baltimore, MD 21201
Office: 410-962-2173
Ethan.a.bean@usace.army.mil

METROPOLITAN WASHINGTON, DISTRICT OF COLUMBIA COASTAL STORM RISK MANAGEMENT FEASIBILITY STUDY

INTEGRATED FEASIBILITY REPORT & ENVIRONMENTAL ASSESSMENT

APPENDIX G5: COOPERATING AND PARTICIPATING AGENCY COORDINATION

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, BALTIMORE DISTRICT
2 HOPKINS PLAZA
BALTIMORE, MARYLAND 21201-2930

August 21, 2019

Mr. Cosmo Servidio
Region III Administrator
Environmental Protection Agency
1650 Arch Street
Mail Code: 3RA00
Philadelphia, PA 19103-2029

Dear Mr. Servidio,

The U.S. Army Corps of Engineers, Baltimore District (USACE), has begun a feasibility study to investigate coastal flooding problems and develop solutions to reduce future flood risk associated with coastal storm events that affect Northern Virginia (see enclosed study area map). The non-federal sponsor is the Metropolitan Washington Council of Governments representing the Commonwealth of Virginia, Arlington County, Fairfax County, Prince William County, the City of Alexandria, and the Metropolitan Washington Airport Authority (Washington Reagan National Airport). As part of the Northern Virginia Coastal Storm Risk Management Study (NoVA), we are preparing environmental documents pursuant to the National Environmental Policy Act (NEPA) of 1969, as amended. As the lead federal agency under NEPA, we are inviting your participation as a cooperating agency in the development of the environmental documents (either an Environmental Impact Statement or an Environmental Assessment). The NEPA documents will evaluate environmental impacts from reasonable project alternatives and determine the potential for significant impacts related to reducing coastal storm risks. We are currently formulating alternatives. The draft integrated Feasibility Report and NEPA document is tentatively scheduled to be released in the fall of 2020.

The North Atlantic coastline has been impacted by numerous coastal storms, including Hurricane Sandy most recently, causing loss of life and extensive economic damages. In response, USACE completed the North Atlantic Coast Comprehensive Study (NACCS), which identified nine high-risk areas on the Atlantic Coast that warrant further investigation of coastal storm risk management solutions. More information on the NACCS can found at: https://www.nad.usace.army.mil/CompStudy/.

The Washington, District of Columbia metropolitan region, including Northern Virginia, was identified as one of nine focus areas for further investigation of coastal flood risk. The study will investigate solutions that would reduce future flood risk in ways that support the long-term resilience and sustainability in the northern Virginia region and its surrounding communities. The goal of the study is to reduce coastal flood risk to vulnerable populations, properties, infrastructure, and environmental and cultural resources considering future sea level rise. The study is considering

structural, non-structural and natural and nature-based features. More information on NoVA can be found at: https://www.nab.usace.army.mil/NOVA_Coastal_Study.

In accordance with the Council on Environmental Quality final implementing regulations for NEPA (40 C.F.R. § 1501.6 and § 1508.5), as a cooperating agency your agency is invited to assist and participate in the NEPA process in the following ways:

- Participation in agency coordination meetings, conference calls, and site visits;
- Comment and provide feedback on the NEPA document schedule, overall scope of the document, significant issues to be evaluated, environmental impacts, study and assessment methodologies, range of alternatives and proposed compensatory mitigation, if applicable;
- Identification of issues related to your agency's jurisdiction by law and special expertise;
- Participation, as appropriate, at public meetings and hearings; and
- Timely review of the draft and final NEPA document to communicate any concerns of your agency.

Please provide your written statement of interest to this invitation and an agency point of contact within 30 days of the date of this letter. If you elect not to become a cooperating agency, you must decline this invitation in writing within 30 days of the date of this letter, indicating that your agency has no jurisdiction or authority with respect to the project, no expertise or information relevant to the project, does not have adequate funds to participate in the project, or does not intend to submit comments on the project. Your response may be transmitted electronically to Ms. Kristina May, Project Biologist at Kristina.K.May@usace.army.mil. Please be advised that if a response is not received within the specified timeframe, your agency will be considered a cooperating agency.

We look forward to your response to this request and your role as a cooperating agency on this study. If you have questions or would like to discuss the project in more detail or our agencies' respective roles and responsibilities during the preparation of the NEPA document, please contact Ms. Kristina May at the email above or by phone at (410) 962-6100.

Sincerely,

Daniel M. Bierly
Chief, Civil Project Development Branch
Planning Division

Enclosure

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
1650 Arch Street
Philadelphia, Pennsylvania 19103-2029

September 18, 2019

Ms. Kristina May
U.S. Army Corps of Engineers, Baltimore District
Planning Division,10th Floor
2 Hopkins Plaza
Baltimore, Maryland 21201

Re: Cooperating Agency Role for the Northern Virginia Coastal Storm Risk Management Study

Dear Ms. May:

The U.S. Environmental Protection Agency (EPA) is responding to your letter of August 21, 2019 in which you requested our participation as a cooperating agency in the development of an Environmental Impact Statement (EIS) or Environmental Assessment (EA) for the Northern Virginia Coastal Storm Risk Management Study. EPA is pleased to reply that we are committed to playing an active role as a cooperating agency for the subject project.

The Council of Environmental Quality (CEQ) has determined that a cooperating agency has the responsibility to assist the lead agency by participating in the National Environmental Policy Act (NEPA) process at the earliest possible time. This participation includes: engaging in the scoping process, developing information and preparing environmental analyses in areas of special technical expertise, and providing staff support at the lead agency's request to enhance the lead agency's interdisciplinary capabilities. Our role as a cooperating agency in support of the subject EIS or EA as presented in your letter of August 21, will include providing technical assistance for:

- General NEPA work such as scoping, development of the range of alternatives, analysis of the alternatives and their environmental impacts, identification of significant issues, and assessment of Environmental Justice, cumulative impacts, and compensatory mitigation as applicable;
- Clean Water Act (CWA) Section 404 and Clean Air Act (CAA) compliance;
- Data, mapping, and assessment methodologies or models that may offer relevant information or analyses;
- Technical support in the field and participation in related meetings.

As you are aware, there are a number of benefits of enhanced cooperating agency participation in the preparation of NEPA analyses, including: disclosing relevant information early in the analytical process; applying available technical expertise and staff support; and establishing a mechanism for

addressing intergovernmental issues. Given reasonable time frames, we would be pleased to review preliminary project documentation, including draft versions of the document.

Please note that CEQ guidance recognizes that status as a cooperating agency should not be construed as expressing agreement with the lead agency regarding the conclusions to be drawn or the selection of the preferred alternative in the NEPA document. In addition, EPA has a number of independent responsibilities related to the proposed project, and we retain our independent obligations and responsibilities pursuant to Section 309 of the Clean Air Act (CAA), Sections 402(d) and 404(b), (c), and (q) of the CWA.

While we plan on being fully engaged as a cooperating agency, resource constraints may require us to limit our in-person attendance at project meetings. We hope that video or telephone conference opportunities are made available for that contingency.

Thank you for the opportunity to be a cooperating agency on this project. We look forward to working with you to ensure that a scientifically sound and sufficient study is developed for this project. If you need additional assistance, the staff contact for this project is Carrie Traver; she can be reached at 215-814-2772.

Sincerely,

Barbara Rudnick
NEPA Program Coordinator
Office of Communities, Tribes, & Environmental Assessment

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, BALTIMORE DISTRICT
2 HOPKINS PLAZA
BALTIMORE, MARYLAND 21201-2930

August 26, 2019

Mr. Marcus Brundage
Environmental Specialist
Federal Aviation Administration
Washington Airports District Office
23723 Freight Air Lane
Suite 210
Dulles, VA 20166

Dear Mr. Brundage,

The U.S. Army Corps of Engineers, Baltimore District (USACE), has begun a feasibility study to investigate coastal flooding problems and develop solutions to reduce future flood risk associated with coastal storm events that affect Northern Virginia (see enclosed study area map). The non-federal sponsor is the Metropolitan Washington Council of Governments representing the Commonwealth of Virginia, Arlington County, Fairfax County, Prince William County, the City of Alexandria, and the Metropolitan Washington Airport Authority (Washington Reagan National Airport). As part of the Northern Virginia Coastal Storm Risk Management Study (NoVA), we are preparing environmental documents pursuant to the National Environmental Policy Act (NEPA) of 1969, as amended. As the lead federal agency under NEPA, we are inviting your participation as a cooperating agency in the development of the environmental documents (either an Environmental Impact Statement or an Environmental Assessment). The NEPA documents will evaluate environmental impacts from reasonable project alternatives and determine the potential for significant impacts related to reducing coastal storm risks. We are currently formulating alternatives. The draft integrated Feasibility Report and NEPA document is tentatively scheduled to be released in the fall of 2020.

The North Atlantic coastline has been impacted by numerous coastal storms, including Hurricane Sandy most recently, causing loss of life and extensive economic damages. In response, USACE completed the North Atlantic Coast Comprehensive Study (NACCS), which identified nine high-risk areas on the Atlantic Coast that warrant further investigation of coastal storm risk management solutions. More information on the NACCS can found at: https://www.nad.usace.army.mil/CompStudy/.

The Washington, District of Columbia metropolitan region, including Northern Virginia, was identified as one of nine focus areas for further investigation of coastal flood risk. The study will investigate solutions that would reduce future flood risk in ways that support the long-term resilience and sustainability in the northern Virginia region and its surrounding communities. The goal of the study is to reduce coastal

flood risk to vulnerable populations, properties, infrastructure, and environmental and cultural resources considering future sea level rise. The study is considering structural, non-structural and natural and nature-based features. More information on NoVA can be found at: https://www.nab.usace.army.mil/NOVA_Coastal_Study.

In accordance with the Council on Environmental Quality final implementing regulations for NEPA (40 C.F.R. § 1501.6 and § 1508.5), as a cooperating agency your agency is invited to assist and participate in the NEPA process in the following ways:

- Participation in agency coordination meetings, conference calls, and site visits;
- Comment and provide feedback on the NEPA document schedule, overall scope of the document, significant issues to be evaluated, environmental impacts, study and assessment methodologies, range of alternatives and proposed compensatory mitigation, if applicable;
- Identification of issues related to your agency's jurisdiction by law and special expertise;
- Participation, as appropriate, at public meetings and hearings; and
- Timely review of the draft and final NEPA document to communicate any concerns of your agency.

Please provide your written statement of interest to this invitation and an agency point of contact within 30 days of the date of this letter. If you elect not to become a cooperating agency, you must decline this invitation in writing within 30 days of the date of this letter, indicating that your agency has no jurisdiction or authority with respect to the project, no expertise or information relevant to the project, does not have adequate funds to participate in the project, or does not intend to submit comments on the project. Your response may be transmitted electronically to Ms. Kristina May, Project Biologist at Kristina.K.May@usace.army.mil. Please be advised that if a response is not received within the specified timeframe, your agency will be considered a cooperating agency.

We look forward to your response to this request and your role as a cooperating agency on this study. If you have questions or would like to discuss the project in more detail or our agencies' respective roles and responsibilities during the preparation of the NEPA document, please contact Ms. Kristina May at the email above or by phone at (410) 962-6100.

Sincerely,

Daniel M. Bierly
Chief, Civil Project Development Branch
Planning Division

Enclosure

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, BALTIMORE DISTRICT
2 HOPKINS PLAZA
BALTIMORE, MARYLAND 21201-2930

August 21, 2019

Ms. MaryAnn Tierney
Regional Administrator
Federal Emergency Management Agency Region III
615 Chestnut Street
One Independence Mall, Sixth Floor
Philadelphia, PA 19106-4404

Dear Mr. Tierney,

The U.S. Army Corps of Engineers, Baltimore District (USACE), has begun a feasibility study to investigate coastal flooding problems and develop solutions to reduce future flood risk associated with coastal storm events that affect Northern Virginia (see enclosed study area map). The non-federal sponsor is the Metropolitan Washington Council of Governments representing the Commonwealth of Virginia, Arlington County, Fairfax County, Prince William County, the City of Alexandria, and the Metropolitan Washington Airport Authority (Washington Reagan National Airport). As part of the Northern Virginia Coastal Storm Risk Management Study (NoVA), we are preparing environmental documents pursuant to the National Environmental Policy Act (NEPA) of 1969, as amended. As the lead federal agency under NEPA, we are inviting your participation as a cooperating agency in the development of the environmental documents (either an Environmental Impact Statement or an Environmental Assessment). The NEPA documents will evaluate environmental impacts from reasonable project alternatives and determine the potential for significant impacts related to reducing coastal storm risks. We are currently formulating alternatives. The draft integrated Feasibility Report and NEPA document is tentatively scheduled to be released in the fall of 2020.

The North Atlantic coastline has been impacted by numerous coastal storms, including Hurricane Sandy most recently, causing loss of life and extensive economic damages. In response, USACE completed the North Atlantic Coast Comprehensive Study (NACCS), which identified nine high-risk areas on the Atlantic Coast that warrant further investigation of coastal storm risk management solutions. More information on the NACCS can found at: https://www.nad.usace.army.mil/CompStudy/.

The Washington, District of Columbia metropolitan region, including Northern Virginia, was identified as one of nine focus areas for further investigation of coastal flood risk. The study will investigate solutions that would reduce future flood risk in ways that support the long-term resilience and sustainability in the northern Virginia region and its surrounding communities. The goal of the study is to reduce coastal flood risk to vulnerable populations, properties, infrastructure, and environmental and cultural resources considering future sea level rise. The study is considering

structural, non-structural and natural and nature-based features. More information on NoVA can be found at: https://www.nab.usace.army.mil/NOVA_Coastal_Study.

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We look forward to your response to this request and your role as a cooperating agency on this study. If you have questions or would like to discuss the project in more detail or our agencies' respective roles and responsibilities during the preparation of the NEPA document, please contact Ms. Kristina May at the email above or by phone at (410) 962-6100.

Sincerely,

Daniel M. Bierly
Chief, Civil Project Development Branch
Planning Division

Enclosure

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, BALTIMORE DISTRICT
2 HOPKINS PLAZA
BALTIMORE, MARYLAND 21201-2930

u ust

Gregg Wollard, Manager
Metropolitan Washington Airports Authority
Planning Department (MA-32)
45045 Aviation Drive, 3rd Floor
Dulles, Virginia 20166

Dear Mr. Wollard

The U.S. Army Corps of Engineers, Baltimore District (USACE), is conducting a feasibility study to investigate coastal flooding problems and develop solutions to reduce future flood risk associated with coastal storm events that affect Northern Virginia. The non-federal sponsor is the Metropolitan Washington Council of Governments representing the Commonwealth of Virginia, Arlington County, Fairfax County, Prince William County, the City of Alexandria, and the Metropolitan Washington Airport Authority (MWAA) (Washington Reagan National Airport).

As part of the Northern Virginia Coastal Storm Risk Management Study (NoVA), we are preparing environmental documents pursuant to the National Environmental Policy Act (NEPA) of 1969, as amended. As the lead federal agency under NEPA, we are inviting your agency as a participating agency in the development of the environmental documents (either an Environmental Impact Statement (EIS) or an Environmental Assessment). The NEPA documents will evaluate environmental impacts from reasonable project alternatives and determine the potential for significant impacts related to reducing coastal storm risks. If an EIS is prepared, we plan to publish the Notice of Intent in the Federal Register in February 2022. The draft integrated Feasibility Report and NEPA document is tentatively scheduled to be released in the spring of 2022.

The North Atlantic coastline has been impacted by numerous coastal storms, including Hurricane Sandy most recently, causing loss of life and extensive economic damages. In response, USACE completed the North Atlantic Coast Comprehensive Study (NACCS), which identified nine high-risk areas on the Atlantic Coast that warrant further investigation of coastal storm risk management solutions. More information on the NACCS can found at: https://www.nad.usace.army.mil/CompStudy/.

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region and its surrounding communities. The goal of the study is to reduce coastal flood risk to vulnerable populations, properties, infrastructure, and environmental and cultural resources considering future sea level rise. The study is considering structural, non-structural and natural and nature-based features. More information on NoVA can be found at: https://www.nab.usace.army.mil/NOVA_Coastal_Study.

As a participating agency, your agency is invited to assist and participate in the NEPA process in the following ways:

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- Timely review of the draft and final NEPA document to communicate any concerns of your agency.

Please provide your written statement of interest to this invitation and an agency point of contact within 30 days of the date of this letter. Your response may be transmitted electronically to Ms. Kristina May, Project Biologist at Kristina.K.May@usace.army.mil.

We look forward to your response to this request and your role as a participating agency on this study. If you have questions or would like to discuss the project in more detail or our agencies' respective roles and responsibilities during the preparation of the NEPA document, please contact Ms. Kristina May at the email above or by phone at (410) 962-6100.

Sincerely,

Daniel M. Bierly
Chief, Civil Project Development Branch
Planning Division

cc: Richard Golinowski, Vice President, MWAA Operations Support

From:	Wasaff, Thomas
To:	May, Kristina K CIV USARMY CENAB (USA)
Cc:	Perkins, Catherine J CIV USARMY CENAB (USA); Metallo, Amber C CIV USARMY CENAB (USA); Wollard, Gregg; Golinowski, Richard
Subject:	[Non-DoD Source] RE: NOVA Coastal Storm Flood Risk Study NEPA
Date:	Tuesday, August 31, 2021 11:15:57 AM
Attachments:	image001.png

Hi Kristina,

Thank you for formally inviting MWAA to be a Participating Agency in the U.S. Army Corps of Engineers administered Northern Virginia Coastal Storm Risk Management Study. We accept the invitation and offer our assistance and participation in the NEPA process.

Tom Wasaff
Environmental Planner

METROPOLITAN WASHINGTON AIRPORTS AUTHORITY

Office of Engineering
Planning Department (MA-32)
45045 Aviation Drive, 3rd Floor
Dulles, Virginia 20166
703-572-0268
thomas.wasaff@mwaa.com
mwaa.com

From: May, Kristina K CIV USARMY CENAB (USA) <Kristina.K.May@usace.army.mil>
Sent: Tuesday, August 10, 2021 1:59 PM
To: Wasaff, Thomas <Thomas.Wasaff@MWAA.com>
Cc: Perkins, Catherine J CIV USARMY CENAB (USA) <Catherine.J.Perkins@usace.army.mil>; Metallo, Amber C CIV USARMY CENAB (USA) <Amber.C.Metallo@usace.army.mil>
Subject: RE: NOVA Coastal Storm Flood Risk Study NEPA

Tom,

Please see the attached letter inviting MWAA to be a participating agency on the NOVA study.

Thanks,

Kristina May
Biologist, Planning Division

Baltimore District, U.S. Army Corps of Engineers
Phone: 410-962-6100
2 Hopkins Plaza, Baltimore, MD 21201

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, BALTIMORE DISTRICT
2 HOPKINS PLAZA
BALTIMORE, MARYLAND 21201-2930

August 21, 2019

Ms. Kimberly Damon-Randall
Deputy Regional Administrator
Greater Atlantic Regional Fisheries Office
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
55 Great Republic Drive
Gloucester, MA 01930

Dear Ms. Damon-Randall,

The U.S. Army Corps of Engineers, Baltimore District (USACE), has begun a feasibility study to investigate coastal flooding problems and develop solutions to reduce future flood risk associated with coastal storm events that affect Northern Virginia (see enclosed study area map). The non-federal sponsor is the Metropolitan Washington Council of Governments representing the Commonwealth of Virginia, Arlington County, Fairfax County, Prince William County, the City of Alexandria, and the Metropolitan Washington Airport Authority (Washington Reagan National Airport). As part of the Northern Virginia Coastal Storm Risk Management Study (NoVA), we are preparing environmental documents pursuant to the National Environmental Policy Act (NEPA) of 1969, as amended. As the lead federal agency under NEPA, we are inviting your participation as a cooperating agency in the development of the environmental documents (either an Environmental Impact Statement or an Environmental Assessment). The NEPA documents will evaluate environmental impacts from reasonable project alternatives and determine the potential for significant impacts related to reducing coastal storm risks. We are currently formulating alternatives. The draft integrated Feasibility Report and NEPA document is tentatively scheduled to be released in the fall of 2020.

The North Atlantic coastline has been impacted by numerous coastal storms, including Hurricane Sandy most recently, causing loss of life and extensive economic damages. In response, USACE completed the North Atlantic Coast Comprehensive Study (NACCS), which identified nine high-risk areas on the Atlantic Coast that warrant further investigation of coastal storm risk management solutions. More information on the NACCS can found at: https://www.nad.usace.army.mil/CompStudy/.

The Washington, District of Columbia metropolitan region, including Northern Virginia, was identified as one of nine focus areas for further investigation of coastal flood risk. The study will investigate solutions that would reduce future flood risk in ways that support the long-term resilience and sustainability in the northern Virginia region and its surrounding communities. The goal of the study is to reduce coastal flood risk to vulnerable populations, properties, infrastructure, and environmental and

cultural resources considering future sea level rise. The study is considering structural, non-structural and natural and nature-based features. More information on NoVA can be found at: https://www.nab.usace.army.mil/NOVA_Coastal_Study.

In accordance with the Council on Environmental Quality final implementing regulations for NEPA (40 C.F.R. § 1501.6 and § 1508.5), as a cooperating agency your agency is invited to assist and participate in the NEPA process in the following ways:

- Participation in agency coordination meetings, conference calls, and site visits;
- Comment and provide feedback on the NEPA document schedule, overall scope of the document, significant issues to be evaluated, environmental impacts, study and assessment methodologies, range of alternatives and proposed compensatory mitigation, if applicable;
- Identification of issues related to your agency's jurisdiction by law and special expertise;
- Participation, as appropriate, at public meetings and hearings; and
- Timely review of the draft and final NEPA document to communicate any concerns of your agency.

Please provide your written statement of interest to this invitation and an agency point of contact within 30 days of the date of this letter. If you elect not to become a cooperating agency, you must decline this invitation in writing within 30 days of the date of this letter, indicating that your agency has no jurisdiction or authority with respect to the project, no expertise or information relevant to the project, does not have adequate funds to participate in the project, or does not intend to submit comments on the project. Your response may be transmitted electronically to Ms. Kristina May, Project Biologist at Kristina.K.May@usace.army.mil. Please be advised that if a response is not received within the specified timeframe, your agency will be considered a cooperating agency.

We look forward to your response to this request and your role as a cooperating agency on this study. If you have questions or would like to discuss the project in more detail or our agencies' respective roles and responsibilities during the preparation of the NEPA document, please contact Ms. Kristina May at the email above or by phone at (410) 962-6100.

Sincerely,

Daniel M. Bierly
Chief, Civil Project Development Branch
Planning Division

Enclosure

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
GREATER ATLANTIC REGIONAL FISHERIES OFFICE
55 Great Republic Drive
Gloucester, MA 01930-2276

September 16, 2019

Daniel Bierly, Chief,
Civil Project Development Branch
Planning Division
US Army Corps of Engineers
Baltimore District
2 Hopkins Plaza
Baltimore, MD 21201-2930

RE: Northern Virginia Coastal Storm Risk Management Feasibility Study

Dear Mr. Bierly:

Thank you for your August 21, 2019, letter inviting us to be a cooperating agency on the preparation of environmental documents pursuant to the National Environmental Policy Act (NEPA) of 1969, as amended, regarding the feasibility study to investigate potential solutions to reduce flood risk associated with coastal storm events in Northern Virginia. The study area includes localities being most affected in Northern Virginia, including metropolitan Washington, Arlington County, Fairfax County, Prince William County, the City of Alexandria, and Washington Reagan National Airport.

Unfortunately, as our staff and resources are fully committed to other obligatory programs of NOAA Fisheries, we respectfully decline your invitation to become a cooperating agency. We are available to provide technical assistance and participate in interagency coordination activities as the feasibility study progresses. In addition, because actions undertaken by your agency to address coastal storms and flooding in Northern Virginia may result in impacts to our trust resources, coordination with us under the Magnuson Stevens Fishery Conservation and Management Act (MSA), the Fish and Wildlife Coordination Act (FWCA) or the Endangered Species Act (ESA) may be required.

Should you have any questions regarding our decision, please contact Karen Greene, Mid-Atlantic Field Offices Supervisor in Highlands, NJ field office (732-872-3023, karen.greene@noaa.gov). For further information about essential fish habitat and other trust resources, please contact Dave O'Brien in our Gloucester Point, VA field office (804-684-7828, david.l.obrien@noaa.gov) or Chris Vaccaro in our Protected Resources Division (978-281-9167, christine.vaccaro@noaa.gov) regarding threatened and endangered species listed by us under the ESA.

Sincerely,

Louis A. Chiarella
Assistant Regional Administrator
for Habitat Conservation

cc: Kristina May, NAB Corps
Kristy Beard, NMFS
Mark Murray-Brown, PRD
Chris Vaccaro, PRD
Brian Hopper, PRD

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
GREATER ATLANTIC REGIONAL FISHERIES OFFICE
55 Great Republic Drive
Gloucester, MA 01930-2276

NOV 15 2019

Daniel Bierly, Chief
Civil Project Development Branch
Planning Division
US Army Corps of Engineers
Baltimore District
2 Hopkins Plaza
Baltimore, MD 21201-2930

RE: Northern Virginia Coastal Storm Risk Management Feasibility Study

Dear Mr. Bierly:

This letter rescinds our September 16, 2019, letter declining your invitation to participate as a cooperating agency on the development the feasibility study for the Northern Virginia Coastal Storm Risk Management Study (NoVA). Subsequent to our September 16, letter, we were advised that this project is covered under the provisions of Section 1005 of the Water Resources Reform and Development Act of 2014 (WRRDA 2014). As a result, we accept your invitation to be cooperating agency for this project. The study will investigate potential solutions to reduce flood risk associated with coastal storm events in Northern Virginia, including metropolitan Washington, Arlington County, Fairfax County, Prince William County, the City of Alexandria, and Washington Reagan National Airport.

Our role and degree of involvement is dependent on existing staff and fiscal resources, and our contribution to the process will be limited to participating in project meetings and providing written comments in response to your documents prepared as part of the National Environmental Policy Act (NEPA) process. We will provide technical information identifying aquatic species and habitats of concern, identification of issues to be considered and evaluated during the NEPA process and guidance on evaluating, avoiding, and minimizing project effects to our trust resources. At this time, we are unable to undertake any data collection, conduct analyses or to prepare any sections of the NEPA document as our staff and resources are fully committed to other obligatory programs of NOAA Fisheries.

Please note that our involvement as a cooperating agency does not constitute an endorsement of this project, nor does it obviate the need for consultations required under the Magnuson-Stevens Fishery Conservation and Management Act, Fish and Wildlife Coordination Act, and the Endangered Species Act.

We look forward to working with you and your staff as the project moves forward. If you have any questions regarding this matter, please contact Dave O'Brien in our Gloucester Point, VA field office (804-684-7828, david.l.obrien@noaa.gov) or Chris Vaccaro in our Protected Resources Division (978-281-9167, christine.vaccaro@noaa.gov) regarding threatened and endangered species listed by us under the ESA.

Sincerely,

Louis A. Chiarella
Assistant Regional Administrator
for Habitat Conservation

cc: Kristina May, NAB Corps
Kristy Beard, NMFS
Mark Murray-Brown, PRD
Chris Vaccaro, PRD
Brian Hopper, PRD

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, BALTIMORE DISTRICT
2 HOPKINS PLAZA
BALTIMORE, MARYLAND 21201-2930

August 21, 2019

Ms. Lisa Mendelson-Ielmini
Acting Regional Director
National Capital Regional Office
National Park Service
1100 Ohio Drive SW
Washington, DC 20242

Dear Ms. Mendelson-Ielmini,

The U.S. Army Corps of Engineers, Baltimore District (USACE), has begun a feasibility study to investigate coastal flooding problems and develop solutions to reduce future flood risk associated with coastal storm events that affect Northern Virginia (see enclosed study area map). The non-federal sponsor is the Metropolitan Washington Council of Governments representing the Commonwealth of Virginia, Arlington County, Fairfax County, Prince William County, the City of Alexandria, and the Metropolitan Washington Airport Authority (Washington Reagan National Airport). As part of the Northern Virginia Coastal Storm Risk Management Study (NoVA), we are preparing environmental documents pursuant to the National Environmental Policy Act (NEPA) of 1969, as amended. As the lead federal agency under NEPA, we are inviting your participation as a cooperating agency in the development of the environmental documents (either an Environmental Impact Statement or an Environmental Assessment). The NEPA documents will evaluate environmental impacts from reasonable project alternatives and determine the potential for significant impacts related to reducing coastal storm risks. We are currently formulating alternatives. The draft integrated Feasibility Report and NEPA document is tentatively scheduled to be released in the fall of 2020.

The North Atlantic coastline has been impacted by numerous coastal storms, including Hurricane Sandy most recently, causing loss of life and extensive economic damages. In response, USACE completed the North Atlantic Coast Comprehensive Study (NACCS), which identified nine high-risk areas on the Atlantic Coast that warrant further investigation of coastal storm risk management solutions. More information on the NACCS can found at: https://www.nad.usace.army.mil/CompStudy/.

The Washington, District of Columbia metropolitan region, including Northern Virginia, was identified as one of nine focus areas for further investigation of coastal flood risk. The study will investigate solutions that would reduce future flood risk in ways that support the long-term resilience and sustainability in the northern Virginia region and its surrounding communities. The goal of the study is to reduce coastal flood risk to vulnerable populations, properties, infrastructure, and environmental and cultural resources considering future sea level rise. The study is considering

structural, non-structural and natural and nature-based features. More information on NoVA can be found at: https://www.nab.usace.army.mil/NOVA_Coastal_Study.

In accordance with the Council on Environmental Quality final implementing regulations for NEPA (40 C.F.R. § 1501.6 and § 1508.5), as a cooperating agency your agency is invited to assist and participate in the NEPA process in the following ways:

- Participation in agency coordination meetings, conference calls, and site visits;
- Comment and provide feedback on the NEPA document schedule, overall scope of the document, significant issues to be evaluated, environmental impacts, study and assessment methodologies, range of alternatives and proposed compensatory mitigation, if applicable;
- Identification of issues related to your agency's jurisdiction by law and special expertise;
- Participation, as appropriate, at public meetings and hearings; and
- Timely review of the draft and final NEPA document to communicate any concerns of your agency.

Please provide your written statement of interest to this invitation and an agency point of contact within 30 days of the date of this letter. If you elect not to become a cooperating agency, you must decline this invitation in writing within 30 days of the date of this letter, indicating that your agency has no jurisdiction or authority with respect to the project, no expertise or information relevant to the project, does not have adequate funds to participate in the project, or does not intend to submit comments on the project. Your response may be transmitted electronically to Ms. Kristina May, Project Biologist at Kristina.K.May@usace.army.mil. Please be advised that if a response is not received within the specified timeframe, your agency will be considered a cooperating agency.

We look forward to your response to this request and your role as a cooperating agency on this study. If you have questions or would like to discuss the project in more detail or our agencies' respective roles and responsibilities during the preparation of the NEPA document, please contact Ms. Kristina May at the email above or by phone at (410) 962-6100.

Sincerely,

Daniel M. Bierly
Chief, Civil Project Development Branch
Planning Division

Enclosure

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, BALTIMORE DISTRICT
2 HOPKINS PLAZA
BALTIMORE, MARYLAND 21201-2930

February 6, 2020

Mr. Charles Cuvelier, Superintendent
George Washington Memorial Parkway Headquarters
National Park Service
700 George Washington Memorial Parkway
McLean, VA 22101

Dear Mr. Cuvelier

The U.S. Army Corps of Engineers, Baltimore District (USACE), is conducting a feasibility study to investigate coastal flooding problems and develop solutions to reduce future flood risk associated with coastal storm events that affect Northern Virginia (see enclosed study area map). The non-federal sponsor is the Metropolitan Washington Council of Governments representing the Commonwealth of Virginia, Arlington County, Fairfax County, Prince William County, the City of Alexandria, and the Metropolitan Washington Airport Authority (Washington Reagan National Airport).

As part of the Northern Virginia Coastal Storm Risk Management Study (NoVA), we are preparing environmental documents pursuant to the National Environmental Policy Act (NEPA) of 1969, as amended. As the lead federal agency under NEPA, we are inviting your participation as a cooperating agency in the development of the environmental documents (either an Environmental Impact Statement or an Environmental Assessment). The NEPA documents will evaluate environmental impacts from reasonable project alternatives and determine the potential for significant impacts related to reducing coastal storm risks. We plan to publish the Notice of Intent in the Federal Register in late April of 2020. The draft integrated Feasibility Report and NEPA document is tentatively scheduled to be released in the fall of 2020. We will send a draft NEPA schedule to you in the next few weeks for your feedback.

The North Atlantic coastline has been impacted by numerous coastal storms, including Hurricane Sandy most recently, causing loss of life and extensive economic damages. In response, USACE completed the North Atlantic Coast Comprehensive Study (NACCS), which identified nine high-risk areas on the Atlantic Coast that warrant further investigation of coastal storm risk management solutions. More information on the NACCS can found at: https://www.nad.usace.army.mil/CompStudy/.

The Washington, District of Columbia metropolitan region, including Northern Virginia, was identified as one of nine focus areas for further investigation of coastal flood risk. The study will investigate solutions that would reduce future flood risk in ways that support the long-term resilience and sustainability in the northern Virginia region and its surrounding communities. The goal of the study is to reduce coastal

flood risk to vulnerable populations, properties, infrastructure, and environmental and cultural resources considering future sea level rise. The study is considering structural, non-structural and natural and nature-based features. More information on NoVA can be found at: https://www.nab.usace.army.mil/NOVA_Coastal_Study.

In accordance with the Council on Environmental Quality final implementing regulations for NEPA (40 C.F.R. § 1501.6 and § 1508.5), as a cooperating agency your agency is invited to assist and participate in the NEPA process in the following ways:

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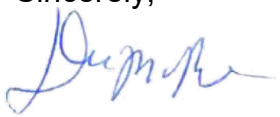
Please provide your written statement of interest to this invitation and an agency point of contact within 30 days of the date of this letter. If you elect not to become a cooperating agency, you must decline this invitation in writing within 30 days of the date of this letter, indicating that your agency has no jurisdiction or authority with respect to the project, no expertise or information relevant to the project, does not have adequate funds to participate in the project, or does not intend to submit comments on the project. Your response may be transmitted electronically to Ms. Kristina May, Project Biologist at Kristina.K.May@usace.army.mil. Please be advised that if a response is not received within the specified timeframe, your agency will be considered a cooperating agency.

We look forward to your response to this request and your role as a cooperating agency on this study. If you have questions or would like to discuss the project in more detail or our agencies' respective roles and responsibilities during the preparation of the NEPA document, please contact Ms. Kristina May at the email above or by phone at (410) 962-6100.

Sincerely,



Daniel M. Bierly
Chief, Civil Project Development Branch
Planning Division

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, BALTIMORE DISTRICT
2 HOPKINS PLAZA
BALTIMORE, MARYLAND 21201-2930

August 21, 2019

Mr. Paul Phifer, Ph.D.
Assistant Regional Director – Ecological Services
U.S. Fish and Wildlife Service
Northeast Region
300 Westgate Center Drive
Hadley, MA 01035

Dear Mr. Phifer,

The U.S. Army Corps of Engineers, Baltimore District (USACE), has begun a feasibility study to investigate coastal flooding problems and develop solutions to reduce future flood risk associated with coastal storm events that affect Northern Virginia (see enclosed study area map). The non-federal sponsor is the Metropolitan Washington Council of Governments representing the Commonwealth of Virginia, Arlington County, Fairfax County, Prince William County, the City of Alexandria, and the Metropolitan Washington Airport Authority (Washington Reagan National Airport). As part of the Northern Virginia Coastal Storm Risk Management Study (NoVA), we are preparing environmental documents pursuant to the National Environmental Policy Act (NEPA) of 1969, as amended. As the lead federal agency under NEPA, we are inviting your participation as a cooperating agency in the development of the environmental documents (either an Environmental Impact Statement or an Environmental Assessment). The NEPA documents will evaluate environmental impacts from reasonable project alternatives and determine the potential for significant impacts related to reducing coastal storm risks. We are currently formulating alternatives. The draft integrated Feasibility Report and NEPA document is tentatively scheduled to be released in the fall of 2020.

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We look forward to your response to this request and your role as a cooperating agency on this study. If you have questions or would like to discuss the project in more detail or our agencies' respective roles and responsibilities during the preparation of the NEPA document, please contact Ms. Kristina May at the email above or by phone at (410) 962-6100.

Sincerely,

Daniel M. Bierly
Chief, Civil Project Development Branch
Planning Division

Enclosure

From: May, Kristina K CIV USARMY CENAB (USA)
To: Guy, Chris
Cc: LaRouche, Genevieve; Julie Thompson
Subject: RE: [Non-DoD Source] Re: [EXTERNAL] Northern Virginia Coastal Cooperating Agency Letter
Date: Tuesday, November 5, 2019 6:39:00 AM

Thanks Chris. Yes, this email should suffice. We look forward to working with USFWS as a participating agency on this project. Talk to you this afternoon!

Kristina May
Biologist, Planning Division
USACE, Baltimore District
410-962-6100

-----Original Message-----
From: Guy, Chris [mailto:chris_guy@fws.gov]
Sent: Monday, November 4, 2019 3:06 PM
To: May, Kristina K CIV USARMY CENAB (USA) <Kristina.K.May@usace.army.mil>
Cc: LaRouche, Genevieve <genevieve_larouche@fws.gov>; Julie Thompson <Julie_Thompson@fws.gov>
Subject: [Non-DoD Source] Re: [EXTERNAL] Northern Virginia Coastal Cooperating Agency Letter

At this point, the Service should be considered a participating agency, If something changes in the future regarding Service priorities, we may wish to become a cooperating agency.

Please let me know if this e-mail will suffice for the Corps at this time, or do you need a formal letter.

Christopher P. Guy

Branch Chief, Conservation Planning and Assistance
177 Admiral Cochrane Dr

Annapolis, MD 21401
4410-573-4529 Office
443-758-8628 Cell
chris_guy@fws.gov <mailto:chris_guy@fws.gov>

Chesapeake Bay Field Office e-newsletter at Blockedhttp://chesapeakebay.fws.gov

On Tue, Oct 29, 2019 at 1:14 PM May, Kristina K CIV USARMY CENAB (USA) <Kristina.K.May@usace.army.mil <mailto:Kristina.K.May@usace.army.mil> > wrote:

> Kristina May
> Biologist, Planning Division
> USACE, Baltimore District
> 410-962-6100

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, BALTIMORE DISTRICT
2 HOPKINS PLAZA
BALTIMORE, MARYLAND 21201-2930

September 6, 2019

Ms. Bettina Rayfield
Manager
Environmental Impact Review and Long Range Priorities Program
Office of Environmental Impact Review
Virginia Department of Environmental Quality
P.O. Box 1105
Richmond, VA 23218

Dear Ms. Rayfield,

The U.S. Army Corps of Engineers, Baltimore District (USACE), has begun a feasibility study to investigate coastal flooding problems and develop solutions to reduce future flood risk associated with coastal storm events that affect northern Virginia (see enclosed study area map). The non-federal sponsor is the Metropolitan Washington Council of Governments representing the Commonwealth of Virginia, Arlington County, Fairfax County, the northern portion of Prince William County, the City of Alexandria, and the Metropolitan Washington Airport Authority (Washington Reagan National Airport). As part of the Northern Virginia Coastal Storm Risk Management Study (NoVA), we are preparing environmental documents pursuant to the National Environmental Policy Act (NEPA) of 1969, as amended. As the lead federal agency under NEPA, we are inviting your participation in the development of the environmental documents (either an Environmental Impact Statement or an Environmental Assessment). The NEPA documents will evaluate environmental impacts from reasonable project alternatives and determine the potential for significant impacts related to reducing coastal storm risks. We are currently formulating alternatives. The draft integrated Feasibility Report and NEPA document is tentatively scheduled to be released in the fall of 2020.

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flood risk to vulnerable populations, properties, infrastructure, and environmental and cultural resources considering future sea level rise. The study is considering structural, non-structural and natural and nature-based features. More information on NoVA can be found at: https://www.nab.usace.army.mil/NOVA_Coastal_Study.

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Please provide your written statement of interest to this invitation and an agency point of contact within 30 days of the date of this letter. Your response may be transmitted electronically to Ms. Kristina May, Project Biologist at Kristina.K.May@usace.army.mil.

We look forward to your response to this request and your role as a participating agency on this study. If you have questions or would like to discuss the project in more detail or our agencies' respective roles and responsibilities during the preparation of the NEPA document, please contact Ms. Kristina May at the email above or by phone at (410) 962-6100.

Sincerely,

Daniel M. Bierly, P.E.
Chief, Civil Project Development Branch
Planning Division

Enclosure

From: Rayfield, Bettina
To: May, Kristina K CIV USARMY CENAB (USA)
Subject: [Non-DoD Source] Re: Participating Agency Guidance
Date: Friday, September 20, 2019 12:53:52 PM

Kristina,

Please include DEQ, with me as the contact, as a participating agency for the Northern Virginia Coastal Storm Risk Management Study.

Ms. Bettina Rayfield

Manager

Environmental Impact Review and Long Range Priorities Program

804.698.4204 <tel:(804)%20698-4204>

Bettina.rayfield@deq.virginia.gov <mailto:Bettina.rayfield@deq.virginia.gov>

Department of Environmental Quality

1111 East Main Street, Suite 1400

Richmond, Virginia 23219

Mailing address

Post Office Box 1105

Richmond, Virginia 23218

Blockedwww.deq.virginia.gov <Blockedhttp://www.deq.virginia.gov/>

For program updates and public notices please subscribe to Constant Contact:
Blockedhttps://lp.constantcontact.com/su/MVcCump/EIR

On Fri, Sep 13, 2019 at 2:01 PM May, Kristina K CIV USARMY CENAB (USA) <Kristina.K.May@usace.army.mil <mailto:Kristina.K.May@usace.army.mil> > wrote:

> Kristina May
> Biologist, Planning Division

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, BALTIMORE DISTRICT
2 HOPKINS PLAZA
BALTIMORE, MARYLAND 21201-2930

September 6, 2019

Mr. Tony Watkinson
Chief, Habitat Management
Virginia Marine Resources Commission
Building 96
380 Fenwick Road
Ft. Monroe, VA 23651

Dear Mr. Watkinson,

The U.S. Army Corps of Engineers, Baltimore District (USACE), has begun a feasibility study to investigate coastal flooding problems and develop solutions to reduce future flood risk associated with coastal storm events that affect northern Virginia (see enclosed study area map). The non-federal sponsor is the Metropolitan Washington Council of Governments representing the Commonwealth of Virginia, Arlington County, Fairfax County, the northern portion of Prince William County, the City of Alexandria, and the Metropolitan Washington Airport Authority (Washington Reagan National Airport). As part of the Northern Virginia Coastal Storm Risk Management Study (NoVA), we are preparing environmental documents pursuant to the National Environmental Policy Act (NEPA) of 1969, as amended. As the lead federal agency under NEPA, we are inviting your participation in the development of the environmental documents (either an Environmental Impact Statement or an Environmental Assessment). The NEPA documents will evaluate environmental impacts from reasonable project alternatives and determine the potential for significant impacts related to reducing coastal storm risks. We are currently formulating alternatives. The draft integrated Feasibility Report and NEPA document is tentatively scheduled to be released in the fall of 2020.

The North Atlantic coastline has been impacted by numerous coastal storms, including Hurricane Sandy most recently, causing loss of life and extensive economic damages. In response, USACE completed the North Atlantic Coast Comprehensive Study (NACCS), which identified nine high-risk areas on the Atlantic Coast that warrant further investigation of coastal storm risk management solutions. More information on the NACCS can found at: https://www.nad.usace.army.mil/CompStudy/.

The Washington, District of Columbia metropolitan region, including northern Virginia, was identified as one of nine focus areas for further investigation of coastal flood risk. The study will investigate solutions that would reduce future flood risk in ways that support the long-term resilience and sustainability in the northern Virginia region and its surrounding communities. The goal of the study is to reduce coastal flood risk to vulnerable populations, properties, infrastructure, and environmental and

cultural resources considering future sea level rise. The study is considering structural, non-structural and natural and nature-based features. More information on NoVA can be found at: https://www.nab.usace.army.mil/NOVA_Coastal_Study.

In accordance with the Council on Environmental Quality final implementing regulations for NEPA (40 C.F.R. § 1501.6 and § 1508.5), as a participating agency your agency is invited to assist and participate in the NEPA process in the following ways:

- Participation in agency coordination meetings, conference calls, and site visits;
- Comment and provide feedback on the NEPA document schedule, overall scope of the document, significant issues to be evaluated, environmental impacts, study and assessment methodologies, range of alternatives and proposed compensatory mitigation, if applicable;
- Identification of issues related to your agency's jurisdiction by law and special expertise;
- Participation, as appropriate, at public meetings and hearings; and
- Timely review of the draft and final NEPA document prior to public review to communicate any concerns of your agency.

Please provide your written statement of interest to this invitation and an agency point of contact within 30 days of the date of this letter. Your response may be transmitted electronically to Ms. Kristina May, Project Biologist at Kristina.K.May@usace.army.mil.

We look forward to your response to this request and your role as a participating agency on this study. If you have questions or would like to discuss the project in more detail or our agencies' respective roles and responsibilities during the preparation of the NEPA document, please contact Ms. Kristina May at the email above or by phone at (410) 962-6100.

Sincerely,

Daniel M. Bierly, P.E.
Chief, Civil Project Development Branch
Planning Division

Enclosure

From: Rachael Peabody
To: May, Kristina K CIV USARMY CENAB (USA)
Subject: [Non-DoD Source] VMRC Cooperating Agency
Date: Wednesday, October 13, 2021 11:18:31 AM

Hi Kristina,

VMRC would like to be a cooperating agency for the NEPA process of Northern Virginia Coastal Storm Risk Management Feasibility Study. Thank you for the informative meeting today!

Rachael Peabody
Senior Advisor for Coastal Adaptation and Ecosystem Restoration
Virginia Marine Resources Commission
Building 96, 380 Fenwick Road
Ft. Monroe, VA 23651
757-247-2269

METROPOLITAN WASHINGTON, DISTRICT OF COLUMBIA COASTAL STORM RISK MANAGEMENT FEASIBILITY STUDY

INTEGRATED FEASIBILITY REPORT & ENVIRONMENTAL ASSESSMENT

APPENDIX G6: US FISH AND WILDLIFE COORDINATION ACT PLANNING AID REPORT

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Chesapeake Bay Field Office
177 Admiral Cochrane Drive
Annapolis, Maryland 21401
http://www.fws.gov/chesapeakebay

January 13, 2021

Kristina May
U.S. Army Corps of Engineers
Baltimore District
2 Hopkins Plaza
Baltimore, MD 21201

Re: Planning Aid Report, Northern Virginia Coastal Storm Risk Management Feasibility Study (Final, January 12, 2020)

Dear Ms. May:

The U.S. Fish and Wildlife Service (Service) Chesapeake Bay Field Office is pleased to provide a Draft Final Planning Aid Report (PAR) for the U.S. Army Corps of Engineers' Northern Virginia Coastal Storm Risk Management Feasibility Study. The Service's comments, recommendations, and conclusions provided in the report are submitted in accordance with provisions of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 *et seq*.) and Section 7 of the Endangered Species Act (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq*.).

The PAR is based primarily on a review of best available literature. The PAR provides information on the following alternatives: No Action, Critical Infrastructure Plan for Reagan National Airport and the Arlington Water Pollution Control Plant, Floodwall/Levee Plan for Arlandria Four Mile Run, and Floodwall/Levee Plan for Belle Haven.

Baseline environmental conditions in the proposed project area, effects of the project alternatives, and potential measures to improve project outcomes were reviewed. The conclusion of the PAR is that, if done correctly, the construction of this project would result in minimal adverse impacts to terrestrial, wetland, and aquatic resources.

As an attachment to this letter, we provide a point-by-point response to the two comments provided in the review of the draft final report. We welcome the opportunity to work with the U.S. Army Corps of Engineers, Baltimore District on this and other projects that support fish and wildlife resources. Please contact Fred Pinkney of my staff at Fred_Pinkney@fws.gov or 410/573-4544 with any questions or comments.

Sincerely,

Genevieve LaRouche
Field Supervisor

Attachment

Attachment: Comments and Responses: Draft Final Report (November 2020)

p. 5, Wetlands section: (Jacqueline Seiple): Is this referring to the lines marked as "closures"? If so, I don't think flap gate is the correct characterization. The closures are temporary closures that would be installed manually (across road, etc.) only when there a storm is impending and then removed following the storm. Does this change your assessment of impacts from these structures?

Response: This is referring to the "flap gate" structures present in the Arlandria Four Mile Run Levee and Belle Haven alternatives. They are located on either side of the Four Mile Run park, on Sunnyside Stream and an unnamed tributary of Four Mile Run. For the Belle Haven alternative, they are located on two tributaries that drain the wetland on Dyke Marsh Wildlife preserve. We have revised the text in the final report to clarify between potential short and long term impacts as follows:

"The flap gate structures proposed in the Belle Haven and Four Mile Run Arlandria alternatives have the potential to increase turbidity and sedimentation upstream when the gate is closed, as well as temporarily increase sediment flow downstream when the barrier is removed. This is an effect of flap gates as flood mitigation structures (Giannico & Souder 2004). It is expected that detailed construction design documents will allow a more complete evaluation of any possible long-term adverse impacts to wetland functions. Given current preliminary LODs, any temporary impacts to wetland habitat at the Action Areas can be mitigated through best practices such as avoiding stockpiling or storing materials in wetlands and utilizing appropriate sediment and erosion control measures to minimize turbidity during construction."

p. 6 Federally Listed Endangered and Threatened Species (Charles Leasure): Why a 5.5 mile buffer?

Response: The following text has been inserted in the final report:

"The VA DWR (at that time VA Department of Game and Inland Fisheries) decided on a 5.5 mile buffer to ensure that large projects (i.e. pipelines) that have the potential to alter the hydrology or geology of the hibernacula were considered when reviewing the maps. The original intention of a 5 mile buffer was revised to an off-center 5.5. mile buffer to make it more difficult to identify the locations of the hibernacula (S. Hoskin, VAFO, personal communication)."

Fish and Wildlife Planning Aid Report

Metropolitan Washington District of Columbia "Northern Virginia" Coastal Storm Risk Management Feasibility Study

Final Report

Prepared by:

Ilana Herold

Alfred E. Pinkney

Under supervision of:
Genevieve LaRouche, Supervisor
U.S. Fish and Wildlife Service
Chesapeake Bay Field Office

January 2021

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EXECUTIVE SUMMARY

The objective of the Northern Virginia Coastal Storm Risk Management Study is to investigate coastal flooding problems, needs, and potential solutions for the region. The goal is to reduce coastal flood risk to people, properties, critical infrastructure, services and important resources in the study area, considering future climate and sea level change scenarios. Currently, a focused array of structural and non-structural alternatives is being considered: No Action; Critical Infrastructure Plan for Reagan National Airport and the Arlington Water Pollution Control Plant (WPCP); Floodwall/Levee Plan for Arlandria Four Mile Run; and Floodwall/Levee Plan for Belle Haven.

This Planning Aid Report (PAR) of the U.S. Fish and Wildlife Service (USFWS, Service) aims to assist the U.S. Army Corps of Engineers (USACE, Corps) with development of the Northern Virginia Coastal Storm Risk Management Study and associated project alternatives. The PAR summarizes best available literature and data resources to provide recommendations on the proposed project alternatives for the different authorities and species within Service jurisdiction.

Conclusions: Under a no action alternative, current conditions would be maintained with no anticipated impact to fish and wildlife resources and their habitat outside of the current threats of climate change. For the remaining alternatives, floodwall, levee, and elevated road construction is expected to temporarily disturb wetland habitat and wildlife during the building process. Differences in habitat and fish and wildlife resources located within each Action Area should be considered in terms of recommended best management practices to minimize disturbance to sensitive wetland and riverine habitat and associated species. Due to adjacent wetland resources and wildlife habitat, further investigation into long-term alteration of water flow and sedimentation patterns for the Belle Haven and Four Mile Run alternatives is suggested. Bald eagle nests within the Belle Haven Action Area may require additional permitting if buffers cannot be adhered to. Overall, protection of vital infrastructure and human resources as a result of any of the above listed alternatives should be considered in conjunction with minimization of adverse impacts on terrestrial, wetland, and wildlife resources. The Service recommends that: 1) activities be performed by contractors that are experienced with construction of these structures to reduce the impacts to critical wetland resources; 2) time of year restrictions are considered in order to protect vulnerable species during construction; and 3) the preferred alternative minimizes any adverse effects to Service trust resources by utilizing the best available environmentally compatible construction and maintenance practices.

Acknowledgments

We appreciate the assistance of Kristina May, Project Manager, and the review team from the Baltimore District U.S. Army Corps of Engineers. The following colleagues from the Chesapeake Bay Field Office helped with various aspects of the project: Chris Guy, Julie Slacum, Amy O'Donnell, and Kathleen Cullen.

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Introduction

The North Atlantic coastline of the United States has been impacted by numerous coastal storms, including the recent Hurricane Sandy, causing loss of life and extensive economic damages. In response, U.S Army Corps of Engineers (USACE) completed the North Atlantic Coast Comprehensive Study (NACCS), which identified nine high-risk areas on the Atlantic Coast that warranted further investigation of coastal flood risk management solutions (USACE 2015). The Metropolitan Washington, District of Columbia (D.C.) region, which includes portions of D.C., Maryland (MD) and Virginia (VA), was identified as one of the nine high-risk areas recommended by NACCS for a follow-on feasibility study to investigate solutions to coastal flooding problems. The region has an existing study authorization from Congress; a resolution of the U.S. Senate Committee on Environment and Public Works, dated May 23, 2001.
The Metropolitan Washington, D.C. Feasibility Cost Share Agreement (FCSA) was signed by USACE and the Metropolitan Washington Council of Governments (MWCOG) in July 2017. MWCOG is the non-federal sponsor for the Northern Virginia Coastal Storm Risk Management Study (NOVA Coastal Study) representing the following jurisdictions in northern VA: the Commonwealth of VA, Arlington County, Fairfax County, the City of Alexandria, Prince William County, and the Metropolitan Washington Airports Authority (MWAA). The study area encompasses the northern VA jurisdictions within the Middle Potomac Watershed boundary, from Arlington County south to include a portion of Prince William County.
This Planning Aid Report (PAR) identifies constraints and opportunities related to the conservation and enhancement of potentially impacted fish and wildlife resources in the proposed project areas (hereafter "Action Areas") as they pertain to the project alternatives. The information is based primarily on a review of best available literature and provides USACE with an assessment of the fish and wildlife issues that may need to be addressed throughout project planning and design. It is submitted in accordance with provisions of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.), the Bald and Golden Eagle Protection Act (16 U.S.C.668 et seq.),and Section 7 of the Endangered Species Act (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.).

Project Description

The NOVA Coastal Study will investigate solutions to reduce future flood risk in ways that support long-term resilience and sustainability in the northern VA region and its surrounding communities. The purpose of the study is to reduce coastal flood risk to vulnerable populations, properties, infrastructure, and environmental and cultural resources, while considering future climate and sea level change scenarios to support resilient communities within northern VA. Existing information generated from NACCS and other previous studies, and new investigations will be used to identify problems, needs, and opportunities as well as to inform and forecast future conditions leading to project selection. The Coastal Storm Risk Management Framework developed for NACCS will be used to guide study analyses.

The study will consider past, current, and future coastal storm risk management (CSRM) and resilience planning initiatives and projects underway by USACE and other federal, state, and local agencies. Three overarching efforts will be performed:

1. Assess the study area's problems, opportunities and future-without project conditions;
2. Assess the feasibility of implementing system-wide CSRM solutions such as policy/programmatic strategies, storm surge barriers at selected inlet entrances, or tidal gates at selected lagoon entrances; and,
3. If system-wide solutions are insufficient, assess the feasibility of implementing site-specific solutions, such as a combination of structural, non-structural, and natural and nature-based features.

The study will address these three efforts using a Specific, Measurable, Achievable, Realistic, and Timely (SMART) planning approach. SMART Planning is a transformation within the USACE Civil Works Program to better incorporate risk-informed, decision-focused thinking into the planning process. It also requires completion of a study within three years and under a $3 million budget, unless an exemption is granted. Tasks including initial project scoping and identification of a focused array of alternatives were completed in the first segment of the study (Table 1). The following alternatives identified in Phase 1 have been screened out and will no longer be considered: the storm surge barrier alternatives (Alternatives 2 and 3), floodwalls along the George Washington Memorial Parkway (Alternative 4a), and the Alexandria floodwall (Alternative 5b). This PAR contains information on the following alternatives (Figure 1):

Alternative 1 - No Action
Alternatives 4(b) and 4(c) - Critical Infrastructure Plan for Reagan National Airport and the Arlington Water Pollution Control Plant (WPCP)
Alternatives 5(a) and 5(c) - Floodwall/Levee Plan for Arlandria, Four Mile Run, and Belle Haven

The alternatives listed above (see Figures 2-8) will be compared to the impacts of the No-Action alternative.
The Action Area for a project is defined as all areas to be affected directly or indirectly by the action (USACE & USFWS 2020). For each alternative, the Action Area is composed of potentially impacted aquatic and terrestrial habitat, including adjacent parks, protected wildlife areas, and riparian zones, as relevant.

Climate Change

Effects of climate change must be considered in the planning and construction of USACE projects. The following information summarizes projected changes at or near the Action Areas.

Sea level at Sewell Point, Norfolk, VA has risen 14.5 inches (0.37 meters) between 1930 and 2010 (Runkle et al. 2017). The Virginia Institute of Marine Science (VIMS) used NOAA tidal gauge data collected from 1969-2017 to project the rise in monthly mean sea level (MMSL) out to 2050. This projection shows a mean 19.3-inch (0.49-meter) rise in MMSL by 2050 for Norfolk, VA, and a 14.6-inch (0.37-meter) rise for Baltimore, MD (Boon et al. 2018). VIMS did not make a projection for D.C. The District Department of Energy and Environment (DOEE) published a Climate Change Adaptation Plan (Thompson et al. 2015) based on USACE NACCS (USACE 2015) data. This report addresses climate change issues including storm surge, average temperature, and sea level rise predictions for D.C. By the 2050s, the 15-year, 24-hour storm is

predicted to rise from the 2013 baseline level of 5.3 inches to 7.1 inches (from 13.5 centimeters to 18.0 centimeters), and average temperature is expected to rise by about 5 to 7 ºF depending on level of emissions for this time frame. Sea levels on the D.C. waterfront have increased 11 inches (0.28 meters) from 1924 to 2013 (Thompson et al. 2015,). Additionally, the number of days per year experiencing high tide flooding (HTF) in D.C. reached the most recorded at 22 days in 2018, and this could reach up to 120 HTF days by 2050 (Sweet et al. 2019).

Aquatic and Terrestrial Resources

The information below describes the aquatic and terrestrial resources specific to each Action Area. The Four Mile Run 4c and 5a alternatives are grouped together due to their close geographic proximity along the Four Mile Run corridor and similarity in potentially affected aquatic and terrestrial resources.

Belle Haven

Aquatic resources include the Dyke Marsh Wildlife Preserve, a 485-acre (196-hectare) freshwater, tidal wetland complex on the western shoreline of the Potomac River (Friends of Dyke Marsh 2020a). It is characterized as a temperate, climax, narrow-leaf cattail marsh, and includes open water resources (Johnston 2000).

Terrestrial/wetland resources in the Belle Haven/Dyke Marsh area include tidal wetland, swamp forest, and upland forest. Belle Haven Park is a more developed area, which includes a marina and picnic area, adjacent to the development of New Alexandria. Tree species noted in the marsh forest include green ash (*Fraxinus lanceolata*) and black willow (*Salix nigra*). American elm (*Ulmus americana*), sweetgum (*Liquidambar styraciflua*), red and silver maple (*Acer rubrum, Acer saccharinum*) and others are found in the higher elevation floodplain forest (Johnston 2000).

Reagan National Airport

Aquatic resources include the waters of the Potomac River and associated wetlands, classified as palustrine emergent. As this area includes the Washington Reagan National Airport and surrounding developed areas, terrestrial resources are limited but include small areas of palustrine forested land.

Four Mile Run (Arlandria and Arlington WPCP)

Aquatic resources include the riverine deep-water and associated wetlands of the Four Mile Run corridor, which functions as a flood control channel (Rhoneside & Harwell 2006).

Terrestrial/wetland resources include Four Mile Run Park, classified as palustrine forested land, and adjacent residential properties. Within the park, one wetland area is preserved as a wildlife sanctuary. This area is classified as a brackish tidal marsh. Woodlands in the sanctuary contain oaks, maples, box elder (*Acer negundo*) green ash (*Fraxinus lanceolata*), alder thickets (*Alnus incana*), and arrowwood (*Viburnum dentatum*), among other species (Rhoneside & Harwell

2006). In 2019, fifty new trees were planted in the park (TreeStewards of Arlington and Alexandria 2019).

Effects on Fish and Wildlife Resources

Data Quality

The following is a description of priority Service resources for the project area. In order to consider potential effects on fish and wildlife resources, database searches for each Action Area were performed. Whenever possible, best available literature was used to supplement and confirm database reports. The information below represents the best available current information that could be gathered from existing sources. Significant potential impacts unique to any of the Action Areas are noted accordingly.

Wetlands

The Service considers wetland habitat a trust resource that is essential to fish and wildlife including native waterfowl and other migratory birds. Trust resources are natural resources that the Service has been entrusted with protecting for the benefit of the American people. This responsibility comes largely from the Fish and Wildlife Coordination Act. Amendments to this Act added provisions to recognize the vital contribution of wildlife resources to the Nation and to require equal consideration and coordination of wildlife conservation with other water resources development programs (Digest of Federal Resources Laws 2018). Since the 1950s, the Service has placed particular emphasis on monitoring wetland losses and their impacts on fish and wildlife populations (USFWS 2005). According to a September 29, 2020 Information for Planning and Consultation (IPaC) database search report, the Action Areas overlap four types of wetlands. Freshwater emergent wetlands (all alternatives) freshwater forested/shrub wetlands (all alternatives), riverine (all alternatives), and freshwater pond wetlands (Belle Haven, National Airport alternatives) are outlined in Figures 3, 5, and 8.

The no action alternative will not change the overall health of the wetlands or their ability to deal with sea level rise and high tide flooding. As noted in the Climate Change section, sea level rise poses a significant threat to the Action Areas and greater northern VA. Wetlands are under various stresses, and losses will be exacerbated by sea-level rise (Nicholls 2004).

The limits of disturbance (LODs) for the concrete floodwalls proposed in the project alternatives intersect minimally with freshwater forested/shrub wetlands (Belle Haven alternative) and riverine wetlands (Four Mile Run and National Airport alternatives). The LOD for the road elevation/levee proposed in the National Airport alternative also intersects with riverine wetland resources at this site. Thus, temporary and minor negative effects associated with construction and staging actions of floodwalls are expected during the construction process. Additionally, with the construction of concrete floodwalls for the Belle Haven and Four Mile Run alternatives, there is the potential for long-term impacts to wetlands due to changes in stormwater flow and sedimentation rates. During flood events, while floodwalls may protect adjacent developed and human resources, they can cause inundation of wetlands and deflect debris and sediment back towards wetlands (FEMA 2013). Wetlands have the potential to reduce storm surges and slow the speed of flood waters (Wamsley et al. 2010, EPA 2016). Therefore, it is critical that in

addition to structural flood risk management, the integrity of wetlands is preserved. In order to protect these valuable wetland resources, the Service recommends that the Corps conduct a thorough evaluation of influences on water flow and sedimentation rate changes due to concrete floodwall construction at the Belle Haven and Four Mile Run project alternatives.

The LODs for the earthen levees proposed in the Belle Haven and Four Mile Run alternatives also intersect minimally with freshwater emergent wetlands (Belle Haven alternative) and freshwater forested/shrub wetlands (Arlandria Four Mile Run alternative). As levee construction requires land clearing for foundation preparation, construction equipment access and maneuvering, and stockpiling of topsoil, it is critical that environmental features are taken into consideration (Hynson et al. 1985). Actions such as minimizing cleared areas, planning for erosion and sediment control during construction, and establishing marsh vegetation on the riverside of the levee are recommended in order to minimize adverse impacts to wetland resources.

The flap gate structures proposed in the Belle Haven and Four Mile Run Arlandria alternatives have the potential to increase turbidity and sedimentation upstream when the gate is closed, as well as temporarily increase sediment flow downstream when the barrier is removed. This is an effect of flap gates as flood mitigation structures (Giannico & Souder 2004). It is expected that detailed construction design documents will allow a more complete evaluation of any possible long-term adverse impacts to wetland functions. Given current preliminary LODs, any temporary impacts to wetland habitat at the Action Areas can be mitigated through best practices such as avoiding stockpiling or storing materials in wetlands and utilizing appropriate sediment and erosion control measures to minimize turbidity during construction.

Federally Listed Endangered and Threatened Species

The U.S. Fish and Wildlife Service's Information for Planning and Consultation (IPaC) database (https://ecos.fws.gov/ipac) was used to determine if federally listed endangered and threatened species occur in the Action Area (searches performed 9/8/2020, individual Action Area polygons; 9/29/2020, all Action Areas shapefile, see Appendix A). IPaC official species lists are valid for 90 days, after 90 days the project proponents should reconfirm their results by requesting an updated species list for their project to ensure an accurate and up-to-date list.

The only federally listed species under the jurisdiction of the Service found in the Action Areas (Belle Haven and National Airport alternatives) is the threatened northern long-eared bat (NLEB, *Myotis septentrionalis*) which has no designated critical habitat. The primary threat to this species across its range is white-nose syndrome (WNS), which is caused by a fungal infection. Other threats include habitat modification of hibernacula (underground caves, mines, and cave-like structures), disturbance of hibernating bats, forest conversion, wind energy facilities, and fires.

On January 14, 2016, the Service published a Federal Register notice under Section 4(d) of the Endangered Species Act that describes necessary and advisable measures for protection of the NLEB (USFWS 2016). Under the rule, "Incidental take resulting from tree removal is prohibited if it: (1) occurs within a 0.25-mile (0.40 kilometer) radius of known northern long-eared bat

hibernacula; or (2) cuts or destroys known occupied maternity roost trees, or any other trees within a 150-foot (45-meter) radius from the known maternity tree during the pup season (June 1 through July 31)." The Virginia Department of Wildlife Resources (VA DWR) has developed **a** map of known VA NLEB maternity roost trees. This map includes both 0.5 mile (0.80 kilometer) inner and 5.5 mile (8.85 kilometer) outer buffer layers around known NLEB maternity roost trees. If a project intersects with the map's 0.5-mile inner buffer, it may be within the 0.25-mile (0.40 kilometer) hibernaculum buffer and therefore subject to applicable time-of-year restrictions (TOYR). If a project is outside the inner hibernaculum buffer but within the outer 5.5-mile buffer, it is still in an area of concern for the Service regarding potential impacts to the hibernaculum and further consultation with the Service's Virginia Field Office (VAFO) is required (VA DWR 2020a). The VA DWR (at that time VA Department of Game and Inland Fisheries) decided on a 5.5 mile buffer to ensure that large projects (i.e. pipelines) that have the potential to alter the hydrology or geology of the hibernacula were considered when reviewing the maps. The original intention of a 5 mile buffer was revised to an off-center 5.5. mile buffer to make it more difficult to identify the locations of the hibernacula (S. Hoskin, VAFO, personal communication). **Analysis of the VA DWR map shows that the Action Areas do not intersect with either the 0.5-mile or 5.5 mile buffers around NLEB maternity roost trees in Virginia(see Appendix B).**

While the Action may affect the NLEB if any tree clearing occurs, any take that may occur as a result is not prohibited under the ESA 4(d) rule adopted for this species at 50 CFR §17.40(o) and satisfies Service responsibilities for this Action under ESA Section 7(a)(2) (see Appendix C). If the Action is not completed within one year of the date of communication (9/29/2020), it is mandatory to update and resubmit the information required in the IPaC determination key (see Appendix C).

No aquatic or marine mammal species are listed in the IPaC search (Appendix A). The National Marine Fisheries (NMFS) has Federal jurisdiction over Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*) and shortnose sturgeon (*Acipenser brevirostrum*). The Service refers the USACE to the NMFS Greater Atlantic Region Fisheries Office, Gloucester, MA for all matters related to these two species (https://www.fisheries.noaa.gov/resource/map/greater-atlantic-region-esa-section-7-mapper).

State-Listed Species

The Virginia Fish and Wildlife Information Service (VaFWIS) database (https://vafwis.dgif.virginia.gov/fwis/) was used to determine if state-listed endangered and threatened species occur in the Action Area, using a 3-mile radius around the approximate mid-point coordinates of each Action Area (searches performed 9/9/2020; Appendix D). State endangered mammals listed as present include the little brown bat (*Myotis lucifugus*) and tri-colored bat (*Perimyotis subflavus*). State threatened species listed as present are the wood turtle (*Glyptemys insculpta*), peregrine falcon (*Falco peregrinus*), loggerhead shrike (*Lanius ludovicianus*), migrant loggerhead shrike (*Lanius ludovicianus migrans*), Henslow's sparrow (*Centronyx henslowii*), and Appalachian grizzled skipper (*Pyrgus wyandot*). Recommended time of year (TOY) restrictions for construction, as well as best-practices for protection of these species, are provided by the Virginia Department of Wildlife Resources (VA DWR) and are

summarized in Table 5 below. The VaFWIS Little Brown Bat and Tri-colored Bat Winter Habitat and Roosts Application (https://dgif-virginia.maps.arcgis.com/apps/webappviewer/index.html?id=15cf32b9c82b426fb6be47b6c8d5b624) was used to assess the known hibernaculum of these species in VA (search performed 11/6/2020). None of the Action Areas intersected with 0.25-mile (0.40 km) hibernaculum buffers or 5.5 mile (8.85 km) outer buffers for these species, and thus no lethal take of little brown bats or tri-colored bats is expected for any project alternative. A map displaying the spatial relationship between known little brown bat and tri-colored bat hibernaculum buffers and the project Action Areas can be found in Appendix B.

The brook floater (*Alasmidonta varicosa*) is a state endangered freshwater mussel with G3/S1 status [Global: G3= Vulnerable**:** moderate risk of extinction or elimination due to a fairly restricted range, relatively few populations or occurrences, recent and widespread declines, threats, or other factors; State: S1= At very high risk of extirpation in the jurisdiction due to very restricted range, very few populations or occurrences, very steep declines, severe threats, or other factors.] (USFWS 2019). In 2016 the Maryland Department of Natural Resources surveyed freshwater mussels in the Potomac and Anacostia Rivers for a community assessment of the tidal-freshwater Anacostia River. The Potomac samples were collected approximately 10 miles south of the Belle Haven Action Area and included four species of mussels. No brook floater mussels were collected (Ashton & Sullivan 2016).

To supplement the VaFWIS database results, a site-specific search of the Virginia Department of Conservation and Recreation (VA DCR) Natural Heritage Resources database for the Belle Haven and Four Mile Run Action Areas (within VA land) was performed on 9/11/2020. This search shows the global and state conservation status rank of VA Natural Heritage species found within the project Action Areas (see Appendix E). Notably, the state threatened wood turtle (*Glyptemys insculpta*) is listed for both the Belle Haven and Four Mile Run Action Areas. Wood turtles are seasonally aquatic and terrestrial, and are sensitive to pesticide and sediment pollution. Wood turtles are highly sensitive to human modification of ecosystems, including urbanization, stream channelization and damming (Burger & Garber 1995, Buech & Nelson 1997). Currently, the only confirmed documentation of a wood turtle in the Four Mile Run Action Areas was in 1953, and due to extensive urbanization, no suitable habitat for wood turtles remains in Arlington County (Zell 2011). Due to the rarity of this species within the Action Areas, the proposed alternatives at both Four Mile Run and Belle Haven are not expected to have an impact on the wood turtle. Any sightings of this species along the George Washington Memorial Parkway (Belle Haven Action Area) should be reported to the National Park Service Natural Resource Management Staff (NPS 2020). For additional information regarding protection of VA endangered and threatened species when initiating a construction project, consultation with a VA DCR biologist is recommended at (804) 367-4335.

Migratory Birds

The IPaC database was searched (9/29/2020) to generate a resource list of migratory birds that have the potential to be found at or near the Action Areas. The list is based on data provided by the Avian Knowledge Network, which includes survey, banding, and citizen science datasets. It is queried on a 10 km grid that intersects with the Action Areas (Appendix A).

The IPaC search generated 25 species across the Action Areas, 23 of which are considered Birds of Conservation Concern (BCC), also known as Birds of Management Concern (Table 2). USFWS (2011) states that Birds of Management Concern can be designated for any of the following reasons: documented or apparent population declines; small or restricted populations; dependence on restricted or vulnerable habitats; or overabundant to the point of causing ecological and economic damage. Bird species are given the BCC distinction within certain Bird Conservation Regions (BCRs). The Action Areas fall within the New England/Mid-Atlantic Coast BCR (NABCI 2020). The remaining IPaC listings are for the bald and golden eagles, which are protected through the Bald and Golden Eagle Act (1940).

To provide additional information on bird species, the eBird database was searched (https://ebird.org/home; September 15, 2020) for observations made at Gravelly Point (within Reagan National Airport Action Area), Dyke Marsh Wildlife Preserve (within Belle Haven Action Area), and Four Mile Run Park (within Four Mile Run Action Area) from 2000-2020. Listings for 113, 265, and 144 species were recorded respectively (see Appendix F). For the Belle Haven Action Area, the additional resource of the Friends of Dyke Marsh Bird List (https://fodm.org/marsh_life/bird_list.html) was used to cross-reference eBird observations, as it contains best available data for the area in the form of a 40-year-long compiled list of 296 species seen at Dyke Marsh (Friends of Dyke Marsh 2020b). All species listed on eBird were confirmed documented on this list. Site-specific data and habitat information for the 25 migratory bird species identified in the IPaC search results are described briefly below. Although most of the species listed as BCC may occur within the Action Areas, the proposed projects are not expected to have either a positive or negative overall effect on these species. This is because they are either not known to nest within the Action Areas, or suitable habitat and forage is not a limiting factor. For BCC species that occur within the project area and have the potential to be either positively or negatively impacted by the proposed alternatives, additional evaluation is provided.

Bald eagle
https://www.allaboutbirds.org/guide/Bald_Eagle/

Bald eagles are found throughout the United States, usually occupying habitats close to large water bodies where they primarily forage for fish. Bald eagles nest in mature trees within a half mile of their foraging areas, preferring to nest in the tallest canopy tree or along an open forest edge. Eagle nest sites and communal roost areas require natural protection buffers to avoid being disturbed from commercial and residential development and other associated human activities. The bald eagle is federally protected under the Bald and Golden Eagle Protection Act (BGEPA 1940) and the Migratory Bird Treaty Act (MBTA 1918).

In 2007, the Service removed the species from the list of threatened and endangered species, created National Bald Eagle Management Guidelines (USFWS 2007), and promulgated new rules under BGEPA (in 2012) to permit incidental take of eagles during activities of otherwise, lawful projects. The guidelines advise landowners and land managers with measures on how to avoid and minimize disturbance to nesting eagles on private and Federal lands. A variety of human actions can potentially interfere with bald eagles, affecting their ability to forage, nest, roost, breed, or successfully raise young. The guidelines are intended to help minimize such

impacts to bald eagles, particularly where they may constitute "disturbance," which is prohibited by the BGEPA. All bald eagle nest trees, including the 660-foot concentric circular forest buffer surrounding the nest, are federally protected and therefore considered as areas restricted from disturbance unless authorized by issuance of a BGEPA permit. Proposed projects must consider the protection standards for bald eagles which include time-of-year restriction from activities (December through June); habitat/nest protection buffers (330-foot and 660-foot zones); and Important High Eagle Use Areas (communal roosts/concentration areas).

The William & Mary Center for Conservation Biology Eagle Nest Locator database and mapping tool (https://ccbbirds.org/maps/#eagles) was used to determine bald eagle nesting sites identified near the Action Areas. The closest bald eagle nest to the Four Mile Run Action Area is approximately 3.05 miles (4.91 km) south. The closest bald eagle nest to the Reagan National Airport Action Area is approximately 4.29 miles northwest. These are both greater than the nest buffer of 0.5 miles recommended by USFWS (2007). The closest bald eagle nests to the Belle Haven Action Area fall within the Action area and are approximately 0.08 and 0.28, and 0.60 miles away from proposed floodwall or levee construction along George Washington Memorial Parkway and into Westgrove Park. These nests were last checked and last known occupied in 2018, 2014, and 2018 respectively (Center for Conservation Biology 2020). Please see Appendix G for site-specific maps generated from the Center for Conservation Biology database report. Project activity at the Belle Haven Action Area falls within Category A of Service National Bald Eagle Activity-Specific guidelines (alteration of shorelines or wetlands). Service recommendations under the National Bald Eagle Management Guidelines of 2007 should be adhered to for this alternative (Table 3). If these buffers cannot be adhered to, contact the Service's Migratory Bird Permit Office at (413) 253-8567 to determine if an eagle disturbance permit is necessary to be in compliance with the prohibitions under the Eagle Act.

Black-billed Cuckoo
https://www.allaboutbirds.org/guide/Black-billed_Cuckoo/

Black-billed cuckoos are uncommon, and typically found in densely wooded areas. It is unlikely that substantial numbers of the species would be present in the Action Areas based on habitat preferences. eBird lists one sighting at Dyke Marsh Wildlife Preserve in May of 2017.

Bobolink
https://www.allaboutbirds.org/guide/Bobolink/

Bobolinks are ground-foraging birds found in grassland habitats. It is unlikely that substantial numbers of the species would be present in the Action Areas based on habitat preferences. eBird lists two flyover sightings at Dyke Marsh Wildlife Preserve in August 2020.

Canada Warbler
https://www.allaboutbirds.org/guide/Canada_Warbler/

Canada warblers breed mainly in the north easternmost U.S. and Canada and winter in South America. They are found in mixed conifer and deciduous forests with a shrubby understory. It is

unlikely that substantial numbers of the species would be present in the Action Areas based on habitat preferences. eBird lists one sighting in Dyke Marsh Wildlife Preserve in May 2020.

Cerulean Warbler
https://www.allaboutbirds.org/guide/Cerulean_Warbler/

Cerulean warblers breed in mature eastern deciduous forests and are found in the upper canopy. Their breeding period listed in IPaC is listed as April 29 to July 20. It is unlikely that substantial numbers of the species would be present in the Action Area, based on habitat preferences and the lack of detection in eBird.

Dunlin
https://www.allaboutbirds.org/guide/Dunlin/overview

Dunlins breed in wet coastal tundra of Alaska and northern Canada. They winter along mudflats, estuaries, marshes, flooded fields, sandy beaches, and shores of lakes and ponds. A flock of about 280 dunlins was observed from Gravelly Point within the National Airport Action Area in October of 2012. Approximately 30 were observed in Dyke Marsh Wildlife Preserve within the Belle Haven Action Area, which contains suitable marshland habitat, in October 2018. The New England/Mid-Atlantic Coast BCR contains critical migration habitat for these species, and they may be observed migrating through the Action Areas in the spring and fall. It is possible that dunlins could experience temporary disturbance during project construction, but as they do not have any breeding habitat within the Action Areas, none of the proposed project alternatives are expected to have any long-term impacts on this species.

Eastern Whip-poor-will
https://www.allaboutbirds.org/guide/Eastern_Whip-poor-will/

Eastern whip-poor-wills are aerial foragers which are found in open woodlands. Their breeding period listed in IPaC is May 1 through August 20. It is unlikely that substantial numbers of the species would be present in the Action Area, based on habitat preferences and the lack of detection in eBird.

Golden Eagle
https://www.allaboutbirds.org/guide/Golden_Eagle/

Golden eagles are found in a wide range of habitats, including the tundra, grasslands, forested habitat and woodland-brushlands, and arid deserts. Golden eagles generally do not nest near urban areas and avoid densely forested habitat, preferring to build their nests on cliffs or in the largest trees of forested stands.

Golden eagles are federally protected under the Bald and Golden Eagle Protection Act (BGEPA 1940) and the Migratory Bird Treaty Act (MBTA 1918). The Eagle Act has prohibited take of Bald Eagles since 1940 and Golden Eagles since 1962. “Take” means pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, destroy, molest, or disturb (USFWS 2011). Golden eagles have not been documented in eBird for any of the Action Areas.

Golden-winged Warbler
https://www.allaboutbirds.org/guide/Golden-winged_Warbler/

Golden-winged warblers breed in wet, shrubby areas in the Upper Midwest and Appalachians. IPaC lists their breeding season as May 1 through July 20. It is unlikely that the species would be present in the Action Area, based on habitat preferences and the lack of detection in eBird.

Hudsonian Godwit
https://www.allaboutbirds.org/guide/Hudsonian_Godwit/

Hudsonian godwits are found along shorelines, mainly in arctic bogs and tidal mudflats. They can be found in North America during spring migration. eBird lists one sighting in Dyke Marsh Wildlife Preserve, which contains suitable habitat, in September 2014. Hudsonian godwits do not breed with in any of the Action Areas, so adverse effects are not expected as a result of the proposed project alternatives.

Kentucky Warbler
https://www.allaboutbirds.org/guide/Kentucky_Warbler/

Kentucky warblers are found in the deciduous forests of the southeastern United States, and mainly stay near the ground and lower parts of forested areas, nesting on the ground. IPaC lists their breeding season as April 20 through August. 20. eBird lists one sighting in Dyke Marsh Wildlife Preserve in June 2001.

Least Tern
https://www.allaboutbirds.org/guide/Least_Tern/overview

Least terns are found on seacoasts, beaches, bays, estuaries, lagoons, lakes and rivers. They breed on sandy or gravelly beaches and banks of rivers or lakes. The breeding period documented in the IPaC report is from April 20 to September 10. eBird lists two sightings in Dyke Marsh Wildlife Preserve in September 2012. Given the lack of recent observation as well as intense urban development in surrounding areas, it is unlikely that there are any nesting terns within any of the Action Areas.

Lesser Yellowlegs
https://www.allaboutbirds.org/guide/Lesser_Yellowlegs/

Lesser yellowlegs breed in boreal Canada and are found in U.S. marshes and wetlands during migration. eBird lists lesser yellowlegs sightings for all three Action Areas, which all contain suitable wetland habitat. The New England/Mid-Atlantic Coast BCR contains critical migration habitat for these species, and they may be observed migrating through the Action Areas in the spring and fall. It is possible that lesser yellowlegs could experience temporary disturbance during project construction, but as they do not have any breeding habitat within the Action Areas, none of the proposed project alternatives are expected to have any long-term impacts on this species.

Prairie Warbler
https://www.allaboutbirds.org/guide/Prairie_Warbler

Prairie warblers are found in shrubby habitats, including regenerating forests, open fields, and Christmas tree farms. They breed throughout the eastern and south-central United States. Nests are in shrubs and trees less than 10 feet tall. The breeding period documented in the IPaC report is from May 1 to July 31. eBird lists one sighting at Four Mile Run Park in April of 2020, and one sighting at Dyke Marsh Wildlife Preserve in September 2020. It is likely that these species are both present and breeding within the Four Mile Run and Belle Haven Action Areas, however their preferred habitat should be largely outside the LODs for these project alternatives. They lack suitable habitat within the National Airport Action Area. In order to minimize negative effects on prairie warblers, damage to trees and brush within the affected Action Areas should be minimized.

Prothonotary Warbler
https://www.allaboutbirds.org/guide/Prothonotary_Warbler/overview

Prothonotary warblers are often located in bottomland forests and wetlands and often forage above standing or slow-moving water. They build nests in holes in standing dead trees, including bald cypress and sweetgum. They are most numerous in the southeast United States. The breeding period documented in the IPaC report is from April 1 through July 31. eBird lists one sighting at Four Mile Run Park in April of 2018, and one sighting at Dyke Marsh Wildlife Preserve in August 2020. It is likely that these species are both present and breeding within the Four Mile Run and Belle Haven Action Areas, however their preferred habitat should be largely outside the LODs for these project alternatives. They lack suitable habitat within the National Airport Action Area. In order to minimize negative effects on prothonotary warblers, removal of dead trees within the affected Action Areas should be minimized.

Red-headed Woodpecker
https://www.allaboutbirds.org/guide/Red-headed_Woodpecker/overview

Red-headed woodpeckers breed in deciduous woodlands with oak or beech, groves of dead or dying trees, river bottoms, burned areas, recent clearings, beaver swamps, orchards, parks, farmland, grasslands with scattered trees, forest edges, and roadsides. During the start of the breeding season they move from forest interiors to forest edges or disturbed areas. They breed in cavities of dead or partially dead trees. The breeding period documented in the IPaC report is from May10 through September 10. eBird lists one sighting in Dyke Marsh Wildlife Preserve in April 2020. Based on habitat preferences and observations, it is likely that these species are both present and breeding within the Four Mile Run and Belle Haven Action Areas, however their preferred habitat should be largely outside the LODs for these project alternatives. They lack suitable habitat within the National Airport Action Area. In order to minimize negative effects on red-headed woodpeckers, removal of dead or dying trees within the affected Action Areas should be minimized.

Red-throated Loon
https://www.allaboutbirds.org/guide/Red-throated_Loon/overview

Red-throated loons breed in low tundra wetlands, bogs, and ponds in forests in northern Canada and Alaska. In migration, flocks stage on large lakes. They winter in relatively shallow, sheltered marine habitats along the Atlantic Coast. The largest threat to red-throated loons on the Atlantic Coast is pollution (National Audubon Society 2020). eBird lists nine sightings in Dyke Marsh Wildlife Preserve in February of 2019, and one sighting at Gravelly Point near National Airport in December 2019. The New England/Mid-Atlantic Coast BCR contains critical migration habitat for these species, and they may be observed migrating through the Action Areas in the spring and fall. It is possible that red-throated loons could experience temporary disturbance during project construction, but as they do not have any breeding habitat within the Action Areas, none of the proposed project alternatives are expected to have any long-term impacts on this species.

Ruddy Turnstone
https://www.allaboutbirds.org/guide/Ruddy_Turnstone/

Ruddy turnstones are a ground-foraging species which breed in the arctic tundra and spend the other seasons on rocky shorelines and sandy beaches in North America. eBird lists one sighting at Dyke Marsh Wildlife Preserve in May 2013. The New England/Mid-Atlantic Coast BCR contains critical migration habitat for these species, and they may be observed migrating through the Action Areas in the spring and fall. It is possible that ruddy turnstones could experience temporary disturbance during project construction, but as they do not have any breeding habitat and lack observation within the Action Areas, it is unlikely that any of the project alternatives will have long-term negative impacts on this species.

Rusty Blackbird
https://www.allaboutbirds.org/guide/Rusty_Blackbird/overview

Rusty blackbirds breed across Canada, Alaska, and northern New England. They winter in swamps, wet woodlands, and pond edges in the mid-Atlantic and south and central states. eBird lists ruddy blackbird sightings for all three Action Areas, which all contain appropriate habitat. The New England/Mid-Atlantic Coast BCR contains critical migration habitat for these species, and they may be observed migrating through the Action Areas in the spring and fall. It is possible that rusty blackbirds could experience temporary disturbance during project construction, although they do not breed within the Action Areas. During migration, they favor trees near water (National Audubon Society 2020). In order to minimize negative effects on rusty blackbirds within the Action Areas, removal of trees should be minimized.

Semipalmated Sandpiper
https://www.allaboutbirds.org/guide/Semipalmated_Sandpiper

Semipalmated sandpipers are shorebirds which breed in the Arctic and winter along South American coastlines. eBird lists one sighting in Dyke Marsh Wildlife Preserve in October of 2018, and one sighting at Four Mile Run Park in May 2020. Both Action Areas include suitable

shoreline habitats. The New England/Mid-Atlantic Coast BCR contains critical migration habitat for these species, and they may be observed migrating through the Action Areas in the spring and fall. It is possible that semipalmated sandpipers could experience temporary disturbance during project construction, but as they do not have any breeding habitat within the Action Areas, it is unlikely that any of the project alternatives will have long-term negative impacts on this species.

Short-billed Dowitcher
https://www.allaboutbirds.org/guide/Short-billed_Dowitcher/

Short-billed dowitchers breed in the tundra and are found in marshes and wetlands across the United States. eBird lists one flight sighting at Gravelly Point near National Airport in August of 2014, and three sightings in Dyke Marsh Wildlife Preserve in August 2020. Both Action Areas contain suitable wetland habitats. The New England/Mid-Atlantic Coast BCR contains critical migration habitat for these species, and they may be observed migrating through the Action Areas in the spring and fall. It is possible that short-billed dowitchers could experience temporary disturbance during project construction, but as they do not have any breeding habitat within the Action Areas, none of the proposed project alternatives are expected to have any long-term impacts on this species.

Snowy Owl
https://www.allaboutbirds.org/guide/Snowy_Owl/

Snowy owls spend summers in the Arctic Circle, and irregularly come to North America to hunt. eBird lists one flight sighting at Gravelly Point near National Airport in January 2015, but overall, it is unlikely that substantial numbers of the species would be present in the Action Areas, based on habitat preferences and the rarity of sightings.

Whimbrel
https://www.allaboutbirds.org/guide/Whimbrel/

Whimbrels nest in the tundra and spend the rest of the year in a variety of shoreline habitats, including mudflats, beaches, and salt marshes. It is unlikely that substantial numbers of the species would be present in the Action Area, based on habitat preferences and the lack of detection in eBird.

Willet
https://www.allaboutbirds.org/guide/Willet/

Willets are ground-nesters that are found in a variety of shoreline habitats, including beaches, mudflats, and rocky shores. The breeding period documented in the IPaC report is from April 20 through August 5. eBird lists one sighting in Dyke Marsh Wildlife Preserve in August 2002, however they are listed as “very rare” within the preserve (Friends of Dyke Marsh 2020b). As they generally nest in large colonies and return to the same favorable areas, it is unlikely that nesting willets will experience negative effects due to any of the project alternatives (National Audubon Society 2020).

Wood Thrush
https://www.allaboutbirds.org/guide/Wood_Thrush/overview

Wood thrushes breed across the eastern and central United States and in southern Canada. Breeding is in mature deciduous and mixed forests, especially those with American beech, sweet gum, red maple, black gum, eastern hemlock, flowering dogwood, American hornbeam, oaks, or pines. They nest in the lower branches of a sapling or shrub, where a fork provides good support. The breeding period documented in the IPaC report is from May 10 through August 31. eBird lists five sightings at Four Mile Run Park in May 2020, and one sighting in Dyke Marsh Wildlife Preserve in April, 2020. It is likely that these species are both present and breeding within the Four Mile Run and Belle Haven Action Areas, however their preferred habitat should be largely outside the LODs for these project alternatives. They lack suitable habitat within the National Airport Action Area. In order to minimize negative effects on wood thrushes, removal of saplings and shrubs within the affected Action Areas should be minimized.

Anadromous and Catadromous Fish and their Habitats

The Anadromous Fish Conservation Act (Act) is a Federal law enacted in 1965 to conserve, develop, and enhance the anadromous fish resources of the U.S. that are subject to depletion from water resources development and other causes, or with respect to which the U.S. has made conservation commitments by international agreements, and the fish in the Great Lakes and Lake Champlain that ascend streams to spawn. The provisions of the Act are found under 16 USCS §§ 757a-757f. Anadromous fish rely on annual adult migrations from the sea to the specific freshwater rivers and habitats of origins to spawn. Catadromous fish, (*Anguilla rostrata*) spawn in the ocean and migrate into rivers as juveniles. Anadromous and catadromous fish are a Service trust resource. Restoration efforts are being implemented in many areas to reclaim important spawning habitat currently unavailable because of migration impediments.

The Virginia Fish and Wildlife Information Service (VaFWIS) database (https://vafwis.dgif.virginia.gov/fwis/) was used to determine the anadromous and catadromous species in the Action Areas (searches performed 9/9/2020; Appendix D). A 3-mile radius around the approximate mid-point coordinates of each Action Area was used. Species found in the search results were consistent across all project Action Areas.

In 2018 the District Department of Energy and Environment (DOEE) Fisheries Research Branch completed an annual report including a biological survey of the anadromous and resident fish in the Potomac and Anacostia Rivers. Fish were collected using monthly electrofishing surveys from March through November of 2018 (Adriance et al. 2019). Two sampling sites, Buzzards Point (38.863331, -77.012019) and Potomac River Flat at Oxon Cove (38.803992, -77.028325) are relevant in assessing species presence within the National Airport Action Area as they are approximately 0.39 miles northeast and 1.70 miles southeast from the Action Area, respectively (Table 4). For complete survey results for 2018, see Appendix H.

Project activities in the waters within the Action Area include concrete floodwall (all alternatives), levee (Belle Haven and Arlandria Four Mile Run alternatives), and road elevation (National Airport alternative) construction. The LODs floodwall and levee construction for the

Belle Haven and Four Mile Run alternatives, as well as the road elevation for the National Airport alternative, do intersect minimally with riverine resources within the Action Areas. The construction process has the potential to disrupt sediment and increase turbidity in these areas, which could temporarily disturb anadromous and catadromous fish in these rivers. Best management practices for control of erosion and sedimentation during construction and maintenance within the Action Areas should be implemented to avoid detrimental impacts to aquatic resources. **Overall, given the largely land-based nature of the proposed alternatives, long-term impacts to anadromous and catadromous fish within the Action Areas is not anticipated.**

Conditions of the No Action Alternative

Currently, sea level rise and high-tide flooding pose a substantial risk to natural systems and human infrastructure, exacerbated by climate change impacts. Under a no action alternative, current conditions would be maintained, and aquatic organisms would likely experience no change in habitat outside of any existing sea level rise, flooding, temperature rise and other climate-change related threats.

Conclusion

The objective of the NOVA Coastal Storm Risk Management Study is to investigate coastal flooding problems, needs and potential solutions for the region. The goal is to reduce coastal flood risk to people, properties, critical infrastructure, services and important resources in the study area, considering future climate and sea level change scenarios (USACE 2020). Currently, a focused array of alternatives is being considered: No Action, Critical Infrastructure Plan for Reagan National Airport and the Arlington WPCP, Floodwall/Levee Plan for Arlandria Four Mile Run and Floodwall/Levee Plan for Belle Haven.

Under a no action alternative, current conditions would be maintained with no anticipated impact to fish and wildlife resources and their habitat outside of the current threats of climate change. For the remaining alternatives, floodwall, levee, and elevated road construction is expected to temporarily disturb wildlife during the construction process. However, impacts to wetland habitat will be minimal if sediment and erosion control practices are followed. For the Belle Haven and Four Mile Run alternatives, floodwall and earthen levee construction has the potential for sedimentation and turbidity increases during the construction process, which again can be minimized by utilizing sediment and erosion control practices. Further investigation into long-term changes in stormwater flow and sedimentation into the wetland as a result of the flap gate structures is recommended. Habitat alteration and tree-clearing at each alternative has the potential to disturb breeding and migrating birds of conservation concern within the Action Areas. Species-specific recommendations in terms of tree removal and avoidance of construction during breeding periods will help avoid and minimize impacts to these species. Additionally, for the Belle Haven Action Area, bald eagle nests have been observed within the last three years. If buffer areas cannot be adhered to, the Corps should contact the Service's Migratory Bird Permit Office at (413) 253-8567 to determine if an eagle disturbance permit is necessary to be in compliance with the prohibitions under the Eagle Act. Although the federally listed northern long-eared bat may be present within the Action Areas, any take that occurs as a result of these

actions is not prohibited under the ESA 4(d) rule adopted for this species. It is possible that some VA state listed species may be present within the Action Areas, however habitat and breeding presence analysis does not indicate adverse effects to any of these species. Long-term negative impacts to anadromous and catadromous fish species are not anticipated, however NMFS has Federal jurisdiction over the Atlantic sturgeon and shortnose sturgeon, thus the Service refers the USACE to the NMFS Greater Atlantic Region Fisheries Office, Gloucester, MA for all matters related to these two species.

Overall, protection of vital infrastructure as a result of any of the above listed alternatives should be considered in conjunction with minimization of adverse impacts to terrestrial, wetland, and wildlife resources. The Service recommends that 1) activities be performed by contractors that are experienced with techniques to reduce the impacts to wetland resources; 2) time of year restrictions are considered in order to protect vulnerable species during construction, and 3) the preferred alternative minimizes any adverse effects to Service trust resources through environmentally compatible best-management construction and maintenance practices.

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TABLES

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Table 1. Initial Array of Alternatives identified in Segment 1.

Alternative	Description
1	No Action
2	Comprehensive Coastal Surge Barrier
3	Upper Coastal Surge Barrier
4	Critical Infrastructure Plan (George Washington Memorial Parkway, Reagan National Airport, Arlington Water Pollution Control Plant (Arlington WPCP)
4a	George Washington Memorial Parkway
4b	Reagan National Airport
4c	Arlington Water Pollution Control Plant
5	Floodwall/Levee Plan (Arlandria Four Mile Run, Alexandria, Belle Haven)
5a	Arlandria Four Mile Run Floodwall
5b	Alexandria Floodwall
5c	Belle Haven Levee and Floodwall
6	Non-Structural Plan (entire study area or components)
7	Alts 3 and 6 (Upper Coastal Surge Barrier + Nonstructural downstream)
8	Combinations of Alts. 4, 5 and 6

Table 2. Migratory Bird Species of Conservation Concern and breeding period listed in the IPaC search results. Species in bold were also documented in eBird at Four Mile Run Park, species in italics were documented at Gravelly Point, immediately north of Nation Airport and within the Action Area, and species marked with an asterisk* were documented at Dyke Marsh Wildlife Preserve (i.e. a species indicated ***as such**** was observed at all three locations). See Appendix F for a complete list of eBird observations.

Species	***Scientific name***	***Breeding season***	***Found in Action Area, IPaC search results***	***Bird of Conservation Concern***
Bald eagle*	*Haliaeetus leucocephalus*	Oct. 15 to Aug. 31	All	No
Black-billed Cuckoo*	*Coccyzus erythropthalmus*	May 15 to Oct. 10	All	Yes
Bobolink*	*Dolichonyx oryzivorus*	May 20 to July 31	All	Yes
Canada Warbler*	*Cardellina canadensis*	May 20 to Aug. 10	All	Yes
Cerulean Warbler	*Dendroica cerulea*	Apr. 29 to July 20	National Airport, Four Mile Run	Yes
*Dunlin**	*Calidris alpina arcticola*	Breeds elsewhere	All	Yes
Eastern Whip-poor-will	*Antrostomus vociferus*	May 1 to Aug. 20	All	Yes
Golden Eagle	*Aquila chrysaetos*	Breeds elsewhere	National Airport, Four Mile Run	No
Golden-winged Warbler	*Vermivora chrysoptera*	May 1 to July 20	Four Mile Run	Yes
Hudsonian Godwit*	*Limosa haemastica*	Breeds elsewhere	Belle Haven	Yes
Kentucky Warbler*	*Oporornis formosus*	Apr. 20 to Aug. 20	All	Yes
Least Tern*	*Sterna antillarum*	Apr. 20 to Sep. 10	All	Yes
Lesser Yellowlegs*	*Tringa Flavipes*	Breeds elsewhere	All	Yes
Prairie Warbler*	*Dendroica discolor*	May 1 to July 31	All	Yes
Prothonotary Warbler*	*Prothonotary Warbler*	Apr. 1 to July 31	All	Yes
Red-headed Woodpecker*	*Melanerpes erythrocephalus*	May 10 to Sep. 10	All	Yes
*Red-throated Loon**	*Gavia stellata*	Breeds elsewhere	All	Yes
Ruddy Turnstone*	*Arenaria interpres morinella*	Breeds elsewhere	All	Yes
Rusty Blackbird*	*Euphagus carolinus*	Breeds elsewhere	All	Yes
Semipalmated Sandpiper*	*Calidris pusilla*	Breeds elsewhere	All	Yes

Table 2 continued

*Short-billed Dowitcher**	*Limnodromus griseus*	Breeds elsewhere	All	Yes
Snowy Owl	*Bubo scandiacus*	Breeds elsewhere	National Airport, Four Mile Run	Yes
Whimbrel	*Numenius phaeopus*	Breeds elsewhere	All	Yes
Willet*	*Tringa semipalmata*	Apr. 20 to Aug. 5	All	Yes
Wood Thrush*	*Hylocichla mustelina*	May 10 to Aug. 31	All	Yes

Table 3. National Bald Eagle Management Guidelines (USFWS 2007). Activity recommendations for protective buffers should be adhered to pertaining to the Belle Haven Action Area, where activity falls within Category A (alteration of shorelines or wetlands).

	If there is no similar activity within 1 mile of the nest	***If there is similar activity closer than 1 mile from the nest***
If the activity will be visible from the nest	660 feet. Landscape buffers are recommended.	660 feet, or as close as existing tolerated activity of similar scope. Landscape buffers are recommended.
If the activity will not be visible from the nest	Category A: 330 feet. Clearing, external construction, and landscaping between 330 feet and 660 feet should be done outside breeding season. Category B: 660 feet.	330 feet, or as close as existing tolerated activity of similar scope. Clearing, external construction and landscaping within 660 feet should be done outside breeding season.

The numerical distances shown in the table are the closest the activity should be conducted relative to the nest.

Table 4. List of anadromous and catadromous species from Virginia Fish and Wildlife Information Service (VaFWIS) database search using the Affected Area and a 3-mile radius. All species were also found in the DOEE 2018 electrofishing survey of D.C. waters. Species in **bold** were found at Buzzards Point and species in *italics* were found at Oxon Cove (Adriance et al. 2019). The NatureServe Conservation Status Ranks provided in the DOEE Wildlife Action Plan are listed with explanations below (DOEE 2015, Master et al. 2012).

Species	**Scientific name**	**Subnational ranking**
Alewife	*Alosa pseudoharengus*	S5
Blueback herring	*Alosa aestivalis*	S5
American shad	*Alosa sapidissima*	S2B
Striped bass	*Morone saxatilis*	S4
Yellow perch	*Perca flavescens*	-
Hickory shad	*Alosa mediocris*	S2B

Key

S2: **Imperiled-** At high risk of extirpation in the jurisdiction due to restricted range, few populations or occurrences, steep declines, severe threats, or other factors.

B (qualifier): **Breeding**—Conservation status refers to the breeding population of the species in the nation or state/province.

S4: **Apparently Secure**- At a fairly low risk of extirpation in the jurisdiction due to an extensive range and/or many populations or occurrences, but with possible cause for some concern as a result of local recent declines, threats, or other factors.

S5: **Secure-** At very low or no risk of extirpation in the jurisdiction due to a very extensive range, abundant populations or occurrences, with little to no concern from declines or threats.

Table 5. Recommended Time of Year Restrictions. These dates represent times of year when species may be most sensitive to human activities such as construction (VA DWR 2020b).

Species	Scientific Name	Recommended Time of Year Restriction
Atlantic sturgeon[1]	*Acipenser oxyrhynchus oxyrhynchus*	TOYR and/or other protective recommendations are applicable for work in the segments of designated Threatened and Endangered Species Waters. However, in addition to these waters, Atlantic Sturgeon are known from tributaries to designated TE Waters, the Chesapeake Bay, Chesapeake Bay embayments, small tributaries to the Chesapeake Bay (including on the eastern Shore), and the Piankatank River. Impacts upon Atlantic sturgeon may be considered for projects impacting such waters, on a case-by-case basis (review by DWR biologist).
Bald eagle (nest sites)	*Haliaeetus leucocephalus*	December 15 through July 15
Brook floater[2]	*Alasmidonta varicosa*	April 15 through June 15 (glochidia release); and August 15 through September 30 (spawning)
Henslow's sparrow[2]	*Ammodramus henslowii*	April 1 through August 31
Least tern	*Sternula antillarum*	April 1 through August 31; TOYR ends when last brood fledges (determined by most recent monitoring activity)
Little brown bat, tri-colored bat[2]	*Myotis lucifugus, Perimyotis subflavus*	Regarding tree removal, prescribed fire, or other land management actions proposed to enhance public safety or to reduce risk of property damage: Provided the "Required Conservation Measures" described in 4VAC15-20 are implemented, take of this species, is not anticipated and any incidental take is not prohibited. We refer interested parties to the Department's "Best management practices for conservation of little brown bats and tri-colored bats" for additional guidance. Regarding any other tree removal or harvest, prescribed fire, or other land management actions: If the activity would occur within 0.25 miles of a "major" hibernaculum or within 150 feet of a known roost tree, the applicant should refer to the Department's "Best management practices for conservation of little brown bats and tri-colored bats" for additional guidance regarding development of a Conservation Plan for these species, if authorization of incidental take is desired. Lacking such plan approval by the Department, the applicant may proceed with the proposed activities at their own discretion, but is not provided any authorization of purposeful or incidental take of these species. To initiate review of such a project, and consultation with DWR regarding development of a project-specific Conservation Plan, the project proponent should access the Department's online application for these species at: http://www.DWR.virginia.gov/wildlife/bats/little-brown-bat-tricolored-bat-winter-habitat-roosts-application/ to determine whether the project footprint intersects with the application specific buffers.

Table 5 cont.

Loggerhead shrike[2]	*Lanius ludovicianus*	April 1 through July 31
Northern Long-Eared Bat	*Myotis septentrionalis*	June 1 through July 31 for projects including tree removal/timbering within 150 feet of a documented maternity roost; NO tree removal/timbering within 0.25 miles of a documented hibernaculum. NO disturbance of hibernating bats and/or physical modification of the hibernaculum entrance. Access a key (guide) to the USFWS Final 4(d) Rule at the following links: Federal project 4(d) Rule Key: https://www.fws.gov/midwest/endangered/mammals/nleb/KeyFinal4dNLEBFedProjects.html
Peregrine falcon[2]	*Falco peregrinus*	February 15 through July 15 for activities w/in 600 ft of nest/box
Striped bass	*Morone saxatilis*	March 15 through June 30
Wood turtle[2]	*Glyptemys insculpta*	For instream work: October 1 through March 31; For work within 900 ft of stream: April 1 through September 30. Maintain undisturbed naturally vegetated buffer of at least 300 feet (preferably larger) on stream.

[1]Under NMFS jurisdiction, the Service recommends consultation with NOAA National Marine Fisheries Service.
[2]State threatened or endangered species, the Service recommends consultation with a Virginia DWR biologist.

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FIGURES

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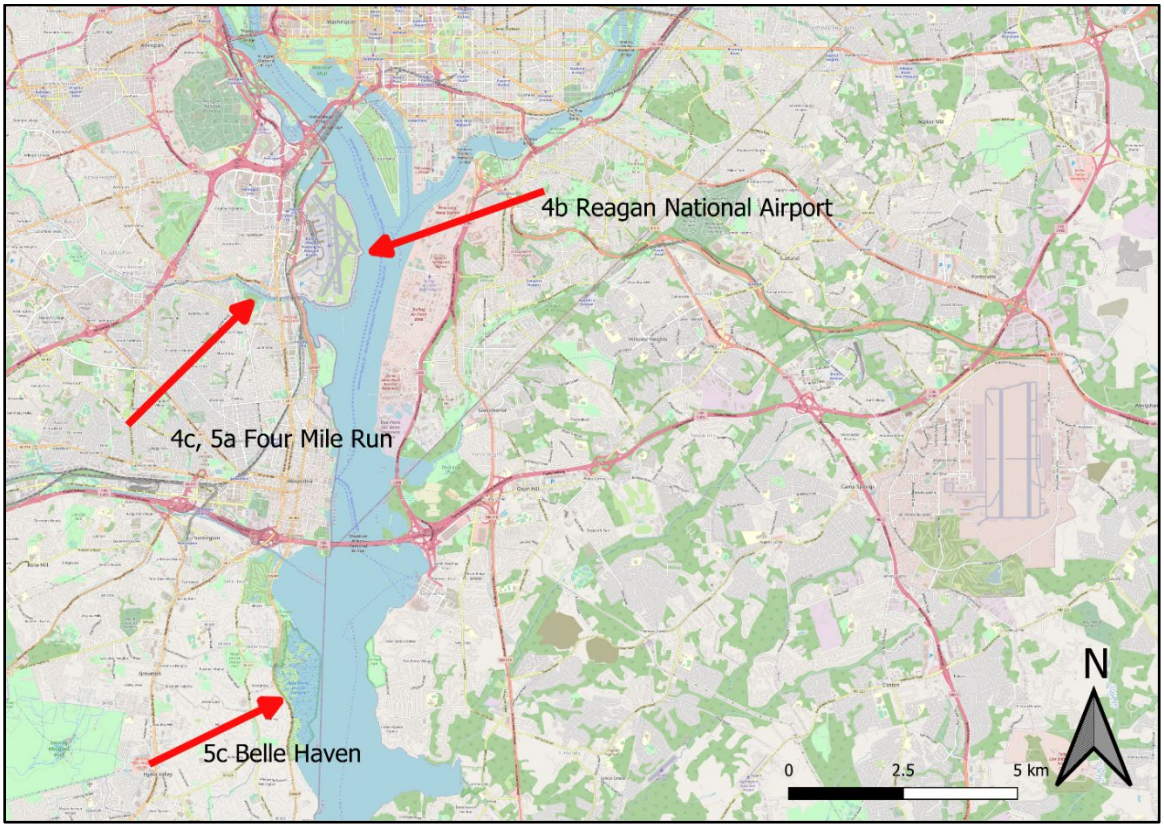


Figure 1. Map with arrows indicating general locations of project alternatives.

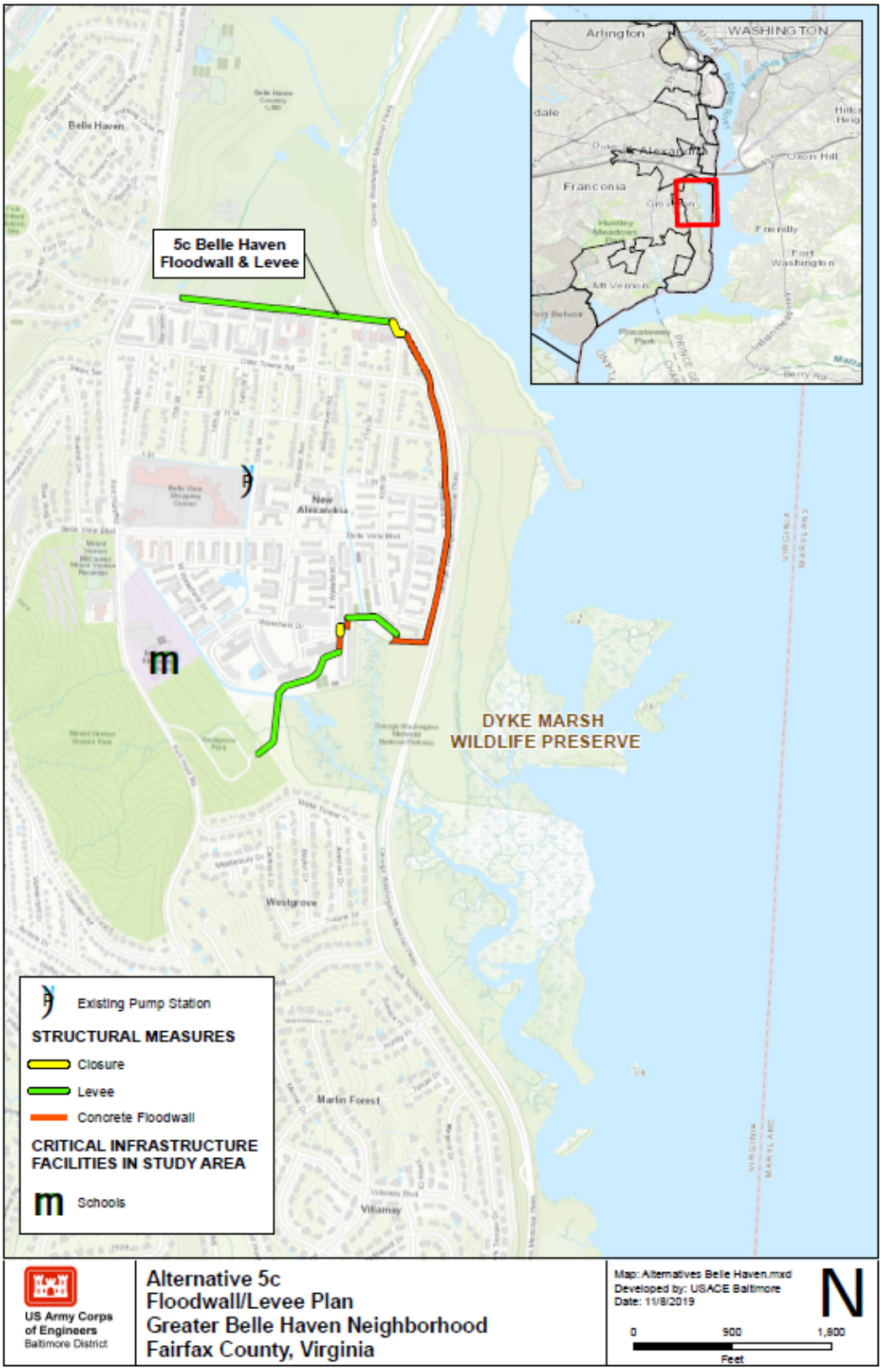


Figure 2. Alternative 5c, Belle Haven Floodwall and Levee.

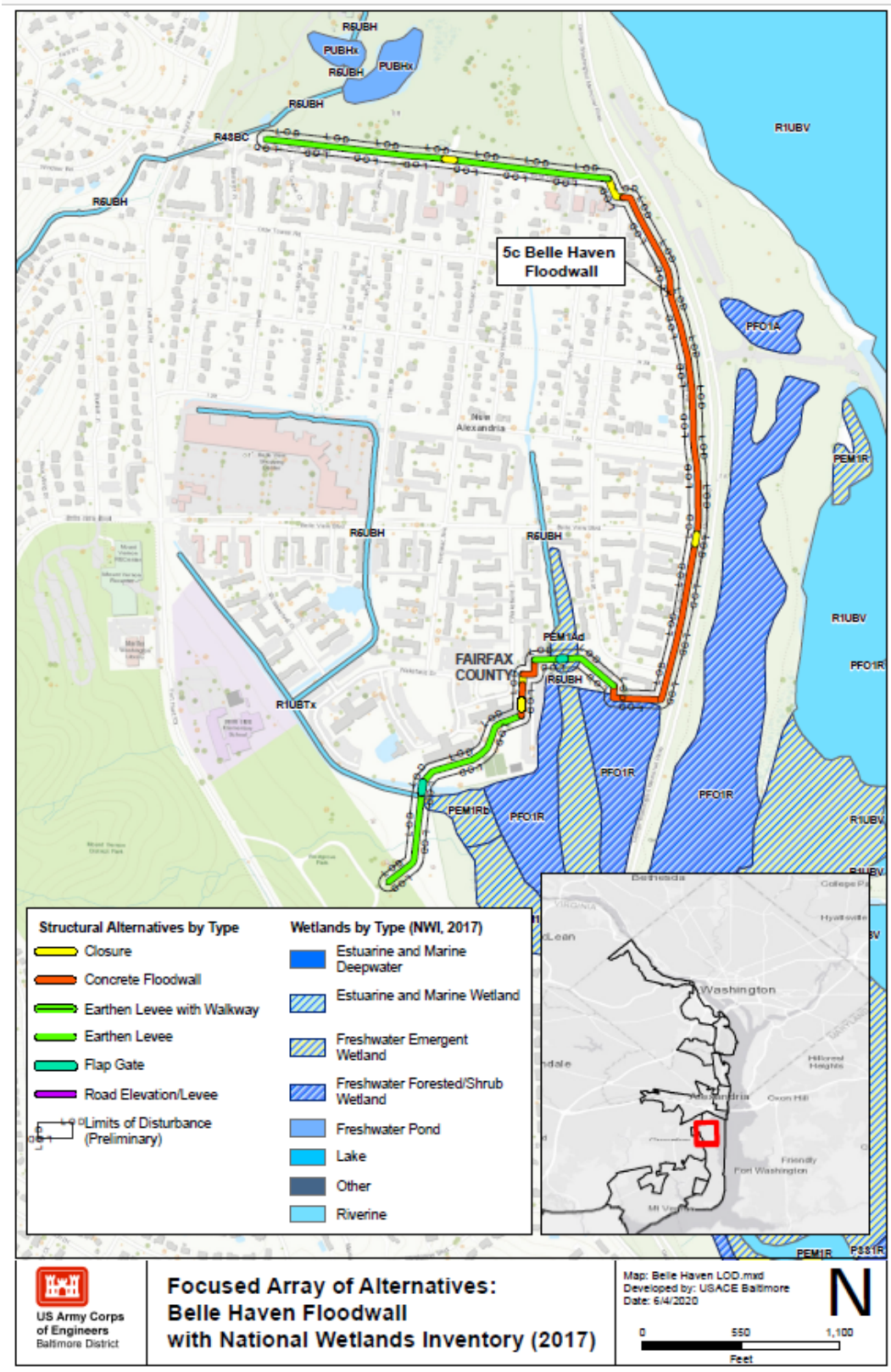


Figure 3. Alternative 5c, Belle Haven Floodwall highlighting structures, limits of disturbance, and wetlands.

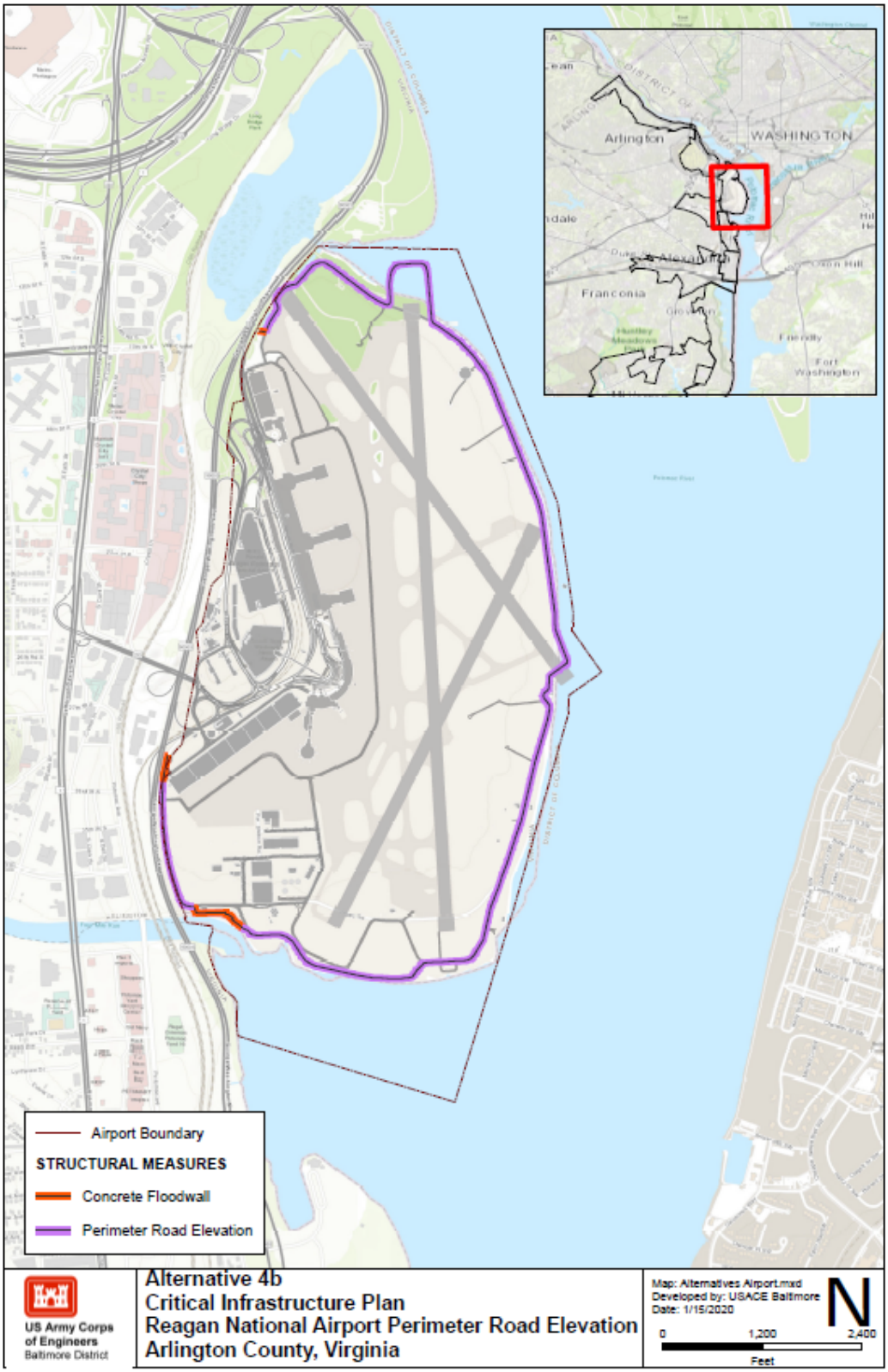


Figure 4. Alternative 4b, Reagan National Airport Perimeter Road Elevation.

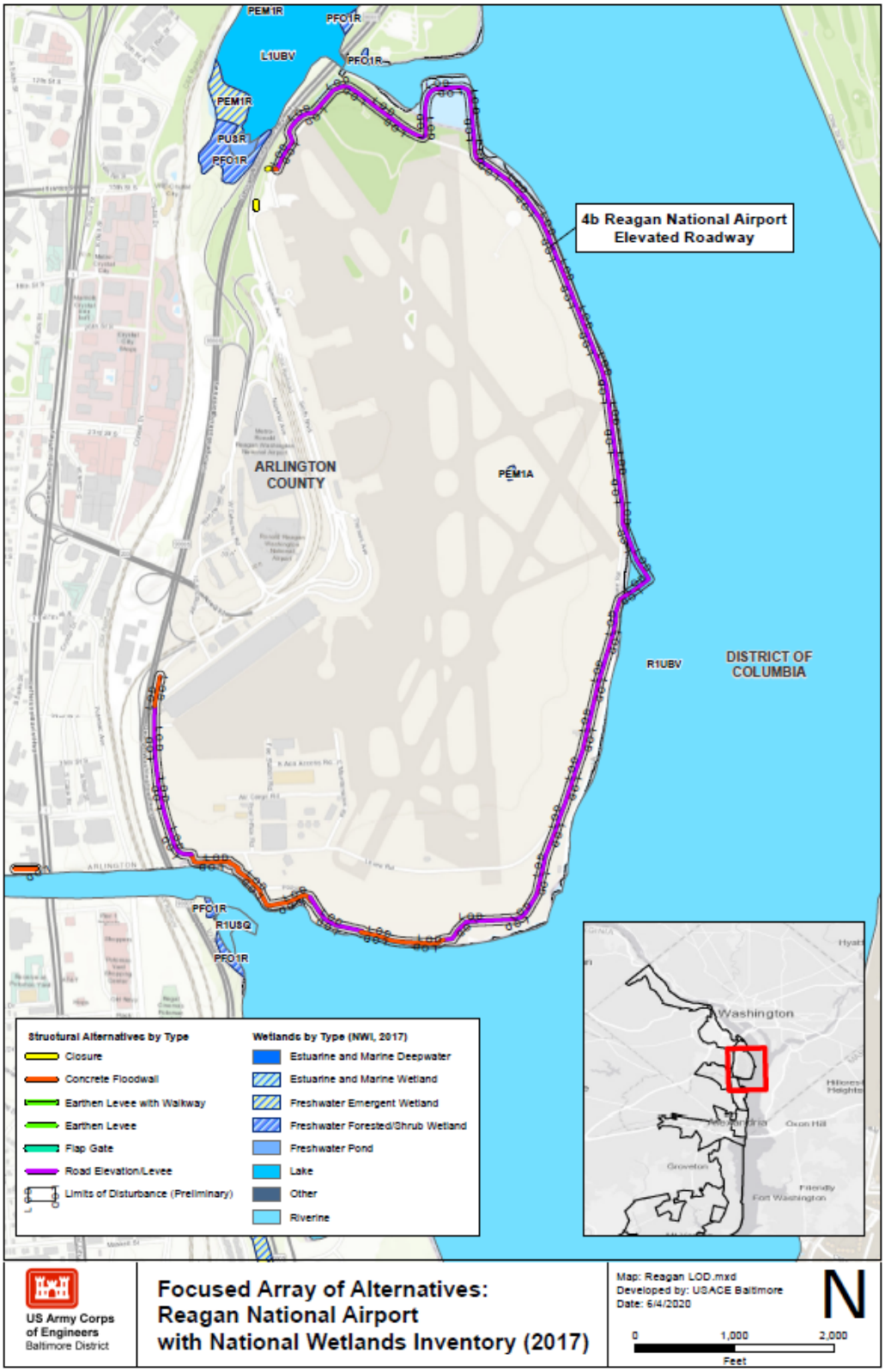


Figure 5. Alternative 4b, Reagan National Airport Perimeter Road Elevation highlighting structures, limits of disturbance, and wetlands.

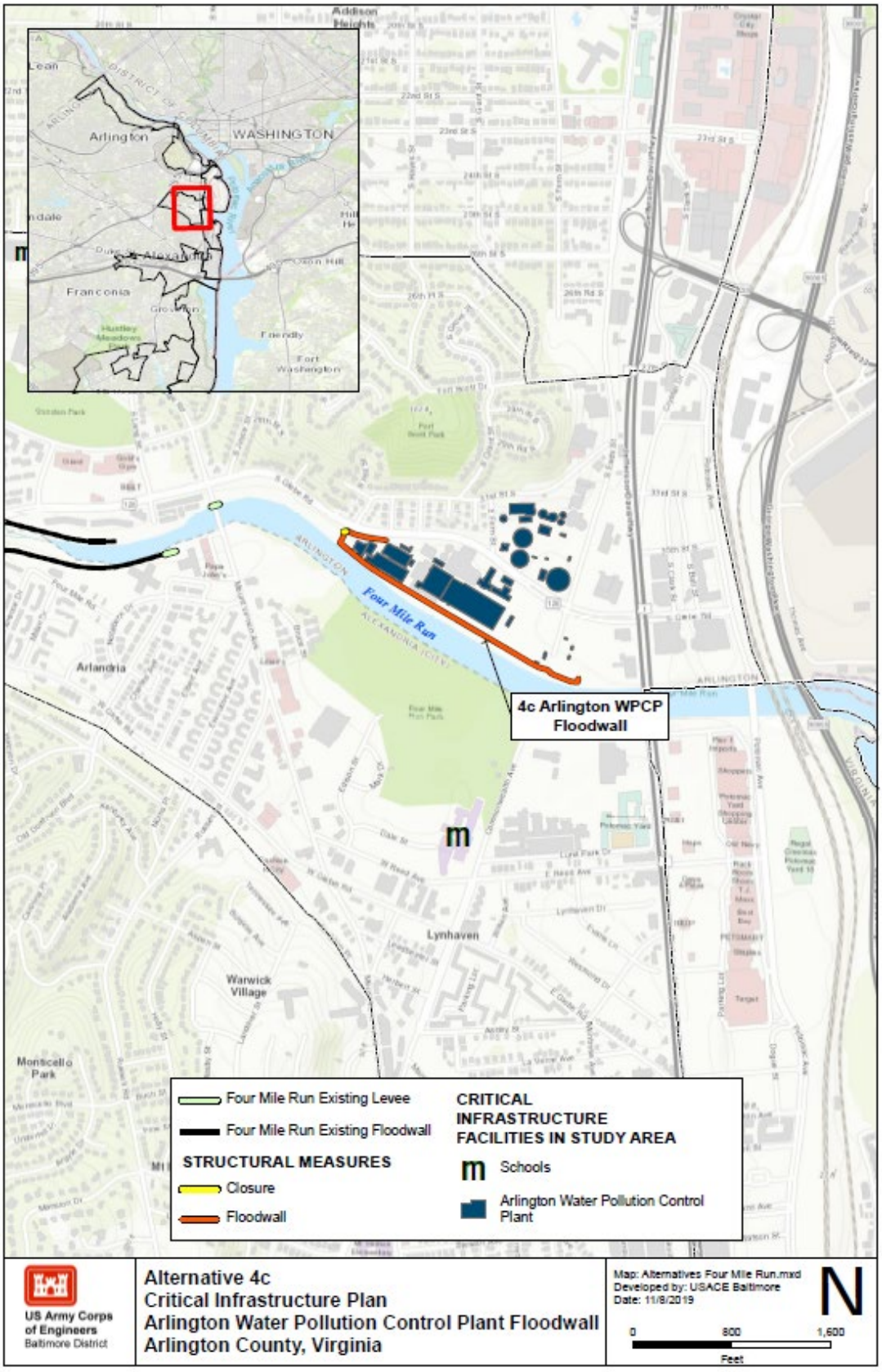


Figure 6. Alternative 4c, Arlington Water Pollution Control Plant (AWPCP) Floodwall.

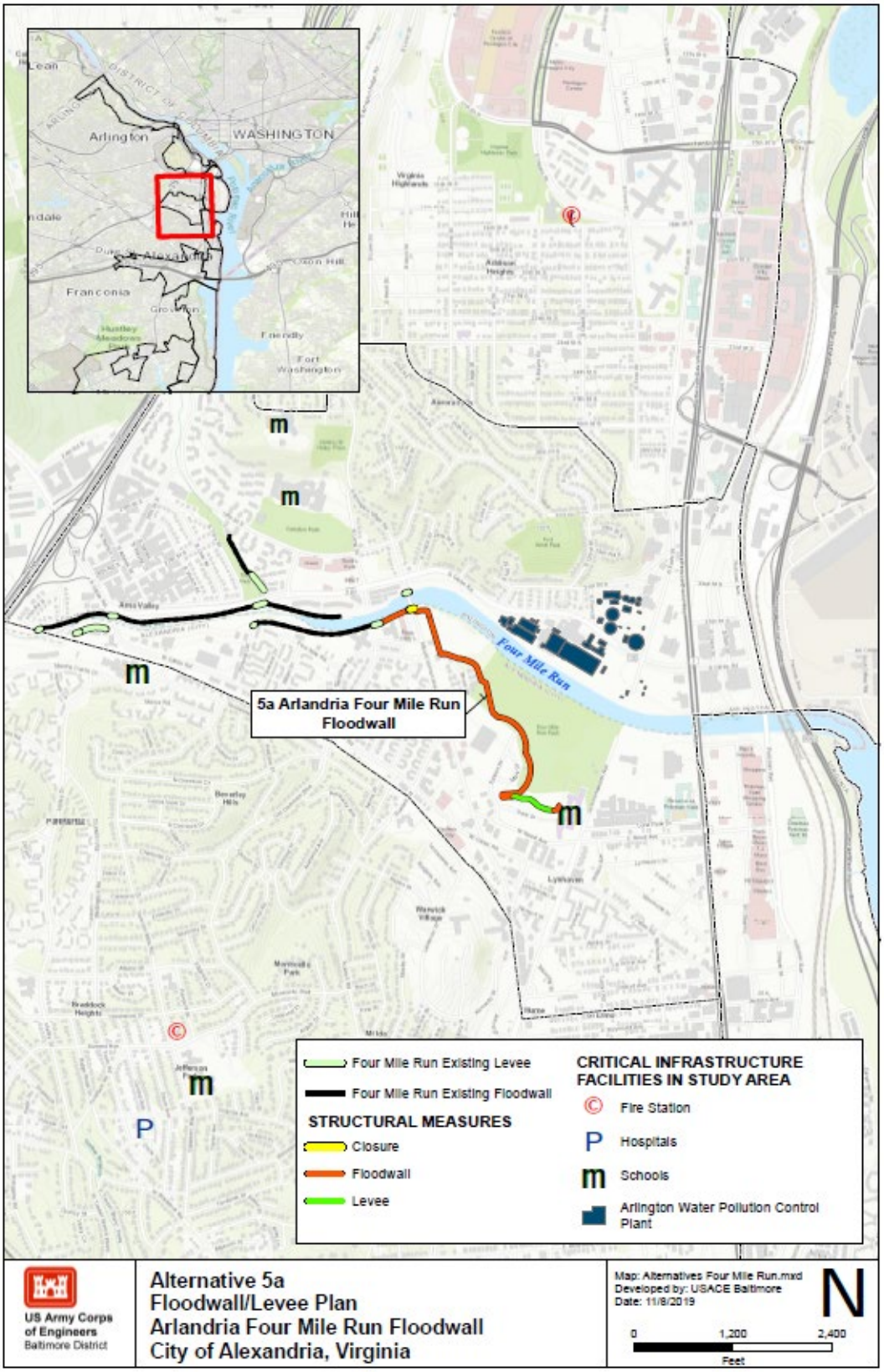


Figure 7. Alternative 5a, Arlandria Four Mile Run Floodwall.

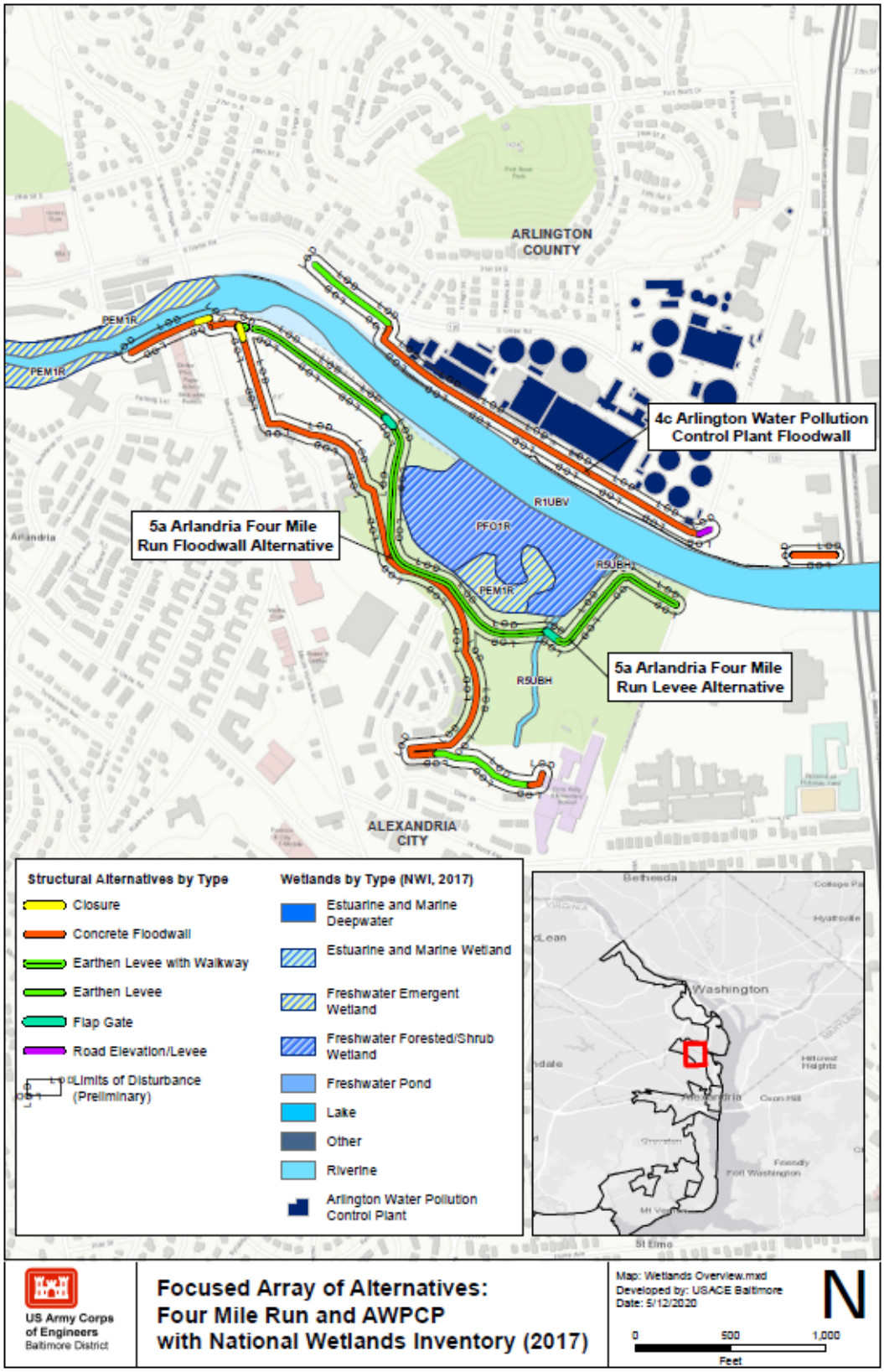


Figure 8. Alternatives 4c and 5a, Arlandria Four Mile Run and Arlington Water Pollution Control Plant, highlighting structures, limits of disturbance, and wetlands.

APPENDIX A

Information for Planning and Consultation (IPaC) Database Search Results

IPaC **U.S. Fish & Wildlife Service**

IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

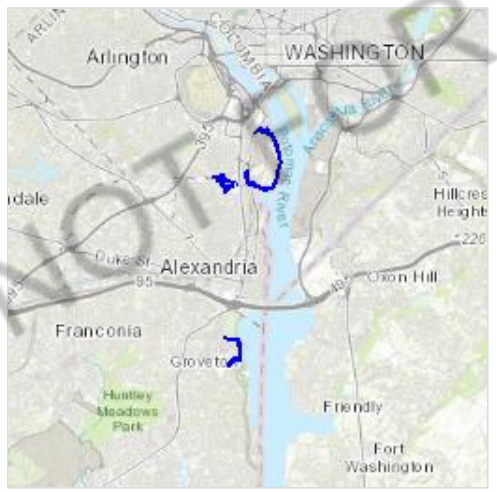
Project information

NAME

NOVA infrastructure COE PAR 09292020

LOCATION

District of Columbia and Virginia



DESCRIPTION

national airport 4 mile run and belle haven

Local offices

Chesapeake Bay Ecological Services Field Office

(410) 573-4599
(410) 266-9127

177 Admiral Cochrane Drive
Annapolis, MD 21401-7307

http://www.fws.gov/chesapeakebay/
http://www.fws.gov/chesapeakebay/endsppweb/ProjectReview/Index.html

Virginia Ecological Services Field Office

(804) 693-6694
(804) 693-9032

6669 Short Lane
Gloucester, VA 23061-4410

http://www.fws.gov/northeast/virginiafield/

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population, even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Log in to IPaC.
2. Go to your My Projects list.
3. Click PROJECT HOME for this project.
4. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information.
2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

Mammals

NAME	STATUS

Northern Long-eared Bat Myotis septentrionalis Threatened
No critical habitat has been designated for this species.
https://ecos.fws.gov/ecp/species/9045

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

THERE ARE NO CRITICAL HABITATS AT THIS LOCATION.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php
- Measures for avoiding and minimizing impacts to birds http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php
- Nationwide conservation measures for birds http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON (IF A BREEDING SEASON IS INDICATED FOR A BIRD ON YOUR LIST, THE BIRD MAY BREED IN YOUR PROJECT AREA SOMETIME WITHIN THE TIMEFRAME SPECIFIED, WHICH IS A VERY LIBERAL ESTIMATE OF THE DATES INSIDE WHICH THE BIRD BREEDS ACROSS ITS ENTIRE RANGE. "BREEDS ELSEWHERE" INDICATES THAT THE BIRD DOES NOT LIKELY BREED IN YOUR PROJECT AREA.)
Bald Eagle *Haliaeetus leucocephalus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Oct 15 to Aug 31
Black-billed Cuckoo *Coccyzus erythropthalmus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9399	Breeds May 15 to Oct 10
Bobolink *Dolichonyx oryzivorus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 20 to Jul 31
Canada Warbler *Cardellina canadensis* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 20 to Aug 10
Cerulean Warbler *Dendroica cerulea* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/2974	Breeds Apr 29 to Jul 20
Dunlin *Calidris alpina arcticola* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA	Breeds elsewhere

Eastern Whip-poor-will Antrostomus vociferus — Breeds May 1 to Aug 20
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Golden Eagle Aquila chrysaetos — Breeds elsewhere
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.
https://ecos.fws.gov/ecp/species/1680

Golden-winged Warbler Vermivora chrysoptera — Breeds May 1 to Jul 20
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/8745

Hudsonian Godwit Limosa haemastica — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Kentucky Warbler Oporornis formosus — Breeds Apr 20 to Aug 20
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Least Tern Sterna antillarum — Breeds Apr 20 to Sep 10
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Lesser Yellowlegs Tringa flavipes — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9679

Prairie Warbler Dendroica discolor — Breeds May 1 to Jul 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Prothonotary Warbler Protonotaria citrea — Breeds Apr 1 to Jul 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Red-headed Woodpecker Melanerpes erythrocephalus — Breeds May 10 to Sep 10
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Red-throated Loon Gavia stellata This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds elsewhere
Ruddy Turnstone Arenaria interpres morinella This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA	Breeds elsewhere
Rusty Blackbird Euphagus carolinus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds elsewhere
Semipalmated Sandpiper Calidris pusilla This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds elsewhere
Short-billed Dowitcher Limnodromus griseus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9480	Breeds elsewhere
Snowy Owl Bubo scandiacus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds elsewhere
Whimbrel Numenius phaeopus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9483	Breeds elsewhere
Willet Tringa semipalmata This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Apr 20 to Aug 5
Wood Thrush Hylocichla mustelina This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 10 to Aug 31

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season (▪)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

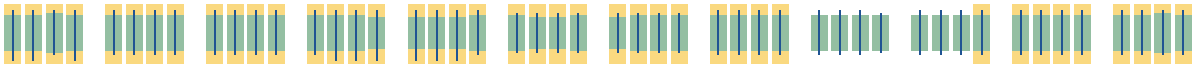
Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

To see a bar's survey effort range, simply hover your mouse cursor over the bar.

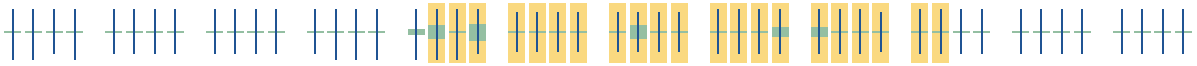
No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.

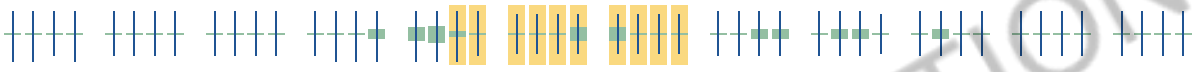
Bald Eagle
Non-BCC Vulnerable (This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.)



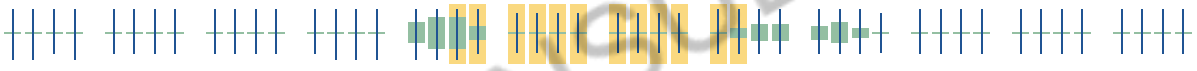
Black-billed Cuckoo
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



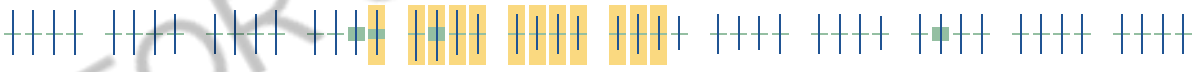
Bobolink
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



Canada Warbler
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

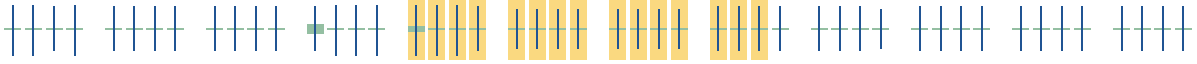


Cerulean Warbler
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



Dunlin
BCC - BCR (This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA)

Eastern Whip-poor-will
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



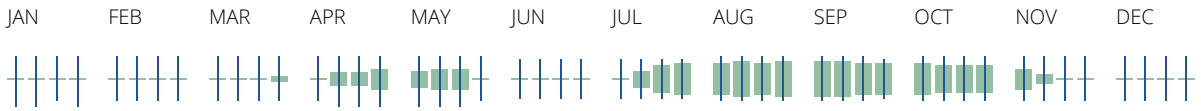
Golden Eagle
Non-BCC Vulnerable (This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.)

Golden-winged Warbler
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

Hudsonian Godwit
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

Kentucky Warbler
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

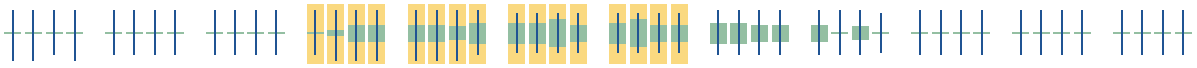
Least Tern
BCC - BCR (This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA)



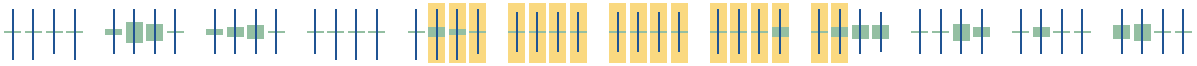
Lesser Yellowlegs
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

Prairie Warbler
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

Prothonotary Warbler
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



Red-headed Woodpecker
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

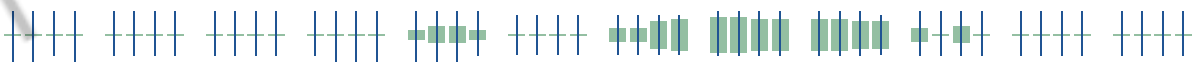


Red-throated Loon
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

Ruddy Turnstone
BCC - BCR (This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA)

Rusty Blackbird
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

Semipalmated Sandpiper
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



Short-billed Dowitcher
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures and/or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the AKN Phenology Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets .

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: The Cornell Lab of Ornithology All About Birds Bird Guide, or (if you are unsuccessful in locating the bird of interest there), the Cornell Lab of Ornithology Neotropical Birds guide. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS AT THIS LOCATION.

Fish hatcheries

THERE ARE NO FISH HATCHERIES AT THIS LOCATION.

Wetlands in the National Wetlands Inventory

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

This location overlaps the following wetlands:

FRESHWATER EMERGENT WETLAND

- PEM1R
- PEM1Rb
- PEM1Ad

FRESHWATER FORESTED/SHRUB WETLAND

- PFO1R

RIVERINE

- R1UBV
- R1UBTx
- R5UBH

A full description for each wetland code can be found at the National Wetlands Inventory website

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

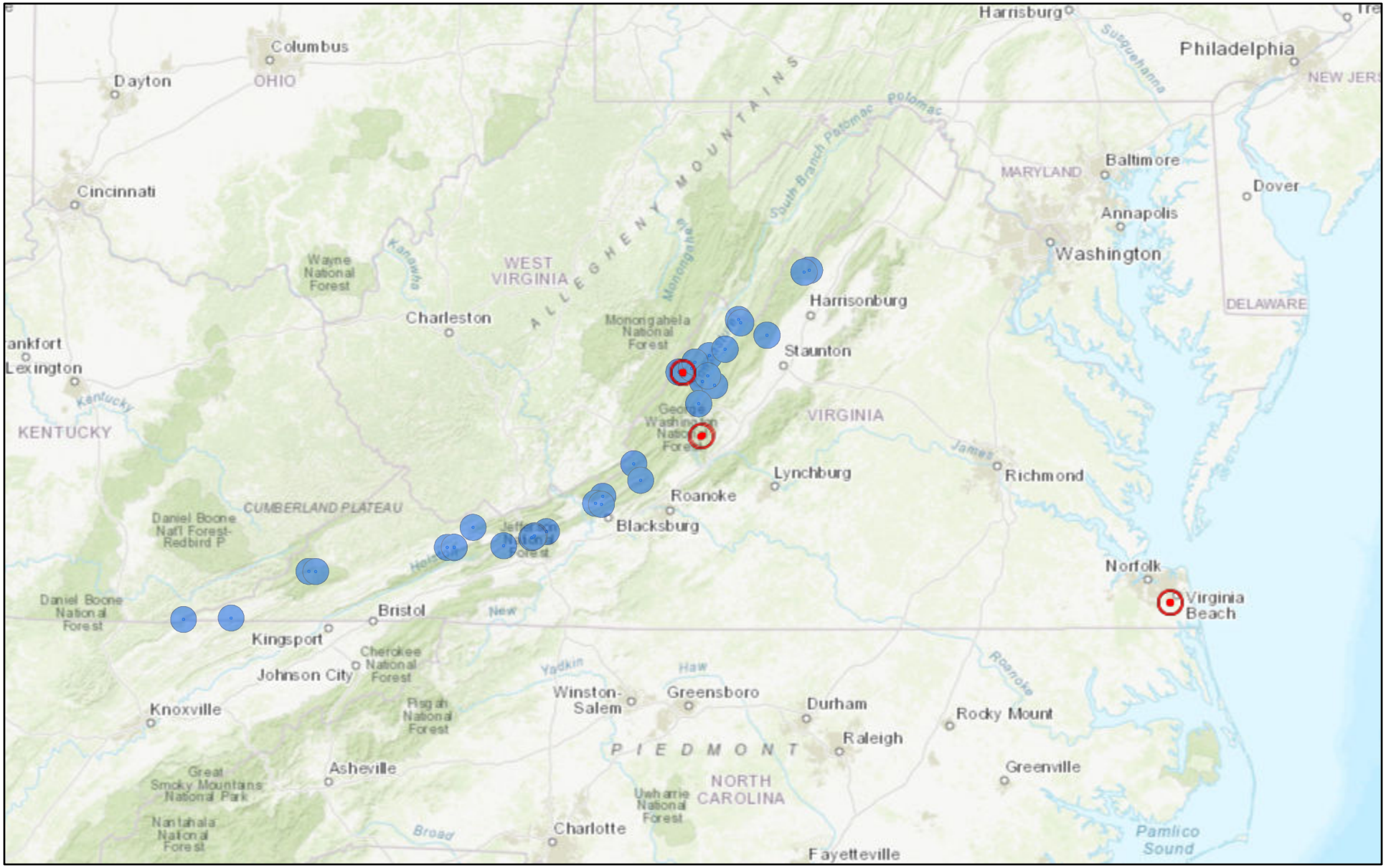
Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

APPENDIX B

Map of Known Northern Long-eared Bat Maternity Roost Trees in Virginia

Virginia NLEB Locations and Roost Trees



9/29/2020, 10:26:28 AM

1:4,622,334

0 30 60 120 mi

0 50 100 200 km

NLEB Known Occupied Maternity Roost (Summer Habitat)

NLEB Hibernaculum 5.5 Mile Buffer

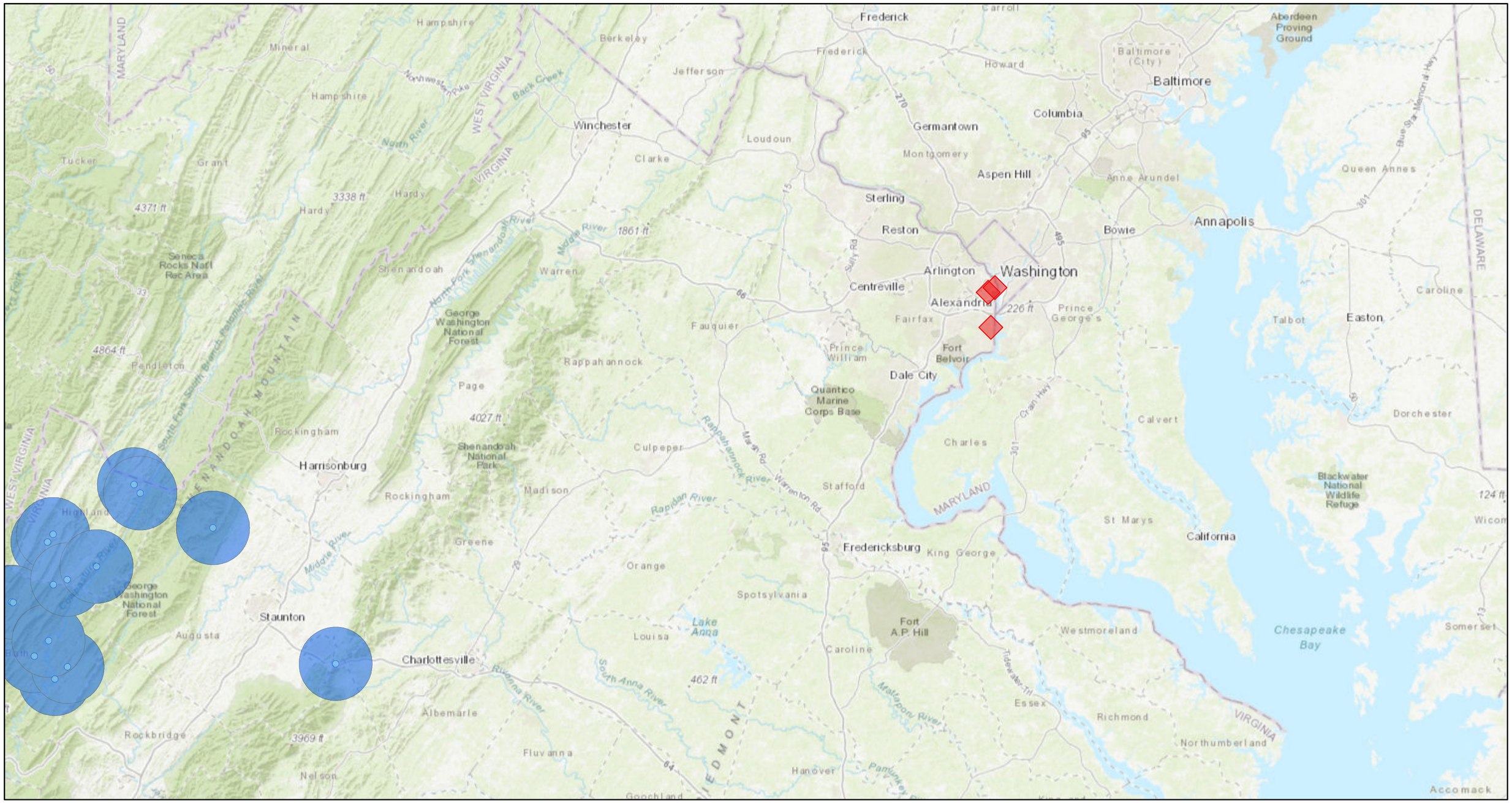
NLEB Hibernaculum Half Mile Buffer

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS,

VA Dept. Game & Inland Fisheries

Esri, HERE, Garmin, FAO, USGS, EPA, NPS |

Known Tri-colored and Little Brown Bat Hibernaculum in Virginia, with Action Areas Highlighted



2020. 11. 6. 오후 1:15:42

Tri-colored and Little Brown Hibernaculum Half Mile Buffer

Tri-colored and Little Brown Hibernaculum 5.5 Mile Buffer

1:1,155,581

0 10 20 40 mi

0 15 30 60 km

Esri, HERE, Garmin, FAO, USGS, NGA, EPA, NPS

Dept. Game and Inland Fisheries
Esri, HERE, Garmin, FAO, USGS, NGA, EPA, NPS |

APPENDIX C

Communication Regarding Endangered Species Act Section 7(a) Compliance

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Virginia Ecological Services Field Office
6669 Short Lane
Gloucester, VA 23061-4410
Phone: (804) 693-6694 Fax: (804) 693-9032
http://www.fws.gov/northeast/virginiafield/

In Reply Refer To: September 29, 2020
Consultation Code: 05E2VA00-2020-SLI-6411
Event Code: 05E2VA00-2020-E-17737
Project Name: NOVA infrastructure COE PAR 09292020

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*). Any activity proposed on National Wildlife Refuge lands must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered

species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm; http://www.towerkill.com; and http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List
- USFWS National Wildlife Refuges and Fish Hatcheries

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Virginia Ecological Services Field Office
6669 Short Lane
Gloucester, VA 23061-4410
(804) 693-6694

This project's location is within the jurisdiction of multiple offices. Expect additional species list documents from the following office, and expect that the species and critical habitats in each document reflect only those that fall in the office's jurisdiction:

Chesapeake Bay Ecological Services Field Office
177 Admiral Cochrane Drive
Annapolis, MD 21401-7307
(410) 573-4599

Project Summary

Consultation Code: 05E2VA00-2020-SLI-6411

Event Code: 05E2VA00-2020-E-17737

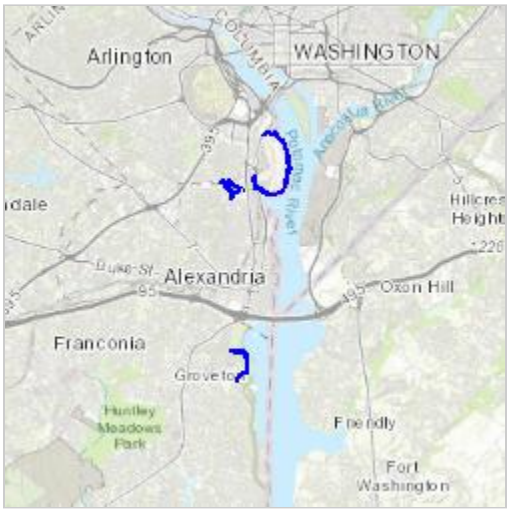
Project Name: NOVA infrastructure COE PAR 09292020

Project Type: LAND - FLOODING

Project Description: national airport 4 mile run and belle haven

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/38.841164646551945N77.05321485551792W



Counties: District of Columbia, DC | Alexandria, VA | Arlington, VA | Fairfax, VA

Endangered Species Act Species

There is a total of 1 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

---

1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
Northern Long-eared Bat *Myotis septentrionalis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Threatened

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

USFWS National Wildlife Refuge Lands And Fish Hatcheries

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS OR FISH HATCHERIES WITHIN YOUR PROJECT AREA.

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Assistant Regional Director-Ecological Services
5600 American Blvd. West
Bloomington, MN 55437-1458
Phone: (612) 713-5350 Fax: (612) 713-5292

In Reply Refer To: September 29, 2020
Consultation Code: 05E2CB00-2020-TA-1897
Consultation Code: 05E2VA00-2020-TA-6411
Event Code: 05E2CB00-2020-E-05246
Project Name: NOVA infrastructure COE PAR 09292020

Subject: Verification letter for the 'NOVA infrastructure COE PAR 09292020' project under the January 5, 2016, Programmatic Biological Opinion on Final 4(d) Rule for the Northern Long-eared Bat and Activities Excepted from Take Prohibitions.

Dear Fred Pinkney:

The U.S. Fish and Wildlife Service (Service) received on September 29, 2020 your effects determination for the 'NOVA infrastructure COE PAR 09292020' (the Action) using the northern long-eared bat (*Myotis septentrionalis*) key within the Information for Planning and Consultation (IPaC) system. This IPaC key assists users in determining whether a Federal action is consistent with the activities analyzed in the Service's January 5, 2016, Programmatic Biological Opinion (PBO). The PBO addresses activities excepted from "take"[1] prohibitions applicable to the northern long-eared bat under the Endangered Species Act of 1973 (ESA) (87 Stat.884, as amended; 16 U.S.C. 1531 et seq.).

Based upon your IPaC submission, the Action is consistent with activities analyzed in the PBO. The Action may affect the northern long-eared bat; however, any take that may occur as a result of the Action is not prohibited under the ESA Section 4(d) rule adopted for this species at 50 CFR §17.40(o). Unless the Service advises you within 30 days of the date of this letter that your IPaC-assisted determination was incorrect, this letter verifies that the PBO satisfies and concludes your responsibilities for this Action under ESA Section 7(a)(2) with respect to the northern long-eared bat.

Please report to our office any changes to the information about the Action that you submitted in IPaC, the results of any bat surveys conducted in the Action area, and any dead, injured, or sick northern long-eared bats that are found during Action implementation. If the Action is not completed within one year of the date of this letter, you must update and resubmit the information required in the IPaC key.

If the Action may affect other federally listed species besides the northern long-eared bat, a proposed species, and/or designated critical habitat, additional consultation between you and this Service office is required. If the Action may disturb bald or golden eagles, additional coordination with the Service under the Bald and Golden Eagle Protection Act is recommended.

---

[1]Take means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct [ESA Section 3(19)].

Action Description
You provided to IPaC the following name and description for the subject Action.

1. Name

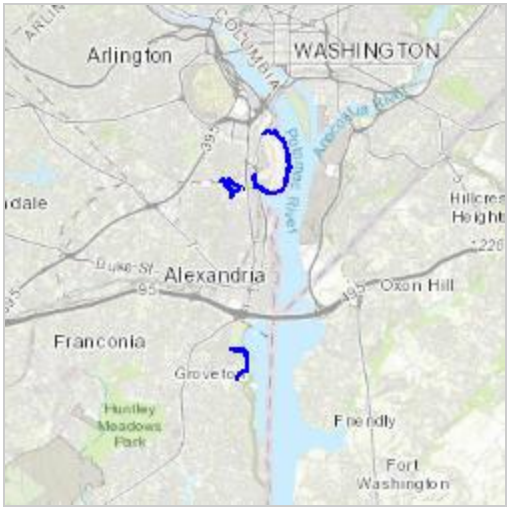
NOVA infrastructure COE PAR 09292020

2. Description

The following description was provided for the project 'NOVA infrastructure COE PAR 09292020':

national airport 4 mile run and belle haven

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/38.841164646551945N77.05321485551792W



Determination Key Result

This Federal Action may affect the northern long-eared bat in a manner consistent with the description of activities addressed by the Service's PBO dated January 5, 2016. Any taking that may occur incidental to this Action is not prohibited under the final 4(d) rule at 50 CFR §17.40(o). Therefore, the PBO satisfies your responsibilities for this Action under ESA Section 7(a)(2) relative to the northern long-eared bat.

Determination Key Description: Northern Long-eared Bat 4(d) Rule

This key was last updated in IPaC on May 15, 2017. Keys are subject to periodic revision.

This key is intended for actions that may affect the threatened northern long-eared bat.

The purpose of the key for Federal actions is to assist determinations as to whether proposed actions are consistent with those analyzed in the Service's PBO dated January 5, 2016.

Federal actions that may cause prohibited take of northern long-eared bats, affect ESA-listed species other than the northern long-eared bat, or affect any designated critical habitat, require ESA Section 7(a)(2) consultation in addition to the use of this key. Federal actions that may affect species proposed for listing or critical habitat proposed for designation may require a conference under ESA Section 7(a)(4).

Determination Key Result

This project may affect the threatened Northern long-eared bat; therefore, consultation with the Service pursuant to Section 7(a)(2) of the Endangered Species Act of 1973 (87 Stat.884, as amended; 16 U.S.C. 1531 et seq.) is required. However, based on the information you provided, this project may rely on the Service's January 5, 2016, *Programmatic Biological Opinion on Final 4(d) Rule for the Northern Long-Eared Bat and Activities Excepted from Take Prohibitions* to fulfill its Section 7(a)(2) consultation obligation.

Qualification Interview

1. Is the action authorized, funded, or being carried out by a Federal agency?

   Yes

2. Have you determined that the proposed action will have "no effect" on the northern long-eared bat? (If you are unsure select "No")

   No

3. Will your activity purposefully **Take** northern long-eared bats?

   No

4. [Semantic] Is the project action area located wholly outside the White-nose Syndrome Zone?

   Automatically answered
   No

5. Have you contacted the appropriate agency to determine if your project is near a known hibernaculum or maternity roost tree?

   Location information for northern long-eared bat hibernacula is generally kept in state Natural Heritage Inventory databases – the availability of this data varies state-by-state. Many states provide online access to their data, either directly by providing maps or by providing the opportunity to make a data request. In some cases, to protect those resources, access to the information may be limited. A web page with links to state Natural Heritage Inventory databases and other sources of information on the locations of northern long-eared bat roost trees and hibernacula is available at www.fws.gov/midwest/endangered/mammals/nleb/nhisites.html.

   Yes

6. Will the action affect a cave or mine where northern long-eared bats are known to hibernate (i.e., hibernaculum) or could it alter the entrance or the environment (physical or other alteration) of a hibernaculum?

   No

7. Will the action involve Tree Removal?

   Yes

8. Will the action only remove hazardous trees for the protection of human life or property?

   No

9. Will the action remove trees within 0.25 miles of a known northern long-eared bat hibernaculum at any time of year?

   No

10. Will the action remove a known occupied northern long-eared bat maternity roost tree or any trees within 150 feet of a known occupied maternity roost tree from June 1 through July 31?

    No

Project Questionnaire

If the project includes forest conversion, report the appropriate acreages below. Otherwise, type '0' in questions 1-3.

1. Estimated total acres of forest conversion:

0

2. If known, estimated acres of forest conversion from April 1 to October 31

0

3. If known, estimated acres of forest conversion from June 1 to July 31

0

If the project includes timber harvest, report the appropriate acreages below. Otherwise, type '0' in questions 4-6.

4. Estimated total acres of timber harvest

0

5. If known, estimated acres of timber harvest from April 1 to October 31

0

6. If known, estimated acres of timber harvest from June 1 to July 31

0

If the project includes prescribed fire, report the appropriate acreages below. Otherwise, type '0' in questions 7-9.

7. Estimated total acres of prescribed fire

0

8. If known, estimated acres of prescribed fire from April 1 to October 31

0

9. If known, estimated acres of prescribed fire from June 1 to July 31

0

If the project includes new wind turbines, report the megawatts of wind capacity below. Otherwise, type '0' in question 10.

10. What is the estimated wind capacity (in megawatts) of the new turbine(s)?

0

APPENDIX D

The Virginia Fish and Wildlife Information Service (VaFWIS) Database Search Results

VaFWIS Search Report Compiled on 9/9/2020, 11:04:22 AM

Help

Observations reported or potential habitat occurs within a **3 mile radius around point 38.7652472 -77.0587305**
in **013 Arlington County, 059 Fairfax County, 510 Alexandria City, VA**

View Map of Site Location

747 Known or Likely Species ordered by Status Concern for Conservation
(displaying first 32) (32 species with Status* or Tier I** or Tier II**)

BOVA Code	Status*	Tier**	Common Name	Scientific Name
010032	FESE	Ib	Sturgeon, Atlantic	Acipenser oxyrinchus
050022	FTST	Ia	Bat, northern long-eared	Myotis septentrionalis
060029	FTST	IIa	Lance, yellow	Elliptio lanceolata
050020	SE	Ia	Bat, little brown	Myotis lucifugus
050027	SE	Ia	Bat, tri-colored	Perimyotis subflavus
060006	SE	Ib	Floater, brook	Alasmidonta varicosa
030062	ST	Ia	Turtle, wood	Glyptemys insculpta
040096	ST	Ia	Falcon, peregrine	Falco peregrinus
040293	ST	Ia	Shrike, loggerhead	Lanius ludovicianus
040379	ST	Ia	Sparrow, Henslow's	Centronyx henslowii
100155	ST	Ia	Skipper, Appalachian grizzled	Pyrgus wyandot
040292	ST		Shrike, migrant loggerhead	Lanius ludovicianus migrans
030063	CC	IIIa	Turtle, spotted	Clemmys guttata
030012	CC	IVa	Rattlesnake, timber	Crotalus horridus
010077		Ia	Shiner, bridle	Notropis bifrenatus
040040		Ia	Ibis, glossy	Plegadis falcinellus
040306		Ia	Warbler, golden-winged	Vermivora chrysoptera
100248		Ia	Fritillary, regal	Speyeria idalia idalia
040213		Ic	Owl, northern saw-whet	Aegolius acadicus
040052		IIa	Duck, American black	Anas rubripes
040033		IIa	Egret, snowy	Egretta thula
040029		IIa	Heron, little blue	Egretta caerulea caerulea
040036		IIa	Night-heron, yellow-crowned	Nyctanassa violacea violacea
040181		IIa	Tern, common	Sterna hirundo
040320		IIa	Warbler, cerulean	Setophaga cerulea
040140		IIa	Woodcock, American	Scolopax minor
060071		IIa	Lampmussel, yellow	Lampsilis cariosa
040203		IIb	Cuckoo, black-billed	Coccyzus erythropthalmus
040105		IIb	Rail, king	Rallus elegans

040304		IIc	Warbler, Swainson's	Limnothlypis swainsonii
070020		IIc	Amphipod, Pizzini's	Stygobromus pizzinii
100154		IIc	Butterfly, Persius duskywing	Erynnis persius persius

To view **All 747 species** View 747

*FE=Federal Endangered; FT=Federal Threatened; SE=State Endangered; ST=State Threatened; FP=Federal Proposed; FC=Federal Candidate; CC=Collection Concern

**I=VA Wildlife Action Plan - Tier I - Critical Conservation Need; II=VA Wildlife Action Plan - Tier II - Very High Conservation Need; III=VA Wildlife Action Plan - Tier III - High Conservation Need;
IV=VA Wildlife Action Plan - Tier IV - Moderate Conservation Need
Virginia Widlife Action Plan Conservation Opportunity Ranking:
a - On the ground management strategies/actions exist and can be feasibly implemented.;
b - On the ground actions or research needs have been identified but cannot feasibly be implemented at this time.;
c - No on the ground actions or research needs have been identified or all identified conservation opportunities have been exhausted.

Anadromous Fish Use Streams (2 records)

View Map of All Anadromous Fish Use Streams

Stream ID	Stream Name	Reach Status	Anadromous Fish Species			View Map
			Different Species	Highest TE*	Highest Tier**	
C25	Fourmile run	Confirmed	2			Yes
C64	Potomac river	Confirmed	6		IV	Yes

Impediments to Fish Passage

N/A

Threatened and Endangered Waters

N/A

Managed Trout Streams

N/A

Bald Eagle Concentration Areas and Roosts

N/A

Bald Eagle Nests

N/A

Habitat Predicted for Aquatic WAP Tier I & II Species

N/A

Habitat Predicted for Terrestrial WAP Tier I & II Species (2 Species)

View Map of Combined Terrestrial Habitat Predicted for 2 WAP Tier I & II Species Listed Below

ordered by Status Concern for Conservation

BOVA Code	Status*	Tier**	Common Name	Scientific Name	View Map
040105		IIb	Rail, king	Rallus elegans	Yes
040038			Bittern, American	Botaurus lentiginosus	Yes

Virginia Breeding Bird Atlas Blocks (5 records)

View Map of All Query Results
Virginia Breeding Bird Atlas Blocks

BBA ID	Atlas Quadrangle Block Name	Breeding Bird Atlas Species			View Map
		Different Species	Highest TE*	Highest Tier**	
54194	Alexandria, CE	49		II	Yes
54193	Alexandria, CW	27		IV	Yes
54192	Alexandria, NE	32		II	Yes
54191	Alexandria, NW	58		III	Yes
54205	Washington West, SW	65		III	Yes

Public Holdings: (5 names)

Name	Agency	Level
Arlington House National Historical Site	National Park Service	Federal
George Washington Memorial National Parkway	National Park Service	Federal
Arlington National Cemetary	U.S. Dept. of Army	Federal
Fort Myer Military Reservation	U.S. Dept. of Army	Federal
The Pentagon	U.S. Dept. of Army	Federal

Summary of BOVA Species Associated with Cities and Counties of the Commonwealth of Virginia:

FIPS Code	City and County Name	Different Species	Highest TE	Highest Tier
013	Arlington	458	FESE	I
059	Fairfax	559	FESE	I
510	Alexandria City	475	FESE	I

USGS 7.5' Quadrangles:
Alexandria
Washington West

USGS NRCS Watersheds in Virginia:

N/A

USGS National 6th Order Watersheds Summary of Wildlife Action Plan Tier I, II, III, and IV Species:

HU6 Code	USGS 6th Order Hydrologic Unit	Different Species	Highest TE	Highest Tier
PL24	Potomac River-Pimmit Run	68	SE	I
PL25	Potomac River-Fourmile Run	67	ST	I
PL26	Cameron Run	69	ST	I
PL28	Potomac River-Little Hunting Creek	71	ST	I

Compiled on 9/9/2020, 11:04:23 AM V1052860.0 report=V searchType= R dist= 4827 poi= 38.7652472 -77.0587305

APPENDIX E

Virginia Natural Heritage Resources

Natural Heritage Resources

Your Criteria

County: Alexandria (City)

Watershed (8 digit HUC): 02070010 - Middle Potomac-Anacostia-Occoquan

Search Run: 9/11/2020 14:19:25 PM

Result Summary

Total Species returned: 21

Total Communities returned: 0

Click scientific names below to go to NatureServe report.

Click column headings for an explanation of species and community ranks.

Common Name/Natural Community	Scientific Name	Scientific Name Linked	Global Conservation Status Rank	State Conservation Status Rank	Federal Legal Status	State Legal Status	Statewide Occurrences	Virginia Coastal Zone
Alexandria (City)								
Middle Potomac-Anacostia-Occoquan								
COLEOPTERA (BEETLES)								
A Tiger Beetle	Cicindela limbalis	Cicindela limbalis	G5	S1	None	None	1	Y
CRUSTACEA (AMPHIPODS, ISOPODS & DECAPODS)								
Northern Virginia Well Amphipod	Stygobromus phreaticus	Stygobromus phreaticus	G1	S1	SOC	None	3	Y
REPTILES								
Wood Turtle	Glyptemys insculpta	Glyptemys insculpta	G3	S2	None	LT	49	Y
VASCULAR PLANTS								
Red Milkweed	Asclepias rubra	Asclepias rubra	G4G5	S2	None	None	30	Y
River Bulrush	Bolboschoenus fluviatilis	Bolboschoenus fluviatilis	G5	S2	None	None	16	Y
Fringed brome grass	Bromus ciliatus	Bromus ciliatus	G5	S1	None	None	5	Y
American bluehearts	Buchnera americana	Buchnera americana	G5?	S1S2	None	None	20	Y
Crested Sedge	Carex cristatella	Carex cristatella	G5	S1	None	None	15	Y
Pear Hawthorn	Crataegus calpodendron	Crataegus calpodendron	G5	S1	None	None	7	Y
Showy Tick-trefoil	Desmodium canadense	Desmodium canadense	G5	S1	None	None	6	Y
Wild cucumber	Echinocystis lobata	Echinocystis lobata	G5	SH	None	None	3	Y
Torrey's Rush	Juncus torreyi	Juncus torreyi	G5	S1	None	None	19	Y

Common Name/Natural Community	Scientific Name	Scientific Name Linked	Global Conservation Status Rank	State Conservation Status Rank	Federal Legal Status	State Legal Status	Statewide Occurrences	Virginia Coastal Zone
Nuttall's Micranthemum	Micranthemum micranthemoides	Micranthemum micranthemoides	GH	SH	None	None	6	Y
Glandular Cinnamon Fern	Osmundastrum cinnamomeum var. glandulosum	Osmundastrum cinnamomeum var. glandulosum	G5TNR	S1	None	None	2	Y
King-root	Plantago cordata	Plantago cordata	G4	SH	None	None	4	Y
Bigleaf Pondweed	Potamogeton amplifolius	Potamogeton amplifolius	G5	S1	None	None	12	Y
Fries' pondweed	Potamogeton friesii	Potamogeton friesii	G5	SH	None	None	1	Y
Flatleaf Pondweed	Potamogeton robbinsii	Potamogeton robbinsii	G5	SH	None	None	1	Y
Flatstem Pondweed	Potamogeton zosteriformis	Potamogeton zosteriformis	G5	S1	None	None	3	Y
Water-plantain crowfoot	Ranunculus ambigens	Ranunculus ambigens	G4	S1	None	None	10	Y
Smith's Bulrush	Schoenoplectus smithii	Schoenoplectus smithii	G5?	SH	None	None	1	Y

Note: On-line queries provide basic information from DCR's databases at the time of the request. They are NOT to be substituted for a project review or for on-site surveys required for environmental assessments of specific project areas.

For Additional Information on locations of Natural Heritage Resources please submit an information request.

To Contribute information on locations of natural heritage resources, please fill out and submit a rare species sighting form.

APPENDIX F

eBird Database Search Results

eBird Menu

« Start Over

Bird Observations

Date Range: Change Date
Jan-Dec, 2000-2020

Change Location **Dyke Marsh Wildlife Preserve**

Updated ~1 day(s) ago.

265 species (+43 other taxa)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Snow Goose (*Anser caerulescens*)												
Ross's Goose (*Anser rossii*)												
Greater White-fronted Goose (*Anser albifrons*)												
Domestic goose sp. (Domestic type) (*Anser sp. (Domestic type)*)												
Brant (*Branta bernicla*)												
Barnacle Goose (*Branta leucopsis*)												
Cackling Goose (*Branta hutchinsii*)												
Canada Goose (*Branta canadensis*)												
Mute Swan (*Cygnus olor*)												
Tundra Swan (*Cygnus columbianus*)												
swan sp. (*Cygnus sp.*)												
Muscovy Duck (Domestic type) (*Cairina moschata (Domestic type)*)												
Wood Duck (*Aix sponsa*)												
Blue-winged Teal (*Spatula discors*)												
Northern Shoveler (*Spatula clypeata*)												

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec

Gadwall (*Mareca strepera*)												
American Wigeon (*Mareca americana*)												
Mallard (*Anas platyrhynchos*)												

265 species (+43 other taxa)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Mallard (Domestic type) (*Anas platyrhynchos (Domestic type)*)												
American Black Duck (*Anas rubripes*)												
Mallard x American Black Duck (hybrid) (*Anas platyrhynchos x rubripes*)												
Mallard/American Black Duck (*Anas platyrhynchos/rubripes*)												
Northern Pintail (*Anas acuta*)												
Green-winged Teal (*Anas crecca*)												
Canvasback (*Aythya valisineria*)												
Redhead (*Aythya americana*)												
Ring-necked Duck (*Aythya collaris*)												
Greater Scaup (*Aythya marila*)												
Lesser Scaup (*Aythya affinis*)												
Greater/Lesser Scaup (*Aythya marila/affinis*)												

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Aythya sp. (*Aythya sp.*)												
Surf Scoter (*Melanitta perspicillata*)												
White-winged Scoter (*Melanitta deglandi*)												
Black Scoter (*Melanitta americana*)												
Long-tailed Duck (*Clangula hyemalis*)												
Bufflehead (*Bucephala albeola*)												
Common Goldeneye (*Bucephala clangula*)												
Hooded Merganser (*Lophodytes cucullatus*)												
Common Merganser (*Mergus merganser*)												
Red-breasted Merganser (*Mergus serrator*)												
Common/Red-breasted Merganser (*Mergus merganser/serrator*)												
Ruddy Duck (*Oxyura jamaicensis*)												
duck sp. (*Anatinae sp.*)												
Northern Bobwhite (*Colinus virginianus*)												

265 species (+43 other taxa)

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec

Wild Turkey (*Meleagris gallopavo*)

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec

Pied-billed Grebe (*Podilymbus podiceps*)

Horned Grebe (*Podiceps auritus*)

Red-necked Grebe (*Podiceps grisegena*)

Eared Grebe (*Podiceps nigricollis*)

Rock Pigeon (*Columba livia*)

Mourning Dove (*Zenaida macroura*)

Yellow-billed Cuckoo (*Coccyzus americanus*)

Black-billed Cuckoo (*Coccyzus erythropthalmus*)

Common Nighthawk (*Chordeiles minor*)

Chimney Swift (*Chaetura pelagica*)

Ruby-throated Hummingbird (*Archilochus colubris*)

King Rail (*Rallus elegans*)

Virginia Rail (*Rallus limicola*)

Sora (*Porzana carolina*)

Common Gallinule (*Gallinula galeata*)

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec

American Coot (*Fulica americana*)

American Avocet (*Recurvirostra americana*)

Black-bellied Plover (*Pluvialis squatarola*)

American Golden-Plover (*Pluvialis dominica*)

Semipalmated Plover (*Charadrius semipalmatus*)

Piping Plover (*Charadrius melodus*)

Killdeer (*Charadrius vociferus*)

Whimbrel (*Numenius phaeopus*)

Hudsonian Godwit (*Limosa haemastica*)

Ruddy Turnstone (*Arenaria interpres*)

Red Knot (*Calidris canutus*)

265 species (+43 other taxa)

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec

Stilt Sandpiper (*Calidris himantopus*)

Sanderling (*Calidris alba*)

Dunlin (*Calidris alpina*)

Baird's Sandpiper (*Calidris bairdii*)

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec

Least Sandpiper (*Calidris minutilla*)

White-rumped Sandpiper (*Calidris fuscicollis*)

Pectoral Sandpiper (*Calidris melanotos*)

Semipalmated Sandpiper (*Calidris pusilla*)

Western Sandpiper (*Calidris mauri*)

peep sp. (*Calidris sp. (peep sp.)*)

Calidris sp. (*Calidris sp.*)

Short-billed Dowitcher (*Limnodromus griseus*)

Long-billed Dowitcher (*Limnodromus scolopaceus*)

American Woodcock (*Scolopax minor*)

Wilson's Snipe (*Gallinago delicata*)

Wilson's Phalarope (*Phalaropus tricolor*)

Red-necked Phalarope (*Phalaropus lobatus*)

Spotted Sandpiper (*Actitis macularius*)

Solitary Sandpiper (*Tringa solitaria*)

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec

Greater Yellowlegs (*Tringa melanoleuca*)

Willet (*Tringa semipalmata*)

Lesser Yellowlegs (*Tringa flavipes*)

Greater/Lesser Yellowlegs (*Tringa melanoleuca/flavipes*)

shorebird sp. (*Charadriiformes sp.*)

Bonaparte's Gull (*Chroicocephalus philadelphia*)

Little Gull (*Hydrocoloeus minutus*)

265 species (+43 other taxa)

Laughing Gull (*Leucophaeus atricilla*)

Franklin's Gull (*Leucophaeus pipixcan*)

Ring-billed Gull (*Larus delawarensis*)

California Gull (*Larus californicus*)

Herring Gull (*Larus argentatus*)

Iceland Gull (*Larus glaucoides*)

Lesser Black-backed Gull (*Larus fuscus*)

Glaucous Gull (*Larus hyperboreus*)

Great Black-backed Gull (*Larus marinus*)

gull sp. (*Larinae sp.*)

Sooty Tern (*Onychoprion fuscatus*)

Least Tern (*Sternula antillarum*)

Caspian Tern (*Hydroprogne caspia*)

Black Tern (*Chlidonias niger*)

Common Tern (*Sterna hirundo*)

Forster's Tern (*Sterna forsteri*)

Royal Tern (*Thalasseus maximus*)

tern sp. (*Sterninae sp.*)

Red-throated Loon (*Gavia stellata*)

Common Loon (*Gavia immer*)

loon sp. (*Gavia sp.*)

Wilson's Storm-Petrel (*Oceanites oceanicus*)

Band-rumped Storm-Petrel (*Oceanodroma castro*)

Double-crested Cormorant (*Phalacrocorax auritus*)

American White Pelican (*Pelecanus erythrorhynchos*)

American Bittern (*Botaurus lentiginosus*)

Least Bittern (*Ixobrychus exilis*)

265 species (+43 other taxa)

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec

Great Blue Heron (*Ardea herodias*)

Great Egret (*Ardea alba*)

Snowy Egret (*Egretta thula*)

Little Blue Heron (*Egretta caerulea*)

Tricolored Heron (*Egretta tricolor*)

Cattle Egret (*Bubulcus ibis*)

white egret sp. (*Ardea/Egretta/Bubulcus sp.*)

Green Heron (*Butorides virescens*)

Black-crowned Night-Heron (*Nycticorax nycticorax*)

Yellow-crowned Night-Heron (*Nyctanassa violacea*)

Black-crowned/Yellow-crowned Night-Heron (*Nycticorax nycticorax/Nyctanassa violacea*)

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec

Glossy Ibis (*Plegadis falcinellus*)

Black Vulture (*Coragyps atratus*)

Turkey Vulture (*Cathartes aura*)

Osprey (*Pandion haliaetus*)

Mississippi Kite (*Ictinia mississippiensis*)

Northern Harrier (*Circus hudsonius*)

Sharp-shinned Hawk (*Accipiter striatus*)

Cooper's Hawk (*Accipiter cooperii*)

Sharp-shinned/Cooper's Hawk (*Accipiter striatus/cooperii*)

Accipiter sp. (*Accipiter sp.*)

Bald Eagle (*Haliaeetus leucocephalus*)

Red-shouldered Hawk (*Buteo lineatus*)

Broad-winged Hawk (*Buteo platypterus*)

Red-tailed Hawk (*Buteo jamaicensis*)

Buteo sp. (*Buteo sp.*)

265 species (+43 other taxa)

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec

hawk sp. (*Accipitridae sp. (hawk sp.)*)

Eastern Screech-Owl (*Megascops asio*)

Great Horned Owl (*Bubo virginianus*)

Barred Owl (*Strix varia*)

Short-eared Owl (*Asio flammeus*)

Northern Saw-whet Owl (*Aegolius acadicus*)

Belted Kingfisher (*Megaceryle alcyon*)

Yellow-bellied Sapsucker (*Sphyrapicus varius*)

Red-headed Woodpecker (*Melanerpes erythrocephalus*)

Red-bellied Woodpecker (*Melanerpes carolinus*)

Downy Woodpecker (*Dryobates pubescens*)

Hairy Woodpecker (*Dryobates villosus*)

Downy/Hairy Woodpecker (*Dryobates pubescens/villosus*)

Pileated Woodpecker (*Dryocopus pileatus*)

Northern Flicker (*Colaptes auratus*)

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec

woodpecker sp. (*Picidae sp.*)

American Kestrel (*Falco sparverius*)

Merlin (*Falco columbarius*)

Peregrine Falcon (*Falco peregrinus*)

small falcon sp. (*Falco sp. (small falcon sp.)*)

falcon sp. (*Falco sp.*)

Eastern Wood-Pewee (*Contopus virens*)

Yellow-bellied Flycatcher (*Empidonax flaviventris*)

Acadian Flycatcher (*Empidonax virescens*)

Alder Flycatcher (*Empidonax alnorum*)

Willow Flycatcher (*Empidonax traillii*)

265 species (+43 other taxa)

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec

Alder/Willow Flycatcher (Traill's Flycatcher) (*Empidonax alnorum/traillii*)

Least Flycatcher (*Empidonax minimus*)

Empidonax sp. (*Empidonax sp.*)

Eastern Phoebe (*Sayornis phoebe*)

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec

Great Crested Flycatcher (*Myiarchus crinitus*)

Eastern Kingbird (*Tyrannus tyrannus*)

White-eyed Vireo (*Vireo griseus*)

Yellow-throated Vireo (*Vireo flavifrons*)

Blue-headed Vireo (*Vireo solitarius*)

Philadelphia Vireo (*Vireo philadelphicus*)

Warbling Vireo (*Vireo gilvus*)

Red-eyed Vireo (*Vireo olivaceus*)

vireo sp. (*Vireo sp.*)

Blue Jay (*Cyanocitta cristata*)

American Crow (*Corvus brachyrhynchos*)

Fish Crow (*Corvus ossifragus*)

crow sp. (*Corvus sp. (crow sp.)*)

Common Raven (*Corvus corax*)

Carolina Chickadee (*Poecile carolinensis*)

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec

Carolina/Black-capped Chickadee (*Poecile carolinensis/atricapillus*)

Tufted Titmouse (*Baeolophus bicolor*)

Northern Rough-winged Swallow (*Stelgidopteryx serripennis*)

Purple Martin (*Progne subis*)

Tree Swallow (*Tachycineta bicolor*)

Bank Swallow (*Riparia riparia*)

265 species (+43 other taxa)

Barn Swallow (*Hirundo rustica*)

Cliff Swallow (*Petrochelidon pyrrhonota*)

swallow sp. (*Hirundinidae sp.*)

Golden-crowned Kinglet (*Regulus satrapa*)

Ruby-crowned Kinglet (*Regulus calendula*)

Red-breasted Nuthatch (*Sitta canadensis*)

White-breasted Nuthatch (*Sitta carolinensis*)

Brown Creeper (*Certhia americana*)

Blue-gray Gnatcatcher (*Polioptila caerulea*)

House Wren (*Troglodytes aedon*)

Winter Wren (*Troglodytes hiemalis*)

Sedge Wren (*Cistothorus platensis*)

Marsh Wren (*Cistothorus palustris*)

Carolina Wren (*Thryothorus ludovicianus*)

wren sp. (*Troglodytidae sp.*)

European Starling (*Sturnus vulgaris*)

Gray Catbird (*Dumetella carolinensis*)

Brown Thrasher (*Toxostoma rufum*)

Northern Mockingbird (*Mimus polyglottos*)

Eastern Bluebird (*Sialia sialis*)

Veery (*Catharus fuscescens*)

Gray-cheeked Thrush (*Catharus minimus*)

Swainson's Thrush (*Catharus ustulatus*)

Hermit Thrush (*Catharus guttatus*)

Catharus sp. (*Catharus sp.*)

Wood Thrush (*Hylocichla mustelina*)

265 species (+43 other taxa)

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec

American Robin (*Turdus migratorius*)

Cedar Waxwing (*Bombycilla cedrorum*)

House Sparrow (*Passer domesticus*)

American Pipit (*Anthus rubescens*)

House Finch (*Haemorhous mexicanus*)

Purple Finch (*Haemorhous purpureus*)

Common Redpoll (*Acanthis flammea*)

Pine Siskin (*Spinus pinus*)

American Goldfinch (*Spinus tristis*)

Acanthis/Spinus sp. (*Acanthis/Spinus sp.*)

Grasshopper Sparrow (*Ammodramus savannarum*)

Chipping Sparrow (*Spizella passerina*)

Field Sparrow (*Spizella pusilla*)

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec

American Tree Sparrow (*Spizelloides arborea*)

Fox Sparrow (*Passerella iliaca*)

Dark-eyed Junco (*Junco hyemalis*)

White-crowned Sparrow (*Zonotrichia leucophrys*)

White-throated Sparrow (*Zonotrichia albicollis*)

Savannah Sparrow (*Passerculus sandwichensis*)

Song Sparrow (*Melospiza melodia*)

Lincoln's Sparrow (*Melospiza lincolnii*)

Swamp Sparrow (*Melospiza georgiana*)

Eastern Towhee (*Pipilo erythrophthalmus*)

sparrow sp. (*Passerellidae sp. (sparrow sp.)*)

Yellow-breasted Chat (*Icteria virens*)

Yellow-headed Blackbird (*Xanthocephalus xanthocephalus*)

265 species (+43 other taxa)

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec

Bobolink (*Dolichonyx oryzivorus*)

Eastern Meadowlark (*Sturnella magna*)

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec

Orchard Oriole (*Icterus spurius*)

Baltimore Oriole (*Icterus galbula*)

Red-winged Blackbird (*Agelaius phoeniceus*)

Brown-headed Cowbird (*Molothrus ater*)

Rusty Blackbird (*Euphagus carolinus*)

Common Grackle (*Quiscalus quiscula*)

blackbird sp. (*Icteridae sp.*)

Ovenbird (*Seiurus aurocapilla*)

Worm-eating Warbler (*Helmitheros vermivorum*)

Louisiana Waterthrush (*Parkesia motacilla*)

Northern Waterthrush (*Parkesia noveboracensis*)

Louisiana/Northern Waterthrush (*Parkesia motacilla/noveboracensis*)

Blue-winged Warbler (*Vermivora cyanoptera*)

Black-and-white Warbler (*Mniotilta varia*)

Prothonotary Warbler (*Protonotaria citrea*)

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec

Tennessee Warbler (*Leiothlypis peregrina*)

Orange-crowned Warbler (*Leiothlypis celata*)

Nashville Warbler (*Leiothlypis ruficapilla*)

Connecticut Warbler (*Oporornis agilis*)

MacGillivray's Warbler (*Geothlypis tolmiei*)

Mourning Warbler (*Geothlypis philadelphia*)

Kentucky Warbler (*Geothlypis formosa*)

Common Yellowthroat (*Geothlypis trichas*)

265 species (+43 other taxa)

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec

Hooded Warbler (*Setophaga citrina*)

American Redstart (*Setophaga ruticilla*)

Cape May Warbler (*Setophaga tigrina*)

Cerulean Warbler (*Setophaga cerulea*)

Northern Parula (*Setophaga americana*)

Magnolia Warbler (*Setophaga magnolia*)

Bay-breasted Warbler (*Setophaga castanea*)

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec

Blackburnian Warbler (*Setophaga fusca*)

Yellow Warbler (*Setophaga petechia*)

Chestnut-sided Warbler (*Setophaga pensylvanica*)

Blackpoll Warbler (*Setophaga striata*)

Bay-breasted/Blackpoll Warbler (*Setophaga castanea/striata*)

Black-throated Blue Warbler (*Setophaga caerulescens*)

Palm Warbler (*Setophaga palmarum*)

Pine Warbler (*Setophaga pinus*)

Yellow-rumped Warbler (*Setophaga coronata*)

Yellow-throated Warbler (*Setophaga dominica*)

Prairie Warbler (*Setophaga discolor*)

Black-throated Green Warbler (*Setophaga virens*)

Canada Warbler (*Cardellina canadensis*)

Wilson's Warbler (*Cardellina pusilla*)

warbler sp. (Parulidae sp.) (*Parulidae sp.*)

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec

Summer Tanager (*Piranga rubra*)

Scarlet Tanager (*Piranga olivacea*)

Northern Cardinal (*Cardinalis cardinalis*)

265 species (+43 other taxa)

Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec

Rose-breasted Grosbeak (*Pheucticus ludovicianus*)

Blue Grosbeak (*Passerina caerulea*)

Indigo Bunting (*Passerina cyanea*)

Passerina sp. (*Passerina sp.*)

passerine sp. (*Passeriformes sp.*)

KEY: | = insufficient data | = rare to widespread

Download Histogram Data

APPENDIX G

William & Mary Center for Conservation Biology Eagle Nest Locator Database and Mapping Tool

CCB Mapping Portal

Layers: VA Eagle Nest Locator

Map Center [longitude, latitude]: [-77.01089859008789, 38.81142282662372]

Map Link:
https://ccbbirds.org/maps/#layer=VA+Eagle+Nest+Locator&zoom=13&lat=38.81142282662372&lng=-77.01089859008789&legend=legend_tab_7c321b7e-e523-11e4-aaa0-0e0c41326911&base=NatGeo+World+Map+%28ESRI%29

Report Generated On: 09/16/2020

CCB Mapping Portal

Layers: VA Eagle Nest Locator

Map Center [longitude, latitude]: [-77.04441547393799, 38.767753275470334]

Map Link:
https://ccbbirds.org/maps/#layer=VA+Eagle+Nest+Locator&zoom=15&lat=38.767753275470334&lng=-77.04441547393799&legend=legend_tab_7c321b7e-e523-11e4-aaa0-0e0c41326911&base=NatGeo+World+Map+%28ESRI%29

Report Generated On: 09/16/2020

APPENDIX H

D.C. Department of Energy and Environment (DOEE) Biological Survey of the Anadromous and Resident Fish of the Potomac and Anacostia Rivers within the District of Columbia, 2018 Annual Report

District of Columbia
Interim Project Performance Report
F17AF01128

State: District of Columbia

Study Title: Fisheries Management Studies
Job 1: Survey and Inventory of Resident and Anadromous Fish
Job 2: Habitat Monitoring and Stock Enhancement
Job 3: Aquatic Habitat Restoration

Agreement Period: August 1, 2017 to September 30, 2019

Report Date: March 2019

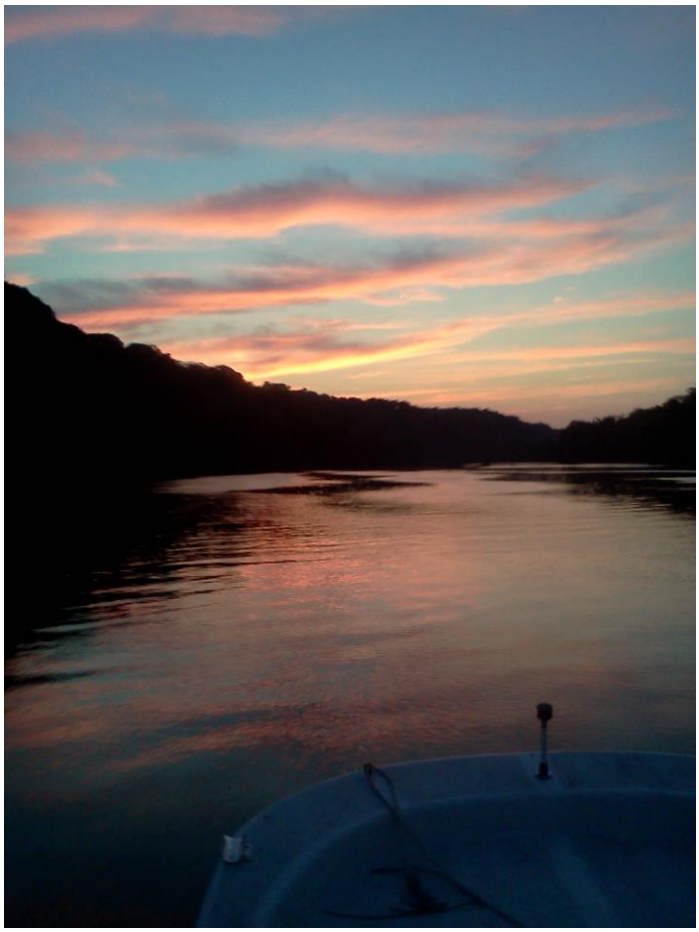
Prepared By: _____
Christopher Adriance, Luke Lyon, Shellie Spencer, Joseph Swann, Eric Celeste Thadey
Fisheries Research Branch
District Department of Environment

Supervisor: _____
Daniel R. Ryan
Fisheries Branch Chief
Fisheries & Wildlife Division
Natural Resource Administration
District Department of Environment

GOVERNMENT OF THE DISTRICT OF COLUMBIA
District Department of Environment
Natural Resource Administration
Fisheries & Wildlife Division
1200 First Street, N.E., 6th Floor
Washington, D.C. 20002

- Annual Report -
2018

Biological Survey of the Anadromous and Resident Fish of the Potomac and Anacostia Rivers within the District of Columbia



Submitted to

The U.S. Fish and Wildlife Service

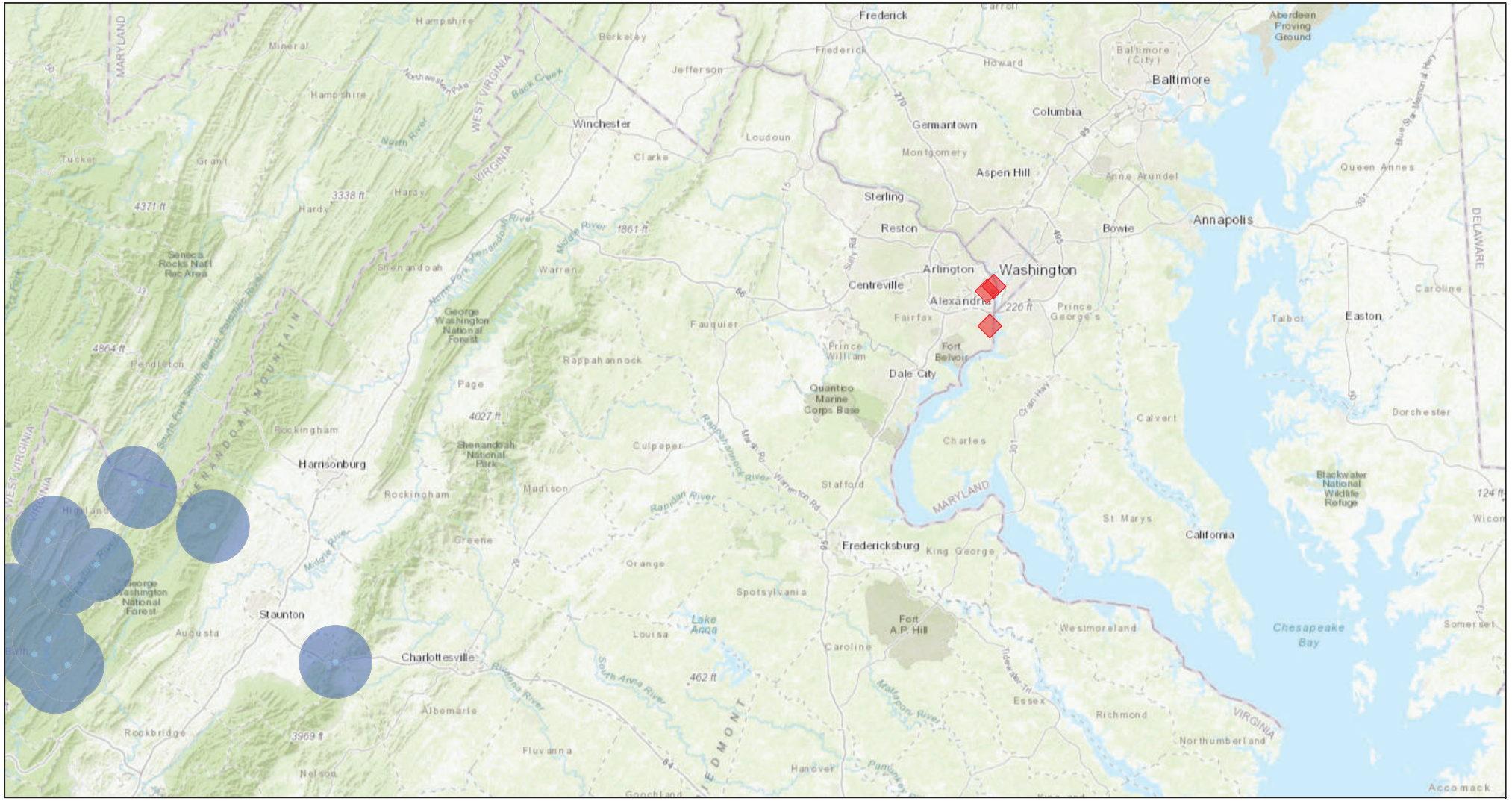
Appendix 1: Total catch and length range of species from seining and electrofishing, 2018.

Species	Total Catch & Length Range (mm)	Total Catch & Length Range By Water-Body			
		Anacostia River	Potomac River	Washington Channel	Rock Creek
Striped Bass	126 (46-650)	22 (46-387)	72 (46-650)	3 (149-305)	29 (249-518
White Perch	884 (58-314)	100 (66-218)	346 (58-314)	6 (122-183)	432 (145-264)
Largemouth Bass	160 (45-503)	87 (46-503)	54 (45-470)	14 (117-470)	5 (286-430)
Smallmouth Bass	38 (39-429)	6 (48-378)	25 (39-429)	5 (295-390)	2 (380-388)
Channel Catfish	100 (55-591)	32 (204-486)	41 (55-591)	7 (380-483)	20 (357-572)
White Catfish	33 (240-419)	17 (240-350)	4 (295-345)	1 (306)	11 (278-419)
Brown Bullhead	31 (196-345)	29 (196-345)	2 (251-300	0	0
Alewife	225 (72-324)	56 (72-304)	27 (72-287)	50 (239-285)	92 (76-324)
Blueback Herring	2922 (38-289)	1878 (39-289)	921 (38-277)	113 (50-268)	10 (53-261)
American Shad	688 (40-473)	282 (50-112)	344 (40-473)	60 (55-80)	2 (63-64)
Hickory Shad	20 (167-426)	1 (167)	7 (368-426)	0	12 (357-409)
Yellow Perch	99 (62-443)	41 (65-270)	47 (62-443)	11 (127-274)	0
Walleye	22 (244-544)	5 (247-544)	3 (468-498)	1 (244)	13 (302-500)
Quillback Carpsucker	45 (39-525)	1 (441)	29 (39-525)	3 (367-487)	12 (405-479)
Golden Redhorse	119 (42-492)	3 (218-380)	51 (42-467)	11 (229-403)	54 (280-492)
Carp	511 (330-880)	236 (330-865)	204 (370-880)	39 (435-860)	32 (426-780)

Species	Total Catch & Length Range (mm)	Total Catch & Length Range By Water-Body			
		Anacostia River	Potomac River	Washington Channel	Rock Creek
Goldfish	72 (188-360)	45 (188-334)	27 (236-360)	0	0
Silvery Minnow	615 (58-127)	58 (70-127)	557 (58-120)	0	0
Golden shiner	8 (85-206)	4 (85-139)	4 (105-206)	0	0
Spottail Shiner	395 (24-126)	182 (54-123)	211 (24-126)	1 (81)	1 (120)
Spotfin Shiner	79 (25-80)	10 (49-80)	68 (25-79)	0	1 (64)
Mississippi Silverside	255 (45-85)	195 (45-85)	60 (45-83)	0	0
Tessellated Darter	277 (36-79)	132 (44-79)	145 (36-72)	0	0
Bluegill	476 (31-196)	430 (31-196)	41 (35-189)	1 (154)	4 (55-127)
Longear Sunfish	1 (101)	0	1 (101)	0	0
Redbreast Sunfish	13 (39-116)	9 (39-95)	3 (96-116)	0	1 (102)
Pumpkinseed	365 (34-164)	303 (34-164)	60 (68-157)	0	2 (73-75)
Mummichog	41 (43-76)	41 (43-76)	0	0	0
Banded Killifish	1047 (28-95)	768 (28-87)	279 (30-95)	0	0
American Eel	8 (130-382)	3 (205-330)	5 (130-382)	0	0
Gizzard Shad	1858 (28-472)	342 (51-447)	1238 (75-472)	69 (299-426)	209 (28-442)
Shorthead Redhorse	41 (316-475)	5 (324-432)	25 (316-475)	4 (382-426)	7 (319-434)
Longnose Gar	11 (552-950)	1 (770)	9 (552-950)	1 (850)	0
Blue Catfish	334 (39-1140)	134 (372-684)	148 (39-1140)	4 (455-665)	48 (449-1020)

Species	Total Catch & Length Range (mm)	Total Catch & Length Range By Water-Body			
		Anacostia River	Potomac River	Washington Channel	Rock Creek
White Sucker	10 (115-460)	1 (115)	4 (348-460)	0	5 (212-443)
Black Crappie	52 (76-347)	31 (76-347)	21 (182-339)	0	0
Green Sunfish	1 (60)	1 (60)	0	0	0
Atlantic Menhaden	5 (147-165)	0	5 (147-165)	0	0
Needlefish	4 (121-421)	2 (121-138)	1 (415)	1 (421)	0
Bluntnose Minnow	25 (40-72)	0	25 (40-72)	0	0
White Crappie	4 (270-371)	4 (270-371)	0	0	0
Mosiquto Fish	2 (37-39	2 (37-39)	0	0	0
Redear Sunfish	2 (156-186)	1 (156)	1 (186)	0	0
Grass Carp	2 (900-970)	0	1 (900)	0	1 (970)
Central Stoneroller	1 (74)	0	1 (74)	0	0
Northern snakehead	3 (544-698)	0	2 (609-698)	1 (544)	0
Flathead Catfish	13 (136-550)	1 (136)	11 (180-550)	0	1 (523)
Hybrid Sunfish	8 (84-176)	4 (84-139)	4 (120-176)	0	0

Known Tri-colored and Little Brown Bat Hibernaculum in Virginia, with Action Areas Highlighted



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Tri-colored and Little Brown Hibernaculum Half Mile Buffer

Tri-colored and Little Brown Hibernaculum 5.5 Mile Buffer

1:1,155,581

0 10 20 40 mi

0 15 30 60 km

Esri, HERE, Garmin, FAO, USGS, NGA, EPA, NPS

Dept. Game and Inland Fisheries

Esri, HERE, Garmin, FAO, USGS, NGA, EPA, NPS |

METROPOLITAN WASHINGTON, DISTRICT OF COLUMBIA COASTAL STORM RISK MANAGEMENT FEASIBILITY STUDY

DRAFT INTEGRATED FEASIBILITY REPORT & ENVIRONMENTAL ASSESSMENT

APPENDIX G7: THREATENED AND ENDANGERED SPECIES NO EFFECT DETERMINATION

NO EFFECT DETERMINATION
Section 7 of the Endangered Species Act
Terrestrial and Freshwater Species

Metropolitan Washington District of Columbia
Coastal Storm Risk Management Feasibility Study

The U.S. Army Corps of Engineers, Baltimore District (USACE) has made the determination under Section 7 of the Endangered Species Act (ESA) that the Recommended Plan would have no effect on those species listed as threatened or endangered by the U.S. Fish and Wildlife Service (Service). USACE has also determined that the Recommended Plan would have no effect on state-listed terrestrial and freshwater species. This No Effect Determination documents our rationale to support those conclusions regarding the effects of the Recommended Plan on protected resources.

I. Recommended Plan

Authority and Purpose
The study authority is a resolution of the U.S. Senate Committee on Environment and Public Works, dated May 23, 2001:

> *"That the Secretary of the Army is requested to review the report of the Chief of Engineers on the Potomac River and Tributaries in Maryland, Virginia, and Pennsylvania published in House Document 343, ninety-first Congress, second session, and other pertinent reports, with a view to conducting a study, in cooperation with the States of Maryland and West Virginia, the Commonwealths of Pennsylvania and Virginia, and the District of Columbia, their political subdivisions and agencies and instrumentalities thereof, other Federal agencies and entities, for improvements in the interest of the ecosystem restoration and protection, flood plain management, and other allied purposes for the middle Potomac River watershed."*

The purpose of the study is to evaluate the feasibility of federal participation in the implementation of solutions to reduce long-term coastal flood risk to vulnerable populations, properties, infrastructure, and environmental and cultural resources considering future climate and sea level change scenarios to support resilient communities in Northern Virginia within the Middle Potomac River watershed. Northern Virginia has been impacted by numerous major tropical and extratropical events, most notably the Chesapeake and Potomac Hurricane of 1933, Hurricane Agnes (1972), Hurricane Floyd (1999), Hurricane Fran (1996), Nor'easter (1998), Hurricane Isabel (2003), Hurricane Irene (2011), and Hurricane Sandy (2012). Hurricane Isabel in 2003 resulted in extreme water levels and caused millions of dollars of damage to residences, businesses, and critical infrastructure.

Location
The Recommended Plan is located at the Arlington Water Pollution Control Plant (WPCP) in Arlington County, Virginia and in the Belle Haven Community in Fairfax County, Virginia. Figure 1 shows the Recommended Plan locations.

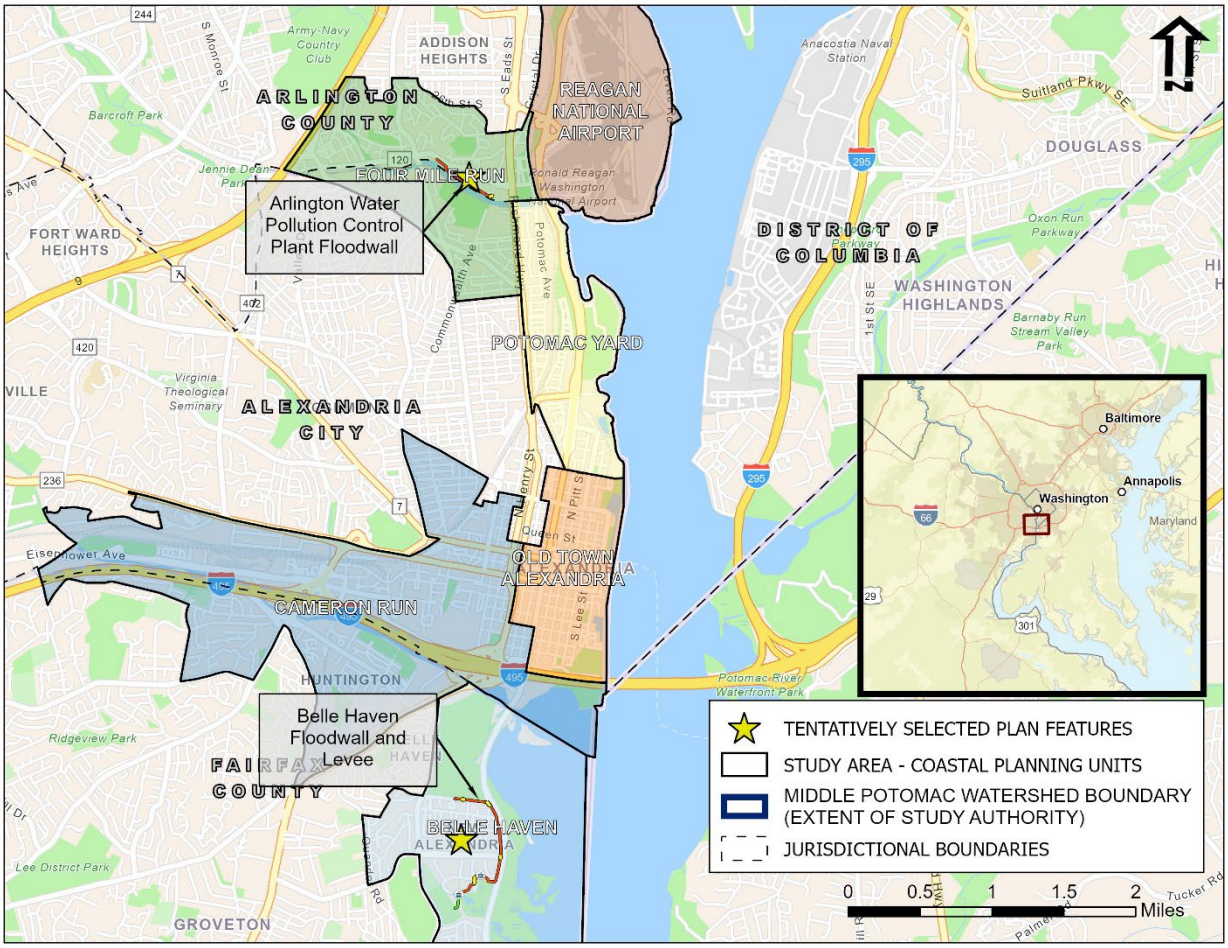

Figure 1. Recommended Plan Locations

Recommended Plan

Construction of a 1,160-linear-foot floodwall at the Arlington WPCP along the left bank of Four Mile Run. A closure structure would be located on the east side of the floodwall across South Eads Street. The east end of the floodwall would tie into the bank just past South Eads Street. The floodwall would wrap around the Arlington WPCP to the west to a stop log closure structure located on South Glebe Road (Figure 2). The floodwall would provide a level of protection against the 500-year coastal storm with moderate sea level change (2080) plus three feet of freeboard at elevation 14.3 feet NAVD 88.

Construction of a 6,725-linear-foot floodwall/levee surrounding the Belle Haven Community. A floodwall would be constructed north of Belle Haven Road from Barrister Place to 10th Street with a closure structure at 10th Street and the George Washington Memorial Parkway (GWMP). Closure structures would also be constructed along Belle Haven Road and Belle View Blvd. The floodwall would tie into the closure structure at 10th Street and run south along the west side of the GWMP, curving around Boulevard View to 10th Street. The floodwall would then run west to East Wakefield Drive tying into both sides of a closure structure on Potomac Avenue. The floodwall would continue west to West Wakefield Drive and tie into a 400-linear-foot earthen levee ending at Westgrove Dog Park. Two culvert crossings with pump stations would be constructed in the Belle Haven East and West Channels (Figure 3). Construction of the culvert crossings would result in roughly 2,250 square feet (0.05 acres) of new permanent fill impacts. The

levee/floodwall would provide a level of protection against the 100-year coastal storm with moderate sea level change (2080) plus three feet of freeboard at elevation 13 feet NAVD 88.

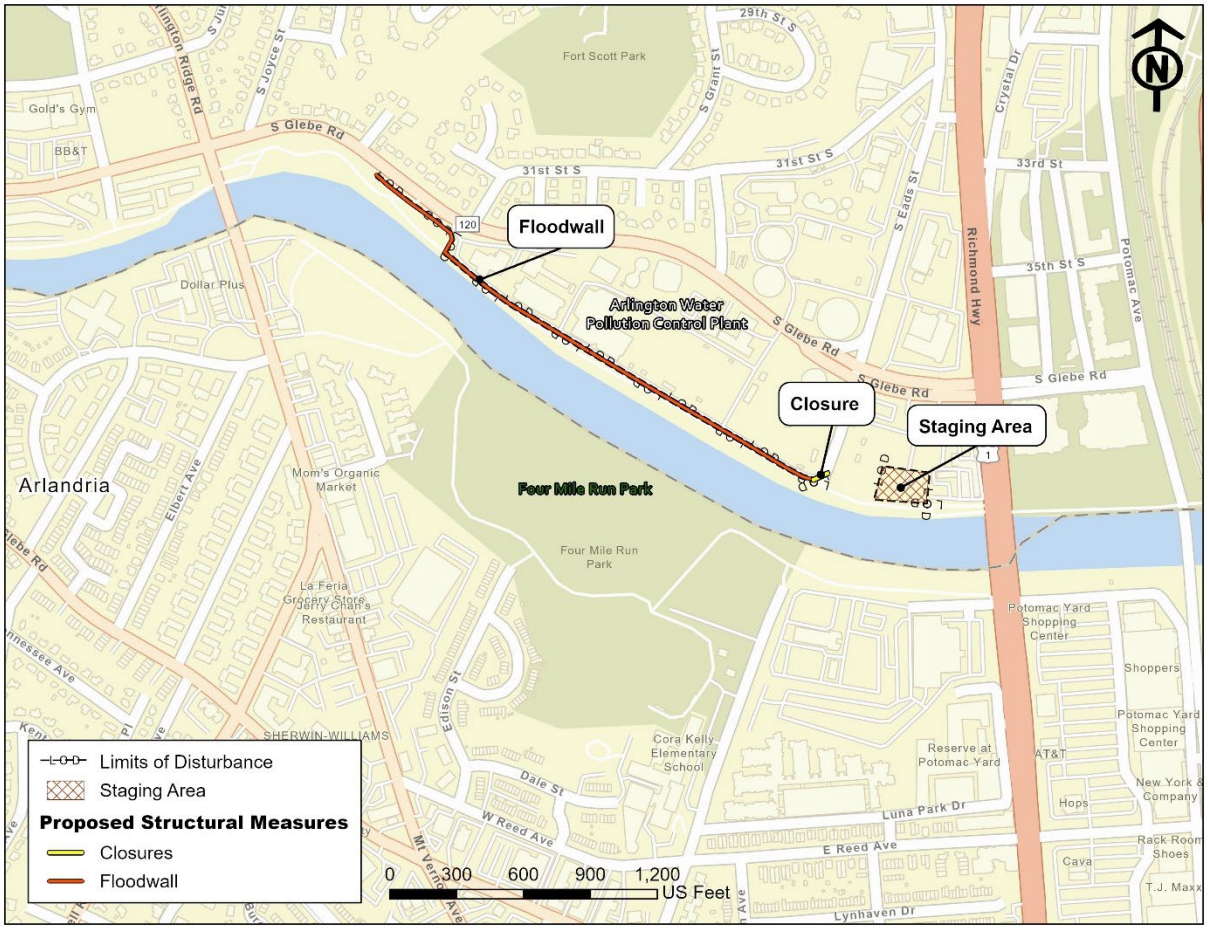

Figure 2. Proposed Floodwall at the Arlington Water Pollution Control Plant

Figure 3. Proposed Levee/Floodwall at Belle Haven

Please note: The hatched area labeled as "Wetland Delineation Boundary" only delineates the north side of the wetlands closest to the proposed limits of disturbance. Wetlands extend to the south beyond the southern boundary delineated by USACE in July 2021.

Timeline/Implementation Schedule

The exact timeline of construction is not yet known at this stage of the project. The project is currently in the feasibility phase, which is expected to end in September of 2024. Following the feasibility phase, the project will enter the Pre-Construction, Engineering, and Design (PED) phase, followed by the construction phase. For PED and construction to be initiated, USACE must sign a Design Agreement with a non-federal sponsor to cost share PED and construction. This project would require congressional authorization for PED and construction. The PED and construction phases are cost shared 75 percent federal and 25 percent non-federal. Implementation would occur provided that sufficient funds are appropriated to design and construct the project. To initiate construction, a Project Partnership Agreement (PPA) would be entered with a non-federal sponsor to cost share construction of the project.

Construction of the floodwall at the Arlington WPCP is expected to take approximately 18 months with no construction phasing. Construction of the Belle Haven levee/floodwall is expected to take approximately 4 years and will be constructed in two phases. Phase 1 would occur during the first year of construction, and Phase 2 would occur the following three years. It is assumed that construction at the Arlington WPCP and at Belle Haven would be complete by the year 2031.

Construction

The levees and floodwalls at the Arlington WPCP and at Belle Haven will be constructed using equipment including bulldozers, backhoes, asphalt/concrete trucks, dump trucks, excavators, and chain saws. Pile drivers are not anticipated to be used. Construction would occur during the daytime.

The floodwall at the Arlington WPCP will consist of 1,160 linear feet of I-Wall and 1,300 linear feet of elevated curb. The I-Wall will be constructed near large transmission poles that run East-West along Four Mile Run. The I-Wall will need to be constructed around the poles and the pole foundations.

The Belle Haven floodwall will be 6,725 linear feet and consist of 1,900 linear feet of I-Wall, 3,715 linear feet of T-Wall, 400 linear feet of earthen levee, and include five aluminum stop-log closures and two culvert crossings. Pump stations will be located in uplands at the location of the two culvert crossings.

Conservation Measures

- USACE will resubmit the information for the northern long-eared bat required in the IPaC determination key to USFWS prior to construction.
- To minimize impacts to migratory birds, removal of trees (both live and dead trees) and saplings and shrubs would be avoided to the greatest extent practicable as recommended by the USFWS Planning Aid Report.
- Protective buffers would be implemented to minimize adverse effects to nesting bald eagles during construction. A permit from USFWS would be obtained prior to construction if these buffers cannot be adhered to.
- To offset permanent stream impacts in Belle Haven, in-kind credits from an approved mitigation bank or in-lieu fee program located in the Middle Potomac River Watershed will be purchased.

II. Action Area

Arlington WPCP

The Arlington WPCP is located in Arlington County, Virginia in a highly developed urban environment with a mix of residential and commercial properties. The WPCP is a commercial facility located on the north side of Four Mile Run across the water from Four Mile Run Park. An asphalt walking path, security fence, and overhead electric power lines suspended by towers are located between the WPCP and Four Mile Run. Noise in the location of the Arlington WPCP may be higher than other urban residential areas due to the amount of surrounding commercial activity on Mount Vernon Avenue and Route 1, and aircraft noise at the nearby Reagan National Airport. Construction of the proposed floodwall would contribute to overall daytime noise in this area and may affect residents as well as users of nearby parks and trails, but the noise would not be significantly louder than the ambient daytime noise.

Existing wetlands run along the north side of Four Mile Run adjacent to the Arlington WPCP. The wetlands are located outside of the footprint of the proposed construction area. The wetlands are located at the bottom of the bank adjacent to the shoreline of Four Mile Run. The floodwall would be constructed at the top of the bank. Sediment may be carried into wetlands during construction. This would be a minor effect that would only occur during the construction period. Sediment and erosion controls would be used to minimize the amount of sediment that may be carried into wetlands. Construction is not expected to generate turbidity in Four Mile Run.

Birds could experience temporary disturbance during construction; however, no long-term impacts would occur. No breeding habitat is known to occur in or adjacent to the construction area.

Due to the potential for groundwater contamination due to historic landfilling of the property and nearby chemical spills, there is a risk that contaminated groundwater would be encountered during construction of the floodwall. Further investigations are needed to determine the presence of contamination in the construction area. If contamination was encountered, safety precautions and appropriate disposal of contaminated material would be implemented.

Belle Haven

Belle Haven is a residential community consisting of a mix of single-family homes, condominiums, and commercial properties. A commercial center is located along Belle View Boulevard and the GWMP runs along the east side of the community. The Dyke Marsh Wildlife Preserve is located south of the community. Two unnamed non-tidal waterways run through the Belle Haven Community. For the purpose of this study, the waterways have been named the Belle Haven West Channel and the Belle Haven East Channel. The channels are considered perennial waterways and originate outside of the study area, flow into the Belle Haven Tributary, which runs through Dyke Marsh, and eventually into the Potomac River (a traditional navigable water). The channels receive hydrology through adjacent waterways, localized urban runoff, and groundwater. The substrate is sand, silt, and mud. The banks are relatively flat and vegetated with native wetland species. Maintained grass lawns are present on either side of the channels. Limitations in habitat availability due to the size of the streams, lack of pools, and water quality problems constrains the diversity of the fish in the streams located in Belle Haven.

Bald eagle nests are located approximately 0.08 and 0.28, and 0.60 miles away from the proposed Belle Haven construction area. These nests were last checked and known to be occupied in 2018 (Center for Conservation Biology, 2020).

The existing wetlands south of Belle Haven are located outside of the proposed construction area. Although the exact locations of the two pump stations and associated generators and parking areas are not known at this time, these features would be located outside of wetlands. Sediment may be carried into wetlands and waterways during construction. This would be a minor effect that would only occur during the construction period. Sediment and erosion controls would be used to minimize the amount of sediment that may be carried into wetlands.

During a flood event, the presence of the floodwall/levee would reduce the effective volume of available floodplain to coastal floodwaters. Therefore, these waters would be forced to stage higher within the remaining areas [including the wetlands located between the levee/floodwall and the Potomac River] than they otherwise would without the floodwall/levee. The relative increase in inundation depth is dependent upon the specific storm event, but the additional elevation (i.e., inundation depth) is not expected to be substantial. The potential change in inundation depth would only occur during storm events and is not expected to affect the health, character, or integrity of the wetlands. USACE is planning to model the future with-project condition to assess the potential for induced flooding. As a result of this modeling, more specificity on the inundation depth in the wetlands under the future with-project condition will be included in the Final Feasibility Report/Environmental Assessment.

Discharge from the pump stations may result in minor impacts to the wetlands located between the proposed floodwall and the Potomac River. During normal water flows, including when a local storm is occurring within the Belle Haven Watershed, water would be able to pass through the drainage pipes of the floodwall with energy dissipaters placed at the pipe outlets to prevent high velocities. It is only during times of extreme flooding due to a coastal event or a massive storm occurring within the entire Potomac River watershed that the pump stations would be utilized. During these scenarios, the water level of the Potomac River would be so high that it would reach the riverside of the floodwall, which would result in the closure of the flap and sluice gates of the floodwall's drainage pipes. During this scenario, flow from the Belle Haven East and West Channels would be conveyed to the Potomac River via the pump stations. However, because the riverside of the floodwall would be inundated with floodwaters, there will be little to no disturbance of the wetlands (scouring and erosion) as the outflow would discharge into floodwaters.

Flap gates would be installed at the ends of the culverts at the proposed culvert crossings. Flap gates are mounted by hinges at the top of the culvert pipe and open and close in response to water pressure. Flap gates allow the free flow of water through the culvert pipe during normal water flows. During a high-water event, when the depth of water is greater on the riverside of the floodwall, the flap will close automatically to prevent back flow. When the water level goes down, the gate will automatically open to allow discharge through the culverts. The flag gate would most likely only remain closed for up to 48 hours after a storm. This would allow a small amount of sediment to build up on the back side of the flap gate. This sediment would be released when the flap gate opens and may be carried into wetlands following a storm event. This would only occur a few times a year during a storm event. The amount of sediment released from the flap gate would be minimal in comparison to the turbidity and sedimentation generated by storm surge from the Potomac River. Therefore, effects to wetlands from sediment being released from the flag gates would be minor and temporary.

Due to the close proximity of the proposed floodwall and levee to several of the condominium buildings in Belle Haven, construction of the proposed levee and floodwall would temporary adversely affect the residents of Belle Haven during the daytime. This adverse effect would not be significant because noise is not expected to exceed 80 dB (no noise would be generated by jack hammering or pile driving) and would be temporary during the period of construction.

Due to the potential for groundwater contamination from the nearby gas station, there is a risk that contaminated groundwater would be encountered during construction. Further investigations are needed to determine the presence of contamination in the construction area. If contamination was encountered, safety precautions and appropriate disposal of contaminated material would be implemented.

III. Listed and Proposed Species that "May Be Present" in the Action Area

Table 1 identifies species [under the jurisdiction of USFWS] listed and proposed under Section 7 of the Endangered Species Act (ESA), as well as state-listed species, that have the potential to be present in the study area. This list was obtained from the following sources:

- Fish and Wildlife Planning Aid Report (PAR) prepared by the USFWS for this study dated January 2021, from the Chesapeake Bay Ecological Services Field Office (USFWS, 2021a)
- USFWS Information for Planning and Consultation (IPaC) species list dated April 12, 2023, from the Virginia Ecological Services Field Office (USFWS, 2021b)
- USFWS Consistency Letter for the Northern Long-Eared Bat dated April 12, 2023
- USFWS Environmental Conservation Online System (ECOS) (USFWS, 2022)
- Virginia Department of Wildlife Resources (formerly the Virginia Department of Game and Inland Fisheries) Fish and Wildlife Information Search (VaFWIS database) (VADWR, 2021a)

Each species was further assessed to determine if suitable habitat conditions are present in the study area to support each species (far right column in Table 1). Based on the assessments below, it is highly unlikely that the most species shown in Table 1 would be present in the study area. Although uncommon, the state-listed peregrine falcon and the Henslow's sparrow have the potential to occur in the study area. It is likely that the monarch butterfly, a federal candidate species, could occur in the study area during its migration period from mid to late September. Although rare, the small whorled pogonia, a federal and state-listed plant, has the potential to occur in upland mixed hardwood forests in the study area.

Table 1. Species [under the jurisdiction of the USFWS] listed and proposed under Section 7 of the Endangered Species Act, and state-listed species, that have the potential to be present in the study area.

SPECIES	GROUP	FEDERAL LISTING STATUS	STATE LISTING STATUS	PRESENCE IN THE STUDY AREA
Northern long-eared bat (*Myotis septentrionalis*)	mammal	endangered	threatened	No known hibernaculum or maternity roosts
Little brown bat (*Myotis lucifugus*)	mammal	proposed endangered	endangered	No known hibernaculum or maternity roosts
Tri-colored bat (*Perimyotis subflavus*)	mammal	proposed endangered	endangered	No known hibernaculum or maternity roosts
Eastern black rail (*Laterallus jamaicensis ssp. jamaicensis*)	bird	threatened	not listed	Highly unlikely
Peregrine falcon (*Falco peregrinus*)	bird	not listed	threatened	Uncommon, but could occur in the study area
Loggerhead shrike (*Lanius ludovicianus*)	bird	not listed	threatened	Highly unlikely
Migrant loggerhead shrike (*Lanius ludovicianus migrans*)	bird	not listed	threatened	Highly unlikely
Henslow's sparrow (*Centronyx henslowii*)	bird	not listed	threatened	Uncommon, but could occur in the study area
Dwarf wedgemussel (*Alasmidonta heterodon*)	mollusk	endangered	not listed	Highly unlikely
Yellow lance (*Elliptio lanceolata*)	mollusk	threatened	threatened	Highly unlikely
Brook floater (*Alasmidonta varicose*)	mollusk	not listed	endangered	Highly unlikely
Monarch butterfly (*Danaus plexippus*)	insect	candidate	not listed	Likely from mid to late Sept
Appalachian grizzled-skipper (Pyrgus wyandot)	insect	not listed	threatened	Highly unlikely
Wood turtle (*Glyptemys insculpta*)	reptile	under review	threatened	Highly unlikely
Small whorled pogonia (*Isotria medeoloides*)	plant	threatened	endangered	Rare, but could occur in the study area

Northern Long-Eared Bat (NLEB)

The NLEB is listed as endangered by the Service and threatened by the Commonwealth of Virginia. This species has no designated critical habitat in the Action Area (USFWS, 2021a). The primary threat to the NLEB throughout its range is white-nose syndrome. Other threats include habitat modification to hibernacula (underground caves, mines, and cave-like structures), disturbance of hibernating bats, forest conversion, wind energy facilities, and fires (USFWS, 2021a). NLEB known occupied maternity roosts (summer habitat) and hibernacula (winter habitat) are primarily located on the west side of the state. No known NLEB hibernaculum or maternity roots are located within the Action Area. The closest known NLEB 5.5-mile hibernaculum buffer zone is located approximately 90 miles west of the Action Area. The closest known occupied maternity roost is located approximately 140 miles southwest of the Action Area (VADWR, 2022a).

Little Brown Bat and Tri-Colored Bat

The little brown bat and the tri-colored bat are listed as endangered by the Commonwealth of Virginia. According to the VaFWIS database, the little brown bat and the tri-colored bat may be present in the Action Area (VADWR, 2021a). These species are currently "under review" by the Service for inclusion on the threatened and endangered species list (USFWS, 2021a; USFWS, 2021b). Known little brown bat and tri-colored bat hibernaculum buffer areas are primarily located on the west side of the state. No known little brown bat and tri-colored bat hibernaculum are located within the Action Area. The closest known hibernaculum 5.5-mile buffer zone is located approximately 105 miles west of the Action Area (VADWR, 2022b).

Eastern Black Rail

The eastern black rail is listed as threatened by the USFWS (USFWS, 2021b). The eastern black rail is not listed by the Commonwealth of Virginia. The eastern black rail lives in saltwater and freshwater marshes along the Atlantic coast but can also be found farther inland in the Chesapeake Bay region (Chesapeake Bay Program, 2022). The only remaining marsh in the study area is the Dyke Marsh Wildlife Refuge. However, there is no documented observance of the eastern black rail in Dyke Marsh (Friends of Dyke Marsh, 2021). Breeding areas are located primarily along the coast. The study area is located in an eastern black rail breeding area (The Center of Conservation Biology, 2021). The Eastern Black Rail is rare in Virginia and appears to be on the verge of extirpation in this state (Wilson et al., 2009). Due to the rarity of this species and the lack of documented observations and suitable habitat in the study area, it is highly unlikely that the eastern black rail would occur in the study area.

Peregrine Falcon

The peregrine falcon is listed as threatened by the Commonwealth of Virginia (VADWR, 2021b) and has a conservation status of critically imperiled in Virginia (NatureServe, 2022). Following the ban of DDT and similar compounds in the 1970's and an intense reintroduction effort, the peregrine falcon was delisted by the Service in 1999 (The Center for Conservation Biology, 2022). Peregrine falcons live primarily along mountain ranges, river valleys, and coastlines, and nest on open rock faces (USFWS, 2006). In Virginia, peregrine falcons are currently nesting on nine peregrine towers and two fishing shacks on the Delmarva Peninsula, five bridges, one power plant stack, and one high rise-building in the coastal plain, and four natural cliff sites in the

mountains (The Center for Conservation Biology, 2022). The VaFWIS database indicated that the peregrine falcon may be present in the Action Area (VADWR, 2021a). The peregrine falcon has been observed in the Dyke Marsh Wildlife Preserve in the spring, fall, and winter; although these sightings are rare (Friends of Dyke Marsh, 2021). Therefore, there is a potential for the peregrine falcon to be present in the Action Area.

Loggerhead Shrike and Migrant Loggerhead Shrike

Both the loggerhead shrike and the migrant loggerhead shrike are listed as threatened by the Commonwealth of Virginia (VADWR, 2021b) and have a conservation status of critically imperiled in Virginia (NatureServe, 2022). These species are not listed by the Service. The loggerhead shrike inhabits open land with short vegetation and well-spaced shrubs and low trees, particularly those with spines or thorns. Loggerhead shrikes are often seen along mowed roadsides with access to fence lines and utility poles. The loggerhead shrike does not breed in the northeast United States (USFWS, 2021c). The documented distribution of the loggerhead shrike is primarily located in the central and western part of the state (NatureServe, 2022). They are currently concentrated west of the Blue Ridge, with some small pockets occurring in the Piedmont (VADWR. 2022c). There is currently no documented occurrences of the migrant loggerhead shrike in Virginia (NatureServe, 2022). There are no documented observations of the loggerhead shrike or the migrant loggerhead shrike in the Dyke Marsh Wildlife Refuge (Friends of Dyke Marsh, 2021). Due to the rarity of the species in Virginia and the lack of documented observances in and surrounding the Action Area, it would be highly unlikely for a loggerhead shrike or a migrant loggerhead shrike to be present in the Action Area.

Henslow's Sparrow

The Henslow's sparrow is listed as threatened by the Commonwealth of Virginia (VADWR, 2021b) and has a conservation status of critically imperiled in Virginia (NatureServe, 2022). The Henslow's sparrow is not listed by the Service (USFWS, 2021b). The Henslow's sparrow forages in grasses usually greater than two feet tall. The Henslow's sparrow is rare statewide and breeds primarily in the Saxis Marsh in Accomack County, Virginia. A stable population exists at the Radford Army Ammunitions Plant Complex on Radford, Virginia. According to the VaFWIS database, the Henslow's sparrow is a rare transient and summer resident in Fairfax and Prince William Counties, Virginia. Breeding has also been recorded in these counties (VADWR, 2022d). Therefore, there is a potential for the Henslow's sparrow to be present within the Action Area.

Dwarf Wedgemussel

The dwarf wedgemussel is a freshwater mussel that is listed as endangered by the Service. The IPaC species list indicated that the dwarf wedgemussel may be present in the Action Area. No critical habitat has been designated for this species (USFWS, 2021b). The dwarf wedgemussel is listed as endangered by the Commonwealth of Virginia; however, it was not identified in the VaFWIS database as having the potential to occur in the Action Area (VADWR, 2021a).

The dwarf wedgemussel can be found in small freshwater streams less than five meters wide to large rivers more than 100 meters wide. Dwarf wedgemussel is usually found in sand, firm muddy sand, and gravel bottoms in rivers of varying sizes with slow to moderate current with silt-free, stable stream beds and well-oxygenated water free of pollutants. Flowing waters are needed to maintain healthy numbers of host fish; however, dwarf wedgemussel can survive in still pools

during low flow periods. It can also be found on various substrates and water depths. They are often patchily distributed in rivers (USFWS, 2020b).

Dwarf wedgemussel was believed to have been extirpated from Virginia in 1989 but was rediscovered in Aquia Creek and in the upper Nottoway River in 1990. Reproducing populations are currently only known to occur in Aquia Creek (approximately 30 miles away from the study area) with remnant populations in the South Anna and Nottoway Rivers (over 100 miles away from the study area) (VADWR, 2021a). The VaFWIS database identifies no known occurrences of the dwarf wedgemussel in Fairfax County (as of 2012). There are no recordings of the dwarf wedgemussel in the Potomac River in the vicinity of the Action Area (Maryland Biodiversity Project, n.d.).

Due to the rarity of the species in Virginia and the lack of documented observances in and surrounding the Action Area, it would be highly unlikely for a dwarf wedgemussel to be present in the Action Area.

Yellow Lance

The yellow lance is a freshwater mussel that is listed as threatened by both the Service and the Commonwealth of Virginia (USFWS, 2021b; VADWR; 2021b). The yellow lance has a conservation status as imperiled in Virginia (NatureServe, 2022). No critical habitat has been designated for this species. Although the IPaC species list did not identify the yellow lance as having the potential to occur in the Action Area, ECOS shows that the current range of the yellow lance overlaps the Action Area. The yellow lance is found often buried in clean, coarse to medium sand (USFWS, 2021b). It does not appear to tolerate fine sediments (NatureServe, 2022). The species is dependent on clean (not polluted) moderate flowing water with high dissolved oxygen content in riverine or larger creek environments (USFWS, 2021b; USFWS, 2021b). Most of the remaining populations are small and fragmented, only occupying a fraction of the reaches that were historically occupied (NatureServe, 2022).

Four-Mile Run is a 303(d)-listed impaired waterbody for failing to meet water quality standards for fecal coliform bacteria and PCB contamination in fish tissue (Northern Virginia Regional Commission, n.d.). The streams in Belle Haven are not 303(d) listed waterbodies. Water quality information is not available for these streams. However, these streams are small, channelized, lack vegetative buffers, and water flow is inconsistent (Fairfax County, 2011). Based on these reasons, it would be highly unlikely that the yellow lance would be present in the Action Area.

Brook Floater

The brook floater is a freshwater mussel listed as endangered by the Commonwealth of Virginia and is at very high risk of extirpation in Virginia due to a very restricted range, very few populations or occurrences, very steep declines, severe threats, or other factors (VADWR, 2021b; USFWS, 2021a). The brook floater is not listed by the Service (USFWS, 2021b). This species is usually found in fast-flowing, clean water in substrates that contain relatively firm rubble, gravel, and substrates free of siltation. The only live specimens that have been recently documented occurred in the mainstem of the Potomac River upstream of the Action Area (VADWR, 2022f). A survey conducted in 2016 by the Maryland Department of Natural Resources found no brook floaters in the Potomac River approximately 10 miles south of Belle Haven (USFWS, 2021a). Due to the

rarity of the species in this region and the lack of documented observances within and surrounding the Action Area, it would be highly unlikely for a brook floater to be present in the Action Area.

Monarch Butterfly

Due to the monarch's decline, the Service completed a status review under the ESA. The Service determined that listing the monarch under the ESA is warranted but precluded at this time by higher priority listing actions. With this funding, the monarch is a candidate for listing, and the Service will review its status each year until a listing decision is made (USFWS, 2021c). The monarch is not listed by the Commonwealth of Virginia (VADWR, 2021b). The monarch has a specific host plant, which provides the butterfly's larvae or caterpillars with food. Monarch larvae feed exclusively on milkweeds. In addition to milkweeds, adult monarchs need sources of nectar almost year-round. They prefer red, orange, yellow or purple nectar-rich flowers in sunny areas. Monarchs migrate through the Action Area in the fall. The peak period to see migrating monarchs in Northern Virginia is when they migrate through the area in large numbers from mid to late September (Fairfax County, n.d.). Therefore, it is likely that monarch butterflies will be present in the Action Area in the fall.

Appalachian Grizzled Skipper

The Appalachian grizzled skipper is listed as threatened under Virginia's Endangered Plant and Insect Species Act and has a conservation status of critically imperiled in Virginia (Commonwealth of Virginia, 2022; NatureServe, 2022). The Appalachian grizzled skipper is not listed by the Service (USFWS, 2021b). In Virginia, the Appalachian grizzled skipper has been found in dry, open areas with shaley soils, and in artificially opened habitats such as rights-of-way from March to June. The Appalachian grizzled skipper is rare in Virginia. Since 1992, it has only been documented in 6 locations in Frederick, Alleghany, and Rockbridge Counties. This species was historically found in Fairfax County prior to 1950. Due to the rarity of the species in Virginia and the lack of documented observances within and surrounding the Action Area, it would be highly unlikely for an Appalachian grizzled skipper to be present in the Action Area.

Wood Turtle

The wood turtle is listed as threatened by the Commonwealth of Virginia and has a conservation status of imperiled in Virginia (VADWR, 2021b; NatureServe, 2022). The wood turtle is under review by the Service to be included on the threatened and endangered species list (USFWS, 2021b). Wood turtles are primarily found near forested streams with sand, gravel, or rocky bottoms, as opposed to mud and silt. During the spring, the turtles leave the water and move to open grasslands, barrens and sandy shores to nest and forage (USFWS, n.d.). In Virginia, they are only found in the northern part of the state in portions of the Shenandoah and Potomac River watersheds. The VADCR Natural Heritage Resources database that the wood turtle can be found in both Belle Haven and Four Mile Run. Wood turtles are highly sensitive to habitat modification including urbanization, stream channelization and damming. Currently, the only confirmed documentation of a wood turtle in Four-Mile Run was in 1953 (USFWS, 2021a). Due to extensive urbanization and the rarity of this species, it would be highly unlikely that a wood turtle would exist in the study area (USFWS, 2021a).

Small Whorled Pogonia

The small whorled pogonia is a plant that is listed as threatened by the Service. No critical habitat has been designated for these species (USFWS, 2021b). This plant is listed as endangered under the Virginia's Endangered Plant and Insect Species Act (Commonwealth of Virginia, 2022). The small whorled pogonia is a member of the orchid family. Although widely distributed, this species is rare. It has been extirpated from Maryland. In Virginia, small whorled pogonias generally occur in upland mixed hardwood forests, usually dominated by oaks. This plant grows in old mature hardwood forests that have an open understory. Most occupied sites occur on land that was historically cleared for agriculture and farmed, then allowed to return to a forest, with canopy trees approximately 40 to 80 years old (Wetlands Studies and Solutions, Inc., 2006). It prefers acidic soils with a thick layer of dead leaves, often on slopes near small streams (USFWS, 2019). Virginia counties with records of the small whorled pogonia include Fairfax County. Fairfax County's first documented occurrence of small whorled pogonia occurred in Fort Belvoir in 2005 (Wetland Studies and Solutions, Inc., 2006). Based on this information, although rare, it is possible that a small whorled pogonia could occur in upland mixed hardwood forests in the Action Area.

IV. Effects of the Recommended Plan on Protected Resources

Northern Long-Eared Bat (NLEB)

NLEB known occupied maternity roosts (summer habitat) and hibernacula (winter habitat) are primarily located on the west side of the state. No known NLEB hibernaculum or maternity roots are located within the study area. The closest known NLEB 5.5-mile hibernaculum buffer zone is located approximately 90 miles west of the study area. The closest known occupied maternity roost is located approximately 140 miles southwest of the Action Area (VADWR, 2022). Therefore, the Recommended Plan would have no effect on NLEB hibernaculum or maternity roosts. As stated in the Planning Aid Report (Appendix G), while the Recommended Plan may affect the NLEB if any tree clearing occurs, any take that may occur as a result is not prohibited under the Endangered Species Act 4(d) rule adopted for this species at 50 CFR §17.40(o) and satisfies USFWS responsibilities for this Action under ESA Section 7(a)(2) (USFWS, 2021b). A consistency letter for the NLEB was obtained from the USFWS on April 12, 2023 (Appendix G). Prior to construction of the Action, USACE will resubmit the information for the NLEB required in the IPaC determination key to USFWS.

Little Brown Bat and Tri-Colored Bat

Known little brown bat and tri-colored bat hibernaculum buffer areas are primarily located on the west side of the state. No known little brown bat and tri-colored bat hibernaculum are located within the location of the Recommended Plan. Therefore, the Recommended Plan would have no effect on little brown bat and tri-colored bat hibernaculum.

Eastern Black Rail

Due to the rarity of this species in Virginia and Maryland, the lack of documented observances in the study area, and the lack of suitable habitat in the study area (high marsh habitat), it is highly unlikely that the eastern black rail would occur in the locations of the Recommended Plan. Therefore, the Recommended Plan would have no effect on the eastern black rail.

Peregrine Falcon

Peregrine falcons live primarily along mountain ranges, river valleys, and coastlines, and nest on open rock faces (USFWS, 2006). In Virginia, peregrine falcons are currently nesting on nine peregrine towers and two fishing shacks on the Delmarva Peninsula, five bridges, one power plant stack, and one high rise-building in the coastal plain, and four natural cliff sites in the mountains (The Center for Conservation Biology, 2022). The VaFWIS database indicated that the peregrine falcon may be present in the study area (VADWR, 2021a). The peregrine falcon has been observed in the Dyke Marsh Wildlife Preserve in the spring, fall, and winter; although these sightings are rare (Friends of Dyke Marsh, 2021). The proposed Recommended Plan would not affect nesting sites since peregrine falcons prefer to nest on high structures. The rare peregrine falcon in the vicinity of the proposed Recommended Plan could experience temporary disturbance during construction, but the proposed Recommended Plan are expected to have no effect on the peregrine falcon.

Loggerhead Shrike and Migrant Loggerhead Shrike

The documented distribution of the loggerhead shrike is primarily located in the central and western part of the state (NatureServe, 2022). They are currently concentrated west of the Blue Ridge, with some small pockets occurring in the Piedmont (VADWR. 2022c). There is currently no documented occurrences of the migrant loggerhead shrike in Virginia (NatureServe, 2022). There are no documented observations of the loggerhead shrike or the migrant loggerhead shrike in the Dyke Marsh Wildlife Refuge (Friends of Dyke Marsh, 2021). Due to the rarity of the species in Virginia and the lack of documented observances in and surrounding the locations of the Recommended Plan, the Recommended Plan would have no effect on the loggerhead shrike or migrant loggerhead shrike.

Henslow's Sparrow

The Henslow's sparrow forages in grasses usually greater than two feet tall. They can also be found in weedy hayfields or pastures and wet meadows. The Henslow's sparrow is rare statewide and breeds primarily in the Saxis Marsh in Accomack County, Virginia. A stable population exists at the Radford Army Ammunitions Plant Complex on Radford, Virginia. According to the VaFWIS database, the Henslow's sparrow is a rare transient and summer resident in Fairfax and Prince William Counties, Virginia. Breeding has also been recorded in these counties (VADWR, 2022d). None of the proposed alternative locations contain habitat preferred by the Henslow's sparrow - grasses in these locations are routinely mowed and maintained and there are no hayfields, pastures, or meadows. Therefore, the Recommended Plan is expected to have no effect on the Henslow's sparrow.

Dwarf Wedgemussel

The Recommended Plan in Belle Haven would permanently affect streams located in the footprint of the proposed structural measures (levee/floodwall). However, these streams are not suitable habitat for the dwarf wedgemussel (flowing, well-oxygenated waters free of pollutants) (Northern Virginia Regional Commission, n.d.). The streams in Belle Haven are not 303(d) listed waterbodies. Water quality information is not available for these streams. However, these streams are small, channelized, lack vegetative buffers, and water flow is inconsistent (Fairfax County, 2011).

The VaFWIS database identifies no known occurrences of the dwarf wedgemussel in Fairfax County (as of 2012). There are no recordings of the dwarf wedgemussel in the Potomac River in the vicinity of the study area (Maryland Biodiversity Project, n.d.). Reproducing populations are currently only known to occur in Aquia Creek (approximately 30 miles away from the study area) with remnant populations in the South Anna and Nottoway Rivers (over 100 miles away from the study area) (VADWR, 2021a).

Due to unsuitable habitat conditions for the dwarf wedgemussel in streams located in Belle Haven, and the lack of documented observances in the study area, the Recommended Plan would have no effect on the dwarf wedgemussel.

Yellow Lance

This species is dependent on clean (not polluted) moderate flowing water with high dissolved oxygen content in riverine or larger creek environments (USFWS, 2021b; USFWS, 2021b). Most of the remaining populations are small and fragmented, only occupying a fraction of the reaches that were historically occupied (NatureServe, 2022).

The streams in Belle Haven are not 303(d) listed waterbodies. Water quality information is not available for these streams. However, these streams are small, channelized, lack vegetative buffers, and water flow is inconsistent (Fairfax County, 2011). Therefore, the Recommended Plan would not affect the yellow lance.

Brook Floater

This species is usually found in fast-flowing, clean water in substrates that contain relatively firm rubble, gravel, and substrates free of siltation. The only live specimens that have been recently documented occurred in the mainstem of the Potomac River upstream of the Action Area (VADWR, 2022f). A survey conducted in 2016 by the Maryland Department of Natural Resources found no brook floaters in the Potomac River approximately 10 miles south of Belle Haven (USFWS, 2021a). Due to the rarity of the species in this region and the lack of documented observances within and surrounding the study area, the Recommended Plan would have no effect on the brook floater.

Monarch Butterfly

It is likely that the monarch butterfly would be present in the location of the Recommended Plan as they migrate through the region in the fall. The monarch's specific host plant, milkweed, was not observed during site visits in the location of the proposed Recommended Plan. Therefore, implementation of the proposed Recommended Plan are expected to have no effect on the monarch butterfly.

Appalachian Grizzled Skipper

In Virginia, the Appalachian grizzled skipper has been found in dry, open areas with shaley soils, and in artificially opened habitats such as rights-of-way from March to June. The Appalachian grizzled skipper is rare in Virginia. Since 1992, it has only been documented in 6 locations in Frederick, Alleghany, and Rockbridge Counties. This species was historically found in Fairfax County prior to 1950. Due to the rarity of the species in Virginia and the lack of documented

observances within and surrounding the study area, the Recommended Plan would have no effect on the Appalachian grizzled skipper.

Wood Turtle

Wood turtles are primarily found near forested streams with sand, gravel, or rocky bottoms, as opposed to mud and silt. During the spring, the turtles leave the water and move to open grasslands, barrens and sandy shores to nest and forage (USFWS, n.d.). In Virginia, they are only found in the northern part of the state in portions of the Shenandoah and Potomac River watersheds. The VADCR Natural Heritage Resources database that the wood turtle can be found in both Belle Haven and Four Mile Run. Wood turtles are highly sensitive to habitat modification including urbanization, stream channelization and damming. Currently, the only confirmed documentation of a wood turtle in Four-Mile Run was in 1953 (USFWS, 2021a). Due to extensive urbanization and the rarity of this species, the Recommended Plan would not affect the wood turtle (USFWS, 2021a).

Small-Whorled Pogonia

Small whorled pogonias generally occur in upland mixed hardwood forests, usually dominated by oaks. This plant grows in old mature hardwood forests that have an open understory. The locations of the Recommended Plan do not contain old mature hardwood forests with an open understory. The upland forests surrounding the wetlands in Belle Haven are hardwood forests, but these areas contain dense understory consisting of spice bush and ivy. Due to the rarity of this species in the study area and the lack of suitable habitat in the locations of the Recommended Plan, the Recommended Plan would have no effect on the small-whorled pogonia.

V. Conclusion and Determination of Effects

The Recommended Plan would have no effect on federal and state-listed threatened and endangered species due to the lack of suitable habitat conditions, rarity of the species, and/or the lack of documented observances in the locations where the effects are likely to occur.

The Recommended Plan would have no effect on NLEB hibernaculum or maternity roosts. The PAR states: “while the proposed TSP may affect the NLEB if any tree clearing occurs, any take that may occur as a result is not prohibited under the Endangered Species Act 4(d) rule adopted for this species at 50 CFR §17.40(o) and satisfies Service responsibilities for this Action under ESA Section 7(a)(2)” (USFWS, 2021b). A consistency letter for the NLEB from the USFWS was received on April 12, 2023. As recommended in the PAR, USACE will resubmit the information for the NLEB required in the USFWS Information for Planning and Consultation (IPaC) determination key to USFWS prior to construction

It is likely that the monarch butterfly, an ESA candidate species, would be present in the locations of the Recommended Plan during the monarch’s migration season (mid to late September). Construction would not directly affect the monarch butterfly and would not affect the monarch’s specific host plant, milkweed.

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METROPOLITAN WASHINGTON, DISTRICT OF COLUMBIA COASTAL STORM RISK MANAGEMENT FEASIBILITY STUDY

INTEGRATED FEASIBILITY REPORT & ENVIRONMENTAL ASSESSMENT

APPENDIX G8: HAZARDOUS, TOXIC, AND RADIOACTIVE WASTE (HTRW) REPORTS

DRAFT

NORTHERN VIRGINIA COASTAL STORM RISK MANAGEMENT STUDY
HTRW INVESTIGATION
FOUR MILE RUN FLOODWALL AND LEVEE

Prepared by:

US Army Corps of Engineers

Environmental and Munitions Design Center

2 Hopkins Plaza

Baltimore, MD

February 2022

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LIST OF ACRONYMS AND ABBREVIATIONS

AST	Aboveground Storage Tank
ASTM	American Society for Testing and Materials
AUL	Activity and Use Limitation
BRAC	Base Realignment and Closure
CERCLA	Comprehensive Environmental Response Compensation and Liability Act
CERCLIS	Comprehensive Environmental Response Compensation and Liability Information System
CORRACTS	RCRA Corrective Action
DoD	Department of Defense
EDR®	Environmental Data Resources, Inc.
EMDC	Environmental and Munitions Design Center
EP	Environmental Professional
ERNS	Emergency Response Notification System
ESA	Environmental Site Assessment
FOIA	Freedom Of Information Act
FUDS	Formerly Used Defense Site
IC/EC	Institutional Control/Engineering Control
LUST	Leaking Underground Storage Tank
MD-DNR	Maryland Department of Natural Resources
MEC	Munitions and Explosives of Concern
NAB	United States Army Corps of Engineers, Baltimore District
NRCS	Natural Resources Conservation Service
NFRAP	No Further Remedial Action Planned
NPL	National Priority List
RCRA	Resource Conservation and Recovery Act
REC	Recognized Environmental Condition
SCRD	State Coalition for Remediation of Dry Cleaners
TSD	Treatment, Storage and Disposal
USACE	United States Army Corps of Engineers
USGS	United States Geological Survey
UST	Underground Storage Tank

EXECUTIVE SUMMARY

A study was performed to evaluate the feasibility of Federal participation in the implementation of solutions to address problems and opportunities associated with coastal storm damage in the study area, which is Northern Virginia within the Middle Potomac River watershed. Northern Virginia has been impacted by numerous major tropical and extratropical events, most notably the Chesapeake and Potomac Hurricane of 1933, Hurricane Agnes (1972), Hurricane Floyd (1999), Hurricane Fran (1996), Nor'easter (1998), Hurricane Isabel (2003), Hurricane Irene (2011), and Hurricane Sandy (2012). Hurricane Isabel in 2003 resulted in extreme water levels and caused millions of dollars of damage to residences, businesses, and critical infrastructure. Within the study area, there are numerous locations of national significance and national security. Facilities important to national security include the Pentagon and Fort Belvoir. Many historic districts and properties are located within the study area, such as Old Town Alexandria, Mount Vernon, and the George Washington Memorial Parkway (GWMP). Environmentally significant resources include Dyke Marsh, Featherstone National Wildlife Refuge, Occoquan Bay National Wildlife Refuge, and Mason Neck National Wildlife Refuge. Critical infrastructure in the study area includes Ronald Reagan Washington National Airport (Reagan National Airport), Washington, DC Metro, transportation networks including GWMP and the Capital Beltway, freight and passenger railways, electrical generation and transmission systems, drinking and wastewater systems, and other lifeline infrastructure.

1.0 INTRODUCTION

1.1 Purpose

This report is a summary of an investigation of the properties that may impact the Arlington Water Pollution Control Plant Floodwall and the Arlandria Four Mile Run Floodwall Project in Arlington County and Alexandria, Virginia and was conducted as an environmental site assessment (ESA). The purpose of the ESA is to evaluate whether or not hazardous substances or petroleum products may be present on the property under conditions suggesting that a past release, continuing release, or material threat of a release to the property is present, and to conclude whether or not recognized environmental conditions (RECs) exist based on the results of the process. This assessment is not intended to identify *de minimis* conditions that do not present a significant risk of harm to public health or the environment, and that would generally not be subject to enforcement action if brought to the attention of appropriate governmental agencies.

1.2 Scope of Services

USACE – Baltimore District (NAB) personnel performed the following work:

- Interviewed state and local governmental officials.

- Reviewed records [Federal environmental records, State and Tribal environmental records, Environmental Data Resources (EDR®) proprietary records, aerial photographs, city directory abstract and historical topographic maps].

1.3 Standards

NAB personnel followed the practice established by ASTM International, formerly the American Society for Testing and Materials, Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process (Designation E 1527-13). This practice defines "good commercial and customary practice in the United States of America for conducting an environmental site assessment of a parcel of commercial real estate with respect to the range of contaminants within the scope of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) and petroleum products."

1.4 Assumptions, Limitations, Exceptions, Deviations, Terms and User Reliance

1.4.1 Significant Assumption

NAB personnel completed this project with the following significant assumptions in mind:

- NAB assumed that the client (NAB-PPMD) relayed any specialized knowledge or experience material to recognized environmental conditions.

- NAB assumed that the owner representative and any other interviewed individuals relayed any specialized knowledge or experience material to recognized environmental conditions.

1.4.2 Limitations

This report was prepared in keeping with accepted standards of practice for preparation of preliminary environmental assessments and limited investigations and using NAB's professional judgment. The findings and conclusions of this report cannot be considered scientific certainties, but rather our opinions considering the limited data gathered during the course of our preliminary environmental investigation. NAB makes no claims as to the presence or absence of subsurface contamination at the site. No other warranties, either expressed or implied, are made herein.

The limitations imposed during the preparation of this report include, but may not be limited to, those noted at the end of relevant sections of this report.

1.4.3 Exceptions and Deviations

There were no exceptions to the ASTM E 1527-13 standards or deviations from the standards during the preparation of this report.

1.4.4 Special Terms and Conditions

There are no special terms or conditions related to this ESA.

1.4.5 User Reliance

The contents of this document cannot be used or relied upon by any party other than the user, NAB, without the express written consent of USACE.

1.4.6 Continuing Obligations

Since the property is not being purchased, this ASTM E 1527-13 topic is not applicable.

2.0 SITE DESCRIPTION

2.1 Location

Four Mile Run between Arlington Wastewater Treatment Plant and the Arlandria section of northern Alexandria Virginia.

Arlington, Virginia 22202 and Alexandria, VA 22305

38º 50' 25.30" N 77º 3' 33.45" W and 38º 50' 32.03" N 77º 3' 24.49" W

This planning unit extends from the Potomac Ave. bridge over Four Mile Run, upstream to approximately 2000 feet west of the Mt Vernon Ave. bridge over Four Mile Run. (See Figure 1 in Appendix A). This includes residential and commercial areas south of Four Mile Run (FMR), and the important Arlington Wastewater Treatment Plan north of FMR, which would be inundated in various planning scenarios involving flooding and sea level rise.

Shoreline type in this area is a thin fringe of parkland with hiking/biking trails, backed by a mix of residential and commercial development. The only industrial development is the Arlington WPCP.

2.2 Current Owners

The property that would mainly be affected by the project is mainly Arlington County and Alexandria City parkland adjacent to FMR. Other land that would be impacted is the various residential and commercial properties immediately adjacent to the parkland, and the State and county roads that would be used to access by the project. Because the area is a dense residential and commercial area, there are many properties within EDR®'s one-quarter mile search radius of the project site. Information contained within the EDR® report lists owners of the properties listed.

2.3 Historical and Current Use of the Property

The use of these properties in the search area are a mix of residential, retail and green space. A limited historical aerial photo survey was conducted using photos dating back to 1937. The photos are shown in Appendix D. Historically the property was mainly marshland.

2.4 Description of the Site Infrastructure

There is no significant existing flood-control infrastructure, except possibly low levees along both banks of FMR.

2.5 Regional Geology, Topography, Soils, and Hydrogeology

2.5.1 Regional Geology

The site is located in the Coastal plain.

2.5.2 Topography

The topography is relatively flat in the site area. It ranges from twenty feet above sea level in the west to three feet above sea level in the east. FMR is tidal at or near the east end of the study area and has a very low gradient upstream. The banks rise about 10 feet above FMR. The south side of FMR is lower than the north rising to a maximum of about 25 feet above mean sea level (amsl) in the study area. Much of the north side is also less than 25 feet amsl, but some areas rise to as much as 100 feet amsl. Much of the Arlington WWTP is at 10 ft amsl or less.

2.5.3 Soils/Geology

The predominant soil type is sandy loam. Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures. The depth to bedrock is listed in the EDR® as greater than sixty inches but is expected to be much more.

2.5.4 Hydrogeology

No specific information on hydrogeology was located but ground water is expected to be less than ten feet below ground surface.

3.0 RECORDS REVIEW

3.1 Information from Federal Environmental Records

3.2.1 Introduction

Environmental Data Resources (EDR®) proprietary records were obtained for the search area. EDR® is recognized as an industry standard for records research. The EDR® vendor indicates:

EDR® searches over 1,600 environmental databases, including hundreds of federal, state, city and tribal sources. The “High-Risk Historical Records database” includes data about historic gas station, dry cleaner or manufactured gas plant for example.

3.2.2 Information from EDR® Proprietary Records

Four Mile Run-South Side

This area has approximately 30 potential contamination locations within ¼ mile of the project site. See Figure 2 in Appendix A. They consist of multiple properties along the commercialized Mt. Vernon Avenue a short distance west of the Site, including several former and current gas stations, and several former and current dry cleaners. In the southern part of the Site, these areas of concern are at least 500 feet away and are not likely to pose a concern. But in the northern part where the levee route is closest to Mt. Vernon Ave., there are three former gas stations and a current gas station within 75-200 feet of the Site. In all cases the potential contamination areas are uphill topographically from the Site, which implies the Site is hydrologically downgradient from them. Historical gas stations used single wall steel tanks which often leaked, causing groundwater contamination. Therefore the gas stations could pose a contamination risk to the Site construction on the north side.

The most significant cleanup site is the Potomac Yards site (#88). This has low-level soil and groundwater contamination from former railroad operations, and now has an impervious soil cover and a restriction on groundwater use. But it is over 1800 feet upgradient of the Site and any effect is not likely to extend to the Site.

There are several closed heating oil tanks within the ¼ mile search radius. These are not expected to pose a risk to the Site construction.

A complete list of mapped sites for the South side of FMR is in Appendix B.

Four Mile Run-North Side

There are several properties within the search range of the EDR® report that could impact the construction of the proposed alternatives (See Figure 3). Any construction of a floodwall will mainly occur on the north side of FMR, in between the water and the Arlington County Water Pollution Control Plant (WPCP). Mary Strawn, chief engineer at the plant, stated that the plant sits on an old landfill. There should be more research done on this as any contamination from landfilled materials could impact the proposed project.

a. The Arlington County WPCP on South Glebe Rd (EDR® site No.'s A1 and 14-20). This facility is listed as a small quantity waste generator. There are underground storage tanks (UST) on site. According to Mary Strawn, Chief Engineer at the plant, there is a contract in place to have all UST's replaced with above ground tanks (AST) this year. There are several sewage spill incidents listed in the EDR® report that are associated with the Water Pollution Control Plant. There are also incidents listing chemical spills, including petroleum products, on the site. Groundwater may be encountered during construction of a floodwall and could be contaminated with petroleum products and /or chemicals from these past spills which could add to the cost and could possibly delay the project.

b. There are two car dealerships at 3100 and 3154 Jefferson Davis Highway (EDR® site No.'s 5-8). These sites are listed as waste handlers dealing with wastes related to the automotive industry and don't pose any hazardous waste concerns to the proposed project.

c. Washington Metropolitan Transit Authority (WMTA) Bus Garage 3501 South Glebe Rd (EDR® site No.'s 37 & 38). The EDR® report lists the site as a small quantity waste generator and shows leaks from AST's, UST's and spills of petroleum products. The operator lists several chemicals on site including chlorinated solvents. Incidents of this nature could possibly contaminate the groundwater and possibly affect the proposed floodwall construction.

d. Virginia Department of Transportation (VDOT) Crystal City Four Mile Run 2910 Jefferson Davis Highway (EDR® Site No. 51), 1st Choice Body Shop 525 31st Street S (EDR® Site No. 57), Virginia Public Works Yard 500 31st Street S (EDR® Site No.65) and the Peterson Residence 814 26th Place S (EDR® Site No.66) are all listed with a LTANK designation. While these cases occurred several years ago and were closed successfully, it is possible that any past spills from these properties could impact the proposed alternatives. Groundwater may be encountered during construction of a floodwall and could be contaminated with petroleum products from these past spills which could add to the cost and could possibly delay the project.

e. National Gateway Land Bay D East 3400 Potomac Ave (EDR® Site No. 63). The site is listed with a LTANK designation. In addition, the site has a Voluntary Remediation Program (VRP) number, VRP00701. The EDR® report states that some soil excavation and testing occurred. More information has to be gathered to determine whether or not the possibility of contamination exists on this site and if it might impact the proposed construction.

f. Arlington County Refuse Transfer Station 500 31st Street S EDR® Site No. 67). The site is listed with LUST and as a solid waste facility. It is listed as closed. Although it has been closed for a number of years, it is possible that contaminants from the site could have affected the groundwater which could have an impact on the project.

g. Thrifty Car Rental – Arlington 2900 Jefferson Davis Highway (EDR® No. 71) and Alamo Rent-a-car 2780 Jefferson Davis Highway (EDR® Site No.78). Both sites are listed with LTANKS, LUST and SPILLS designation. While these cases occurred several years ago and were closed successfully, it is possible that any past spills from these properties could impact the proposed alternatives. Groundwater may be encountered during construction of a floodwall and could be contaminated with petroleum products from these past spills which could add to the cost and could possibly delay the project.

There are several properties within the search range of the EDR® report that could impact the construction of the proposed alternatives (See Figure 3). Any construction of a floodwall will mainly occur on the north side of Four Mile Run. In between the water and the Arlington County Water Pollution Control Plant (WPCP). Mary Strawn, chief engineer at the plant, stated that the plant sits on an old landfill. There should be more research done on this as any contamination from could impact the proposed project.

A complete list of mapped sites for the North side of FMR is in Appendix B.

3.2.3 Orphan Sites

Orphan sites are those that were identified in the EDR® Government database search, but which could not be mapped.

South Side

There are ten orphan sites in this area, listed as follows:

ALEXANDRIA S113411888 POTOMAC YARD LANDBAY G, PARCEL H BOUND BY E. GLEBE RD, MAINLINE 22305 VA ENG CONTROLS, VA INST

CONTROL, VA VCP

ALEXANDRIA S103894806 OLD ATF BUILDING 3800 SOUTH FOUR MILE RUN DRIVE 0 VA LUST

ALEXANDRIA S103374931 OAKVILLE INDUSTRIAL PARK (PREP) JEFFERSON DAVIS HIGHWAY (ACROS 22301 VA LUST

ARLINGTON S105502276 COLONIES OF ARLINGTON 1517 SOUTH 26TH STREET 0 VA LUST

ARLINGTON S105463124 RFP YARD 400 BLK OLD JEFFERSON DAVIS HW 22202 VA LTANKS

ARLINGTON S105983308 WETA TV26/FM91 (XREF 92-1331) 3700 SOUTH FOUR MILE DRIVE 0 VA LUST

ARLINGTON S111339291 FIELDS DELORES J RESIDENCE 3829 S FOUR MILE RD DR 22206 VA LTANKS

ARLINGTON S105982846 FORT MYER LEE ROAD 0 VA LUST

ARLINGTON S105982837 FORT MYER LEE ROAD 0 VA LUST, VA SPILLS

ARLINGTON S106610665 ARLINGTON INDUSTRIAL PROPERTY - NO OLD JEFFERSON DAVIS HIGHWAY (A 22202 VA ENG CONTROLS, VA

INST CONTROL, VA VCP

These were searched by name and by address and found to be at least ¼ mile from the Site and not expected to cause any impact.

North Side

There are eleven orphan sites in this area listed as follows:

ALEXANDRIA S113411888 POTOMAC YARD LANDBAY G, PARCEL H BOUND BY E. GLEBE RD, MAINLINE 22305 VA ENG CONTROLS, VA INST

CONTROL, VA VCP

ALEXANDRIA S103894806 OLD ATF BUILDING 3800 SOUTH FOUR MILE RUN DRIVE 0 VA LUST

ALEXANDRIA S103374931 OAKVILLE INDUSTRIAL PARK (PREP) JEFFERSON DAVIS HIGHWAY (ACROS 22301 VA LUST

ARLINGTON S105502276 COLONIES OF ARLINGTON 1517 SOUTH 26TH STREET 0 VA LUST

ARLINGTON S105463124 RFP YARD 400 BLK OLD JEFFERSON DAVIS HW 22202 VA LTANKS

ARLINGTON S105983308 WETA TV26/FM91 (XREF 92-1331) 3700 SOUTH FOUR MILE DRIVE 0 VA LUST

ARLINGTON S111339291 FIELDS DELORES J RESIDENCE 3829 S FOUR MILE RD DR 22206 VA LTANKS

ARLINGTON S106239738 ARLINGTON POLLUTION CONTROL PLANT GLEBE ROAD VA SPILLS

ARLINGTON S115953704 ARLINGTON COUNTY WATER POLLUTION C 3401 GLEBE ROAD VA RGA LUST

ARLINGTON S121485082 ARLINGTON COUNTY WATER POLLUTION C S GLEBE RD/S EADS ST VA SPILLS

ARLINGTON S106610665 ARLINGTON INDUSTRIAL PROPERTY - NO OLD JEFFERSON DAVIS HIGHWAY (A 22202 VA ENG CONTROLS, VA INST CONTROL, VA VCP

The first seven sites and last site are the same as the first seven and last on the South side, and again are greater than ¼ mile from the Site and pose no risk. The remaining three are associated with the Arlington Water Pollution Control Plant, which is already identified in detail in the EDR® report from other databases.

Overall, none of the orphan sites pose an addition risk to construction.

3.3 Aerial Photograph Review

Historical aerial photos were obtained from the Arlington County (Arlington, 2020) GIS website for the years 1937, 1949, and 1957. A full set of historical imagery has been ordered from EDR®, however this small sampling of online aerial photos was used to perform a brief assessment of the type of land use occurring in the past at the project site. This was done by overlaying the floodwall/levee route, from the EDR® report, onto the imagery. The 1937 imagery was only available for the southeast half of the project area. The overlay figures are in Appendix D.

South of 4 Mile Run/Arlandria

On the south side of the project, the property was undeveloped marshy land until it began filling in with residences. The property within 500-1000 feet of 4 Mile Run remained undeveloped, likely since it was marshy. On the north/west side, a mix of residential and commercial buildings were in place along Mt Vernon Ave. by 1948, and clearing was occurring at the far west end of the project where Mt. Vernon Ave. crosses 4 Mile Run. At this end of the project, 4 Mile Run is anywhere from 100 to 500 feet south of its current location, and the floodwall will actually cross the former stream bed of 4 Mile Run on its north-most routing. By 1957, residences filled the space west of the project on the south, while the area to the north remained marshland. In the center there are commercial buildings. At the north end of the project clearing is still occurring, and several properties near the floodwall have large items stacked and scattered, like a storage yard.

North of 4 Mile Run/Arlington

This property was marshland until the construction of the WWTP. This began north of Glebe Road by 1949, and appears fully built and operational in 1957. At that time the property between Glebe Road and 4 Mile Run was being cleared and starting to be built.

4.0 INTERVIEWS CONDUCTED

Call with Mary Strawn, Chief Engineer, Arlington Water Pollution Control Plant 7/7/20.

Mary said the site has been in existence since the 1930's. It operated as a landfill until the plant was built. There was soil testing done and soil was removed. More research has to be done on the site history. It is possible that contamination from the landfill still exists. Currently, all chemical storage tanks have secondary containment and any UST's are contracted to be replaced by AST's.

5.0 EVALUATION

5.1 Data Gaps

a. Any Voluntary Remediation Program reports for the dry cleaner sites. This is necessary to determine groundwater contamination.

b. VADEQ UST program reports for fuel stations. Reports needed to determine the extent of groundwater contamination.

After several attempts to reach a representative at VADEQ, spoke with Richard Doucette July 13, 2020 at VADEQ Northern Regional Office and discussed the sites listed in the EDR® report for another site (Belle Haven). He advised to use the Freedom of Information Act (FOIA) to obtain information about the sites in question. These reports are pending for Belle Haven, and the same process will need to be followed for the sites along FMR.

c. Hazardous material response reports from Alexandria City and Arlington County Fire and Hazardous Materials office. E.g., for the Belle Haven Site, Fairfax County Fire and Hazardous Materials Investigative Division was contacted Spoke with Rick Forte 7/14/20 and he asked that we make all inquiries through FOIA. These reports are still pending. A similar process will be needed for Alexandria and Arlington.

d. A site visit has yet to be conducted.

6.0 FINDINGS AND CONCLUSIONS

According to the data provided, nearly all of the project route is within a narrow band of City and County parkland adjacent to FMR, and other wider section of County park. This investigation identified no known sources of environmental contamination on the project route itself. There are several potential sources of environmental contamination on the north side of FMR, all associated with the Arlington WWTP. In addition, based on interview and aerial photo evidence that landfilling occurred in order to construct the WWTP in the floodplain of FMR, the entire route of the floodwall/levee adjacent to WWTP should be considered a possible risk of encountering groundwater contamination that would require proper safety precautions, and proper disposal if containerized.

On the south side of FMR, there are approximately 10 sites that are potential sources of contamination including current and former gas stations, and current and former dry cleaners. Former gas stations and dry cleaners are frequently the source of groundwater contamination. All the sites are likely to be upgradient of the floodwall, so any contaminated groundwater would flow towards the floodwall. Fortunately most of these sites are at least 500 feet away. However three former gas stations and one current (though with a long history) gas station are within 75 to 200 feet of the floodwall route on its western end. These are thought to pose the greatest risk and need to be further investigated.

7.0 REFERENCES AND SOURCES

Arlington, 2020. https://maps.arlingtonva.us/interactive-maps/

USACE, 2020. *Report Summary for Metropolitan Washington (DC, Maryland, Virginia) Coastal Storm Risk Management Feasibility Study*. (USACE-March 2020)

VDEQ, 2011. *STORAGE TANK PROGRAM TECHNICAL MANUAL. DEQ Guidance Document # 01-2024D (Fourth Edition, May 10, 2011).*Virginia Department of Environmental Quality. Accessed online at https://www.deq.virginia.gov/Portals/0/DEQ/Land/Tanks/012024d.pdf

APPENDIX A
FIGURES

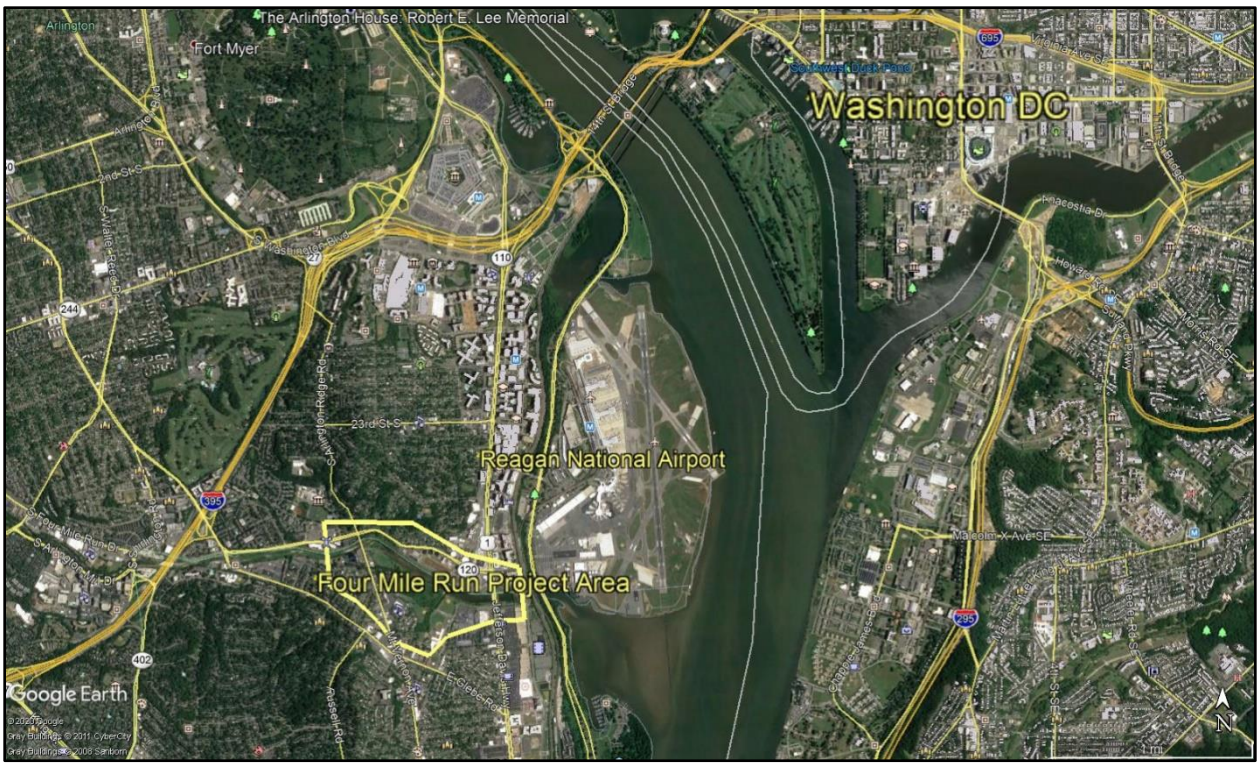

FIGURE 1: FOUR MILE RUN PROJECT AREA

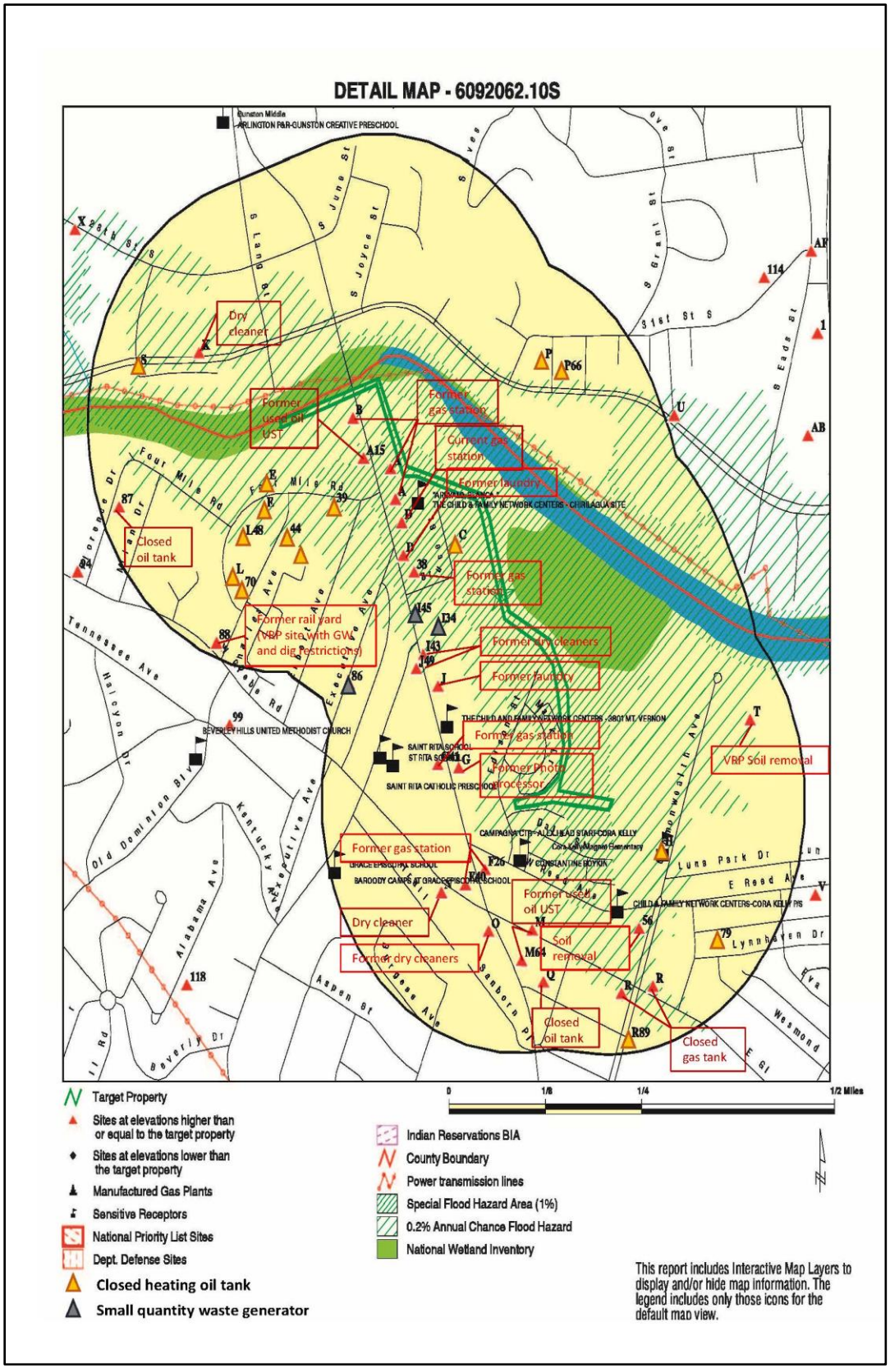

FIGURE 2: FOUR MILE RUN, SOUTH (ARLANDRIA) SITES OF CONCERN

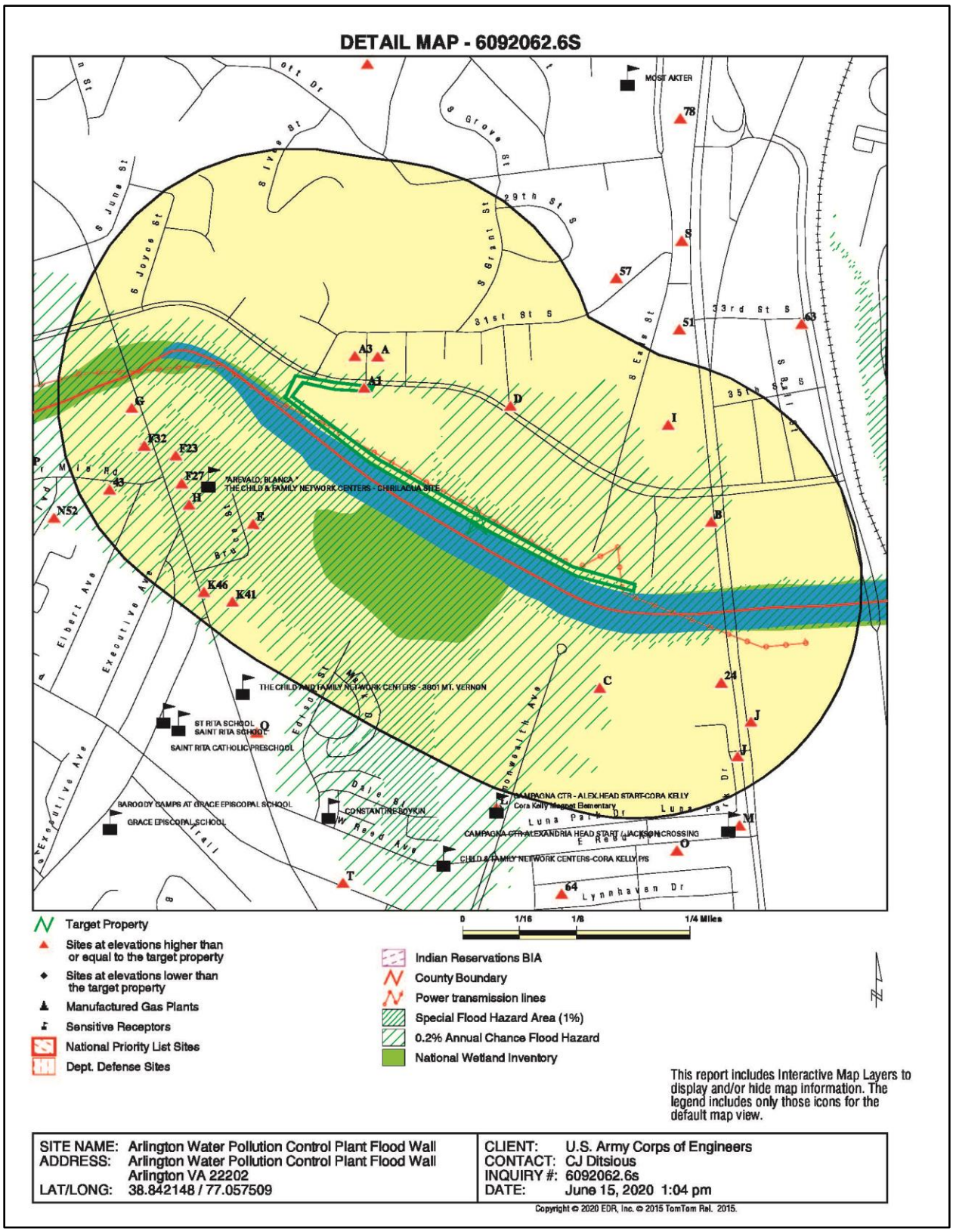

FIGURE 3: FOUR MILE RUN, NORTH (ARLINGTON) SITES OF CONCERN

APPENDIX B

MAPPED SITES SUMMARY-SOUTH OF FOUR MILE RUN

(keyed to Figure 2)

MAPPED SITES SUMMARY

Target Property Address:
ARLINGTON WATER POLLUTION CONTROL PLANT FLOOD WALL
ARLINGTON, VA 22202

Click on Map ID to see full detail.

MAP ID	SITE NAME	ADDRESS	DATABASE ACRONYMS	RELATIVE ELEVATION	DIST (ft. & mi.) DIRECTION
J40	SHOPPERS FOOD WAREHO	3801 JEFFERSON DAVIS	PA MANIFEST	Higher	1020, 0.193, SE
K41	CVS PHARMACY #1422	3811 MT. VERNON AVEN	RCRA NonGen / NLR	Higher	1124, 0.213, WSW
J42	AUTO BENZ BODY SHOP	3700 JEFF DAVIS HWY	RCRA-VSQG, FINDS, ECHO, NY MANIFEST	Higher	1136, 0.215, SE
43	POTOMAC VILLAGE APAR	506 FOUR MILE DRIVE	VA LUST	Higher	1151, 0.218, West
J44	CRYSTAL CAR CARE INC	3700 JEFFERSON DAVIS	RCRA-SQG, FINDS, ECHO	Higher	1151, 0.218, SE
J45	VIRGINIA ADJUSTABLE-	3700 JEFFERSON DAVIS	VA UST	Higher	1151, 0.218, SE
K46	MOM'S ORGANIC MARKET	3831 MOUNT VERNON AV	RCRA NonGen / NLR, FINDS, ECHO	Higher	1182, 0.224, WSW
L47	CORA B. KELLY SCHOOL	3600 COMMONWEALTH AV	VA LUST	Higher	1425, 0.270, South
L48	CORA B KELLY SCHOOL	3600 COMMONWEALTH AV	VA LTANKS	Higher	1425, 0.270, South
M49	JACKSON CROSSING	120 E REED AVE	VA ENG CONTROLS, VA INST CONTROL, VA VCP	Higher	1474, 0.279, SE
M50	ALEXANDRIA CITY PROP	3600 JEFFERSON DAVIS	VA LTANKS	Higher	1495, 0.283, SE
51	VDOT - CRYSTAL CITY	2910 JEFFERSON DAVIS	VA LTANKS	Higher	1496, 0.283, NE
N52	GP CONDO LIMITED LIA	3915 OLD DOMINION BL	VA LTANKS	Higher	1512, 0.286, West
O53	NATIONAL CAR RENTAL	117 E REED AVE	VA LTANKS, VA UST	Higher	1527, 0.289, SSE
O54	NATIONAL CAR RENTAL	117 EAST REED AVENUE	VA LUST	Higher	1527, 0.289, SSE
P55	NEW BROOKSIDE APARTM	601 FOUR MILE ROAD	VA LUST	Higher	1539, 0.291, West
P56	NEW BROOKSIDE APARTM	601 FOUR MILE RD	VA LTANKS	Higher	1539, 0.291, West
57	1ST CHOICE BODY SHOP	525 31ST ST S	VA LTANKS	Higher	1549, 0.293, NNE
N58	RUDD REALTY	649 NOTABENE DR	VA LTANKS	Higher	1598, 0.303, West
N59	RUDD REALTY	649 NOTOBENE DRIVE	VA LUST	Higher	1598, 0.303, West
Q60	QUALEX	3701 MOUNT VERNON AV	VA LUST	Higher	1686, 0.319, SW
Q61	QUALEX INCORPORATED	3701 MOUNT VERNON AV	VA LTANKS	Higher	1686, 0.319, SW
R62	ARLEDGE REAL ESTATE	625 NOTABENE DR	VA LUST, VA LTANKS	Higher	1789, 0.339, West
63	NATIONAL GATEWAY LAN	3400 POTOMAC AVE	VA LTANKS, VA VCP	Higher	1798, 0.341, ENE
64	MONTE CARLO FINANCIA	112 LYNHAVEN DR	VA LTANKS	Higher	1806, 0.342, SSE
S65	VIRGINIA PUBLIC WORK	500 31ST ST S	VA LTANKS	Higher	1852, 0.351, NE
66	PETERSON MARK GARDNE	814 26TH PL S	VA LTANKS	Higher	1854, 0.351, NNW
S67	ARLINGTON COUNTY REF	500 31ST ST S	VA SWF/LF, VA LUST	Higher	1877, 0.355, NE
68	AI SMITH MANAGEMENT	3812 OLD DOMINION BL	VA LUST, VA LTANKS	Higher	1922, 0.364, West
R69	JAMES D GANANER		VA LUST, VA UST	Higher	1937, 0.367, West
R70	GARDEN APARTMENTS	607 NOTABENE DR	VA LTANKS	Higher	1937, 0.367, West
S71	THRIFTY CAR RENTAL -	2900 JEFFERSON DAVIS	VA LTANKS, VA SPILLS, VA TIER 2	Higher	1968, 0.373, NE
72	ARLINGTON RIDGE SHOP	2921-2955 SOUTH GLEB	VA VCP	Higher	2002, 0.379, WNW
73	AUBURN CLEANERS	6 E GLEBE RD	VA VCP, US AIRS, FINDS, ECHO, VA DRYCLEANERS	Higher	2151, 0.407, South
T74	RAY BURNETT VOLKSWAG	107 W GLEBE RD	VA LTANKS, VA SPILLS	Higher	2207, 0.418, SSW
T75	RAY BURNETTE VW	107 WEST GLEBE ROAD	VA LUST, VA SPILLS	Higher	2207, 0.418, SSW
76	POTOMAC YARD LANDBAY	621 W GLEBE RD	VA ENG CONTROLS, VA INST CONTROL, VA VCP	Higher	2225, 0.421, West
U77	JUST TIRES	3300 JEFFERSON DAVIS	VA LUST, VA LTANKS	Higher	2280, 0.432, SSE
78	ALAMO RENT-A-CAR	2780 JEFFERSON DAVIS	VA LUST, VA LTANKS, VA SPILLS	Higher	2371, 0.449, NNE

MAPPED SITES SUMMARY

Target Property Address:
ARLINGTON WATER POLLUTION CONTROL PLANT FLOOD WALL
ARLINGTON, VA 22202

Click on Map ID to see full detail.

MAP ID	SITE NAME	ADDRESS	DATABASE ACRONYMS	RELATIVE ELEVATION	DIST (ft. & mi.) DIRECTION
79	BERKLEY APARTMENTS	2900 S GLEBE RD	VA LTANKS, VA SPILLS	Higher	2374, 0.450, WNW
V80	AT & T	101 LEDBEATER STREET	VA LUST	Higher	2419, 0.458, SSW
V81	ALEXANDRIA B24K020	101 LEDBEATER ST	VA LTANKS, VA UST	Higher	2419, 0.458, SSW
82	HALE HEATHER RESIDEN	415 TENNESSEE AVE	VA LTANKS	Higher	2440, 0.462, WSW
83	AUBURN VILLAGE	3307 COMMONWEALTH AV	VA LUST, VA LTANKS	Higher	2478, 0.469, South
U84	CROWN #VA-007	3216 JEFFERSON DAVIS	VA LUST, VA LTANKS, VA SPILLS	Higher	2519, 0.477, SSE
85	EATON SQUARE	3814 FLORENCE DR	VA LTANKS	Higher	2550, 0.483, West

APPENDIX C

MAPPED SITES SUMMARY-NORTH OF FOUR MILE RUN

(keyed to Figure 3)

MAPPED SITES SUMMARY

Target Property Address:
ARLINGTON WATER POLLUTION CONTROL PLANT FLOOD WALL
ARLINGTON, VA 22202

Click on Map ID to see full detail.

MAP ID	SITE NAME	ADDRESS	DATABASE ACRONYMS	RELATIVE ELEVATION	DIST (ft. & mi.) DIRECTION
A1	ARLINGTON COUNTY WPC	3324 SOUTH GLEBE ROA	VA SPILLS	Higher	1 ft.
A2	KONRAD MATTHEW J RES	3113 S HIGH ST	VA LTANKS	Higher	119, 0.023, NNW
A3	VERA LUIS MANUEL RES	3110 S HIGH ST	VA LTANKS	Higher	166, 0.031, NW
A4	BAUMGARTNER CHRISTOP	3109 S HIGH ST	VA LTANKS	Higher	178, 0.034, NNW
B5	PORSCHE ARLINGTON	3100 JEFFERSON DAVIS	PA MANIFEST	Higher	527, 0.100, East
B6	HEISHMAN BMW INC	3100 JEFFERSON DAVIS	RCRA-VSQG	Higher	527, 0.100, East
B7	HEISHMAN BMW	3154 JEFFERSON DAVIS	VA LTANKS	Higher	574, 0.109, East
B8	HEISHMAN BMW INC	3154 JEFFERSON DAVIS	RCRA-VSQG, VA UST, FINDS, ECHO, NJ MANIFEST	Higher	574, 0.109, East
C9	HERTZ RENT A CAR (AR	3800 RICHMOND HWY	VA UST, VA SPILLS, VA Financial Assurance, VA TIER...	Higher	593, 0.112, SE
C10	HELMS CONCRETE SITE	3800 JEFFERSON DAVIS	VA LUST, VA LTANKS, VA INST CONTROL, VA VCP, VA...	Higher	593, 0.112, SE
C11	HERTZ RENT A CAR (AR	3800 RICHMOND HWY	VA AST	Higher	593, 0.112, SE
C12	ALEXANDRIA TOYOTA	3800 JEFFERSON DAVIS	VA VCP	Higher	593, 0.112, SE
C13	HERTZ CORP	3800 JEFFERSON DAVIS	RCRA-VSQG, FINDS, ECHO, NJ MANIFEST	Higher	593, 0.112, SE
D14	ARLINGTON COUNTY WAT	3402 SOUTH GLEBE ROA	RCRA-VSQG	Higher	642, 0.122, NNE
D15	ARLINGTON COUNTY WAT	3402 S GLEBE RD	VA LTANKS, VA SPILLS, VA AIRS, VA NPDES	Higher	642, 0.122, NNE
D16	ARLINGTON COUNTY WPC	3402 S GLEBE RD	PA MANIFEST	Higher	642, 0.122, NNE
D17	ARLINGTON COUNTY WAT	3402 S GLEBE RD	VA UST, VA AST	Higher	642, 0.122, NNE
D18	ARLINGTON COUNTY GOV	3401 S GLEBE RD	PA MANIFEST	Higher	648, 0.123, NNE
D19	ARLINGTON CNTY GOVT-	3401 S GLEBE ROAD	RCRA NonGen / NLR, ICIS, US AIRS, NY MANIFEST	Higher	648, 0.123, NNE
D20	ARLINGTON POTW	3401 SOUTH GLEBE ROA	VA LUST, VA SPILLS	Higher	648, 0.123, NNE
E21	POTOMAC VILLAGE APAR	3913 BRUCE ST	VA LTANKS	Higher	693, 0.131, West
E22	POTOMAC VILLAGE APAR	3913 BRUCE STREET	VA LUST	Higher	693, 0.131, West
F23	DURON PAINT	4109 MOUNT VERNON AV	VA LTANKS	Higher	717, 0.136, WNW
24	ALEXANDRIA TOYOTA SI	3800 JEFFERSON DAVIS	RCRA NonGen / NLR, NJ MANIFEST	Higher	737, 0.140, SE
G25	KEUM, KIM S	4125 MT VERNON AV	RCRA NonGen / NLR	Higher	768, 0.145, WNW
G26	ARLANDRIA CLEANERS	4125 MOUNT VERNON AV	VA DRYCLEANERS	Higher	768, 0.145, WNW
F27	SUNOCO SERVICE STATI	4007 MT VERNON AVE	RCRA NonGen / NLR, FINDS, ECHO	Higher	779, 0.148, West
H28	EXXON CO USA #24205	4001 MT VERNON-EXECU	RCRA-VSQG, FINDS, ECHO	Higher	835, 0.158, West
H29	CHEVRON 122159	4001 MOUNT VERNON AV	VA LTANKS	Higher	835, 0.158, West
H30	EXXON R/S #24205	4001 MOUNT VERNON AV	VA UST, VA Financial Assurance	Higher	835, 0.158, West
H31	CHEVRON #122159	4001 MT. VERNON AVEN	VA LUST	Higher	835, 0.158, West
F32	KEITH PETERSON	4102 MOUNT VERNON AV	VA UST	Higher	864, 0.164, WNW
G33	AMOCO OIL CO	4122 MOUNT VERNON AV	VA UST	Higher	892, 0.169, WNW
G34	JOANNE S. PETERS	4118 MOUNT VERNON AV	VA UST	Higher	892, 0.169, WNW
G35	AMOCO - EUDY'S	4118 MOUNT VERNON AV	VA LUST, VA LTANKS	Higher	892, 0.169, WNW
I36	WMATA - BUS GARAGE	3501 SOUTH GLEBE ROA	VA LUST, VA SPILLS	Higher	946, 0.179, ENE
I37	WMATA METRO BUS GARA	3501 SOUTH GLEBE ROA	RCRA-SQG, US AIRS, FINDS, NY MANIFEST, PA MANIFEST	Higher	946, 0.179, ENE
I38	WMATA - FOUR MILE RU	3501 S GLEBE RD	VA LTANKS, VA UST, VA AST, VA Financial Assurance	Higher	946, 0.179, ENE
J39	SHOPPERS FOOD WAREHO	3801 JEFFERSON DAVIS	RCRA-VSQG, FINDS, ECHO	Higher	1020, 0.193, SE

MAPPED SITES SUMMARY

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ARLINGTON, VA 22202

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K41	CVS PHARMACY #1422	3811 MT. VERNON AVEN	RCRA NonGen / NLR	Higher	1124, 0.213, WSW
J42	AUTO BENZ BODY SHOP	3700 JEFF DAVIS HWY	RCRA-VSQG, FINDS, ECHO, NY MANIFEST	Higher	1136, 0.215, SE
43	POTOMAC VILLAGE APAR	506 FOUR MILE DRIVE	VA LUST	Higher	1151, 0.218, West
J44	CRYSTAL CAR CARE INC	3700 JEFFERSON DAVIS	RCRA-SQG, FINDS, ECHO	Higher	1151, 0.218, SE
J45	VIRGINIA ADJUSTABLE-	3700 JEFFERSON DAVIS	VA UST	Higher	1151, 0.218, SE
K46	MOM'S ORGANIC MARKET	3831 MOUNT VERNON AV	RCRA NonGen / NLR, FINDS, ECHO	Higher	1182, 0.224, WSW
L47	CORA B. KELLY SCHOOL	3600 COMMONWEALTH AV	VA LUST	Higher	1425, 0.270, South
L48	CORA B KELLY SCHOOL	3600 COMMONWEALTH AV	VA LTANKS	Higher	1425, 0.270, South
M49	JACKSON CROSSING	120 E REED AVE	VA ENG CONTROLS, VA INST CONTROL, VA VCP	Higher	1474, 0.279, SE
M50	ALEXANDRIA CITY PROP	3600 JEFFERSON DAVIS	VA LTANKS	Higher	1495, 0.283, SE
51	VDOT - CRYSTAL CITY	2910 JEFFERSON DAVIS	VA LTANKS	Higher	1496, 0.283, NE
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O53	NATIONAL CAR RENTAL	117 E REED AVE	VA LTANKS, VA UST	Higher	1527, 0.289, SSE
O54	NATIONAL CAR RENTAL	117 EAST REED AVENUE	VA LUST	Higher	1527, 0.289, SSE
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P56	NEW BROOKSIDE APARTM	601 FOUR MILE RD	VA LTANKS	Higher	1539, 0.291, West
57	1ST CHOICE BODY SHOP	525 31ST ST S	VA LTANKS	Higher	1549, 0.293, NNE
N58	RUDD REALTY	649 NOTABENE DR	VA LTANKS	Higher	1598, 0.303, West
N59	RUDD REALTY	649 NOTOBENE DRIVE	VA LUST	Higher	1598, 0.303, West
Q60	QUALEX	3701 MOUNT VERNON AV	VA LUST	Higher	1686, 0.319, SW
Q61	QUALEX INCORPORATED	3701 MOUNT VERNON AV	VA LTANKS	Higher	1686, 0.319, SW
R62	ARLEDGE REAL ESTATE	625 NOTABENE DR	VA LUST, VA LTANKS	Higher	1789, 0.339, West
63	NATIONAL GATEWAY LAN	3400 POTOMAC AVE	VA LTANKS, VA VCP	Higher	1798, 0.341, ENE
64	MONTE CARLO FINANCIA	112 LYNHAVEN DR	VA LTANKS	Higher	1806, 0.342, SSE
S65	VIRGINIA PUBLIC WORK	500 31ST ST S	VA LTANKS	Higher	1852, 0.351, NE
66	PETERSON MARK GARDNE	814 26TH PL S	VA LTANKS	Higher	1854, 0.351, NNW
S67	ARLINGTON COUNTY REF	500 31ST ST S	VA SWF/LF, VA LUST	Higher	1877, 0.355, NE
68	AI SMITH MANAGEMENT	3812 OLD DOMINION BL	VA LUST, VA LTANKS	Higher	1922, 0.364, West
R69	JAMES D GANANER		VA LUST, VA UST	Higher	1937, 0.367, West
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S71	THRIFTY CAR RENTAL -	2900 JEFFERSON DAVIS	VA LTANKS, VA SPILLS, VA TIER 2	Higher	1968, 0.373, NE
72	ARLINGTON RIDGE SHOP	2921-2955 SOUTH GLEB	VA VCP	Higher	2002, 0.379, WNW
73	AUBURN CLEANERS	6 E GLEBE RD	VA VCP, US AIRS, FINDS, ECHO, VA DRYCLEANERS	Higher	2151, 0.407, South
T74	RAY BURNETT VOLKSWAG	107 W GLEBE RD	VA LTANKS, VA SPILLS	Higher	2207, 0.418, SSW
T75	RAY BURNETTE VW	107 WEST GLEBE ROAD	VA LUST, VA SPILLS	Higher	2207, 0.418, SSW
76	POTOMAC YARD LANDBAY	621 W GLEBE RD	VA ENG CONTROLS, VA INST CONTROL, VA VCP	Higher	2225, 0.421, West
U77	JUST TIRES	3300 JEFFERSON DAVIS	VA LUST, VA LTANKS	Higher	2280, 0.432, SSE
78	ALAMO RENT-A-CAR	2780 JEFFERSON DAVIS	VA LUST, VA LTANKS, VA SPILLS	Higher	2371, 0.449, NNE

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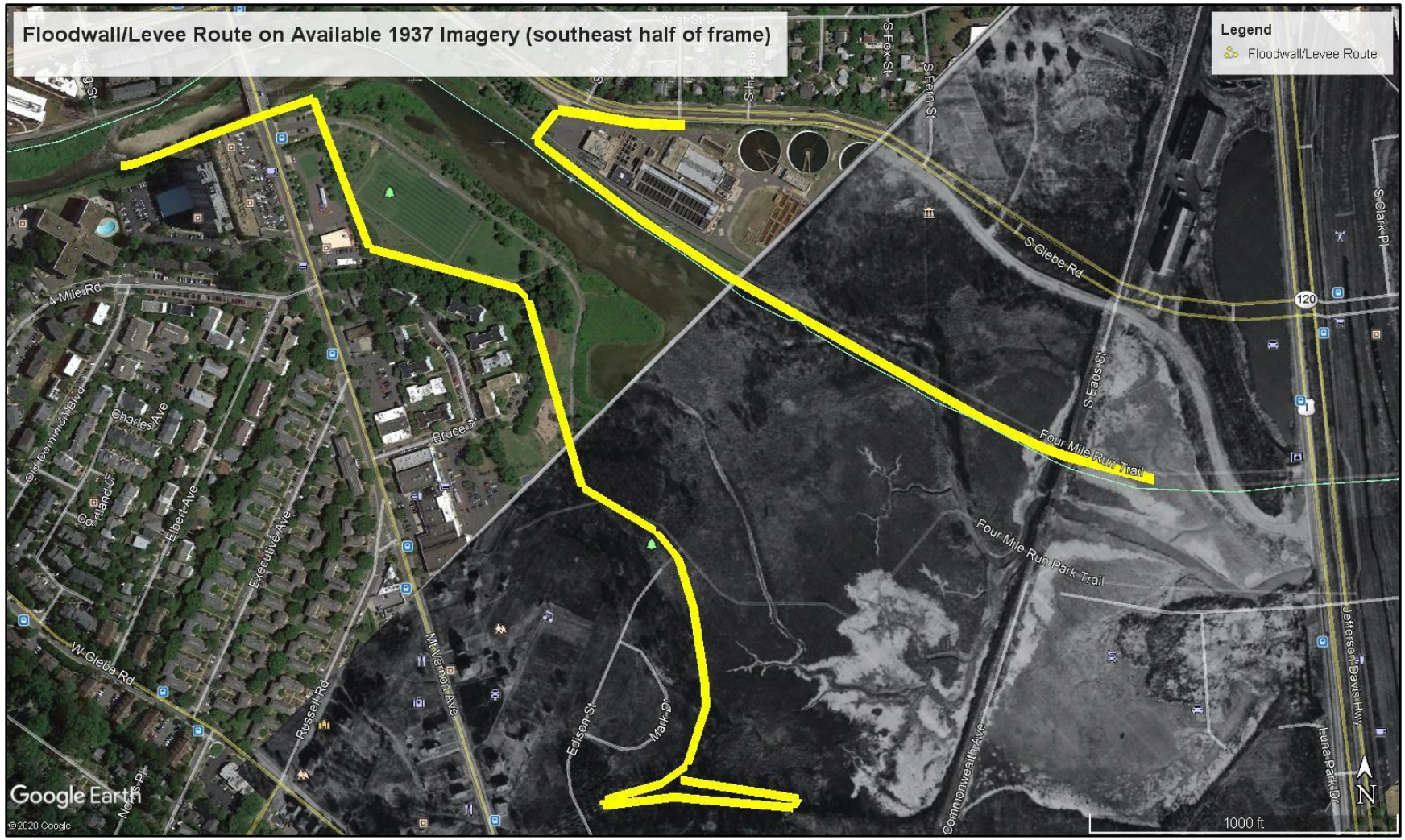
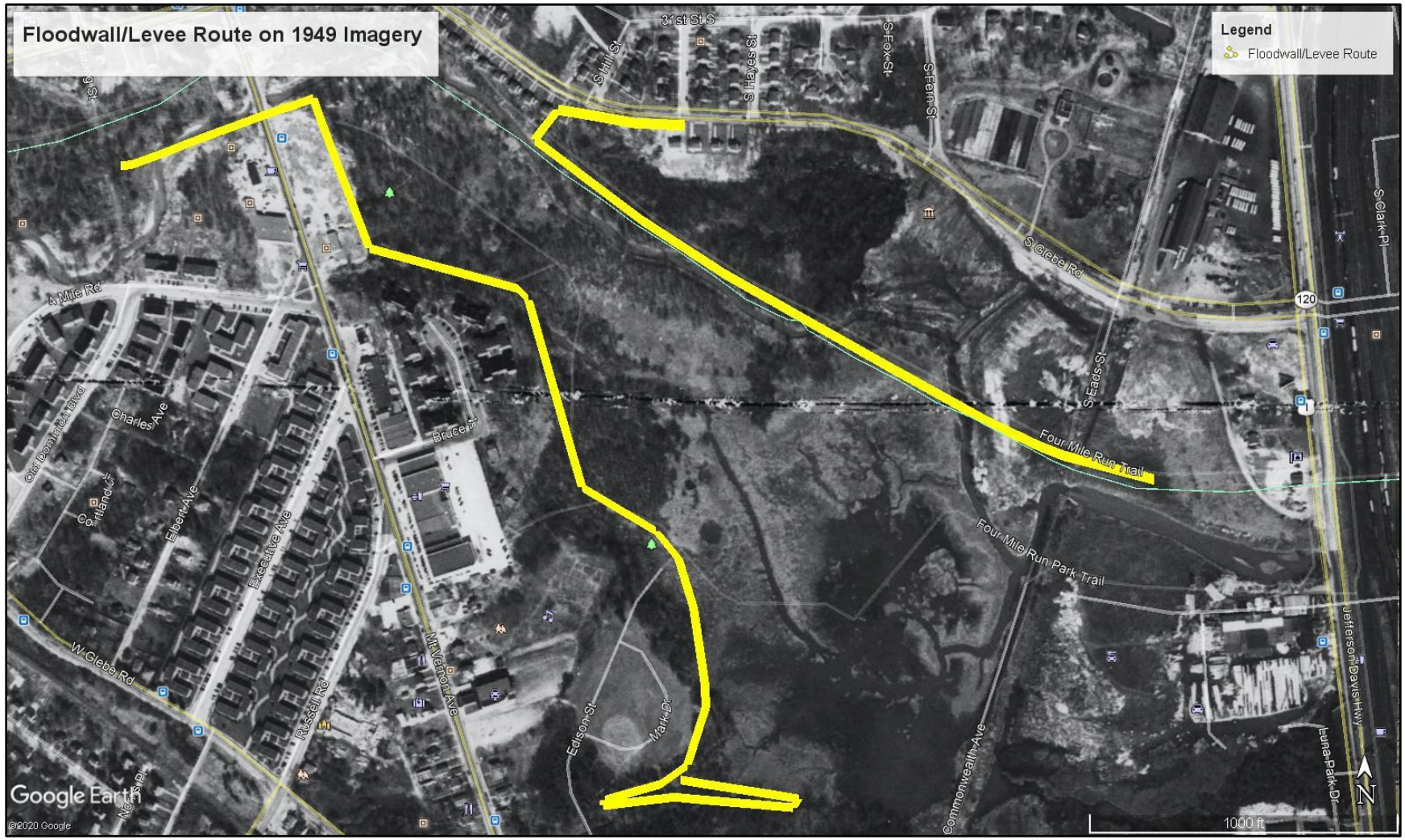
V81	ALEXANDRIA B24K020	101 LEDBEATER ST	VA LTANKS, VA UST	Higher	2419, 0.458, SSW
82	HALE HEATHER RESIDEN	415 TENNESSEE AVE	VA LTANKS	Higher	2440, 0.462, WSW
83	AUBURN VILLAGE	3307 COMMONWEALTH AV	VA LUST, VA LTANKS	Higher	2478, 0.469, South
U84	CROWN #VA-007	3216 JEFFERSON DAVIS	VA LUST, VA LTANKS, VA SPILLS	Higher	2519, 0.477, SSE
85	EATON SQUARE	3814 FLORENCE DR	VA LTANKS	Higher	2550, 0.483, West

APPENDIX D

HISTORICAL AERIAL PHOTOGRAPHS


Floodwall/Levee Route on Available 1937 Imagery (southeast half of frame)
Legend
Floodwall/Levee Route
S Fox St
S Fern St
S Clark Pl
S Glebe Rd
120
4 Mile Rd
Charles Ave
Bruce St
Glebe Dominion Blvd
Cortland Ct
Elbert Ave
Executive Ave
Four Mile Run Trail
Four Mile Run Park Trail
W Glebe Rd
Russell Rd
Mt Vernon Ave
Edison St
Mark Dr
Commonwealth Ave
Jefferson Davis Hwy
Luna Park Dr
Nelms Pl
Google Earth
© 2020 Google
1000 ft
N


Floodwall/Levee Route on 1949 Imagery
Legend
Floodwall/Levee Route
31st St S
S Hill St
S Hayes St
S Fox St
S Fern St
S Glebe Rd
S Clark Pl
120
S Eads St
Four Mile Run Trail
Four Mile Run Park Trail
4 Mile Rd
Old Dominion Blvd
Charles Ave
Bruce Dr
Courtland Dr
Ebert Ave
Executive Ave
W Glebe Rd
Russell Rd
Mt Vernon Ave
Edison St
Mark Dr
Commonwealth Ave
Jefferson Davis Hwy
Luna Park Dr
Google Earth
©2020 Google
1000 ft
N


Floodwall/Levee Route on 1957 Imagery
Legend
Floodwall/Levee Route
31st St S
S Hill St
S Hayes St
S Fox St
S Fern St
S Clark Pl
120
S Glebe Rd
4 Mile Rd
S Eads St
Four Mile Run Trail
Four Mile Run Park Trail
Old Dominion Blvd
Charles Ave
Bruce St
Courtland Pl
Elbert Ave
Executive Ave
W Glebe Rd
Russell Rd
Mt Vernon Ave
Edsall St
Mark Dr
Commonwealth Ave
Jefferson Davis Hwy
Luna Park Dr
Norris St
Google Earth
©2020 Google
Gray Buildings © 2008 Sanborn
1000 ft
N

DRAFT

NORTHERN VIRGINIA COASTAL STORM RISK MANAGEMENT STUDY
HTRW INVESTIGATION
BELLE HAVEN FLOODWALL AND LEVEE

Prepared by:

US Army Corps of Engineers

Environmental and Munitions Design Center

2 Hopkins Plaza

Baltimore, MD

February 2022

TABLE OF CONTENTS

LIST OF APPENDICES

*The EDR Report is not included in this appendix. Please contact USACE, Baltimore District for a copy of the EDR® Report.

LIST OF ACRONYMS AND ABBREVIATIONS

AST	Aboveground Storage Tank
ASTM	American Society for Testing and Materials
AUL	Activity and Use Limitation
BRAC	Base Realignment and Closure
CERCLA	Comprehensive Environmental Response Compensation and Liability Act
CERCLIS	Comprehensive Environmental Response Compensation and Liability Information System
CORRACTS	RCRA Corrective Action
DoD	Department of Defense
EDR®	Environmental Data Resources, Inc.
EMDC	Environmental and Munitions Design Center
EP	Environmental Professional
ERNS	Emergency Response Notification System
ESA	Environmental Site Assessment
FOIA	Freedom Of Information Act
FUDS	Formerly Used Defense Site
IC/EC	Institutional Control/Engineering Control
LUST	Leaking Underground Storage Tank
MD-DNR	Maryland Department of Natural Resources
MEC	Munitions and Explosives of Concern
NAB	United States Army Corps of Engineers, Baltimore District
NRCS	Natural Resources Conservation Service
NFRAP	No Further Remedial Action Planned
NPL	National Priority List
RCRA	Resource Conservation and Recovery Act
REC	Recognized Environmental Condition
SCRD	State Coalition for Remediation of Dry Cleaners
TSD	Treatment, Storage and Disposal
USACE	United States Army Corps of Engineers
USGS	United States Geological Survey
UST	Underground Storage Tank

EXECUTIVE SUMMARY

A study was performed to evaluate the feasibility of Federal participation in the implementation of solutions to address problems and opportunities associated with coastal storm damage in the study area, which is Northern Virginia within the Middle Potomac River watershed. Northern Virginia has been impacted by numerous major tropical and extratropical events, most notably the Chesapeake and Potomac Hurricane of 1933, Hurricane Agnes (1972), Hurricane Floyd (1999), Hurricane Fran (1996), Nor'easter (1998), Hurricane Isabel (2003), Hurricane Irene (2011), and Hurricane Sandy (2012). Hurricane Isabel in 2003 resulted in extreme water levels and caused millions of dollars of damage to residences, businesses, and critical infrastructure. Within the study area, there are locations of national significance and national security. Facilities important to national security include the Pentagon and Fort Belvoir. Many historic districts and properties are located within the study area, such as Old Town Alexandria, Mount Vernon, and the George Washington Memorial Parkway. Environmentally significant resources include Dyke Marsh, Featherstone National Wildlife Refuge, Occoquan Bay National Wildlife Refuge, and Mason Neck National Wildlife Refuge. Critical infrastructure in the study area includes Ronald Reagan Washington National Airport, Washington, DC Metro, transportation networks including GWMP and the Capital Beltway, freight and passenger railways, electrical generation and transmission systems, drinking and wastewater systems, and other lifeline infrastructure.

1.0 INTRODUCTION

1.1 Purpose

This report is a summary of an investigation of the properties that may impact the Belle Haven Floodwall and Levee Project in Fairfax County Virginia and was conducted as an environmental site assessment (ESA). The purpose of the ESA is to evaluate whether or not hazardous substances or petroleum products may be present on the property under conditions suggesting that a past release, continuing release, or material threat of a release to the property is present, and to conclude whether or not recognized environmental conditions (RECs) exist based on the results of the process. This assessment is not intended to identify *de minimis* conditions that do not present a significant risk of harm to public health or the environment, and that would generally not be subject to enforcement action if brought to the attention of appropriate governmental agencies.

1.2 Scope of Services

USACE – Baltimore District (NAB) personnel performed the following work:

- Interviewed state and local governmental officials.
- Reviewed records [Federal environmental records, State and Tribal environmental records, Environmental Data Resources (EDR®) proprietary records, aerial photographs, city directory abstract and historical topographic maps].

1.3 Standards

NAB personnel followed the practice established by ASTM International, formerly the American Society for Testing and Materials, Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process (Designation E 1527-13). This practice defines "good commercial and customary practice in the United States for conducting an environmental site assessment of a parcel of commercial real estate with respect to the range of contaminants within the scope of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) and petroleum products."

1.4 Assumptions, Limitations, Exceptions, Deviations, Terms and User Reliance

1.4.1 Significant Assumption

NAB personnel completed this project with the following significant assumptions in mind:

- NAB assumed that the client (NAB-PPMD) relayed any specialized knowledge or experience material to recognized environmental conditions.

- NAB assumed that the owner representative and any other interviewed individuals relayed any specialized knowledge or experience material to recognized environmental conditions.

1.4.2 Limitations

This report was prepared in keeping with accepted standards of practice for preparation of preliminary environmental assessments and limited investigations and using NAB's professional judgment. The findings and conclusions of this report cannot be considered scientific certainties, but rather our opinions considering the limited data gathered during the course of our preliminary environmental investigation. NAB makes no claims as to the presence or absence of subsurface contamination at the site. No other warranties, either expressed or implied, are made herein.

The limitations imposed during the preparation of this report include, but may not be limited to, those noted at the end of relevant sections of this report.

1.4.3 Exceptions and Deviations

There were no exceptions to the ASTM E 1527-13 standards or deviations from the standards during the preparation of this report.

1.4.4 Special Terms and Conditions

There are no special terms or conditions related to this ESA.

1.4.5 User Reliance

The contents of this document cannot be used or relied upon by any party other than the user, NAB, without the express written consent of USACE.

1.4.6 Continuing Obligations

Since the property is not being purchased, this ASTM E 1527-13 topic is not applicable.

2.0 SITE DESCRIPTION

2.1 Location

Belle Haven Floodwall and Levee

Alexandria, VA 22307

38º 46' 32.71" N 77º 3' 7.31" W

This planning unit extends from Cameron Run along the Potomac River south toward Mt. Vernon (See Figure 1). Two subdivisions that experienced severe flooding from storm surge during Hurricane Isabel in 2003 are located within this unit, including New Alexandria and Belle View. Over 200 structures were damaged in this area during Isabel. From the north end of the Belle Haven Country Club (golf course), southward to Wake Forest Drive, encompassing the towns of Belle View and New Alexandria. New Alexandria is the northern section of the watershed, above I-Street and contains mostly single-family houses. Belle View contains condominiums, the Belle View shopping center, and the River Towers high-rise apartment complex.

Shoreline type in this area is a mix of wetlands (sheltered), man-made structures (exposed), and beaches. Dyke Marsh Wildlife Preserve and Hog Island (and adjacent houses) are within the area that would be inundated by a coastal storm. Additionally, the George Washington Memorial Parkway runs the entire length of this planning unit along the Potomac River, and several sections, including adjacent to the Belle Haven/New Alexandria communities, would be inundated under existing conditions.

2.2 Current Owners

The property that could be possibly be disturbed by the project mainly sits on National Park Service land. Some of it is marsh land. The Parkway sits on land that was forested before the roadway was built. Other land possibly impacted by the project sits on a road right of way next to a golf course. The south end of the project extends through several private residential properties and terminates at a county park. Because the area is a dense residential and commercial area, there are many properties within EDR's one-quarter mile search radius of the project site. Information contained within the EDR® report lists owners of the properties listed.

2.3 Historical and Current Use of the Property

The use of these properties in the search area are a mix of residential, retail and green space. Historical aerial photo survey was conducted using photos dating back to 1937. The results are shown in Appendix C. Historically the property was rural/residential and forested. The most

significant historical feature was a waste water treatment plant which no longer exists. It was situated where a park now sits at the southern end of the project area.

2.4 Description of the Site Infrastructure

Belle Haven/New Alexandria Tide Gates – Existing flood risk management infrastructure in this area includes a pump station at the northeast corner of the Belle View Shopping Center along 13th Street and a tide gate along a small channel where it crosses I Street between Potomac Avenue and 10th Street. The I Street Tide Gate protects the residential area upstream of I Street when the tide is above 4 feet in elevation (NGVD29). When the tide elevation is greater than 4 feet, the tide gate closes and will stay closed as long as the downstream water surface elevation is above 4 feet. If it senses a 6-inch differential between upstream and downstream of the gate, it will then open until that difference equalizes and will close again (USACE 2008). The pump station at 13th Street pumps storm water runoff from a drainage basin upstream into a drainage channel where it can flow by gravity to the Potomac River.

2.5 Regional Geology, Topography, Soils, and Hydrogeology

2.5.1 Regional Geology

The site is located in the Coastal plain.

2.5.2 Topography

The topography is relatively flat in the site area. It ranges from twenty feet above sea level in the west to three feet above sea level in the east.

2.5.3 Soils/Geology

The predominant soil type is sandy loam. Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures. The depth to bedrock is listed in the EDR® as greater than sixty inches but is expected to be much more.

2.5.4 Hydrogeology

No specific information on hydrogeology was located but ground water is expected to be less than ten feet below ground surface.

It is reasonable to assume that there is some contamination presence at the two gas stations within in the study area from small spills at the gas pumps. Both are listed under the LUST and LTANKS database searches with cases that are closed.

3.0 RECORDS REVIEW

3.1 Introduction

It is reasonable to assume that there is some contamination present at the two gas stations within in the study area from small spills at the gas pumps. Both are listed under the LUST and LTANKS database searches with cases that are closed. Besides this, since the gas stations date back to the 1940's, it is possible that they had leaks from their underground storage tanks, which were likely to be single wall steel construction. These tanks were replaced with fiberglass reinforced plastic (FRP) tanks in 1984. No groundwater wells are present, consequently, there is no information about groundwater contamination.

3.2 Information from Federal Environmental Records

3.2.1 Introduction

Environmental Data Resources (EDR®) proprietary records (Appendix D) were obtained for the search area. EDR® is recognized as an industry standard for records research. The EDR® vendor indicates:

EDR® searches over 1,600 environmental databases, including hundreds of federal, state, city and tribal sources. The "High-Risk Historical Records database" includes data about historic gas station, dry cleaner or manufactured gas plant for example.

3.2.2 Information from EDR® Proprietary Records

There are several properties within the search range of the EDR® report that could impact the construction of the proposed alternatives (See Figure 2). Floodwall and Levee alternatives will mainly occur at the north side along Belle Haven Rd. There are a few properties of concern along this corridor. Fairfax Department of Public Works and Environmental Services "F" Street Pumping Station at 1497 Belle Haven Rd., Belle Haven Shell Station at 1201 Belle Haven Rd., and Assurance Technology Corp at 6304 Potomac Ave. There are several residences within the search area. Some are listed with leaking heating oil tanks (LTANKS). These instances are all closed. Most are listed with the tanks either being removed or not in use. All residences listed under the LTANKS designation have closure dates associated with their cases. The rest of the Floodwall and Levee show residences, two service stations, wastewater and storm water pumping stations, and a shopping center, with a dry cleaner, within the search distance of the report. The shopping center suffered a fire October 21, 2019 in which the dry cleaners was severely damaged and it is unclear when it will reopen, if at all. The individual sites of concern are discussed below.

a. Belle Haven Shell gas station at 1201 Belle Haven Rd (EDR® site No. B11) reported on 4/9/04. The spill was listed as a surface gasoline spill of 10-15 gallons which was reported to be washed down the storm drain by the attendant. The case was closed 6/19/06. This may impact the project as petroleum products may still contaminate the groundwater at the site of the proposed construction. The tanks are located on the east side of the site approximately 60-130 feet upgradient of the proposed routing of the floodwall. According to the EDR® report, there are no groundwater wells on the site and, therefore, no information on groundwater contamination. A FOIA request showed that tank inspections are ongoing as required and there have been no recent violations.

b. Shopping Center Dry Cleaners (EDR® report site No.'s C20 & C22): The dry cleaners is listed as a small quantity generator and is participating in a Voluntary Remediation Program (VRP) with the Commonwealth of Virginia requiring regular monitoring of their thermal desorption system. Their facility ID# is VRP00706. There is no information on groundwater contamination although dry cleaners often have contamination due to the use of chlorinated solvents. The site is hydrologically upgradient from the project and at least 1000 feet from it. Due to the distance, it is not likely to impact the project. However it is still important to determine how large of an environmental impact exists. A FOIA request shows that regular monitoring was performed until January 2018 when request for permit termination by the owners was accepted by VADEQ.

c. Belle View Texaco station at 1800 Belle View Blvd (EDR® site No. 28). The incident (PC# 2004-3305) was reported on 10/20/09 as a strong gasoline odor in the air at the station. It was observed that there was water being pumped from a tank field observation well to a storm drain inlet. A site characterization report (SCR) was conducted. Petroleum contaminated water is known to exist at the site from the results of the SCR. The tanks are approximately 2000 feet upgradient of the floodwall.

d. The "F" Street Pumping Station (EDR® site No. A1). There are spills listed in the EDR® report that are associated with the pumping station. These are sewage spills that were the result of equipment failure and posed no hazardous waste concerns.

e. Assurance Technology Corporation 6304 Potomac Ave. (EDR® site No. A12). The site is located approximately 150 feet from the proposed project. It is listed as a small quantity hazardous waste generator. There are no violations listed in the EDR® report for this site.

f. Residential heating oil tanks at 1209 Olde Towne Rd (EDR® site No. 13) and Belle View Condominiums on Belle View Blvd (EDR® site No. 14), both approximately 250-400 feet from the proposed floodwall, are listed with a LTANK and/or LUST

designation. While these cases occurred several years ago and were closed successfully, it is possible that any past spills from these properties could impact the proposed alternatives. Groundwater may be encountered during construction of a floodwall and could be contaminated with petroleum products from these past spills which could add to the cost and could possibly delay the project.

g. Former wastewater treatment plant, not included in the EDR® report. A wastewater treatment plant operated at the current site of Westgrove Park from approximately 1950 to 1985. The project route terminates in Westgrove Park. Residual chemicals may be present (Fairfax County, 2013).

3.2.3 Orphan Sites

There are three orphan sites listed in the EDR® report. They are Plantation Pipe Line- CSX Rail line, S Duke St and Dove Street 22314; South Duke Norfolk Southern RR, Duke Street; City of Alexandra Right of Way, Intersection of Duke Street and Reynolds Street 22314. These properties are not within the search radius of the proposed project.

3.3 Aerial Photograph Review

Summary of Historic Aerial Photo Analysis

Aerial photos of the project location were obtained from the USGS for the years 1949, 1957, 1959, 1963, 1964, 1970, 1983, 1984, and 2002. Photos for years 1937, 1953, 1990, and 1997 were obtained from the Fairfax County GIS.

All of the property was rural prior to the construction of homes and apartments beginning in the 1949 timeframe. At that time the golf course was started north of the site. The gas station at the northeast corner and the shopping center with the dry cleaners in the west center were first present in the 1953 aerial photo, and the shopping center was being expanded at that time. The USTs for the gas station are at the east side of the station's property and are approximately 60-80 feet from the route of the floodwall. Presuming that groundwater flows topographically downgradient toward the Potomac River, as is typical, the floodwall is hydrologically downgradient of the tanks. At the south end of the floodwall routing, the current Westgrove Park where the levee will terminate was a wastewater treatment facility from as early as 1953 until as late as 1980. The levee terminates in the east part of this former facility in an area that appears to have held the administration building rather than processing facilities.

Other than the sites mentioned above, the remainder of the floodwall route, and area closely adjacent to it, has been and remains residential, parkland, or road right-of-way.

The figures from the aerial photograph review are in Appendix C.

4.0 INTERVIEWS CONDUCTED

a. Call with Dan Lovette - USACE Civil Engineer 6/23/2020 1000. When asked what the proposed plan for Belle Haven entailed, Dan mentioned that the only possible anchoring of a flood wall would occur along the north side of the plan area approximately running along Belle Haven Road. We obtained updated maps and shape files from Mr. Luis Santiago.

b. Call to Fairfax County Planning and Evaluation Branch

   Call with Radwan Idris, Dipmani Kumar, Daniel Habete, Kyle Parker, Dennis Powers and myself. July 7, 2020 1300-1350. Discussed their involvement with the project and the site visit conducted in November 2019. Mr. Kumar and Mr. Idris stated that they thought any of the proposed alternatives would face opposition from the public. They also indicated that the "F" Street Pumping Station on Belle Haven Rd and the New Alexandria Pumping Station 6529 13th Street was converting its diesel storage tanks to all above ground tanks per request of VADEQ. This is anticipated to be completed this year.

c. Call to Jim Seaton Pumping Station Branch Chief – Fairfax County Department of Public Works and Environmental Services

   July 10, 2020 at 1430. Discussed the pumping stations located within the Belle Haven plan location. He noted that the diesel UST at the storm water pump station (at the shopping center 6529 13st Street) was contracted to be replaced with an AST this summer. The Belleview Wastewater Pump Station (1413A Belleview Blvd) has an above grade belly tank for an emergency generator, all inside a building. The Tidewater Facility at 1111A I Street has an AST and generator, above grade, inside a small building. The "F" Street pump station also has a generator and AST, above grade, inside a building. Another pump station that may borderline our search area is the River Towers pump station at 6801 Fort Hunt Rd. It has an above grade AST and generator inside a building. Mr. Seaton noted that there have been no spills or leaks at these facilities.

5.0 EVALUATION

5.1 Data Gaps

a. Voluntary Remediation Program reports for the dry cleaner site. This is necessary to determine groundwater contamination.

b. VADEQ UST program reports for fuel stations. Reports needed to determine the extent of groundwater contamination.

After several attempts to reach a representative at VADEQ, spoke with Richard Doucette July 13, 2020 at VADEQ Northern Regional Office and discussed the sites listed in the EDR® report. He advised to use the Freedom of Information Act (FOIA) to obtain information about the sites in question. These reports are pending.

c. Hazardous material response reports from Fairfax County Fire and Hazardous Materials Bureau. Mr. Richard Forte - Fairfax County Fire and Hazardous Materials Investigative Division. Spoke with Rick Forte 7/14/20 and he asked that we make all inquiries through FOIA. These reports are still pending

d. A site visit has yet to be conducted.

6.0 FINDINGS AND CONCLUSIONS

According to the data provided, all of the project route is road right-of-way, national and county parkland, and residential private property. This investigation identified no known sources of environmental contamination on the project route. There are eight potential sources of environmental contamination in the vicinity of the project route. These include: two gas stations, a wastewater pumping station, a commercial user of chlorinated solvents, a heating oil tank for a single residence and one for a multi-unit building, a dry cleaners and a former wastewater treatment plant. The gas station at 1201 Belle Haven Rd poses biggest threat due to its close proximity to the project route and likelihood of having groundwater contamination. The other sites may have contamination but are thought to be far enough from the project route to have any effect.

7.0 REFERENCES

Fairfax County, 2013. *Westgrove Park Master Plan.* Fairfax County Park Authority. 9/25/13 https://www.fairfaxcounty.gov/sites/parks/files/assets/documents/plandev/master-plans/westgrovemp-092513.pdf

USACE, 2020. *Report Summary for Metropolitan Washington (DC, Maryland, Virginia) Coastal Storm Risk Management Feasibility Study*. (USACE-March 2020)

VDEQ, 2011. *STORAGE TANK PROGRAM TECHNICAL MANUAL. DEQ Guidance Document # 01-2024D (Fourth Edition, May 10, 2011).*Virginia Department of Environmental Quality. Accessed online at https://www.deq.virginia.gov/Portals/0/DEQ/Land/Tanks/012024d.pdf

APPENDIX A
FIGURES

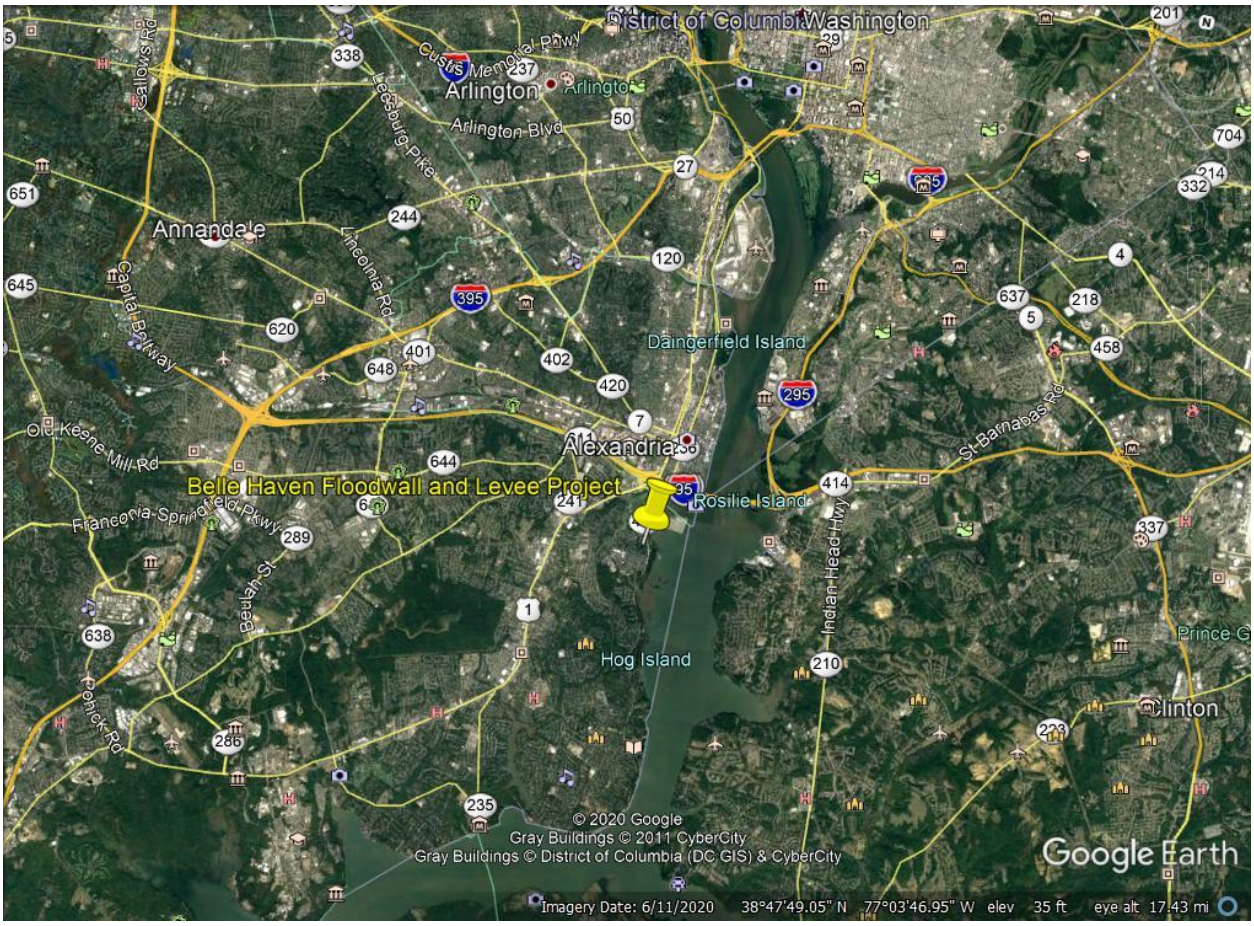


FIGURE 1: SITE LOCATION

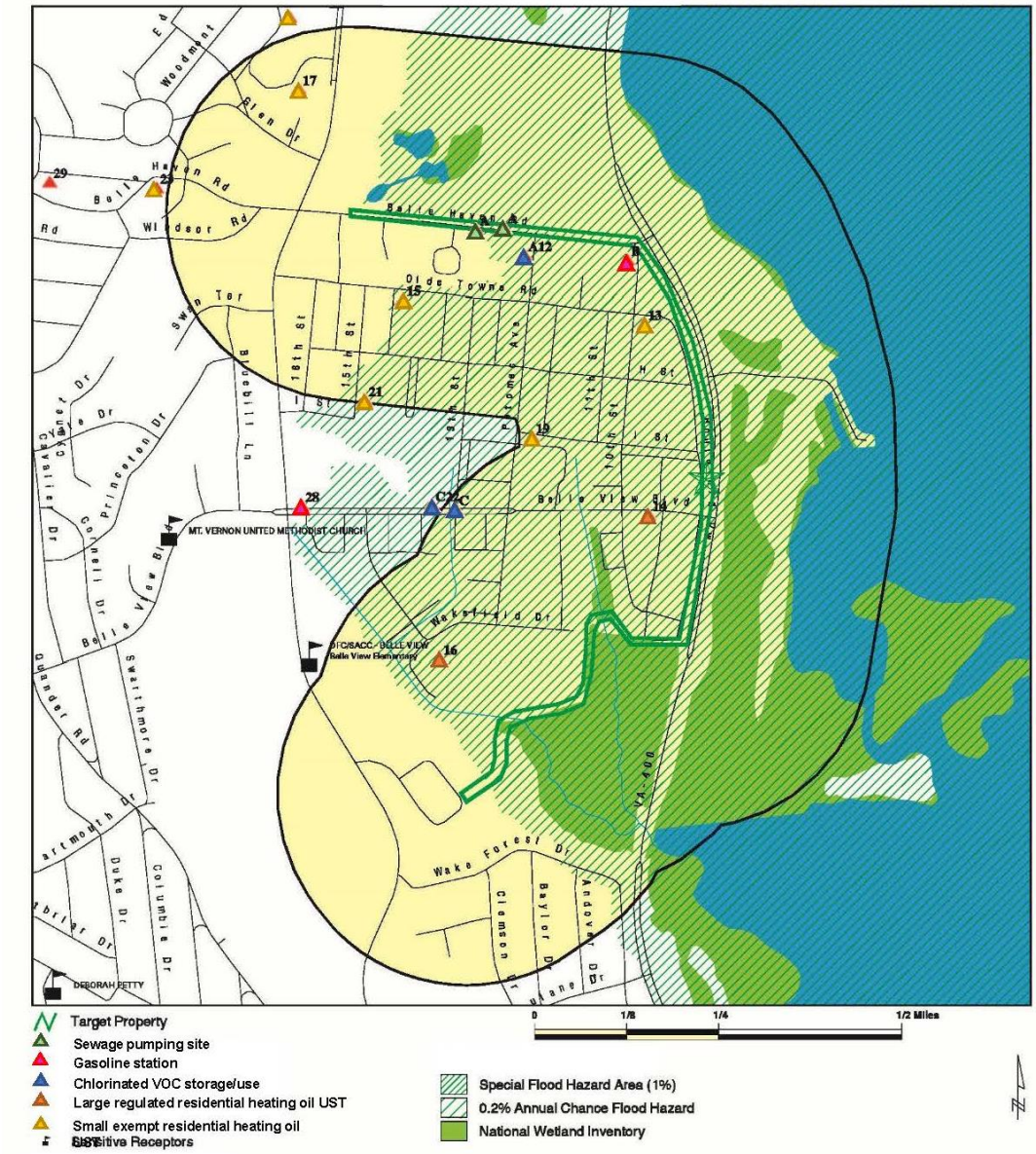


FIGURE 2: BELLE HAVEN SITES OF CONCERN

APPENDIX B

MAPPED SITES SUMMARY

Target Property Address:

BELLE HAVEN FLOODWALL AND LEVEE

ALEXANDRIA, VA 22307

	SITE NAME	ADDRESS	DATABASE ACRONYM	DISTANCE (FT./MILES) DIRECTION
1	F STREET PUMP STATION	1400 BELLE HAVEN ROAD	VA SPILLS	1 ft.
2	F STREET PUMP STATION	1400 BELLEHAVEN RD	VA SPILLS	1 ft.
3	FAIRFAX DPWES "F" ST	1497 BELLE HAVEN ROAD	VA LUST	1 ft.
4	F STREET PUMPING STATION	1497 BELLE HAVEN BLVD	VA UST, VA AST	1 ft.
5	FAIRFAX DPWES F STREET	1497 BELLE HAVEN BLVD	VA LTANKS	1 ft.
6	FAIRFAX DPWES "F" ST	1497 BELLE HAVEN ROAD	VA RGA LUST	1 ft.
7	TEXACO #23-068-0029	1201 BELLE HAVEN ROAD	VA LUST	93, 0.018, NNW
8	TEXACO 230680029	1201 BELLE HAVEN RD	VA LTANKS	93, 0.018, NNW
9	STAR ENTERPRISE	1201 BELLE HAVEN RD	RCRA NonGen / NLR, FINDS, ECHO	93, 0.018, NNW
10	BOULEVARD TEXACO	1201 BELLE HAVEN RD	EDR Hist Auto	93, 0.018, NNW
11	BELLE HAVEN SHEL	1201 BELLE HAVEN RD	VA UST, VA SPILLS, VA Financial Assurance	93, 0.018, NNW
12	ASSURANCE TECHNOLGY	6304 POTOMAC AVE	RCRA NonGen / NLR, FINDS, ECHO	149, 0.028, NW
13	WEIMER BOB RESIDENCE	1209 OLDE TOWNE RD	VA LTANKS	227, 0.043, NNW
14	BELLE VIEW CONDOMINIUMS	BELLE VIEW BLVD	VA LTANKS, VA UST	379, 0.072, WSW
15	FENLONG MARK A RESIDENCE	1601 OLDE TOWNE RD	VA LTANKS	555, 0.105, WNW
16	6631 CENTER BLDG FRONT	6621 6631 AND 6641 WAKEFIELD DR	VA UST	612, 0.116, SW
17	DOWNS MARTHA P RESIDENCE	1811 EDGEHILL DR	VA LTANKS	947, 0.179, NW
18	BELLEVIEW PUMPING STATION	1415 BELLEVIEW BLVD	VA UST, VA AST	1149, 0.218, West
19	O'NEILL KEVIN PROPER RESIDENCE	1111 I ST	VA LTANKS	1226, 0.232, WNW
20	BELLE VIEW SHOPPING CENTER	1500-1604-1800 BELLE VIEW	RCRA-SQG	1240, 0.235, West
21	BURNS TOM PROPERTY	6421 15TH ST	VA LTANKS	1301, 0.246, WNW
22	BELLE VIEW SHOPPING CENTER	1500 BELLE VIEW BLVD	VA VCP	1394, 0.264, West

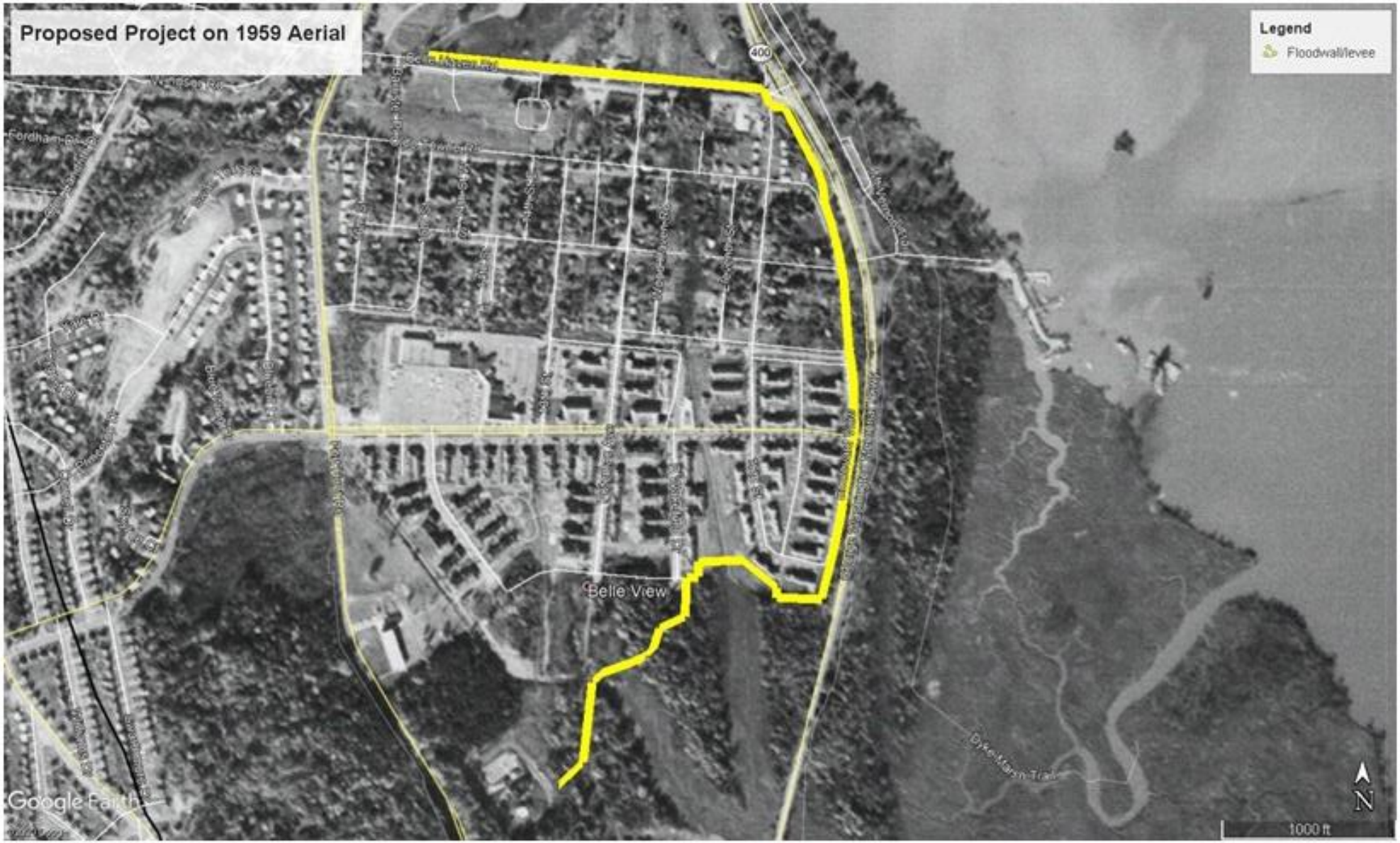
	(EASTERN PARCEL)			
23	HOBBS FAMILY TRUST PROPERTY	2005 BELLE HAVEN RD	VA LTANKS	1402, 0.266, WNW
24	DEMAREST ELIZABETH J RESIDENCE	6117 VERNON TERR	VA LTANKS	1459, 0.276, NW
25	KERR JOHN A RESIDENCE	6102 WOODMONT RD	VA LTANKS	1748, 0.331, NW
26	COWARD VICTORIA A AND NICHOLAS F RESIDENCE	6109 EDGEWOOD TERR	VA LTANKS	1855, 0.351, NW
27	BELLE HAVEN COUNTRY CLUB	6023 FORT HUNT RD	VA LTANKS	2025, 0.384, NNW
28	BELLE VIEW TEXAXO	1800 BELLE VIEW BLVD	VA LTANKS, VA UST, VA SPILLS, VA Financial Assurance	2092, 0.396, West
29	PESSALA ALEXANDER M AND KENDALL D RESIDENCE	2205 FOREST HILL RD	VA LTANKS	2170, 0.411, WNW
30	BURNS NANCY A AND MOORE JESSE F RESIDENCE	6033 WOODMONT RD	VA LTANKS	2204, 0.417, NW
31	ANDERSON ANGELA S RESIDENCE	6008 FORT HUNT RD	VA LTANKS	2536, 0.480, NNW

APPENDIX C

HISTORICAL AERIAL PHOTOGRAPHS


Proposed Project on 1937 Aerial
Legend
Floodwall/levee
Belle View
Google Earth
1000 ft
N


Proposed Project on 1949 Aerial
Legend
Floodwall/levee
400
629
Belle View Blvd
Belle View
Mt Vernon Ter
George Washington Memorial Hwy
Dyke Marsh Trail
Google Earth
2000 ft
N


Proposed Project on 1959 Aerial
Legend
Floodwall/levee
400
Belle View
Google Earth
N
1000 ft


Proposed Project on 1963 Aerial
Legend
Floodwall/levee
Belle View
Dyke Marsh Trail
Google Earth
2000 ft
N


Proposed Project on 1970 Aerial
Legend
Floodwall/levee
Belle Haven Rd
Windsor Rd
Olde Towne Rd
Swan Terrace
16th St
15th St
H St
14th St E
14th St
I St
Wood Haven Rd
Eleventh St
Mt Vernon Trail
400
629
Bluebill Ln
13th St
Potomac Ave
E Wakefield Dr
10th St
Boulevard View
George Washington Memorial Pkwy
Fort Hunt Rd
Princeton Dr
Yale Dr
Crystal Dr
Skyline Dr
Belle View
Dyke Marsh Trail
Google Earth
2000 ft
N


Proposed Project on 1984 Aerial
Legend
Floodwall/levee
Belle Haven Rd
Windsor Rd
Olde Towne Rd
Swan Terrace
16th St
15th St
14th St E
14th St
13th St
Woodhaven Rd
Eleventh St
Mt Vernon Trl
George Washington Memorial Pkwy
Potomac Ave
E Wakefield Dr
Belle View
Fort Hunt Rd
Bluebill Ln
Yale Dr
Princeton Dr
Skyline Ct
Williams Dr
Swartmore Ct
629
400
Dyke Marsh Trail
Google Earth
2000 ft
N


Proposed Project on 2002 Aerial
Legend
Floodwall/levee
400
629
Belle View
Potomac Ave
E Wakefield Dr
10th St
13th St
14th St
14th St E
15th St
16th St
I St
Wood Haven Rd
Eleventh St
Boulevard View
George Washington Memorial Pkwy
Bluebill Ln
Yale Dr
Princeton Dr
Cavalier Dr
Skyline Ct
Williams Dr
Swarthmore Dr
Dartmouth Dr
Quander Rd
Fort Hunt Rd
Wake Forest Dr
Mt Vernon Trail
Dyke Marsh Trail
Google Earth
2000 ft
N

DRAFT

NORTHERN VIRGINIA COASTAL STORM RISK MANAGEMENT STUDY

HTRW INVESTIGATION

REAGAN NATIONAL AIRPORT FLOODWALL AND LEVEE

Prepared by:

US Army Corps of Engineers

Environmental and Munitions Design Center

2 Hopkins Plaza

Baltimore, MD

February 2022

TABLE OF CONTENTS

LIST OF APPENDICES

*The EDR Report is not included in this appendix. Please contact USACE, Baltimore District for a copy of the EDR® Report.

LIST OF ACRONYMS AND ABBREVIATIONS

AAI	all appropriate inquiries
AST	Aboveground Storage Tank
ASTM	American Society for Testing and Materials
AUL	Activity and Use Limitation
BRAC	Base Realignment and Closure
CERCLA	Comprehensive Environmental Response Compensation and Liability Act
CERCLIS	Comprehensive Environmental Response Compensation and Liability Information System
CSRM	Coastal Storm Risk Management
CTL	Cleanup Target Level
COC	Contaminant of Concern
CORRACTS	RCRA Corrective Action
DoD	Department of Defense
EDR®	Environmental Data Resources, Inc.
EMDC	Environmental and Munitions Design Center
EP	Environmental Professional
EPA	U.S. Environmental Protection Agency
ERNS	Emergency Response Notification System
ESA	Environmental Site Assessment
FAA	Federal Aviation Administration
FOIA	Freedom of Information Act
FUDS	Formerly Used Defense Site
GWMP	George Washington Memorial Parkway
IC/EC	Institutional Control/Engineering Control
LUST	Leaking Underground Storage Tank
MD-DNR	Maryland Department of Natural Resources
MWAA	Metropolitan Washington Airport Authority
NAB	United States Army Corps of Engineers, Baltimore District
NRCS	Natural Resources Conservation Service
NFRAP	No Further Remedial Action Planned
NPL	National Priorities List
PFAS	per- and polyfluoroalkyl substances
PFOA	Perfluorooctanoic Acid
PFOS	Perflurorooctanesulfonic Acid
RCRA	Resource Conservation and Recovery Act
REC	Recognized Environmental Condition
SCRD	State Coalition for Remediation of Dry Cleaners
SIS	South Investigation Site (of the Reagan National Airport)
TCDD	Tetrachlorodibenzo-p-dioxin

TSD	Treatment, Storage and Disposal
USACE	United States Army Corps of Engineers
USGS	United States Geological Survey
UST	Underground Storage Tank
VADEQ	Virginia Department of Environmental Quality

EXECUTIVE SUMMARY

A study was performed to evaluate the feasibility of Federal participation in the implementation of solutions to address problems and opportunities associated with coastal storm damage in the study area, which is Northern Virginia within the Middle Potomac River watershed. Northern Virginia has been impacted by numerous major tropical and extratropical events, most notably the Chesapeake and Potomac Hurricane of 1933, Hurricane Agnes (1972), Hurricane Floyd (1999), Hurricane Fran (1996), Nor'easter (1998), Hurricane Isabel (2003), Hurricane Irene (2011), and Hurricane Sandy (2012). Hurricane Isabel in 2003 resulted in extreme water levels and caused millions of dollars of damage to residences, businesses, and critical infrastructure. Within the study area, there are locations of national significance and national security. Facilities important to national security include the Pentagon and Fort Belvoir. Many historic districts and properties are located within the study area, such as Old Town Alexandria, Mount Vernon, and the George Washington Memorial Parkway (GWMP). Environmentally significant resources include Dyke Marsh, Featherstone National Wildlife Refuge, Occoquan Bay National Wildlife Refuge, and Mason Neck National Wildlife Refuge. Critical infrastructure in the study area includes Ronald Reagan Washington National Airport (Airport), Washington Metro, transportation networks including GWMP and the Capital Beltway, freight and passenger railways, electrical generation and transmission systems, drinking and wastewater systems, and other lifeline infrastructure.

This report documents the findings of investigation activities conducted regarding the Airport property and its nearby surroundings to determine environmental hazards which may impact the construction of flood risk management measures being considered for the Ronald Reagan Washington National Airport in Arlington, VA. Several primary methods were pursued as part of these investigations. The primary investigatory method involved a search of environmental records utilizing EDR®. EDR® conducts searches of Federal environmental records, State and Tribal environmental records, EDR® proprietary records, aerial photographs, city directory abstract and historical topographic maps in pursuit of all appropriate inquiries (AAI) as defined by the U.S. Environmental Protection Agency (EPA). The conduct of the environmental records review utilizing EDR® is one of the primary facets of ASTM E1527-13, *Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process*.

Other avenues which were pursued to accomplish AAI included retrieval of additional historical aerial photography utilizing internet sources, and interviews with persons knowledgeable about historical environmental conditions and practices on the Airport. Interviews with Airport personnel made evident on-going environmental investigation activities which are being pursued by the Airport. As of July 2020, a summary of environmental activities conducted regarding known and suspected environmental release areas has been summarized within the *Remedial Investigation Summary Report, Ronald Reagan Washington National Airport (DCA) South Investigation Site (SIS), July 2020* (RI Summary Report).

The RI Summary Report has documented investigatory and cleanup activities which have been on-going for about 30 years. Cleanup included the excavation of 10 to 15 buried drums which were discovered in 1988 during a parking area construction project. In addition to excavation and removal of the drums, associated contaminated soil and debris surrounding the drums were also excavated and removed. Other areas of the Airport which were included in the RI Summary Report included: Areas on the southern portion of the Airport which were used as a landfill from the 1950s to the late 1970s; multiple areas along the southern/southeastern shoreline which were used as fire training areas; a solvent disposal area; and drainage swales and outfalls.

The RI Summary Report documents numerous chemical contaminants in soil and groundwater sample results in these areas on the Airport which exceeded State of Virginia Department of Environmental Quality (VADEQ) Cleanup Target Levels (CTLs). The vast majority of the samples exceeding CTLs involved exceeding commercial/industrial CTLs, as opposed to the more restrictive/conservative residential CTLs. Some of the more common chemical contaminants which exceeded CTLs included: Arsenic, 2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD), naphthalene, 2-methylnaphthalene, benzo(a)anthracene, benzo(a)pyrene, biphenyl and dibenzofuran. Many of these chemicals are either constituents of petroleum products, or they are products of combustion of petroleum.

Based on the current understanding of environmental contamination on the Airport, future levee/floodwall construction activities which would require excavations into the subsurface would be likely to require an evaluation of environmental health and safety measures to protect construction workers. In addition, implementation of procedures for handling and off-site disposal of contaminated materials may also be required.

One of the primary findings and recommendations of the RI Summary Report was for the conduct of additional investigation activities, either to define the extent of discovered contamination in multiple areas, or to investigate a newly discovered fire training area along the eastern shoreline of the Airport. Based on recent discussions with Airport personnel, these additional investigations may commence in Spring/Summer of 2022 and may be likely to continue for more than a year, and perhaps several years. Once the RI is completed, there are also plans to perform additional human health risk evaluations to consider the risk to potential future receptors.

1.0 INTRODUCTION

1.1 Purpose

This report is a summary of an investigation of the properties that may impact the Ronald Reagan Washington National Airport Floodwall and Levee Project in Northern Virginia and was conducted as an environmental site assessment (ESA). The purpose of the ESA is to evaluate whether or not hazardous substances or petroleum products may be present on the property under conditions suggesting that a past release, continuing release, or material threat of a release to the property is present, and to conclude whether or not recognized environmental conditions (RECs) exist based on the results of the process. This assessment is not intended to identify *de minimis* conditions that do not present a significant risk of harm to public health or the environment, and that would generally not be subject to enforcement action if brought to the attention of appropriate governmental agencies.

1.2 Scope of Services

USACE – Baltimore District (NAB) personnel performed the following work:

- Interviewed state and local governmental officials.
- Reviewed records [Federal environmental records, State and Tribal environmental records, Environmental Data Resources (EDR®) proprietary records, aerial photographs, city directory abstract and historical topographic maps].
- Reviewed reports of investigations on the Airport, primarily consisting of the Remedial Investigation Summary Report, Ronald Reagan Washington National Airport (DCA) South Investigation Site (SIS).

1.3 Standards

NAB personnel followed the practice established by ASTM International (formerly the American Society for Testing and Materials) Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process (Designation E1527-13). This practice defines "good commercial and customary practice in the United States for conducting an environmental site assessment of a parcel of commercial real estate with respect to the range of contaminants within the scope of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) and petroleum products."

1.4 Assumptions, Limitations, Exceptions, Deviations, Terms and User Reliance

1.4.1 Significant Assumption

NAB personnel completed this project with the following significant assumptions in mind:

- NAB assumed that the client (NAB-PPMD) relayed any specialized knowledge or experience material to recognized environmental conditions.

- NAB assumed that the owner representative and any other interviewed individuals relayed any specialized knowledge or experience material to recognized environmental conditions.

1.4.2 Limitations

This report was prepared in keeping with accepted standards of practice for preparation of preliminary environmental assessments and limited investigations and using NAB's professional judgment. The findings and conclusions of this report cannot be considered scientific certainties, but rather our opinions considering the limited data gathered during the course of our preliminary environmental investigation. NAB makes no claims as to the presence or absence of subsurface contamination at the site. No other warranties, either expressed or implied, are made herein.

The limitations imposed during the preparation of this report include, but may not be limited to, those noted at the end of relevant sections of this report.

1.4.3 Exceptions and Deviations

There were no exceptions to the ASTM E1527-13 standards or deviations from the standards during the preparation of this report.

1.4.4 Special Terms and Conditions

There are no special terms or conditions related to this ESA.

1.4.5 User Reliance

The contents of this document cannot be used or relied upon by any party other than the user, NAB, without the express written consent of USACE.

1.4.6 Continuing Obligations

Since the property is not being purchased, this ASTM E1527-13 topic is not applicable.

2.0 SITE DESCRIPTION

2.1 Location

Ronald Reagan Washington National Airport Floodwall and Levee

Arlington, VA 22202

38°51′08″N 077°02′16″W

2.2 Current Owners

In 1987, Congress transferred control of the airport from the Federal Aviation Administration (FAA) to the newly established Metropolitan Washington Airports Authority (MWAA). The MWAA is responsible for the operation and administration of the two D.C. Metro area airports (Ronald Reagan Washington National Airport and Washington Dulles International Airport), as well as being responsible for operation, maintenance and control of the Dulles Toll Road and management of the Dulles Corridor Metrorail project.

2.3 Historical and Current Use of the Property

The Washington National Airport was constructed in the area known as Gravelly Point, Virginia beginning in the late 1930s. Gravelly Point is located on a bend in the Potomac River, 4.5 miles south of Washington, D.C. Prior to construction of the airport, Gravelly Point consisted of mudflats. A portion of the airport property was the site of the 18th and 19th century Abingdon Plantation, which was destroyed by fire in 1930. The ruins of the plantation were stabilized and the MWAA preserved the site and in 1998 an exhibit of artifacts in Terminal A was established.

Between November 1938 and December 1939, almost 20 million cubic yards of sand and gravel were moved onto the site. A dike was erected around the perimeter of the site, and stabilized runway locations were established by removing silt and replacing it with sand and gravel up to a height of 20 feet above the river level. On September 28, 1940, President Roosevelt laid the cornerstone of the terminal building and on June 16, 1941, the National Airport opened for business.
In 1998, Congress passed legislation renaming Washington National Airport to Ronald Reagan Washington National Airport.

The Airport is currently situated on 860 acres, 733 of these acres are on land, and 127 acres are underwater.

2.4 Description of the Site Infrastructure

An existing levee, built during construction of the airport, surrounds the airport. Additional information needed to further characterize this feature was not obtained due to limitations on site visits and travel at the time of the drafting of this report.

2.5 Regional Geology, Topography, Soils, and Hydrogeology

Descriptions of the Site Geology, Soils and Hydrogeology in the following sections are taken from the *Remedial Investigation Summary Report, Ronald Reagan Washington National Airport (DCA) South Investigation Site (SIS)*, dated July 21, 2020 (Booz Allen Hamilton, 2020).

2.5.1 Geologic Setting

The site lies on Coastal Plain sediments that dip gently to the southeast and rest uncomformably on igneous and metamorphic rocks of the Piedmont Complex. The sediments of the Coastal Plain are generally located surrounding the Potomac River downstream of Washington D.C. and wedge out to the northwest within five or six miles of the site where the underlying Piedmont rocks are exposed.

2.5.2 Soils

The surface of most of the region is composed of either Quaternary alluvium, Tertiary-Quaternary terrace deposits, outcrops of the Cretaceous Potomac Formation, or weathered Piedmont bedrock. The land area of the Airport *is comprised entirely of Quaternary alluvium, presumably dredged from the Potomac River and utilized as fill material to construct the* Airport over the years since 1938 when the construction of the Airport was begun.

Based on historic surface and subsurface soil sampling activities, soil above four to five feet below ground surface (bgs) was observed to consist of a silty clay soil containing debris such as concrete, metal, brick, burnt wood, and cobbles. Soil below five feet bgs consisted mostly of hydrated clay, sand lenses, and silt.

2.5.3 Hydrogeology

Prior to the construction of the Airport, *the elevation was below the surface of the Potomac River and consisted of a shallow mud bank, which was deposited in an embayment of the Potomac River at the mouth of Four Mile Run.* The Airport *was built to the current grade with the addition of fill. The top five to fifteen feet of material at the Site is primarily fill material, including dredged sediment and construction debris.*

The deposited muds and dredge or fill materials lie upon the Pleistocene and more recent deposits of the Ancestral Potomac. These latter sediments are primarily sands and gravels extending 25 to 35 feet below sea level and underlie the entire airport. They range from 0 to 30 feet in thickness, and due to the character of the sands and gravels, hydrologic interaction between the Potomac and these Pleistocene sediments is expected.

Below the Pleistocene deposits are the sands and clays of the Potomac formation, which are 220 to 235 feet thick below the Site. The Potomac Formation contains several confined aquifers, with only the lowermost aquifer present beneath the Site. This aquifer, which is 65 feet thick, is confined by 175 feet of overlying clays.

Groundwater elevation contours, based on measurements obtained in June 2008, indicate that groundwater flow in the surficial aquifer at the Site is toward the Potomac River. During a survey of groundwater depth at the Site in October 2017, the groundwater elevation was measured at about two to three feet above Mean Sea Level (MSL, based on the North America Vertical Datum [NAVD] 88).

3.0 DATA REVIEW

3.1 EDR® Proprietary Records

EDR® proprietary records were obtained for the search area. EDR® is recognized as an industry standard for records research. The EDR® vendor indicates:

EDR® searches over 1,600 environmental databases, including hundreds of federal, state, city and tribal sources. The "High-Risk Historical Records database" includes data about historic gas station, dry cleaner or manufactured gas plants for example.

3.1.1 Information from EDR® Proprietary Record

There are numerous issues identified based on the EDR search results which could impact the construction of the proposed alternative. The Floodwall and Levee alternative will mainly occur along the perimeter roadway surrounding the Airport. See Figure 1 for the projected routing of the floodwall and levee portions.

On the Airport property itself, there are approximately 22 issues identified from the EDR database search. In addition, there are 12 additional issues identified within 1/4-mile of the project site, which are off the airport property. Please see Figures 2, 3, and 4 for the locations by Map ID Numbers and Table 1, below, for details regarding each of the ID numbered issues.

Table 1

MAP ID#, location name	Reporting Database(s)	Reported Date	Closed Date	On/Off Airport Property	Comments
1 – Airport, Old Terminal	1) LTANKS	25 JUL 1997	1 MAY 2001	On	Heating oil tank leak.
2 – Airport, Ogden Fueling Area	1) SPILLS	31 JAN 2000	31 JAN 2000	On	100 gallons "jet a" released from tanker truck crack, suspected due to cold temps. No release to water reported.
3 – Airport, Truck 20 on Aviation Ramp	1) SPILLS	4 APR 2001	4 APR 2001	On	Release on 3 APR 2001. 82 gallons jet a fuel spilled transferring from one truck to another. "Vacuumed and scrubbed storm drain, nothing to Potomac outfall" in the report notes.
4 – Airport	1) SPILLS	16 FEB 2001	28 FEB 2001	On	Jet fuel vented from wing tank and entered storm drains. Estimated as approximately 100 gallons jet fuel.
5 – FAA, Old Terminal	1) LUST REG NO	25 JUL 1997	1 MAY 2001	On	Regulatory Case Type: "Article 11". Heating Oil tank.
6 – Airport, Gate 24	1) SPILLS	15 MAY 2001	19 JUN 2006	On	50 gallons aircraft fuel released onto concrete ramp during fueling, fire department hazmat responded and kept the fuel from getting to drains. Release was absorbed and concrete scrubbed.
7 – Airport	1) SPILLS	14 NOV 2002	14 NOV 2002	On	Deicing fluid released due to cracked piping, quantity of 1400 gallons estimated, 50% polypropylene glycol/50% water.
8 – Airport, Remote Ramp at Operations Office	1) SPILLS	12 AUG 1999	12 AUG 1999	On	7 gallons fuel oil (may have been gasoline) released from failure of generator return line to above ground storage tank.
9 – Airport	1) FACILITY	N/A	N/A	On	Under this facility are listed numerous (19) underground storage tanks, storing diesel, gasoline, used oil and "unknown." Tank sizes vary from several hundred gallons up to 12,000 gallons. Some tanks are reported to be "permanently out of use", others are removed from the ground, and others are reported as closed in the ground.
10 – Airport, Gate 39, Terminal C	1) SPILLS	26 DEC 2003, incident occurred on 25 DEC 2003	30 DEC 2003	On	Fuel pump malfunction, 35 gallons "jet a fuel" spilled and cleaned up by locals.
11 – Airport	1) SPILLS	29 JUN 2003	30 JUN 2003	On	25 gallons petroleum/fuel-aviation. Report indicated, "Cargo Tanker not breeched, release from piping. Spill to Tarmac, no drains impacted. A&A responded to scene, drilled hole in tanker to unload fuel, before righting tanker. Incident blocked US Air access to ramp".
12 – Airport, Jet Blue, 1 Aviation Circle	1) FINDS 2) ECHO	N/A	N/A	On	FINDS dealing with NPDES under CWA and ECHO with facility compliance history. A civil enforcement case under ECHO indicated that the "PERMITTEE FAILED TO APPLY FOR THE 2015 MSGP PERMIT FOR STORM WATER DISCHARGES ASSOCIATED WITH INDUSTRIAL ACTIVITY." This resulted in an Enforcement Action with no further issues apparent.
13 – Airport, 51 Post Office Rd. (located east of Economy parking, south of Fire Station 301)	1) FINDS 2) ECHO	N/A	N/A	On	Conditionally exempt small quantity generator. Appears to be a limousine/Taxi service operating at the airport. No violations evident within previous 12 quarters based on the ECHO database (Environmental Compliance History Online (EPA database).
14 – National Gateway Land Bay D East, 3400 Potomac Ave.	1) LTANKS 2) VRP	23 MAR 2017	23 MAY 2017	Off	Leaking tank listed as unknown. Under VRP, indicated that "2019-5-22 QRA received 2019-3-5 Change of owner contact received 2019-1-4 VRP Process guidance to agent 2018-9-7 Post site excavation soil sample results submitted 2017-9-27 Recorded DORC received 2017-9-19 RAP comments to agent 2017-9-13 RAP received". RAP = Remedial Action Plan.

MAP ID#, location name	Reporting Database(s)	Reported Date	Closed Date	On/Off Airport Property	Comments
15 – Potomac Yard Land Bay D East, 3400 Potomac Ave.	1) FINDS 2) ECHO	N/A	N/A	Off	Looks to involve discharge of treated water. May be related to construction activities (?). Had an excursion of pH limits of 6 to 9 units with a value of "about" 5 to 5.5 (based upon visual observation of a graph showing pH values).
16 – Airport	1) FINDS 2) ECHO 3) ICIS	N/A	N/A	On	Jet Blue Airways and Worldwide Flight Services both received an Enforcement Action indicating that the permittee failed to apply for a 2015 MSGP (multi-sector General Permit) for stormwater discharge.
17 – Airport, 901 Air Cargo Rd., Bay 102	1) SPILLS	7 DEC 2019	11 DEC 2019	On	90 gallons of Type 4 De-icing fluid released due to tank failure. Indicated that no waterways were affected and no state assistance requested.
18 – National Park Service Maintenance Yard, 2700 GW Parkway	1) LUST REG NO 2) LTANKS 3) ENFORCEMENT	28 DEC 1990 24 JUN 1994	13 MAY 1997 5 AUG 1994	Off	Two UST releases, one in 1990 (closed in 1997) and one in 1994, closed in 1994. Both fell under VADEQ Article 9 case type. Also, an enforcement action, which consisted of an NOV (notice of violation), was actioned on 8 APR 2013 and a 2nd NOV with an action date of 25 MAR 2015, without additional details.
19 – Parkway Maintenance Facility, 2700 GW Parkway	1) FACILITY 2) VA FINANCIAL ASSURANCE 1	N/A	N/A	Off	Facility report indicates that there are five USTs with either a status of removed from the ground (three USTs), or currently in use (two USTs). Tanks range in size from 1,000 gallons to 20,000 gallons and contain/had contained diesel, gasoline, or used oil.
20 – Renaissance Arlington Capital View, 2800 S. Potomac Ave.	1) AST	N/A	N/A	Off	Indicates that there is a 1,000 gallons Aboveground Storage tank storing diesel, still in use.
21 – Airport, Jet Blue Airways	1) MANIFEST DETAILS	N/A	N/A	On	Two manifest numbers from 2013 are reported, both having D0001 waste characteristics (for Ignitability).
22 – Waterpark Towers North & South, 1501 and 1505 Crystal Drive	1) FACILITY	N/A	N/A	Off	Indicates that two 550 gallons Diesel USTs had been used, one removed from the ground, and one closed in ground.
23 – Jeff Davis Associates/Budget Rent a Car, 2800 Crystal Dr.	1) FACILITY	N/A	N/A	Off	Two different "owners" as part of this facility. Total of eight USTs reported, six reported as closed in ground, and two as permanently out of use. Contents included heating oil, diesel, and gasoline and sizes ranged from 2,000 gallons to 15,000 gallons.
24 – Heishman BMW, Inc. 3154 Jefferson Davis Hwy	1) LTANKS	2 OCT 2013	12 NOV 2013	Off	"Excluded" UST. Unsure of "excluded" category meaning. Exempt I think would be used for a residential heating oil tank.
25 – Heishman BMW Inc., 3154 Jefferson Davis Hwy	1) RCRA-VSQG 2) FACILITY 3) FINDS 4) ECHO 5) NJ MANIFEST	N/A	N/A	Off	Conditionally exempt small quantity generator. Three inactive USTs, 350 to 1,000 gallons (used oil, "other tank contents" and gasoline tanks). Shows a 1978 Enforcement Action which was "last updated" in 1988, though no specific details. Shows hazardous manifests across numerous years being shipped to a New Jersey TSDF (treatment, storage and disposal facility).
26 – Porsche Arlington, 3100 Jefferson Davis Hwy	1) MANIFEST DETAILS	N/A	N/A	Off	Shows a single hazardous waste manifest from 2013 with two hazardous waste categories (D001 – Ignitability, and D002 – Corrosivity), waste being shipped to a Pennsylvania TSDF.
27 - Heishman BMW, Inc. 3100 Jefferson Davis Hwy	1) RCRA-VSQG	N/A	N/A	Off	Shows D001 waste category with no violations recorded.
28 – VIRGINIA Dept of Transportation, 2910 Jefferson Davis Hwy.	1) LTANKS	13 MAR 1990	25 JAN 1995	Off	Federally Regulated UST/Regulated Petroleum UST, no further details.

MAP ID#, location name	Reporting Database(s)	Reported Date	Closed Date	On/Off Airport Property	Comments
29 – Airport	1) FUDS	N/A	N/A	On	DoD acquired leases to portions of the airport for use between 1942 and 1944 included uses for personnel housing, warehouses, terminal operations, etc. Shortly after WWII, the buildings reverted to civilian use. Due to heavy subsequent airport usage, none of the DoD constructed buildings remain.
63 – Airport	1) LUST REG NO	1 APR 1994	9 SEP 1994	On	Case Type Article 9. (Within VADEQ Regulations, Article 9 is where the DEQ implements the UST program within the state of Virginia.) No further specific details regarding this incident.
106 – Airport	1) LTANKS	1 APR 1994	9 SEP 1994	On	Appears to be same incident as reported in MAP ID# 63.
107 – Airport, South End of Airport	1) SEMS 2) PRP	N/A	N/A	On	SEMS = Superfund Enterprise Management System and PRP = Potentially Responsible Party. These appear to consist of a 20+/- years investigation and remediation of a single "site" on the south end of the airport.
118 – Airport	1) VRP 2) SPILLS	9 DEC 1999	9 DEC 1999	On	The SPILLS database entry appears to have involved a "damp" package which had been labeled as an "Etiologic NOS infectious package" which had been taken off of a jet from FL. This was reported, and closed on 9 DEC 1999. An additional SPILLS PC entry is documented from 16 SEP 1988, and is indicated as "potential for GW contamination from leaking herbicide drums at airport, DWM and DACS to follow up". Additional comments indicate that a complete reported filed by VWCB.
121 – Airport, Four Mile Run Sampling Project, 2401 Smith Blvd, Arlington	1) LTANKS	4 SEP 2014	18 MAR 2015	On	Only details are that it is indicated to be "special project" in the "Other Description" within the EDR report under LTANKS. Also, a 2nd spills was indicated to be 500 gallons of Type 1 Glycol on to asphalt with 250 gallons into a storm drain due to equipment failure. This had occurred on 9 JAN 2017 and was closed on 27 JAN 2017.

As shown in Table 1, there are numerous spills and historical leaks from tanks on the Airport property as well as within 1/4-mile of the project site (the floodwall and levee footprint.) The spills and leaks on the Airport property appear to consist of petroleum products (jet fuels, heating oil, de-icing fluids, fuel oil, and a single report of leaking herbicide drums from 1988.) The spills and leaks within 1/4-mile of the project footprint, off-site, appear to either be heating oil, or other petroleum, although there are not always sufficient details to provide certainty.

Off-site of the Airport, within 1/4 to 1/2-mile of the project footprint, there are approximately 71 EDR® database locations, many having findings reported for several databases. However, 11 of these database locations are towards the southwest, on the opposite side of Four Mile Run. Any releases from these 11 locations which are across Four Mile Run would not be likely to transport hazardous substances onto the Airport project site. However, the other 60 locations could impact contamination in the groundwater within the footprint of the planned flood risk management structures.

Given the preponderance of spills and leaks reported within the Airport property, as well as other similar incidents within 1/2-mile of the project footprint off-site, it is not unlikely that intrusive work on the Airport could encounter hazardous substance contamination in groundwater and/or soils.

3.1.2 Orphan Sites

There are fifteen orphan sites listed in the EDR® report. It is apparent that some of these are on the Airport property, and some are within approximately 1/4 to 1/2-mile radius of the project footprint. The environmental concerns associated with the database reports for these orphan sites are generally consistent with the concerns presented by the sites discussed in the previous section. As this project moves forward, it is recommended that these specific orphan sites be further considered and discussed with Airport personnel, as well as VADEQ regulators, to ensure that any specific environmental concerns are not overlooked as plans proceed for project construction.

3.2 **Remedial Investigation Summary Report** (Booz Allen Hamilton 2020)

Following the discovery of buried drums during a parking lot expansion in September 1988, the United States Environmental Protection Agency (EPA) added the Airport to a Federal Agency Hazardous Waste Compliance Docket (Docket) on September 27, 1991. With this action, the investigation of what is referred to as the South Investigation Site (SIS) came under the EPA's regulatory jurisdiction and several investigations and interim site cleanup efforts occurred between 1991 and 2006. EPA requested additional investigation of soil, groundwater, surface water and sediments associated with the Airport SIS in 2007.

Subsequent to the inclusion of the SIS on the Docket, there have been multiple soil and groundwater investigation efforts to further the understanding of the nature and extent of soil and groundwater contamination across the SIS portion of the Airport.

Based on the RI results of the SIS to date, as of the July 2020 Summary Report (Booz Allen Hamilton, 2020), there have been more than 10 areas in the SIS which have been investigated due to physical evidence of contamination, reports of releases to the environment, or based upon interviews with employees. These areas include the Solvent Disposal Area; the Dumpster Area; the Dumpster Area Debris Pile; the Suspect Disposal Area; Fire Training Areas (FTAs) (1, 2, 3, 4, 5, 6 and 7); Drainage Swales (1, 2, 3, 4 and 5). The Dumpster Area was the location of 10 to 15 partially decomposed buried drums that were discovered in September 1988. In November 1992, the partially decomposed drums, associated contaminated soils and debris from the Dumpster Area were removed and staged in an area of the Crew Parking Lot that became known as the Dumpster Area Debris Pile.

Subsequently, in June 2008, an additional interim remedial measure on the SIS involved removal of this debris pile and the underlying soil in the approximately 40-foot by 20-foot Dumpster Area Debris Pile.

In March 2009, a human health risk evaluation was conducted based on the investigations of the SIS to date. The risk evaluation determined, "No unacceptable cancer risks or non-cancer hazards were calculated for the receptors potentially exposed to contaminants in the SIS area." In addition, the

risk evaluation concluded that “an elevated non-cancer hazard index (HI) was identified for future construction workers that performed excavation activities more than 25 days per year.”

Although there have been numerous investigations of soil and groundwater at the SIS, as of January 2022, the MWAA is in consultation with VADEQ with regard to the next steps towards further delineation of contamination on the SIS. The current schedule anticipates “further RI efforts to recommence (about) late Spring/Summer of (2022)," dependent “on a number of factors, including the ongoing pandemic, FAA resources and their ability to support our access to the site during the pandemic, etc.” In addition, the RI Summary report states that FAA intends to perform “additional risk evaluations once the RI is completed.”

3.2.1 Soil and Groundwater Sampling Results

Analytical results from the multiple phases of the RI were compared to VADEQ Tier II (residential) and Tier III (commercial/industrial) Cleanup Target Levels (CTLs). Twenty-six Contaminants of Concern (COCs) were identified in soil which exceeded the VADEQ Tier II (residential) CTLs in the SIS. 359 soil samples from 172 sampling locations were associated with these 26 COCs found to exceed Tier II CTLs. The primary contaminants found to exceed the Tier II CTLs were: arsenic, naphthalene, benzo(a)pyrene, 2-methylnaphthalene, benzo(a)anthracene, biphenyl, dibenzofuran, and 2,3,7,8-tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD).

In addition to COCs exceeding the Tier II CTLs, two of these eight COCs identified above, arsenic and 2,3,7,8-TCDD, also exceeded Tier III (commercial/industrial) CTLs in a relatively limited number of samples. In addition, arsenic was found to exceed the Tier II groundwater CTL in multiple wells during multiple phases of the RI. Naphthalene was found to exceed its Tier II CTL for groundwater in several wells during one or two of the sampling events. 2,3,7,8-TCDD, was not detected exceeding the Tier II or Tier III CTLs for groundwater. 2-methylnaphthalene was reported to have a single groundwater sample exceeding its Tier II CTL. Biphenyl and dibenzofuran were reported to have two groundwater sample results each exceeding their Tier II CTL.

In addition to the more common COC groups reported above (metals, VOCs and SVOCs), the emerging contaminants of Perflurorooctanesulfonic Acid (PFOS) and Perfluorooctanoic Acid (PFOA) of the class of chemicals referred to as PFAS (per- and polyfluorinated alkyl substances) were also detected in groundwater exceeding the EPA’s Lifetime Health Advisory level. The presence of elevated levels of PFAS is not surprising, given their prevalence in firefighting chemicals referred to as Aerosol Fire Fighting Foams (AFFF). AFFF containing PFAS were in routine use for firefighting, as well as their use in fire training areas (FTAs) from the 1970s at least through the first decade of the 21st century. More recently these PFAS chemicals have been phased out of common use due to their known health effects as well as their long-last presence in the naturel environment.

3.3 Aerial Photograph Review

Summary of Historic Aerial Photo Analysis

Aerial photos of the project location were obtained for the years 1949, 1953, 1957, 1962, 1967, 1969 and 1974.

Within the Airport property itself, there is significant disturbance evidenced in the southwest and southeast portions of the property, in areas which appear to be planned for Floodwall construction. Although there is insufficient evidence to suggest that hazardous substances were released in these areas based on these aerial photographs, additional evidence is provided through an interview with NAB's Planning Division Environmental Policy Advisor, Charles Leasure, as documented in Section 4.0. Mr. Leasure, as part of his prior employment history with a private Consultant, was involved with a project to construct an end of runway device to slow-down/prevent airplanes from overshooting the north-south runway, and proceeding into the Potomac River. During the excavation of the site for construction of this device, buried drums were encountered to the immediate south of this runway, halting the installation of the runway overshoot device. This occurred about ten years ago.

There is more limited photographic documentation of the northern portion of the planned floodwall footprint, and there was no significant photographic evidence observed, in this area. However, additional photographic documentation has been procured from EDR, and has not yet been reviewed.

In addition, areas off of the Airport property, to the west, show significant commercial/industrial activity within about 1/4 to 1/2-mile of the project site. Some of this industrial activity may be the still active Arlington County Water Pollution Control Facility. Photographic evidence in this general area includes significant disturbed areas of earth, as well as tall smokestacks, large aboveground storage tanks, as well as other industrial-looking activity.

The photographic evidence since the earliest observations (currently earliest photo from 1949) shows tremendous railroad activity and railroad yards to the west-southwest of the Airport. It's not unlikely that this enormous amount of railroad activity could have contributed contamination to this area either from spills and/or maintenance activities on the railroad facilities.

The aerial photographs are in Appendix B.

4.0 INTERVIEWS CONDUCTED

a. Dennis Powers (CENAB-ENE-T) conversation with Charles Leasure. Charles is an Environmental Policy Advisor in the Planning Division of USACE, Baltimore District. Charles had previously worked for an environmental consultant/contractor on a project which was installing equipment/devices to slow-down/arrest airplanes if they were traveling out of control towards the Potomac River on the north-south runway. Charles explained that as they were working on the project, which was located to the south of the north-south

runway, between the end of the runway and the Potomac River, they had uncovered numerous buried drums. Upon discovery of these buried drums, the project was halted, and the drums were left in place and the ground cover returned atop the drums. Although Charles was not certain of the timing of this discovery, he thought it occurred around 2010. Further conversations with Tom Wasaff and support staff at MWAA (including FAA personnel, as well as Booz Allen Hamilton support personnel) suggest that this area of buried drums has been investigated, and necessary remediation has been conducted such that this area may no longer present any hazards.

b. CJ Ditsious conversation with Richard Doucette, VADEQ Northern Regional Office. Mr. Doucette is the Program Manager for Hazardous and Solid Waste in VADEQ's Land Protection and Revitalization Program. Mr. Doucette requested that NAB submit a FOIA request to obtain information on incidents we are interested in learning more about from their perspective. Mr. Ditsious has begun the process for making requests under FOIA for the incidents of interest, though no information has yet been received.

c. Dennis Powers and CJ Ditsious spoke with Tom Wasaff of MWAA. In addition to Tom Wasaff, Booz Allen Hamilton contractor personnel and staff from FAA provided input during this Telephone conversation on 20 JUL 2020. Dennis Powers questioned MWAA regarding their knowledge of the EDR report findings for MAP ID# 107, described as "Washington National Airport, South End of the Airport" which proceeded chronologically from Discovery phase in 1988, through an SI from 1994 to 1995, and eventually to Cleanup in 2017. MWAA explained that this work which had begun in 1988 included an area known as the Dumpster Area and branched out to include several other areas, one of which was known as the Drums Area. As a result of our conversation, MWAA will provide NAB with RI reports and internal risk analysis performed to characterize potential health risks to FAA site-workers performing construction activities on-site. We had a very productive telephone call, and the additional RI information that they will provide should significantly further our understanding of potential risks to site construction workers. MWAA also indicated that they are continuing further site studies and site testing.

5.0 EVALUATION

5.1 Data Gaps

Significant information and insight could be obtained from VADEQ regarding incidents for which they are involved as a regulator for releases both on the Airport property, as well as those nearby to the project location. After several attempts to reach a representative at VADEQ, CJ Ditsious spoke with Richard Doucette on July 13, 2020 at VADEQ Northern Regional Office and discussed

the sites listed in the EDR® report. He advised to use the Freedom of Information Act (FOIA) to obtain information about the sites in question. These reports are pending.

A site visit has yet to be conducted.

6.0 FINDINGS AND CONCLUSIONS

There were significant findings from the EDR® database search which demonstrate that there have been a significant number of spills and leaks of hazardous substances within the Airport property, as well as properties nearby to the project location. In addition, the RI Summary Report documents numerous chemical contaminants in soil and groundwater sample results on the SIS of the Airport which exceeded VADEQ CTLs. The vast majority of the samples exceeding CTLs involved exceeding commercial/industrial CTLs, as opposed to the more restrictive/conservative residential CTLs. Some of the more common chemical contaminants which exceeded CTLs included: Arsenic, 2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD), naphthalene, 2-methylnaphthalene, benzo(a)anthracene, benzo(a)pyrene, biphenyl and dibenzofuran. Many of these chemicals are either constituents of petroleum products, or they are products of combustion of petroleum.

A March 2009 human health risk evaluation concluded that "No unacceptable cancer risks or non-cancer hazards were calculated for the receptors potentially exposed to contaminants in the SIS area." In addition, the risk evaluation concluded "an elevated non-cancer hazard index (HI) was identified for future construction workers that performed excavation activities more than 25 days per year."

One of the primary findings and recommendations of the RI Summary Report was for the conduct of additional soil and/or groundwater investigation activities. The additional investigations are planned to focus on determining the extent of contamination in multiple areas, and also to investigate a newly discovered fire training area along the eastern shoreline of the Airport. Based on recent conversations with Airport personnel, these additional investigations may commence in Spring/Summer of 2022 and may be likely to continue for more than a year, and perhaps several years. Once the RI is completed, it is the intent that additional risk evaluations will be conducted to determine risks to human health based on the completed RI results.

Based on the current understanding of environmental contamination on the Airport, future levee/floodwall construction activities which would require subsurface excavation would be likely to require an evaluation of environmental health and safety measures to protect construction workers. In addition, implementation of procedures for handling and off-site disposal of contaminated materials may be required. As future RI investigation activities are planned for the Airport, it will be necessary for the CSRM to consider the future findings in order to properly plan for measures to protect future construction workers and to incorporate appropriate costs into the study.

7.0 REFERENCES

Booz Allen Hamilton, 2020. *Remedial Investigation Summary Report, Ronald Reagan Washington National Airport (DCA) South Investigation Site (SIS), July 2020.*

Metropolitan Washington Airports Authority, information obtained regarding the history of the Ronald Reagan Washington National Airport from: https://www.flyreagan.com/dca/reagan-national-airport

USACE, 2020. Report Summary for Metropolitan Washington (DC, Maryland, Virginia) Coastal Storm Risk Management Feasibility Study. (USACE-March 2020)

VDEQ, 2011. STORAGE TANK PROGRAM TECHNICAL MANUAL.
DEQ Guidance Document # 01-2024D
(Fourth Edition, May 10, 2011).
Virginia Department of Environmental Quality. Accessed online at https://www.deq.virginia.gov/Portals/0/DEQ/Land/Tanks/012024d.pdf

APPENDIX A
FIGURES


4b Reagan National Airport
Elevated Roadway
ARLINGTON
COUNTY
DISTRICT OF
COLUMBIA
Structural Alternatives by Type
Closure
Concrete Floodwall
Earthen Levee with Walkway
Earthen Levee
Flap Gate
Road Elevation/Levee
Limits of Disturbance (Preliminary)
US Army Corps
of Engineers
Baltimore District
Figure 1
Reagan National Airport
with Limits of Disturbance
Map: Reagan LOD.mxd
Developed by: USACE Baltimore
Date: 6/4/2020
N
0
1,000
2,000
Feet

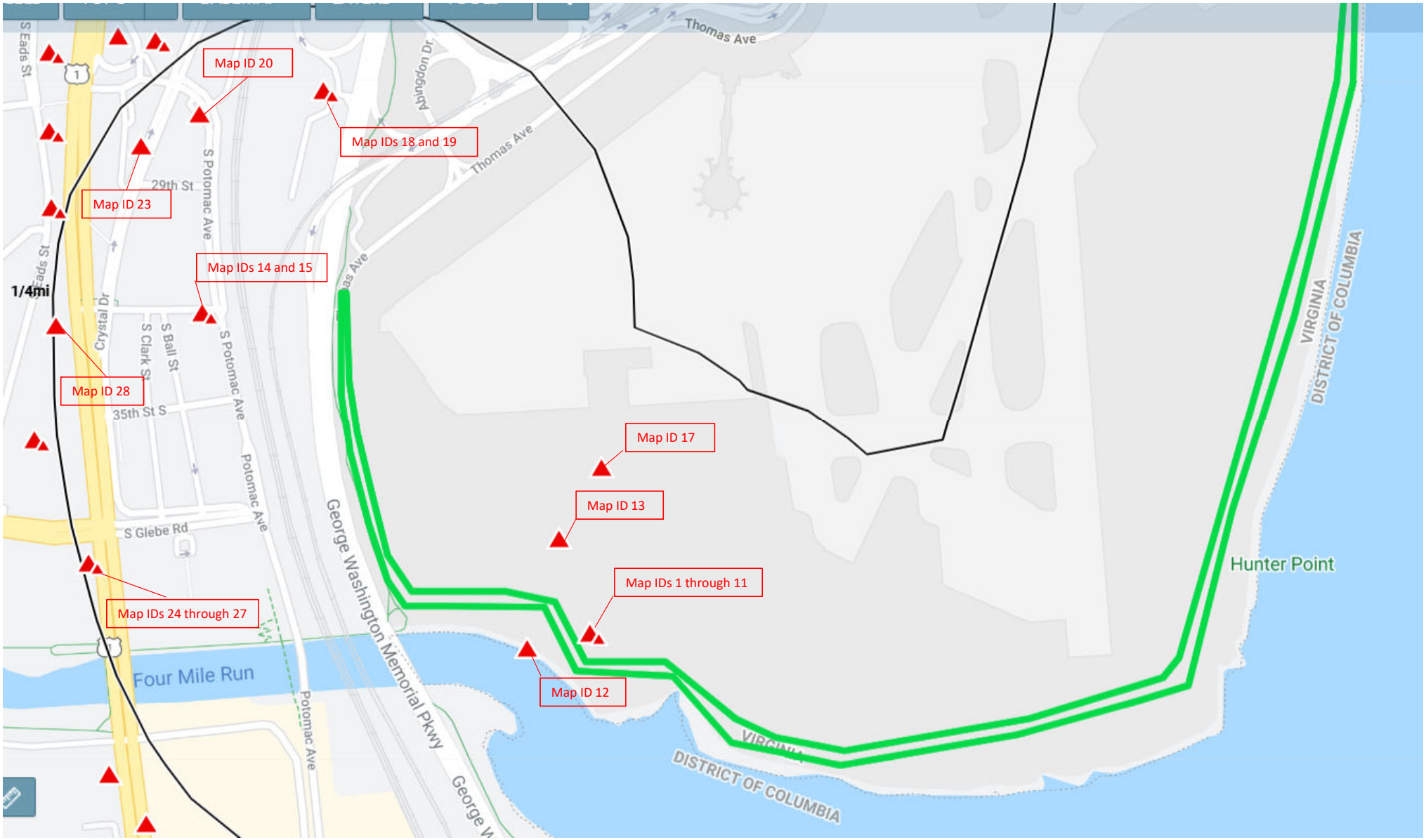


Figure 2 - Southern Portion of Airport showing Labeled Map IDs on Airport and within 1/4-mile of Project

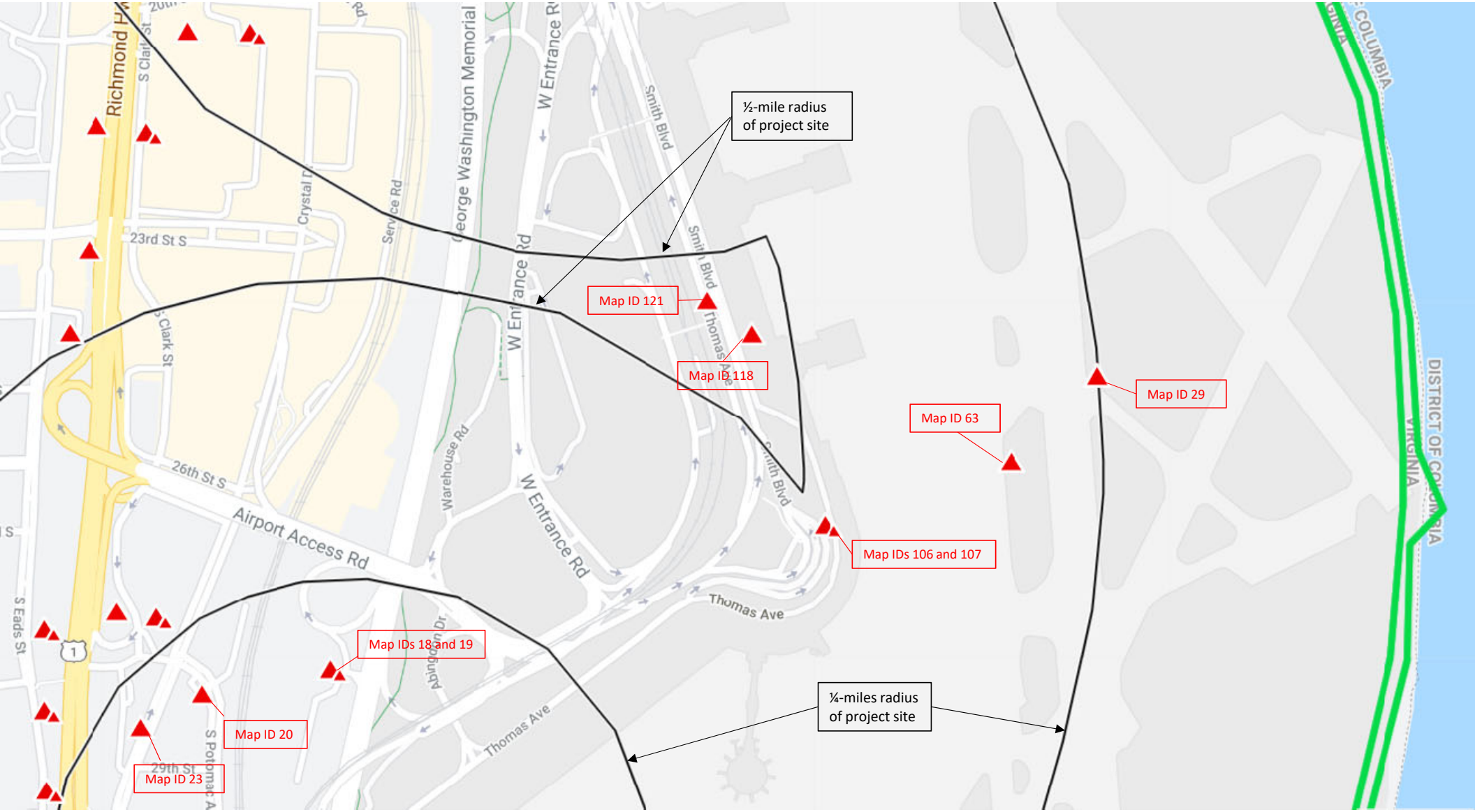


Figure 3 - Central Portion of Airport showing Labeled Map IDs on Airport and within 1/4-mile of Project Site

Figure 4 - Northern Portion of Airport showing Labeled Map IDs on Airport and within 1/4-mile of Project Site

APPENDIX B
HISTORICAL AERIAL PHOTOGRAPHS

1949

1953

1953

(27)

1957

1962

1967

1969

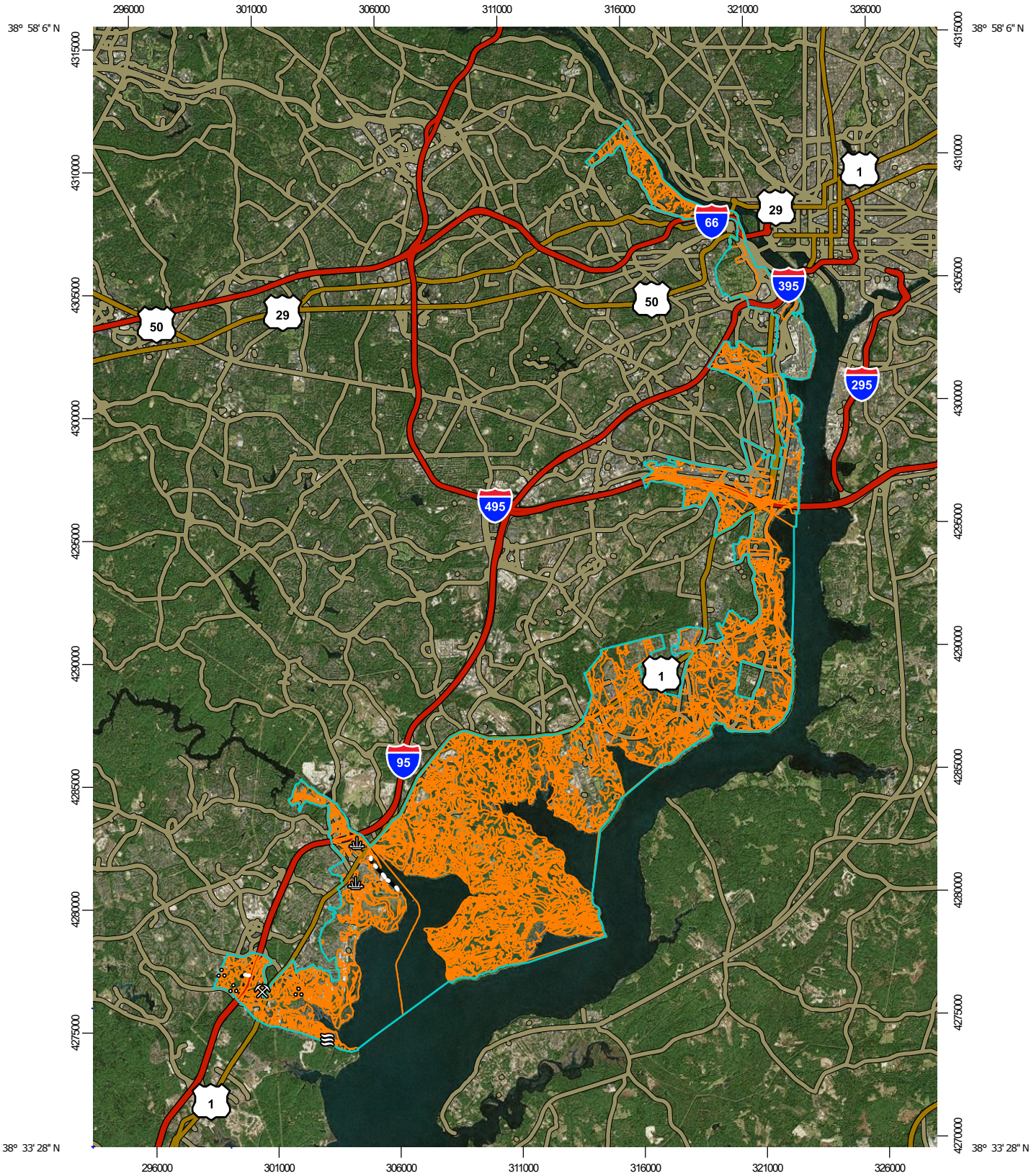
1974

METROPOLITAN WASHINGTON, DISTRICT OF COLUMBIA COASTAL STORM RISK MANAGEMENT FEASIBILITY STUDY

INTEGRATED FEASIBILITY REPORT & ENVIRONMENTAL ASSESSMENT

APPENDIX G9: WEB SOIL SURVEY

Soil Map—Alexandria City, Virginia, Arlington County, Virginia, Charles County, Maryland, District of ...
(DC Coastal Study Area Soil Map)



Map Scale: 1:222,000 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 3000 6000 12000 18000

Feet
0 10000 20000 40000 60000

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at scales ranging from 1:12,000 to 1:24,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Alexandria City, Virginia
Survey Area Data: Version 11, Sep 17, 2021

Soil Survey Area: Arlington County, Virginia
Survey Area Data: Version 18, Sep 13, 2021

Soil Survey Area: Charles County, Maryland
Survey Area Data: Version 15, Aug 27, 2021

Soil Survey Area: District of Columbia
Survey Area Data: Version 15, Aug 26, 2021

Soil Survey Area: Fairfax County, Virginia
Survey Area Data: Version 19, Sep 13, 2021

Soil Survey Area: Prince George's County, Maryland
Survey Area Data: Version 19, Aug 27, 2021

Soil Survey Area: Prince William County, Virginia
Survey Area Data: Version 18, Sep 14, 2021

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

MAP LEGEND

MAP INFORMATION

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jan 1, 1999—Dec 31, 2003

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
30A	Codorus and Hatboro soils, 0 to 2 percent slopes, occasionally flooded	76.6	0.2%
40	Grist Mill sandy loam, 0 to 25 percent slopes	412.1	0.9%
47B	Grist Mill-Woodstown complex, 2 to 7 percent slopes	28.5	0.1%
66	Kingstowne sandy clay loam, 0 to 45 percent slopes	72.7	0.2%
71C	Kingstowne-Sassafras-Marumsco complex, 7 to 15 percent slopes	1.5	0.0%
71D	Kingstowne-Sassafras-Marumsco complex, 15 to 25 percent slopes	2.3	0.0%
91D	Sassafras-Marumsco complex, 15 to 25 percent slopes	t te i e t ce 4.6	0.0%
95	Urban land	1,317.6	2.8%
98	Urban land-Grist Mill	807.9	1.7%
100	Urban land-Kingstowne complex	61.9	0.1%
109B	Woodstown sandy loam, 2 to 7 percent slopes	i e u ie u et s 15.4	0.0%
W	Water	209.3	0.4%
Subtotals for Soil Survey Area		**3,010.3**	**6.4%**
Totals for Area of Interest		**46,702.6**	**100.0%**

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
3A	Urban land-Codorus complex, 0 to 3 percent slopes	61.1	0.1%
4A	Sassafras-Urban land-Neabsco complex, 0 to 3 percent slopes	5.8	0.0%
4B	Urban land-Sassafras-Neabsco complex, 3 to 8 percent slopes	100.7	0.2%
5	Arlington National Cemetery	616.9	1.3%
6B	Glenelg loam, 3 to 8 percent slopes	i e 11.7	0.0%
6C	Glenelg loam, 8 to 15 percent slopes	44.5	0.1%
6D	Glenelg-Manor complex, 15 to 35 percent slopes	450.7	1.0%

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
7B	Glenelg-Urban land complex, 3 to 8 percent slopes	128.3	0.3%
7C	Glenelg-Urban land complex, 8 to 15 percent slopes	391.6	0.8%
7D	Glenelg-Urban land complex, 15 to 25 percent slopes	203.0	0.4%
9D	Sassafras gravelly sandy loam, 15 to 25 percent slopes	13.0	0.0%
11C	Urban land-Sassafras complex, 8 to 15 percent slopes	24.3	0.1%
11D	Urban land-Sassafras complex, 15 to 25 percent slopes	54.1	0.1%
12	Urban land-Udorthents complex, 2 to 15 percent slopes	1,901.2	4.1%
13	Udorthents, loamy	45.6	0.1%
15D	Sassafras-Urban land complex, 15 to 25 percent slopes	58.8	0.1%
16B	Urban land-Woodstown complex, 3 to 8 percent slopes	2.5	0.0%
W	Water	63.0	0.1%
Subtotals for Soil Survey Area		**4,176.9**	**8.9%**
Totals for Area of Interest		**46,702.6**	**100.0%**

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
W	Water	101.6	0.2%
Subtotals for Soil Survey Area		**101.6**	**0.2%**
Totals for Area of Interest		**46,702.6**	**100.0%**

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
W	Water	55.4	0.1%
Subtotals for Soil Survey Area		**55.4**	**0.1%**
Totals for Area of Interest		**46,702.6**	**100.0%**

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
7B	Beltsville silt loam, 2 to 7 percent slopes	1,397.5	3.0%
29A	Codorus silt loam, 0 to 2 percent slopes, occasionally flooded	5.4	0.0%

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
30A	Codorus and Hatboro soils, 0 to 2 percent slopes, occasionally flooded	1,149.3	2.5%
33A	Downer loamy sand, 0 to 2 percent slopes	173.9	0.4%
36A	Elkton silt loam, 0 to 2 percent slopes, occasionally ponded	314.2	0.7%
37B	Elsinboro loam, 2 to 7 percent slopes, rarely flooded	3.9	0.0%
38B	Fairfax loam, 2 to 7 percent slopes	1.7	0.0%
39E	Glenelg silt loam, 25 to 45 percent slopes	0.0	0.0%
40	Grist Mill sandy loam, 0 to 25 percent slopes	422.5	0.9%
41A	Grist Mill-Downer complex, 0 to 2 percent slopes	27.6	0.1%
42A	Grist Mill-Elkton complex, 0 to 2 percent slopes	2.9	0.0%
43A	Grist Mill-Gunston complex, 0 to 2 percent slopes	997.4	2.1%
44A	Grist Mill-Honga complex, 0 to 2 percent slopes	0.8	0.0%
45A	Grist Mill-Matapeake complex, 0 to 2 percent slopes	54.6	0.1%
45B	Grist Mill-Matapeake complex, 2 to 7 percent slopes	283.0	0.6%
46A	Grist Mill-Mattapex complex, 0 to 2 percent slopes	59.8	0.1%
46B	Grist Mill-Mattapex complex, 2 to 7 percent slopes	2,214.2	4.7%
47B	Grist Mill-Woodstown complex, 2 to 7 percent slopes	294.7	0.6%
48A	Gunston silt loam, 0 to 2 percent slopes	1,056.8	2.3%
49A	Hatboro silt loam, 0 to 2 percent slopes, frequently flooded	348.7	0.7%
60A	Honga peat, 0 to 1 percent slopes, very frequently flooded, tidal	1,104.4	2.4%
66	Kingstowne sandy clay loam, 0 to 45 percent slopes	87.2	0.2%
67B	Kingstowne-Beltsville complex, 2 to 7 percent slopes	810.5	1.7%
69B	Kingstowne-Elsinboro complex 2 to 7 percent slopes	67.1	0.1%

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
70A	Kingstowne-Sassafras complex, 0 to 2 percent slopes	40.6	0.1%
70B	Kingstowne-Sassafras complex, 2 to 7 percent slopes	69.8	0.1%
70C	Kingstowne-Sassfras complex, 7 to 15 percent slopes	146.8	0.3%
71C	Kingstowne-Sassafras-Marumsco complex, 7 to 15 percent slopes	496.8	1.1%
71D	Kingstowne-Sassafras-Marumsco complex, 15 to 25 percent slopes	155.7	0.3%
71E	Kingstowne-Sassafras-Marumsco complex, 25 to 45 percent slopes	85.8	0.2%
72B	Kingstowne-Sassafras-Neabsco complex, 2 to 7 percent slopes	287.9	0.6%
74B	Lunt-Marumsco complex, 2 to 7 percent slopes	325.6	0.7%
76A	Matapeake silt loam, 0 to 2 percent slopes	409.9	0.9%
76B	Matapeake silt loam, 2 to 7 percent slopes	494.1	1.1%
77A	Mattapex loam, 0 to 2 percent slopes	1,408.8	3.0%
77B	Mattapex loam, 2 to 7 percent slopes	739.8	1.6%
82B	Orange silt loam, 2 to 7 percent slopes	2.6	0.0%
84B	Panorama loam, 2 to 7 percent slopes	2.2	0.0%
86	Pits, gravel	13.7	0.0%
88E	Rhodhiss-Rock outcrop complex, 25 to 45 percent slopes	14.7	0.0%
90A	Sassafras sandy loam, 0 to 2 percent slopes	99.2	0.2%
90B	Sassafras sandy loam, 2 to 7 percent slopes	319.9	0.7%
90C	Sassafras sandy loam, 7 to 15 percent slopes	302.3	0.6%
91C	Sassafras-Marumsco complex, 7 to 15 percent slopes	1,016.3	2.2%
91D	Sassafras-Marumsco complex, 15 to 25 percent slopes	1,363.4	2.9%

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
91E	Sassafras-Marumsco complex, 25 to 45 percent slopes	2,342.9	5.0%
92B	Sassafras-Neabsco complex, 2 to 7 percent slopes	22.8	0.0%
93B	Sumerduck loam, 2 to 7 percent slopes	5.0	0.0%
95	Urban land	2,324.4	5.0%
98	Urban land-Grist Mill	643.7	1.4%
100	Urban land-Kingstowne complex	87.5	0.2%
103A	Wheaton-Codorus complex, 0 to 2 percent slopes	217.2	0.5%
105B	Wheaton-Glenelg complex, 2 to 7 percent slopes	0.1	0.0%
108B	Wheaton-Sumerduck complex, 2 to 7 percent slopes	5.9	0.0%
109B	Woodstown sandy loam, 2 to 7 percent slopes	715.4	1.5%
W	Water	5,580.5	11.9%
Subtotals for Soil Survey Area		**30,619.5**	**65.6%**
Totals for Area of Interest		**46,702.6**	**100.0%**

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
W	Water	6.2	0.0%
Subtotals for Soil Survey Area		**6.2**	**0.0%**
Totals for Area of Interest		**46,702.6**	**100.0%**

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
1A	Aden silt loam, 0 to 2 percent slopes	93.2	0.2%
10B	Buckhall loam, 2 to 7 percent slopes	10.5	0.0%
10C	Buckhall loam, 7 to 15 percent slopes	7.7	0.0%
15A	Comus loam, 0 to 2 percent slopes	28.7	0.1%
16A	Delanco fine sandy loam, 0 to 4 percent slopes	154.8	0.3%
18C	Dumfries sandy loam, 7 to 15 percent slopes	165.0	0.4%
18D	Dumfries sandy loam, 15 to 25 percent slopes	286.0	0.6%
18E	Dumfries sandy loam, 25 to 50 percent slopes	446.5	1.0%

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
20B	Elsinboro sandy loam, 2 to 7 percent slopes	484.0	1.0%
22A	Featherstone mucky silt loam, 0 to 1 percent slopes	598.4	1.3%
27A	Hatboro-Codorus complex, 0 to 2 percent slopes	178.8	0.4%
34B	Lunt loam, 2 to 7 percent slopes	167.2	0.4%
34C	Lunt loam, 7 to 15 percent slopes	291.5	0.6%
34D	Lunt loam, 15 to 25 percent slopes	140.3	0.3%
36D	Marr very fine sandy loam, 7 to 25 percent slopes	12.4	0.0%
37A	Marumsco loam, 0 to 4 percent slopes	397.4	0.9%
38B	Meadowville loam, 0 to 5 percent slopes	24.5	0.1%
41B	Neabsco loam, 0 to 7 percent slopes	2.9	0.0%
41C	Neabsco loam, 7 to 15 percent slopes	1.6	0.0%
42B	Neabsco-Quantico complex, 2 to 7 percent slopes	101.4	0.2%
44D	Occoquan sandy loam, 7 to 25 percent slopes	111.1	0.2%
44E	Occoquan sandy loam, 25 to 50 percent slopes	34.9	0.1%
47B	Quantico sandy loam, 2 to 7 percent slopes	123.1	0.3%
47C	Quantico sandy loam, 7 to 15 percent slopes	168.4	0.4%
47D	Quantico sandy loam, 15 to 25 percent slopes	35.6	0.1%
53B	Sycoline-Kelly complex, 2 to 7 percent slopes	21.1	0.0%
54B	Urban land-Udorthents complex, 0 to 7 percent slopes	1,445.3	3.1%
55D	Watt channery silt loam, 15 to 25 percent slopes	99.0	0.2%
55E	Watt channery silt loam, 25 to 50 percent slopes	192.0	0.4%
W	Water	2,909.6	6.2%
Subtotals for Soil Survey Area		**8,732.7**	**18.7%**
Totals for Area of Interest		**46,702.6**	**100.0%**

METROPOLITAN WASHINGTON, DISTRICT OF COLUMBIA COASTAL STORM RISK MANAGEMENT FEASIBILITY STUDY

INTEGRATED FEASIBILITY REPORT & ENVIRONMENTAL ASSESSMENT

APPENDIX G10: SPONSORS LETTERS OF SUPPORT

From:	Mary Strawn
To:	Perkins, Catherine J (Katie) CIV USARMY CENAB (USA); Metallo, Amber C CIV USARMY CENAB (USA); Bierly, Daniel M CIV USARMY CENAB (USA); Roach, Andrew A CIV USARMY CENAB (USA); Bieber, Steve; Jeffrey King
Cc:	Wilbur Brown; Mike Collins
Subject:	[Non-DoD Source] Arlington"s support of TSP for WPCP floodwall
Date:	Monday, March 28, 2022 5:07:00 PM

Good afternoon-

The Arlington County Water Pollution Control Plant (WPCP), located in South Arlington on the lower stretch of Four Mile Run, is a water resource recovery facility that treats the wastewater for more than 250,000 people in the DC Metropolitan area. Due to the high level of treatment required to protect public health and the Chesapeake Bay watershed, there is an ongoing investment in high-performing treatment processes, including automation for control and monitoring of the facility.

The WPCP is vulnerable to flooding, and a major coastal flooding event would significantly impact our ability to protect public health and the environment. Due to damage that would be sustained to critical infrastructure at the facility, it could potentially take months to fully recover from such an event.

Arlington believes that there are substantial benefits to better protecting the WPCP through the US Army Corps of Engineers' tentatively selected plan of constructing a flood wall around the WPCP. The proposed project provides protection to the WPCP with a relatively modest investment and minimal impacts to the surrounding community. The County supports the project and feels that it warrants more detailed analysis to confirm the feasibility.

Sincerely,

Mary Strawn
Chief Engineer
Arlington County
Water Pollution Control Bureau
3402 S. Glebe Rd.
Arlington, VA 22202
703-228-6829

Dan Storck
Mount Vernon District Supervisor
Fairfax County Board of Supervisors
2511 Parkers Lane
Mount Vernon, VA 22306

Telephone: (703) 780-7518 E-mail: mtvernon@fairfaxcounty.gov

March 28, 2022

Steve Bieber
Water Resources Program Director
Metropolitan Washington Council of Governments
777 North Capitol Street NE, Suite 300
Washington, DC 2002

Amber Metallo
Biologist/Study Manager
U.S. Army Corps of Engineers
Baltimore District, Planning Division
2 Hopkins Plaza Baltimore, MD 21201

Subject: MWCOG/USACE Coastal Storm Risk Study Tentatively Selected Plan

Dear Mr. Bieber & Ms. Metallo,

I am writing express my support for the proposed levee and floodwall improvements in the Belle Haven community. I am pleased to see that it is among your favored alternatives being considered for reducing flood risks in tidal areas of our region.

Many of the residents of Belle Haven and the nearby New Alexandria, River Towers and Belle View communities have been advocating for many, many years to me and my predecessor, Supervisor Gerry Hyland, about the importance of implementing flood mitigation measures that will protect their quality of life especially as we deal with the increasing threat of climate change.

While I see this as a positive step forward, I understand that the devil is in the details, and there is still much more to be done in terms of evaluating this proposal. As you approach the release of this proposed plan for public comment in late May 2022, please let me and my office know how we can work best with you to facilitate and assist with any community meetings you expect to hold as part of the public input process.

Thank you both for your service to our community.

Respectfully yours in public service,

Dan Storck

County of Fairfax, Virginia

To protect and enrich the quality of life for the people, neighborhoods and diverse communities of Fairfax County

March 29, 2022

Mr. Steve Bieber
Water Resources Program Director
Metropolitan Washington Council of Governments
777 North Capitol Street NE, Suite 300
Washington, DC 2002

Ms. Amber Metallo
Biologist/Study Manager
U.S. Army Corps of Engineers
Baltimore District, Planning Division
2 Hopkins Plaza
Baltimore, MD 21201

Subject: MWCOG/USACE Coastal Storm Risk Study Tentatively Selected Plan

Dear Mr. Bieber and Ms. Metallo:

On behalf of Fairfax County, I am writing to express support for the proposed levee and floodwall improvements in Belle Haven. It has been determined that these improvements will have a favorable benefit/cost ratio among the various alternatives considered for reducing flood risks in tidal areas of our region.

It is my understanding that the next step would be to include the levee and floodwall project in the Tentatively Selected Plan (TSP) which would then be carried forward for further evaluation. It is also my understanding that you anticipate the TSP to be released for public comment in the late May 2022 timeframe. My team looks forward to working with you to facilitate and assist with any community meetings you expect to hold as part of the public input process.

Sincerely,

Bryan J. Hill
County Executive

cc: Rachel Flynn, Deputy, County Executive
Christopher Herrington, Director, Department of Public Works and Environmental Services (DPWES)
Eleanor Ku Codding, Deputy Director, DPWES, Stormwater and Wastewater Divisions

Office of the County Executive
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METROPOLITAN WASHINGTON, DISTRICT OF COLUMBIA COASTAL STORM RISK MANAGEMENT FEASIBILITY STUDY

INTEGRATED FEASIBILITY REPORT & ENVIRONMENTAL ASSESSMENT

APPENDIX G11: PUBLIC NOTICE

US Army Corps of Engineers
Baltimore District

Notice of Availability of Draft Report and Public Meeting

Metropolitan Washington, District of Columbia,
Coastal Storm Risk Management Feasibility Study
Draft Integrated Feasibility Report and Environmental Assessment

ALL INTERESTED PARTIES: The U.S. Army Corps of Engineers, Baltimore District (USACE) and the non- federal sponsor, the Metropolitan Washington Council of Governments (MWCOG), have prepared a draft Integrated Feasibility Report and Environmental Assessment (EA) to determine whether the implementation of coastal storm risk management (CSRM) measures would reduce coastal flood risk to critical public and private infrastructure along the west bank of the Potomac River in Northern Virginia. The study area encompasses approximately 76 square miles and includes the Northern Virginia jurisdictions within the Middle Potomac watershed boundary, from Arlington County south to include a portion of Prince William County.

Purpose of Work: The purpose of this study is to evaluate the feasibility of Federal participation in the implementation of solutions to reduce long-term coastal flood risk to vulnerable populations, properties, infrastructure, and environmental and cultural resources considering future climate and sea level change scenarios to support resilient communities in Northern Virginia within the Middle Potomac River watershed. Northern Virginia has been impacted by numerous major tropical and extratropical events, most notably the Chesapeake and Potomac Hurricane of 1933, Hurricane Agnes (1972), Hurricane Fran (1996), Nor'easter (1998), Hurricane Floyd (1999), Hurricane Isabel (2003), Hurricane Irene (2011), and Hurricane Sandy (2012). Hurricane Isabel in 2003 resulted in extreme water levels and caused millions of dollars of damage to residences, businesses, and critical infrastructure.

Proposed Action: The Tentatively Selected Plan (TSP) presented in this draft report includes a floodwall at the Arlington Water Pollution Control Plant (WPCP) and a levee and floodwall at the community of Belle Haven (Figures 1 and 2). The TSP is the National Economic Development Plan (NED); the plan that reasonably maximizes net benefits.

At the Arlington WPCP, a floodwall would be constructed along the left bank of Four Mile Run between Four Mile Run and the Arlington WPCP with a closure structure on the east side of the structure. The new floodwall would tie into the bank to the east just past South Eads Street. The floodwall would wrap around the Arlington WPCP to the west where the stop log closure structure is located along South Glebe Road.

At Belle Haven, a floodwall would be constructed just north of Belle Haven Road from Barrister Place to 10th Street with a closure structure at 10th Street and at the George Washington Memorial Parkway (GWMP). Closure structures would also be constructed along Belle Haven Road and Belle View Boulevard. A floodwall would tie into the closure structure at 10th Street and run south along the west side of the GWMP, curving around Belle View Boulevard to 10th Street. The floodwall would then run west to East Wakefield Drive tying into both sides of a closure structure on Potomac Avenue. The floodwall would continue west to West Wakefield Drive and tie into a small portion of earthen levee ending at Westgrove Dog Park.

Comments: The draft integrated Feasibility Report and EA will be made available to the public for a 30-day review and comment period beginning on May 31, 2022. Comments need to be received on or before June 30, 2022, to be considered. The draft Integrated Feasibility Report and EA are available via the USACE website at: https://www.nab.usace.army.mil/DC_Coastal_Study/. Comments can be submitted electronically to: DC-Metro-CSRM-Study@usace.army.mil

Public Meeting: USACE and MWCOG will hold at least one public meeting. The first meeting will be held on 14 June at Belle View Elementary School (6701 Fort Hunt Rd, Alexandria, VA 223007) from 6:00 pm to 8:00 pm to present the report and receive comments. Additional information on this and other public meetings will be available on the USACE project website above.

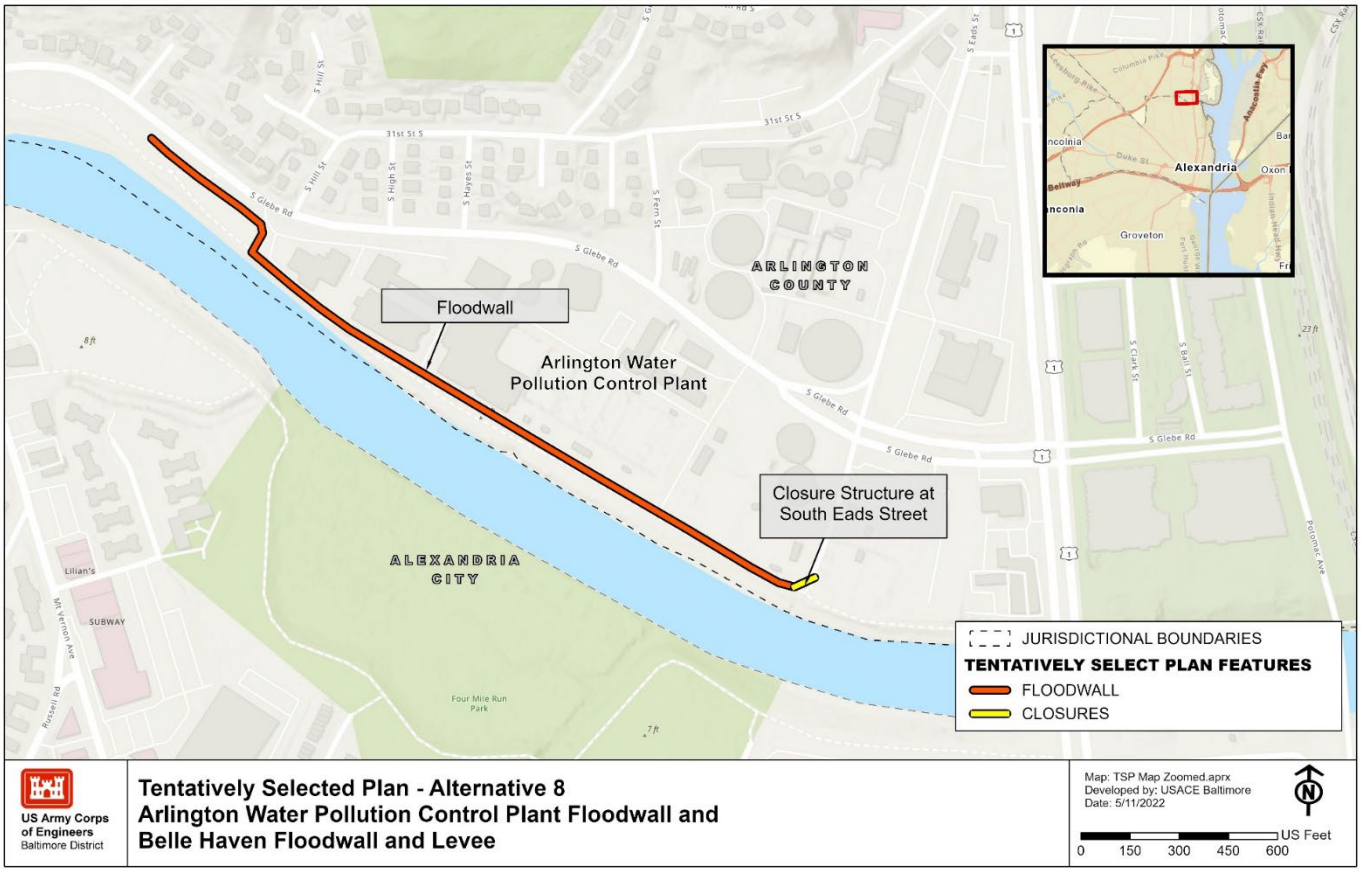

FIGURE 1. TENTATIVELY SELECTED PLAN – ARLINGTON WATER POLLUTION CONTROL PLANT FLOODWALL

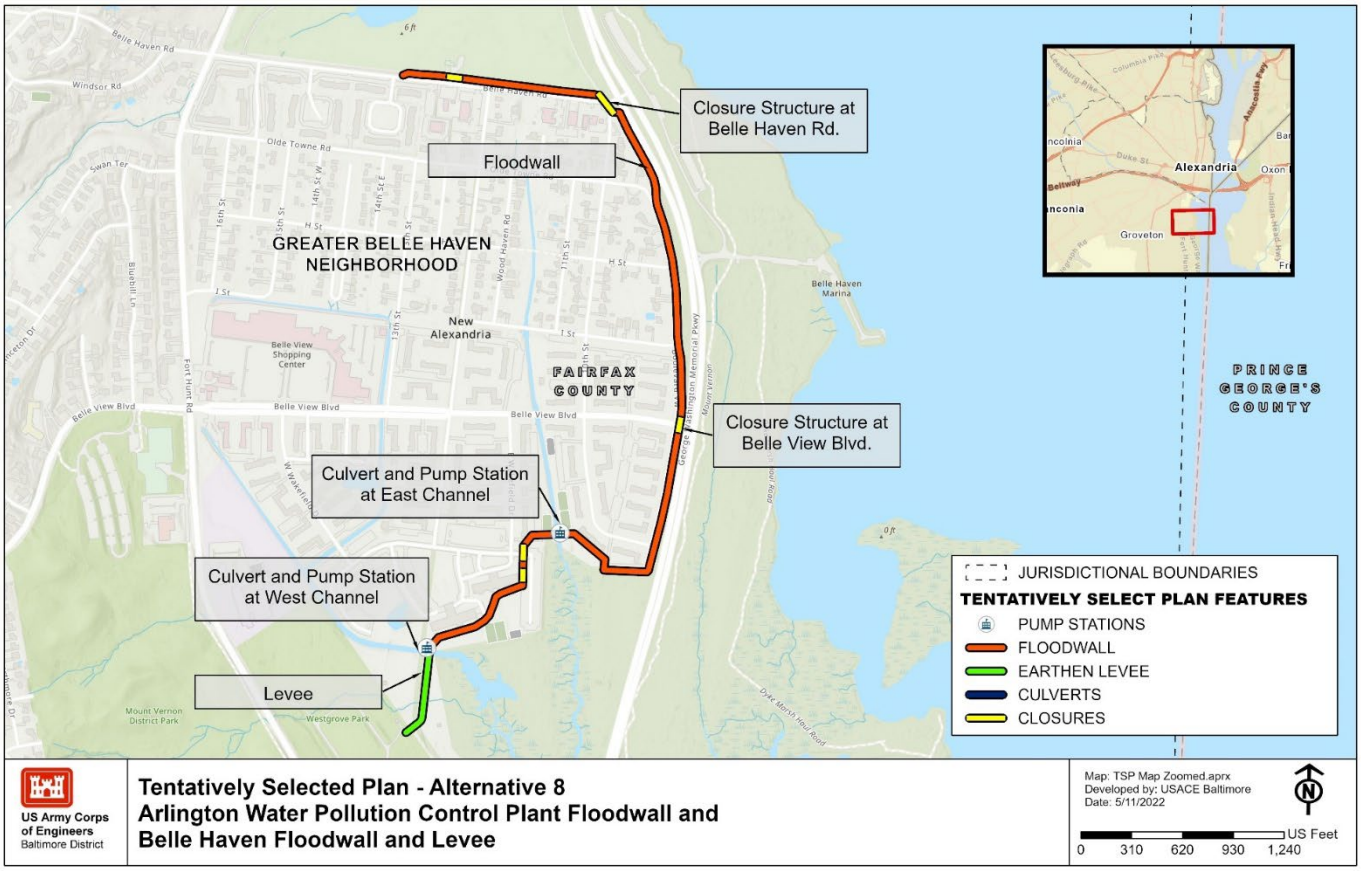

FIGURE 2. TENTATIVELY SELECTED PLAN – BELLE HAVEN FLOODWALL AND LEVEE

METROPOLITAN WASHINGTON, DISTRICT OF COLUMBIA COASTAL STORM RISK MANAGEMENT FEASIBILITY STUDY

INTEGRATED FEASIBILITY REPORT & ENVIRONMENTAL ASSESSMENT

APPENDIX G12: AGENCY COMMENTS AND USACE RESPONSES

AGENCY COMMENTS

From:	Traver, Carrie
To:	DC-Metro-CSRM-Study
Cc:	May, Kristina K CIV USARMY CENAB (USA); Nevshehirlian, Stepan
Subject:	[Non-DoD Source] Metropolitan Washington, District of Columbia, Coastal Storm Risk Management Feasibility Study Draft Integrated Feasibility Report and EA
Date:	Monday, August 1, 2022 9:54:52 AM

The U.S. Environmental Protection Agency (EPA) reviewed the Draft Integrated Feasibility Report and Environmental Assessment (IFR/EA or EA) for the Metropolitan Washington District of Columbia Coastal Storm Risk Management Feasibility Study (Study) (which also has been referred to as the Northern Virginia Study.) Alternative 4c-Arlington Water Pollution Control Plant (WPCP) Floodwall and 5c-Belle Haven Levee and Floodwall were combined into Alternative 8. Alternative 8 was identified as the National Economic Development (NED) Plan and was chosen as the Tentatively Selected Plan (TSP).

EPA has several recommendations for your consideration in the development of the Final IFR/EA and FONSI in compliance with the National Environmental Policy Act (NEPA) of 1969, the CEQ regulations implementing NEPA (40 CFR 1500-1508), and Section 309 of the Clean Air Act. We note that although EPA accepted the invitation to be a cooperating agency in September 2019, EPA has had limited involvement in development of the study. Therefore, our comments reflect the information provided in the publicly available IFR/EA materials. Please also note that as July 31st is a Sunday, we are providing our comments on August 1st.

Alternatives

Nature-based infrastructure not only helps slow floodwaters but can have co-benefits for water quality, habitat, and aesthetic enhancement, and may benefit long term climate resilience. Section 1.7 acknowledges the benefits of natural and nature-based features (NNBF) and indicates that opportunities exist in the study area to incorporate it.

- EPA recommends clarifying the evaluation and assessment of nonstructural and NNBF measures. It is unclear how the models used for evaluating the alternatives have considered the benefits provided by nature-based infrastructure. Table 3-2. indicates that nonstructural measures such wetland restoration, reefs, and beach restoration did not meet the planning objectives for the Study, but it is not evident how this was determined.

- EPA recommends the addition of NNBF to the TSP in the Final IFR/EA. As stated in Section 3.0, NNBF will be added as a design consideration to enhance the performance and effectiveness of the final array of alternatives. However, specific opportunities for adding NNBF were not identified in the Draft IFR/EA.

Air Quality

Section 4.2.3 indicates that the actions associated with Alternatives 4b, 4c, 5a, and 5c are exempt from General Conformity as the ozone precursors, volatile organic compounds (VOCs) and nitrogen oxides (NOx) are below the USEPA threshold of 100 tons per year (tpy) for all maintenance areas.

- As indicated in Section 2.4.4.1, the Washington, DC-MD-VA region is designated as a nonattainment area for 8-hour ozone 2015 standard as well as maintenance for the 2008 standard. The project area also appears to be in an Ozone Transport Region (OTR). Specifically, the Consolidated Metropolitan Statistical Area that includes the District of Columbia is in the OTR. For the OTR, the applicable de minimis emission threshold for maintenance and nonattainment (as listed in Table 2-1 in Appendix A4) is 50 tpy for VOCs and 100 tpy of NOx. We recommend that Section 4.2.3 be updated and clarified.

- In addition to meeting requirements of General Conformity, we recommend that localized air quality impacts from construction on local communities be addressed. The EA indicates high ozone; other EJScreen indicators such as Diesel Particulate Matter and Air Toxics Respiratory Hazard Index show existing high air pollution relative to the nation. We recommend consideration of BMPs and how they will be implemented. (For example, anti-idling restrictions may be helpful, but how will they be enforced?)

Environmental Justice

EPA appreciates the intent to identify underserved communities. However, it is unclear from the information provided whether the assessment is sufficient to fully identify potential communities with EJ concerns.

- By using the 80th percentile or greater nationally, people of color populations may not be sufficiently evaluated. For an initial screening, EPA recommends following the guidance provided regarding EO 12898 in Environmental Justice under the National Policy Act and identifying all census block groups where the minority populations either exceed 50 percent or determining what minority population percentage lower than 50% would be meaningfully greater. Comparing to state and regional percentiles may be more informative than using the national percentiles.
- We recommend that the selection of the screening criteria to identify low-income populations be clarified. The IFR/EA uses the 80th percentile or greater nationally for percent of the population that is at or below 200% of the federal poverty line. While 200% of the federal poverty line may be appropriate given the cost of living in the metropolitan Washington D.C. area, it is unclear whether the 80th percentile should be used in this analysis.

- As the very large study area makes it difficult to conduct a full analysis of potential EJ concerns, we recommend that the communities impacted by the final array of alternatives be evaluated in greater detail. We recommend using this information to tailor outreach to underserved communities or potential communities with EJ concerns, if appropriate.

Vegetation

Section 2.3 did not include a discussion of terrestrial vegetation in the study area, although 4.2.1 does describe some riparian vegetation in the area of the proposed structural measures.

The EA indicates that removal of live and dead trees and saplings and shrubs would be avoided to the greatest extent practicable to minimize impacts on migratory birds. We concur that this is an important minimization measure but note that conversion of vegetation may have additional impacts which should be evaluated, including stormwater and water quality, aesthetics, shade/temperature, and habitat for a range of fauna.

Aquatic Resources

A potential change in inundation depth in the wetlands following construction of the floodwall/levee is currently not expected to affect the wetlands. However, providing the modeling results that confirm this assumption in the Final IFR/EA would be helpful.

Construction of the proposed culvert crossings in two streams in Belle Haven would result in roughly 2,250 sqft of new permanent fill impacts and 2,000 sqft of temporary impacts. Section 6.8.1 indicates that the amount of fill material placed into the channels was minimized to the greatest extent practicable. In addition, the culvert design should be considered to minimize potential impacts, including prevention of barriers to passage of aquatic and semi-aquatic species during low-flow conditions.

Water Quality

Section 2.4.1.2 indicates that Arlington County, Fairfax County, and the City of Alexandria have identified opportunities for both structural and non-structural improvement projects to address accelerated stream erosion and sedimentation from stormwater runoff. We recommend evaluating opportunities to incorporate green infrastructure in conjunction with the TSP to enhance the plan. Likewise, we recommend consideration of additional activities that may enhance floodplains or wetlands such as Dyke Marsh to increase resilience from storms and flooding.

Cultural Resources

The potential impacts to resources under Section 106 of the National Historic Preservation Act are current unclear. The Belle Haven neighborhood may need to be formally evaluated for listing on the National Register of Historic Places, archaeological

surveys may be needed in the footprint of the proposed levee and floodwall, and the proposed floodwall may have viewshed impacts from historic resources such as the George Washington Memorial Parkway (GWMP) and the Mount Vernon Trail. Based on Sections 6.9 and 6.10, a Programmatic Agreement is currently being developed or will be developed with the Section 106 consulting parties for impacts. We recommend that the Final IFR/EA be updated with the status of consultation, the draft or final PA, resource impacts, and other relevant information.

Noise

As described in the EA/IFR, it is estimated that the construction duration for the Arlington WPCP would be 18 months and construction duration for Belle Haven is 4 years. Expected equipment such as bulldozers, flatbed trucks, trailers, dump trucks, and asphalt and concrete trucks typically generate noise levels ranging from 70 to >80 dB, well above the typical background noise levels in urban residential neighborhoods. The assumption of 12-hour construction days could mean that noise could have substantial impacts in early morning or evening hours as well as all day. Noise pollution has been linked to health effects such as stress-related illnesses, high blood pressure, speech interference, and sleep disruption, as well as adverse impacts to children's learning.

- Due to the close proximity of the proposed floodwall and levee to several of the condominium buildings in Belle Haven, construction would adversely affect the residents of Belle Haven during the daytime. The IFR/EA states that this adverse effect would not be significant because noise is not expected to exceed 80 dB (although it was stated the crane would "average 81 dB") and would be temporary. We recommend additional evaluation of noise on nearby residences and other sensitive receptors, including metrics that factor in noise perception and impacts based on equipment, distance, and shielding and consideration of noise mitigation measures, particularly at Belle Haven given the lengthy construction time frame.

- Section 4.2.9 indicates that noise in the location of the Arlington WPCP may be higher than other urban residential areas due to the amount of surrounding commercial activity on Mount Vernon Avenue and Route 1 and aircraft noise from the nearby Reagan National Airport. As noise is an additive stressor, we recommend further analysis to support the conclusion that construction noise would not be significant.

- We recommend consideration of noise BMPs and mitigation, including screening, mufflers, time-of-day restrictions, etc.

- We also recommend addressing operational and maintenance noise from the

pump stations.

Aesthetics and Recreation

The proposed levee/floodwall at Belle Haven may permanently obstruct the view of the natural areas located south of Belle Haven and the GWMP. The IFR/EA indicates that the view from the lower floors of the River Towers Condominiums and from the community grounds and recreational areas would be obstructed. It appears that there may be both temporary and permanent impacts to aesthetics, but the severity of the impacts is currently unclear.

Recreational impacts associated with the TSP should be fully evaluated, including impacts from temporary closures. For example, Section 4.2.8 indicates that the portion of the existing asphalt pedestrian path between the Arlington WPCP and Four Mile Run may need to be removed or temporarily closed in order to construct the floodwall. Would closure of the path have impacts beyond recreation, such as commuting by foot or bike? For the Belle Haven Levee and Floodwall, 4 years is a substantial amount of time to disrupt access to recreational facilities and outdoor enjoyment for community residents. Further, it is unclear if there is an area to replace the tennis courts that will be removed.

Outreach

As the TSP will impact communities, quality of life issues such as noise, aesthetics, and recreation are important and should be fully considered. We thank the USACE for providing additional time for public comment, and we recommend additional and continued outreach to work with impacted communities to refine the plan and reduce potential impacts to residents and businesses.

Section 3.3 notes that USACE recommended a combination levee/floodwall as the most cost-effective solution for the Belle Haven planning unit in 2008 and 2014, but a project was not implemented due to community opposition. It is currently unclear if the community is supportive of the proposed Belle Haven floodwall and levee; we recommend additional meetings and stakeholder communication.

Environmental Consequences

EPA recommends that the determination of duration and significance of environmental consequences summarized in Section 6.7 be supported with further detail, particularly for the alternatives carried forward as the TSP.

To support the findings of impacts to water quality, habitat, and other resources, we recommend estimating potential temporary and permanent impacts earth disturbance, vegetation clearing, conversion, and increases in impervious area from the construction of the levee and floodwalls, pump stations, and parking areas.

Mitigation

Construction of the proposed culvert crossings is expected to result in roughly 2,250 sqft of new permanent fill impacts to two streams. The draft plan for compensatory mitigation is to purchase credits from an approved mitigation bank or an approved in-lieu fee program in the Middle Potomac River Watershed. Appendix G indicates that the USACE is in the process of identifying the appropriate mitigation bank to meet the need for this mitigation plan. We recommend that available banks with appropriate credits be listed in the Final EA/IFR. As the Middle Potomac watershed is quite large and the urban watersheds have suffered degradation, mitigation that offsets impacts at a local level should be assessed.

Cumulative Impacts

As the proposal is refined, cumulative effects should be more fully explored. We support including the modeling results of evaluating potential cumulative effects of induced flooding from the proposed flood risk management measures and existing flood risk management in the Final IFR/EA and evaluating impacts to environmental and cultural resources from the TSP in more detail.

We understand that many details are still preliminary. Therefore, additional NEPA studies may be necessary to fully evaluate impacts. We recommend clarifying whether additional studies are planned in the Final IFR/EA. Commitment to continued outreach and specific mitigation measures may also be helpful in reducing potential adverse impacts.

Thank you for providing us with notice to provide comments for your consideration in the development of this Study. If you would like to discuss any of these recommendations, please don't hesitate to contact me.

Thank you,

Carrie

Carrie Traver
Life Scientist
Office of Communities, Tribes, & Environmental Assessment
U.S. Environmental Protection Agency, Region 3
215-814-2772
traver.carrie@epa.gov

From:	Stafford, Susan (FAA)
To:	May, Kristina K CIV USARMY CENAB (USA)
Cc:	Carper, Chad (FAA)
Subject:	[URL Verdict: Neutral][Non-DoD Source] RE: Notice of Availability of Draft Report and Environmental Assessment - DC Coastal Storm Risk Management Study
Date:	Friday, July 8, 2022 10:23:06 AM

Kristina,

The FAA does not have a federal action associated with the Metropolitan Washington District of Columbia Coastal Storm Risk Management Feasibility Study as the tentatively selected plan (TSP), Alternative 8 – Combination of a floodwall and stop log closure at the Arlington WPCP and a levee and floodwall system and pump stations at Belle Haven, does not impact Ronald Reagan Washington National Airport (DCA).

While not the TSP, Alternative 4b - Ronald Reagan Airport Levee and Floodwall, is part of the final array of alternatives. Alternative 4b proposes "raising the perimeter road of Reagan National Airport to be an earthen levee topped with heavy duty pavement. In two areas where there is limited land available to raise the road (along the water's edge south of the airport and along the GWMP), a floodwall would be constructed in lieu of an earthen levee. Stop log closures would be used at the end of the runways to avoid impacts to airport operations. Repairs would be made to sidewalks and asphalt within the project footprint once construction is completed. The construction period would be broken into 3 phases, spanning 6 years."

General Comment - If Alternative 4b is subject to future consideration, or any action involves property within the Metropolitan Washington Airports Authority leasehold, the FAA may have a federal action and will reengage in the project. The FAA may need to concur with the proposed action and issue an approval. Additional analysis will be required to insure the alternatives compliance with FAA advisory circulars and orders pertaining to runway safety areas, protection zones, and approach and departure surface requirements as well as ensuring avoidance of the engineered material arresting systems (EMAS) at the Runways 22, 15, and 33 ends.

Comment 1 – The Executive Summary should include the historic properties at DCA.

Comment 2 – Table 2-5 should include resources 00-9880 - Abingdon Research Station/Department of Transportation Laboratory Buildings – Eligible, and 000-9881 - Jet Engine Test Cell – Eligible.

Comment 3 – Section 4.2.6 – Alternative 4b narrative should include Abingdon Research Station/Department of Transportation Laboratory Buildings, Jet Engine Test Cell and Abingdon Ruins.

Thank you,

Susan B. Stafford
Environmental Protection Specialist
Beckley Airports Field Office
176 Airport Circle, Rm 101
Beaver, WV 25813

304-252-6216 x 130

From: May, Kristina K CIV USARMY CENAB (USA) <Kristina.K.May@usace.army.mil>
Sent: Monday, June 27, 2022 8:28 AM
To: LaRouche, Genevieve <genevieve_larouche@fws.gov>; Pinkney, Fred <fred_pinkney@fws.gov>; Christine Vaccaro - NOAA Federal <christine.vaccaro@noaa.gov>; David.L.O'Brien@noaa.gov; nmfs.gar.esa.section7@noaa.gov; Karen Greene - NOAA Federal <karen.greene@noaa.gov>; Traver, Carrie <Traver.Carrie@epa.gov>; Joseph, Maureen <Maureen_Joseph@nps.gov>; Virta, Matthew <Matthew_Virta@nps.gov>; Mocko, Robert <Robert_Mocko@nps.gov>; Gorder, Joel S <Joel_Gorder@nps.gov>; Young, Allison M <Allison_Young@nps.gov>; Stafford, Susan (FAA) <Susan.Stafford@faa.gov>; gregg.wollard@mwaa.com; Keough, Dorothy E <dorothy.e.keough.civ@mail.mil>; bradley.s.hancock.civ@mail.mil; laura.grape@fairfaxcounty.gov
Cc: Perkins, Catherine J (Katie) CIV USARMY CENAB (USA) <Catherine.J.Perkins@usace.army.mil>; Metallo, Amber C CIV USARMY CENAB (USA) <Amber.C.Metallo@usace.army.mil>
Subject: RE: Notice of Availability of Draft Report and Environmental Assessment - DC Coastal Storm Risk Management Study

Good morning,

The public and agency comment period has been extended for an additional 30 days. Please provide comments by July 31, 2022.

Thank you,
Kristina May
Biologist, Planning Division

Baltimore District, U.S. Army Corps of Engineers
Office: 410-962-6100
Cell: 410-920-6507
2 Hopkins Plaza, Baltimore, MD 21201
Email: kristina.k.may@usace.army.mil

From: May, Kristina K CIV USARMY CENAB (USA)
Sent: Tuesday, May 31, 2022 3:00 PM
To: LaRouche, Genevieve <genevieve_larouche@fws.gov>; Pinkney, Fred <fred_pinkney@fws.gov>; Christine Vaccaro - NOAA Federal <christine.vaccaro@noaa.gov>; David.L.O'Brien@noaa.gov; nmfs.gar.esa.section7@noaa.gov; Karen Greene - NOAA Federal <karen.greene@noaa.gov>; Traver, Carrie <Traver.Carrie@epa.gov>; Joseph, Maureen <Maureen_Joseph@nps.gov>; Virta, Matthew <Matthew_Virta@nps.gov>; Mocko, Robert <Robert_Mocko@nps.gov>; Gorder, Joel S <Joel_Gorder@nps.gov>; Young, Allison M <Allison_Young@nps.gov>; susan.stafford@faa.gov; gregg.wollard@mwaa.com; Keough, Dorothy E <dorothy.e.keough.civ@mail.mil>; bradley.s.hancock.civ@mail.mil; laura.grape@fairfaxcounty.gov
Cc: Perkins, Catherine J (Katie) CIV USARMY CENAB (USA) <Catherine.J.Perkins@usace.army.mil>; Metallo, Amber C CIV USARMY CENAB (USA) <Amber.C.Metallo@usace.army.mil>
Subject: Notice of Availability of Draft Report and Environmental Assessment - DC Coastal Storm Risk Management Study

Greetings,

The Metropolitan Washington, District of Columbia, Coastal Storm Risk Management Feasibility Study Draft Integrated Feasibility Report and Environmental Assessment is available for public review for a period of 30 days. The documents are available via the USACE website at: https://www.nab.usace.army.mil/DC_Coastal_Study/. Please submit comments to: DC-Metro-CSRM-Study@usace.army.mil by June 30, 2022.

The U.S. Army Corps of Engineers, Baltimore District and the non-federal sponsor, the Metropolitan Washington Council of Governments, will hold a public meeting on June 14, 2022 at Belle View Elementary School from 6:00 pm to 8:00 pm to present the draft report and receive comments.

Please see the attached Public Notice for additional details.

Thank you,

Kristina May
Biologist, Planning Division

Baltimore District, U.S. Army Corps of Engineers
Office: 410-962-6100
Cell: 410-920-6507
2 Hopkins Plaza, Baltimore, MD 21201
Email: kristina.k.may@usace.army.mil

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
GREATER ATLANTIC REGIONAL FISHERIES OFFICE
55 Great Republic Drive
Gloucester, MA 01930

July 28, 2022

Daniel M. Bierly, Chief
Civil Project Development Branch
Planning Division
Baltimore District
U.S. Army Corps of Engineers
2 Hopkins Plaza
Baltimore, MD 21201

Dear Mr. Bierly:

We have reviewed the draft Integrated Feasibility Report and Environmental Assessment (DEA) available May 31, 2022, for the Metropolitan Washington, District of Columbia, Coastal Storm Risk Management Feasibility Study. The U.S. Army Corps of Engineers (USACE) and the Metropolitan Washington Council of Governments (MWCOG), have prepared this report to determine whether the implementation of coastal storm risk management (CSRM) measures would reduce coastal flood risk to critical public and private infrastructure along the west bank of the Potomac River in Northern Virginia. As part of this study, you are evaluating potential environmental effects of a suite of considered CSRM measures, in accordance with the National Environmental Policy Act of 1969 (NEPA). This DEA document includes consideration of impacts for the Tentatively Selected Plan (TSP; Alternative 8), an array of alternatives composed of various management actions that have been carried forward for this analysis, and the no-build alternative. In the DEA, USACE concludes that the proposed project would not have an adverse effect on essential fish habitat (EFH) or federally managed fishery species.

Project purpose is driven by the confluence of projected sea-level rise (SLR), anticipated storm-related precipitation, and the existence of extensive human infrastructure in flood-prone areas of the upper-tidal reaches of the Potomac River. Several alternatives were considered to address anticipated flooding for the built environment. During the initial phases of the study, several alternatives were screened from further consideration, including the construction of a coastal surge barrier across the Potomac River at two potential locations. The remaining evaluated alternatives, other than the No Action alternative, included some combination of the following actions:

- Building flood walls and/or levees around existing infrastructure with attending features (e.g., pumping station, stop log closures), including
    - Reagan National Airport
    - Arlington Water Pollution Control Plant (WPCP)
    - Four Mile Run Park
    - City of Alexandria
    - The community of Belle Haven
- Non-structural measures (e.g., floodproofing, enhancing existing elevations)

Alternative 8, the TSP, entails building two flood wall/levee structures, one along Four Mile Creek to control flooding of the Arlington WPCP and another surrounding much of the southeastern portion of the community of Belle Haven. The Arlington WPCP is proposed to be fully constructed in uplands and has no tidal wetland or waterway impacts. The project around the community of Belle Haven entails building a levee/floodwall complex with culverted crossings with self-regulating gates and associated pump station at two tributaries.

Authorities

The Magnuson-Stevens Conservation and Management Act (MSA) requires federal agencies, such as USACE, to consult with us on any action or proposed action authorized, funded, or undertaken by such agency that may adversely affect essential fish habitat (EFH). However, based on the site location (i.e., upland of the tidal freshwater portions of the Potomac River), the proposed action is unlikely to present adverse impacts to EFH.

The Fish and Wildlife Coordination Act (FWCA) requires that all federal agencies consult with us when proposed actions might result in modifications to a natural stream or body of water. It also requires that they consider the effects that these projects would have on fish and wildlife and must also provide for the improvement of these resources. Under this authority, we work to protect, conserve and enhance species and habitats for a wide range of aquatic resources such as shellfish, diadromous species, and other commercially and recreationally important species that are not managed by the federal fishery management councils and do not have designated EFH. The Potomac River and several of its tributaries in the project area are designated as anadromous fish use area by the Virginia Department of Game and Inland Fisheries (VDGIF; see: https://vafwis.dgif.virginia.gov/fwis). This includes the confluence of Hog Island Gut with the Potomac River.

Adverse Effects to Aquatic Resources

Many of the alternatives considered under this CSRM study present adverse impacts to NOAA trust resources, including migratory fish such as American shad (*Alosa sapidissima*), alewife (*A. pseudoharengus*) and blueback herring (*A. aestivalis*). Specifically, the screened coastal surge barriers (i.e., Alternative 2, Alternative 3) would have likely presented a substantial chronic barrier for fish movement throughout the mainstem Potomac River by fundamentally altering the flow of the Potomac River in these areas. These alternatives were screened out, in part, due to their anticipated impact on fish movement and migration. We agree with this reasoning and support the screening of this alternative from further consideration.

Under the TSP, the proposed in-water impacts entail 2,250 square feet of permanent impacts to two tributaries of Hog Island Gut through the construction of a culverted floodwall which will be constructed to span each of these channels. These impacts are currently proposed to be offset through the purchase of compensatory mitigation credits. Proposed culverts will include flap gates that will automatically close when adjacent water surface elevations reach flood stage and automatically re-open when water levels recede. When installed channelward of existing tidal wetlands, such restrictions have the potential to fundamentally alter the hydrology of these sensitive habitats, which can lead to degradation of quality and diminish their ability to withstand

other perturbations. Tidal gates can present particularly damaging results when they are not "self-regulating" and/or are not properly maintained due to a lack of proper tidal flushing for protracted periods of time.

Based on the information in the plan, it appears that these two stream channels upstream of the project area, termed Belle Haven "East" and "West" channels, respectively, have been historically modified (e.g., straightening) and likely have a hydrology typical of urbanized streams (e.g., highly variable flows). While these proposed culverts will likely further alter the hydrology of these small streams, it appears that such impacts to tidal wetlands associated with Hog Island Gut would be largely avoided in the currently proposed alignment. However, culverts should be designed to avoid creating barriers for fish movement and/or causing downstream scour, to the extent possible. Several guidance documents (e.g., FHWA 2007, CBP 2021) exist to inform designs of culverted stream crossings that minimize impacts to aquatic connectivity for fish. Also, erosion and sediment control measures described in the DEA should be employed during construction to prevent nutrients and sediment from entering Hog Island Gut, adversely affecting downstream water quality. Minimization of turbidity generated by in-water work should be particularly pursued during the period extending from March 1 - June 15, to avoid impacts to anadromous fish which likely spawn in tidal waters downstream of the project area.

Fish and Wildlife Coordination Act Recommendations

As proposed, the project may result in degradation of riverine habitat. To avoid and minimize these impacts, we recommend the following measures be incorporated to the extent possible, pursuant to the Fish and Wildlife Coordination Act (FWCA):

- Design proposed culverts to allow for the movement of aquatic organisms
- Incorporate measures to minimize the amount of turbidity generated by in-water work, notably during the anadromous fish spawning season (March 1 - June 15).

Endangered Species Act (ESA)

Threatened or endangered species under our jurisdiction including Atlantic sturgeon (*Acipenser oxyrhynchus*) may be present in the project area. As the lead federal action agency, you are responsible for determining the nature and extent of effects and for coordinating with our Protected Resources Division as appropriate. Guidance and tools to assist you in this endeavor are available on our website at: https://www.fisheries.noaa.gov/new-england-mid-atlantic/consultations/section-7-consultations-greater-atlantic-region. Please contact Brian Hopper of our Protected Resources Division (brian.d.hopper@noaa.gov) if you have any questions or to discuss your project and obligations under Section 7 of the Endangered Species Act (ESA).

Conclusion

We appreciate your attention to our comments here as your study progresses. Please note that a distinct and further EFH consultation must be reinitiated pursuant to 50 CRF 600.920 (j) if new information becomes available, or if the project is revised in such a manner that affects the basis

for the EFH determination. If you have questions or would like to discuss this further, please contact Jonathan Watson in our Annapolis field office at Jonathan.Watson@noaa.gov or (410) 295-3152.

Sincerely,

GREENE.KAREN.M.1365830785 Digitally signed by GREENE.KAREN.M.1365830785 Date: 2022.07.28 13:29:05 -04'00'

Karen M. Greene
Mid-Atlantic Branch Chief
Habitat and Ecosystem Services Division

cc: B Hopper (NMFS - PRD)
D. O'Brien (NMFS-HESD)
K. May, T. Smith (USACE)
S. Corson (NCBO)
R. Li (USFWS)
M. Eversole (VMRC)
DC-Metro-CSRM-Study@usace.army.mil

Literature Cited

Chesapeake Bay Program (CBP). 2021. Recommendations for aquatic organism passage at Maryland road-stream crossings. 25 pp.

Federal Highway Administration (FHWA). 2007. Design for fish passage at roadway-stream crossings: Synthesis report. FHWA-HIF-07-033. 280 pp.

United States Department of the Interior

NATIONAL PARK SERVICE
George Washington Memorial Parkway
700 George Washington Memorial Parkway
McLean, VA 22101

JUL 29 2022

IN REPLY REFER TO:
1.A.1 (GWMP)

US Army Corps of Engineers
Baltimore District
2 Hopkins Plaza
Baltimore, MD 21201

Dear Sir/Madam:

The National Park Service (NPS) appreciates the opportunity to review and provide comment on the Metropolitan Washington District of Columbia draft Integrated Feasibility Report and Environmental Assessment (EA) prepared by the U.S. Army Corps of Engineers, Baltimore District (USACE). The purpose of the study is to evaluate the feasibility of federal participation in the implementation of solutions to reduce long-term coastal flood risk to vulnerable populations, properties, infrastructure, and environmental and cultural resources within the Middle Potomac River watershed of Northern Virginia.

The USACE and the NPS have been discussing the potential for this project for many years and during those discussions, the NPS has consistently expressed concern related to the effect of this project on NPS resources located within the George Washington Memorial Parkway (GW Parkway), a listed property in the National Register of Historic Places. The project alternatives would potentially impact GW Parkway resources in two locations, along Reagan National Airport and the Belle Haven area, where levee and floodwall infrastructure are proposed.

Reagan National Airport

The proposed action for the airport property includes raising the perimeter road of Reagan National Airport to be on an earthen levee topped with heavy duty pavement. The study states that two areas have limited land available to raise the road (along the water's edge south of the airport and along GW Parkway), where a floodwall would need to be constructed and that the Mount Vernon Trail (NPS resource) may be affected. NPS property for the GW Parkway is located on the west side of the airport property. The EA does not offer the location of such floodwalls; therefore, it is unclear if there are impacts to NPS resources.

Belle Haven

The NPS understand that the proposed action within this feasibility study includes a floodwall at Belle Haven that would be constructed just north of Belle Haven Road from Barrister Place to

10th street, with a closure structure at 10th Street and at the GW Parkway. The referenced floodwall would run along the west side of the GW Parkway and would then curve around Boulevard View to 10th Street. The EA does not offer the precise location of such floodwall or closures; therefore, it is unclear if there are impacts to NPS resources,

For the NPS to provide meaningful comment, we would need to better understand the potential to impact NPS resources. If there is infrastructure proposed on the GW Parkway or if GW Parkway land would be temporarily required for the construction of infrastructure, then the EA would need to be explicit regarding what infrastructure, where it would be located, and how much land is required. Furthermore, the amount of impacts to NPS resources would need to be evaluated. As written, the EA is insufficient to adopt should the NPS be required to make a federal decision on the use of its properties.

If there is no new infrastructure proposed on the GW Parkway and no land temporarily required for the construction of infrastructure, then the only impact of concern would be related to viewshed due to construction adjacent to the GW Parkway. This construction has been evaluated in the EA but no determination as to effect was made. Under these circumstances, the NPS would still wish to continue as a Consulting Party under Section 106 of the National Historic Protection Act since there appears to be the potential to effect viewsheds of importance to the NPS.

The NPS continues to be concerned with impacts to NPS resources but remains open to ongoing coordination with the USACE to explore potential measures that limit the effects of coastal flooding. Specifically, the NPS would like USACE to consider how Dyke Marsh might assist with mitigations to flooding impacts in the Belle Haven area.

Thank you for the opportunity to provide comments. For further coordination please contact Resource Management Division Manager, Maureen Joseph, at 703-289-2512 or Maureen_Joseph@nps.gov or me at GWMP_Superintendent@nps.gov or 703-289-2511.

Sincerely,

Charles Cuvelier Date: 2022.07.29 16:46:48 -04'00'

Charles Cuvelier
Superintendent

Commonwealth of Virginia

VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY

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Travis A. Voyles
Acting Secretary of Natural and Historic Resources

Michael S. Rolband, PE, PWD, PWS Emeritus
Director
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July 14, 2022

U.S. Army Corps of Engineers, Baltimore District
Attn: Kristina May, Biologist
Planning Division
2 Hopkins Plaza
Baltimore, MD 21201
Via email: kristina.k.may@usace.army.mil

RE: Comments on the Draft Integrated Feasibility Report and Environmental Assessment and Federal Consistency Determination for the Metropolitan Washington District of Columbia Coastal Storm Risk Management Feasibility Study, U.S. Army Corps of Engineers, Arlington, Fairfax and Prince William Counties, and the City of Alexandria, VA (DEQ 22-084F)

Dear Ms. May:

The Commonwealth of Virginia has completed its review of the above-referenced documents. The Department of Environmental Quality (DEQ) is responsible for coordinating Virginia's review of federal environmental documents submitted under the National Environmental Policy Act (NEPA) and responding to appropriate federal officials on behalf of the Commonwealth. DEQ is also responsible for coordinating Virginia's review of federal consistency documents submitted pursuant to the Coastal Zone Management Act (CZMA) and providing the state's response. This is in response to the May 2022 Environmental Assessment (EA) and Federal Consistency Determination (FCD) submitted by the U.S. Army Corps of Engineers for the above referenced project, received on May 31, 2022. The following agencies and localities participated in the review of this proposal:

Department of Environmental Quality
Department of Historic Resources (DHR)
Department of Conservation and Recreation (DCR)
Marine Resources Commission (VMRC)

Department of General Services (DGS)
Department of Aviation (DOAV)
Department of Health (VDH)
City of Alexandria
Fairfax County

In addition, the Department of Wildlife Resources (DWR), Department of Transportation (VDOT), Arlington County, Prince William County, and the Northern Virginia Regional Commission were invited to comment on the proposal.

PROJECT DESCRIPTION

The U.S. Army Corps of Engineers (Corps) submitted the Draft Integrated Feasibility Report and EA for the Metropolitan Washington District of Columbia Storm Risk Management Feasibility Study. In the aftermath of Hurricane Sandy in 2012, the Corps completed the North Atlantic Coast Comprehensive Study (NACCS), which identified nine high-risk areas on the Atlantic Coast that warranted further investigation of coastal storm risk management solutions. The Metropolitan Washington, District of Columbia (DC) region, which includes portions of Washington, D.C., Maryland, and Virginia, was identified as one of the nine high-risk areas recommended by NACCS for a follow-on feasibility study to investigate solutions to coastal flooding problems. The purpose of the study is to evaluate the feasibility of Federal participation in the implementation of solutions to reduce long-term coastal flood risk to vulnerable populations, properties, infrastructure, and environmental and cultural resources considering future climate and sea level change scenarios to support resilient communities. Within the study area, the Virginia side of the Potomac River contains approximately 135 miles of Potomac River shoreline. The study area is located in a densely populated urban setting that is primarily residential, but also includes commercial districts, industrial facilities, military installations, and transportation infrastructure as well as natural areas, green spaces, and historic properties.

As part of the project package, a Federal Consistency Determination for the Tentatively Selected Plan (TSP) of the Draft Integrated Feasibility Report and Environmental Assessment for the Metropolitan Washington District of Columbia Coastal Storm Risk Management Feasibility Study was included in Appendix G. The TSP is Alternative 8, the combination plan that incorporates a floodwall and stop log closure at the Arlington Water Pollution Control Plant (WPCP), and a levee and floodwall system with pump stations at Belle Haven. The TSP includes two locations within the study area where coastal flood risk measures could be implemented. At the Arlington WPCP, a floodwall would be constructed along the left bank of Four Mile Run between Four Mile Run and the Arlington WPCP with a closure structure on the east side of the floodwall. The new floodwall would tie into the bank to the east just past South Eads Street. At Belle Haven, a floodwall would be constructed just north of Belle Haven Road from Barrister Place to 10th Street with a closure structure at 10th Street and the George Washington Memorial Parkway (GWMP). Closure structures would also be constructed along Belle Haven Road and Belle View Blvd. A floodwall would tie into the closure structure at 10th Street

and run south along the west side of the GWMP, curving around Boulevard View to 10th Street. The floodwall would then run west to East Wakefield Drive tying into both sides of a closure structure on Potomac Avenue. The floodwall would continue west to West Wakefield Drive and tie into a small portion of earthen levee ending at Westgrove Dog Park.

FEDERAL CONSISTENCY UNDER THE COASTAL ZONE MANAGEMENT ACT

Pursuant to the Coastal Zone Management Act of 1972 (§ 1456(c)), as amended, and the federal consistency regulations implementing the CZMA (15 CFR Part 930, Subpart C, § 930.30 *et seq*.), federal actions that can have reasonably foreseeable effects on Virginia's coastal uses or resources must be conducted in a manner which is consistent, to the maximum extent practicable, with the Virginia Coastal Zone Management (CZM) Program. The CZM Program is comprised of a network of programs administered by several agencies. In order to be consistent with the CZM Program, the federal agency must obtain all the applicable permits and approvals listed under the enforceable policies of the CZM Program prior to commencing the project.

Federal Consistency Public Participation

In accordance with 15 CFR § 930.2, public notice of the proposed action was published in the OEIR Program Newsletter from June 6, 2022 to July 1, 2022. No public comments were received in response to the notice.

Federal Consistency Determination

A Federal Consistency Determination for the Tentatively Selected Plan (Alternative 8) was included in Appendix G of the draft EA. The document provided an analysis of the project's impact on the enforceable policies. According to the FCD, the project will be consistent to the maximum extent practicable with Virginia's Coastal Zone Management Program.

The project is expected to affect the following enforceable policies: Tidal and Non-Tidal Wetlands, Subaqueous Lands, and Non-point Source Water Pollution. These impacts and jurisdictional agency comments, recommendations, and requirements are discussed below in the "Environmental Impacts and Mitigation" section of this document.

Federal Consistency Concurrence

Based on our review of the FCD and the comments submitted by agencies administering the enforceable policies of the CZM Program, DEQ concurs that the proposal will be consistent to the maximum extent practicable with the CZM Program provided all applicable permits and approvals are obtained as described below in the Regulatory and Coordination Needs section.

If, prior to construction, the project should change significantly and any of the enforceable policies of the Virginia CZM Program would be affected, pursuant to 15 CFR 930.46, the applicant must submit supplemental information to DEQ for review and

approval. Additionally, other state approvals which may apply to this project are not included in this consistency concurrence. Therefore, the Corps must ensure that this project is operated in accordance with all applicable federal, state and local laws and regulations.

ENVIRONMENTAL IMPACTS AND MITIGATION

1. Surface Waters and Wetlands. According to the EA (page 117), existing wetlands that run along the north side of Four Mile Run adjacent to the Arlington WPCP are located outside of the footprint of the proposed floodwall, the proposed limits of disturbance (LOD), and the proposed staging area. The existing wetlands that run along the south side of Four Mile Run in Four Mile Run Park are located outside of the footprint of the proposed Belle Haven levee and floodwall, the proposed LOD, and the proposed staging area.

1(a) Agency Jurisdiction.

1(a)(i) Surface Water and Non-Tidal Wetlands. The State Water Control Board promulgates Virginia's water regulations covering a variety of permits to include the Virginia Pollutant Discharge Elimination System Permit (VPDES) regulating point source discharges to surface waters, Virginia Pollution Abatement Permit regulating sewage sludge, storage and land application of biosolids, industrial wastes (sludge and wastewater), municipal wastewater, and animal wastes, the Surface and Groundwater Withdrawal Permit, and the Virginia Water Protection (VWP) Permit regulating impacts to streams, wetlands, and other surface waters. The VWP permit is a state permit which governs wetlands, surface water, and surface water withdrawals and impoundments. It also serves as §401 certification of the federal Clean Water Act §404 permits for dredge and fill activities in waters of the U.S. The VWP Permit Program is under the Office of Wetlands and Stream Protection, within the DEQ Division of Water Permitting. In addition to central office staff that review and issue VWP permits for transportation and water withdrawal projects, the six DEQ regional offices perform permit application reviews and issue permits for the covered activities:

- Clean Water Act, §401;
- Section 404(b)(i) Guidelines Mitigation Memorandum of Agreement (2/90);
- State Water Control Law, Virginia Code section 62.1-44.15:20 *et seq*.; and
- State Water Control *Regulations*, 9 VAC 25-210-10.

1(a)(ii) Tidal Wetlands. The Virginia Marine Resources Commission (VMRC) regulates encroachments in, on or over state-owned subaqueous beds as well as tidal wetlands pursuant to Virginia Code §28.2-1200 through 1400. For nontidal waterways, VMRC states that it has been the policy of the Habitat Management Division to exert jurisdiction only over the beds of perennial streams where the upstream drainage area is 5 square miles or greater. The beds of such waterways are considered public below the ordinary high water line.

1(b) DEQ Findings. The project manager is reminded that a VWP permit from DEQ may be required should impacts to surface waters be necessary. The disturbance of surface waters or wetlands may require prior approval by DEQ and/or the U.S. Corps of Engineers. The Corps is the authority for an official confirmation of whether there are federal jurisdictional waters, including wetlands, which may be impacted by the proposed project. DEQ may confirm additional waters as jurisdictional beyond those under federal authority. Review of National Wetland Inventory maps or topographic maps for locating wetlands or streams may not be sufficient; there may need to be a site-specific review of the site by a qualified professional.

1(c) VMRC Findings. VMRC found that impacts are proposed to tidal wetlands adjacent to the project sites.

1(d) Agency Recommendation. The VWP program at the DEQ Northern Regional Office (NRO) recommends the avoidance and minimization of surface water impacts to the maximum extent practicable. Even if there will be no intentional placement of fill material in jurisdictional waters, potential water quality impacts resulting from construction site surface runoff must be minimized. This can be achieved by using Best Management Practices (BMPs).

1(e) Requirements.

1(e)(i) VWP Permit. A VWP permit may be required if construction activities will occur in or along any streams (perennial, intermittent, or ephemeral), open water or wetlands. The Corps should contact DEQ NRO VWP staff to determine the need for any permits prior to commencing work. Upon receipt of a Joint Permit Application (JPA) for the proposed surface water impacts, DEQ VWP Permit staff will review the proposed project in accordance with the VWP permit program regulations and current VWP permit program guidance.

1(e)(ii) VMRC Permit. A permit may be required from the Fairfax County Wetlands Board for impacts associated with Belle Haven and Four Mile Run, and from VMRC for impacts associated with the Arlington Water Pollution Control Plant.

1(f) CZMA Federal Consistency. Provided VWP, VMRC and Wetlands Board authorization is received, as required, for impacts to surface waters and/or wetlands, this project will be consistent to the maximum extent practicable with the Tidal and Non-tidal Wetlands enforceable policy of the Virginia Coastal Zone Management (CZM) Program (see Federal Consistency under the CZMA section above for additional information).

2. Subaqueous Lands. The FCD (Appendix G) indicates that construction of the proposed culvert crossing at the Belle Haven West Channel would result in approximately 800 square feet of temporary impacts and roughly 900 square feet of permanent impacts. Construction of the proposed culvert crossing at the Belle Haven

East Channel would result in roughly 1,200 square feet of temporary impacts and roughly 2,250 square feet of new permanent fill impacts to the East Channel. Implementation of the Arlington WPCP floodwall will not directly affect any waterways

2(a) Agency Jurisdiction. The Virginia Marine Resources Commission regulates encroachments in, on or over state-owned subaqueous beds as well as tidal wetlands pursuant to Virginia Code §28.2-1200 through 1400. For nontidal waterways, VMRC states that it has been the policy of the Habitat Management Division to exert jurisdiction only over the beds of perennial streams where the upstream drainage area is 5 square miles or greater. The beds of such waterways are considered public below the ordinary high water line.

2(b) Agency Finding. VMRC noted that the proposed construction includes a 6,725 linear foot (LF) concrete floodwall and earthen levee at the Bell Haven site and a 1,160 LF concrete floodwall along the Arlington Water Pollution Control Plant. Associated culvert crossings at both proposed site locations will involve permanent fill impacts totaling 7,110 square feet (SF). The project is located in Arlington and Fairfax Counties, Virginia.

As proposed, the project will result in a total of 7,110 SF of permanent fill of state-owned bottoms in association with culvert crossing construction.

2(c) Requirement. A permit from VMRC will be required for this proposed encroachment over jurisdictional subaqueous bottom.

2(d) CZMA Federal Consistency. Provided the required VMRC subaqueous lands permit is obtained, the project will be consistent to the maximum extent practicable with the Subaqueous Lands enforceable policy of the Virginia CZM Program (see Federal Consistency under the CZMA section above for additional information).

3. Nonpoint Source Water Pollution. The FCD (Appendix G) states that an erosion and sediment control measures would be used to minimize the amount of sediment that may be carried into waterways during construction.

3(a) Agency Jurisdiction. The DEQ Office of Stormwater Management administers the following laws and regulations governing construction activities:

- Virginia Erosion and Sediment Control (ECS) Law (§ 62.1-44.15:51 *et seq*.) and Regulations (9VAC25-840) (*VESCL&R*);
- Virginia Stormwater Management Act (§ 62.1-44.15:24 *et seq*.) (*VSWML)*;
- Virginia Stormwater Management Program (VSMP) regulation (9VAC25-870) (*VSWMR*); and
- 2014 General Virginia Pollutant Discharge Elimination System (VPDES) Permit for Discharges of Stormwater from Construction Activities (9VAC25-880).

In addition, DEQ is responsible for the Virginia Stormwater Management Program (VSMP) General Permit for Stormwater Discharges from Construction Activities related to Municipal Separate Storm Sewer Systems (MS4s) and construction activities for the control of stormwater discharges from MS4s and land disturbing activities under the Virginia Stormwater Management Program (9VAC25-890-40).

3(b) Requirements.

3(b)(i) Erosion and Sediment Control and Stormwater Management Plans. The Corps and its authorized agents conducting regulated land-disturbing activities on private and public lands in the state must comply with *VESCL&R* and Virginia Stormwater Management Law and Regulations (*VSWML&R*), including coverage under the general permit for stormwater discharge from construction activities, and other applicable federal nonpoint source pollution mandates (e.g. Clean Water Act-Section 313, federal consistency under the Coastal Zone Management Act). Clearing and grading activities, installation of staging areas, parking lots, roads, buildings, utilities, borrow areas, soil stockpiles, and related land-disturbing activities that result in the total land disturbance of equal to or greater than 10,000 square feet (2,500 square feet in a Chesapeake Bay Preservation Area) would be regulated by *VESCL&R*. Accordingly, the Corps must prepare and implement an erosion and sediment control (ESC) plan to ensure compliance with state law and regulations. Land-disturbing activities that result in the total land disturbance of equal to or greater than 1 acre (2,500 square feet in Chesapeake Bay Preservation Area) would be regulated by *VSWML&R*. Accordingly, the Corps must prepare and implement a Stormwater Management (SWM) plan to ensure compliance with state law and regulations. The ESC/SWM plan is submitted to the DEQ Regional Office that serves the area where the project is located for review for compliance. The Corps is ultimately responsible for achieving project compliance through oversight of on-site contractors, regular field inspection, prompt action against non-compliant sites, and other mechanisms consistent with agency policy.

3(b)(ii) Virginia Stormwater Management Program General Permit for Stormwater Discharges from Construction Activities (VAR10). The operator or owner of a construction activity involving land disturbance of equal to or greater than 1 acre is required to register for coverage under the General VPDES Permit for Discharges of Stormwater from Construction Activities and develop a project specific stormwater pollution prevention plan (SWPPP). The SWPPP must be prepared prior to submission of the registration statement for coverage under the General Permit, and it must address water quality and quantity in accordance with the Virginia Stormwater Management Program Regulations. Construction activities requiring registration also include land disturbance of less than one acre of total land area that is part of a larger common plan of development or sale if the larger common plan of development will collectively disturb equal to or greater than one acre. The SWPPP must be prepared prior to submission of the registration statement for coverage under the general permit and the SWPPP must address water quality and quantity in accordance with the *VSMP Permit Regulations*. General information and registration forms for the General Permit are available on DEQ's website at Stormwater - Construction | Virginia DEQ.

3(c) Recommendation. Consider using permeable paving for parking and walkways where appropriate. Denuded areas should be promptly revegetated following construction work.

3(d) CZMA Federal Consistency. The project will be consistent to the maximum extent practicable with the Nonpoint Source Water Pollution enforceable policy of the Virginia CZM Program, provided the activities comply with the above requirements, and applicable permits are obtained as necessary (see Federal Consistency under the CZMA section above for additional information).

4. Point Source Water Pollution. The FCD indicates by omission that the point source water pollution enforceable policy does not apply to this project. The Draft EA does not discuss the need for VPDES permit.

4(a) Agency Jurisdiction. The point source program is administered by the State Water Control Board pursuant to Virginia Code §62.1-44.15. Point source pollution control is accomplished through the implementation of the National Pollutant Discharge Elimination System (NPDES) permit program established pursuant to §402 of the federal Clean Water Act and administered in Virginia as the VPDES permit program. The Water Quality Certification requirements of §401 of the Clean Water Act of 1972 are administered under the Virginia Water Protection Permit program.

4(b) VPDES Requirements. A construction project may require coverage under the VPDES General Permit for Petroleum Contaminated Sites, Groundwater Remediation, and Hydrostatic Tests (VAG83) for any hydrostatics tests on any new piping installed, or for any potential dewatering during construction if petroleum contamination is encountered.

4(c) Agency Recommendation. Coordinate with the DEQ NRO Water Permitting Program or visit DEQ's website at Discharge to Surface Waters - Virginia Pollutant Discharge Elimination System | Virginia DEQ to determine the applicability of the VAG83 permit.

4(d) CZMA Federal Consistency. Provided the VAG83 permit is obtained and adhered to, as necessary, the project will be consistent to the maximum extent practicable with the Point Source Water Pollution enforceable policy of the Virginia CZM Program (see Federal Consistency under the CZMA above below for additional information).

5. Chesapeake Bay Preservation Areas. The draft EA does not discuss Chesapeake Bay Preservation Areas and the FCD indicates by omission that the Chesapeake Bay Preservation Area enforceable policy is not applicable to the project.

5(a) Agency Jurisdiction. The DEQ Office of Local Government Programs (OLGP) administers the Chesapeake Bay Preservation Act (Virginia Code §62.1-44.15:67 *et seq*.) and Chesapeake Bay Preservation Area Designation and Management

Regulations (9 VAC 25-830-10 *et seq*.). Each Tidewater locality must adopt a program based on the Chesapeake Bay Preservation Act and the Chesapeake Bay Preservation Area Designation and Management Regulations. The Act and regulations recognize local government responsibility for land use decisions and are designed to establish a framework for compliance without dictating precisely what local programs must look like. Local governments have flexibility to develop water quality preservation programs that reflect unique local characteristics and embody other community goals. Such flexibility also facilitates innovative and creative approaches in achieving program objectives. The regulations address nonpoint source pollution by identifying and protecting certain lands called Chesapeake Bay Preservation Areas. The regulations use a resource-based approach that recognizes differences between various land forms and treats them differently.

5(b) Agency Findings. In the City of Alexandria and in Arlington, Fairfax and Prince William Counties, the areas protected by the *Chesapeake Bay Preservation Act* (CBPA), as locally implemented, require conformance with performance criteria. These areas include Resource Protection Areas (RPAs) and Resource Management Areas (RMAs) as designated by each of the four local governments. RPAs include tidal wetlands, certain non-tidal wetlands, tidal shores, and a 100-foot vegetated buffer area located adjacent to and landward of these features and along both sides of any water body with perennial flow. All lands within the City of Alexandria and Arlington, Fairfax and Prince William Counties not located within the RPA are designated as RMA. Resource Management Areas require less stringent performance criteria than RPAs.

At the Arlington Water Pollution Control Plant (WPCP), a proposed floodwall would be constructed along the left bank of Four Mile Run between Four Mile Run and the Arlington WPCP. The proposed floodwall would tie into the bank to the east just past South Eads Street. The floodwall would wrap around the Arlington WPCP to the west where a stop log closure structure is located along South Glebe Road.

At Belle Haven, a proposed floodwall would be constructed just north of Belle Haven Road from Barrister Place to 10th Street with a closure structure at 10th Street and at the George Washington Memorial Parkway (GWMP). Closure structures would be constructed along Belle Haven Road and Belle View Boulevard. The floodwall would tie into the closure structure at 10th Street and run south along the west side of the GWMP, curving around Belle View Boulevard to 10th Street. The floodwall would then run west to East Wakefield Drive tying into both sides of a closure structure on Potomac Avenue. The floodwall would continue west to West Wakefield Drive and tie into a small portion of earthen levee ending at Westgrove Dog Park.

The submitted Draft Integrated Feasibility Report and EA shows no evidence that the Corps has considered the impacts of the proposed feasibility study and construction activities on locally-designated CBPA lands in the proposed project areas. While the CZMA Enforceable Policies section of the FCD includes considerations of Tidal and Non-Tidal Wetlands, Subaqueous Lands, Wildlife and Inland Fisheries, Point Source Air Pollution and Non-point Source Water Pollution, there is no mention made (and no

analysis of) the Chesapeake Bay Preservation Areas enforceable policy. The proposed study area and the locations of proposed construction activities associated with the proposed floodwalls are both within locally-designated CBPA lands, and are as such subject to the Regulations.

5(c) Requirement. Per 9VAC25-830-110 of the Regulations (Site-specific Refinement of Chesapeake Bay Preservation Area Boundaries), the applicant must confirm that (i) a reliable, site-specific evaluation is conducted to determine whether water bodies on or adjacent to the development site have perennial flow and (ii) RPA boundaries are adjusted, as necessary, on the site, based on this evaluation of the site.

Per 9VAC25-830-140 1 vi of the Regulations (Development Criteria For Resource Protection Areas), land development activities that meet the definition of a flood control or stormwater management facility may be allowed on designated RPA lands if the proposed activities satisfy the conditions set forth in 9VAC25-830-140 1 e, including the following:

i. that the local government has conclusively established that location of the facility within the RPA is the optimum location;
ii. the size of the facility is the minimum necessary to provide necessary flood control or stormwater treatment, or both;
iii. (if applicable) the facility must be consistent with a comprehensive stormwater treatment stormwater management plan developed and approved in accordance with 9VAC25-870-92 of the Virginia Stormwater Management Program (VSMP) regulations;
iv. all applicable permits for construction in state and federal waters must be obtained from the appropriate state and federal agencies, such as the U.S. Army Corps of Engineers, DEQ, and the Virginia Marine Resources Commission;
v. approval must be received from the local government prior to construction; and
vi. routine maintenance is allowed to be performed on such facilities to assure that they continue to function as designed.

Per 9VAC25-830-140 6, a Water Quality Impact Assessment (WQIA) shall be required for any proposed development within the RPA and for any other development in CBPAs that may warrant such assessment because of the unique characteristics of the site or intensity of the proposed use or development.

The proposed project must also adhere to:

(i) regulations promulgated pursuant to the Erosion and Sediment Control Law and the Virginia Stormwater Management Act;
(ii) an erosion and sediment control plan and a stormwater management plan approved by the Department of Environmental Quality; or
(iii) local water quality protection criteria at least as stringent as the above state requirements. To the degree possible and where applicable, the staging of equipment and supplies associated with all proposed land disturbing and land development activities should be outside of the RPA.

5(d) CZMA Federal Consistency. Provided adherence to the above requirements, the project will be consistent to the maximum extent practicable with the Chesapeake Bay Preservation Areas enforceable policy of the Virginia CZM Program (see Federal Consistency under the CZMA section above for additional information).

6. Air Pollution. According to the EA (page 136), ozone precursors, volatile organic compounds (VOCs) and oxides of nitrogen (NOx) are below the EPA threshold of 100 tons per year for all maintenance areas. All other annual emission totals and aggregated study emission totals for criteria pollutants are not anticipated to exceed all other EPA *de minimis* thresholds.

The FCD (Appendix G) states that air pollution generated from construction equipment would be temporary and minor. The proposed flood protection measures will have no long-term effects on air quality.

6(a) Agency Jurisdiction. The DEQ Air Division, on behalf of the State Air Pollution Control Board, is responsible for developing regulations that implement Virginia's Air Pollution Control Law (Virginia Code §10.1-1300 *et seq.*). DEQ is charged with carrying out mandates of the state law and related regulations as well as Virginia's federal obligations under the Clean Air Act as amended in 1990. The objective is to protect and enhance public health and quality of life through control and mitigation of air pollution. The division ensures the safety and quality of air in Virginia by monitoring and analyzing air quality data, regulating sources of air pollution, and working with local, state and federal agencies to plan and implement strategies to protect Virginia's air quality. The appropriate DEQ regional office is directly responsible for the issuance of necessary permits to construct and operate all stationary sources in the region as well as monitoring emissions from these sources for compliance. In the case of certain projects, additional evaluation and demonstration must be made under the general conformity provisions of state and federal law.

The Air Division regulates emissions of air pollutants from industries and facilities and implements programs designed to ensure that Virginia meets national air quality standards. The most common regulations associated with major projects are:

- Open burning: 9 VAC 5-130 *et seq.*
- Fugitive dust control: 9 VAC 5-50-60 *et seq.*
- Permits for fuel-burning equipment: 9 VAC 5-80-1100 *et seq.*

6(b) Agency Findings. According to the DEQ Air Division, the project site is located in a designated ozone non-attainment area and an emission control area for oxides of nitrogen (NOx) and volatile organic compounds (VOCs).

6(c) Requirements.

6(c)(i) Fugitive Dust. During construction, fugitive dust must be kept to a minimum by using control methods outlined in 9 VAC 5-50-60 *et seq.* of the *Regulations for the Control and Abatement of Air Pollution*. These precautions include, but are not limited to, the following:

- Use, where possible, of water or chemicals for dust control;
- Installation and use of hoods, fans, and fabric filters to enclose and vent the handling of dusty materials;
- Covering of open equipment for conveying materials; and
- Prompt removal of spilled or tracked dirt or other materials from paved streets and removal of dried sediments resulting from soil erosion.

6(c)(ii) Fuel-Burning Equipment. Fuel-burning equipment (boilers, generators, compressors, etc.) or any other air-pollution-emitting equipment may be subject to registration or permitting requirements under 9 VAC5-80, Article 6, Permits for New and Modified Sources.

6(c)(iii) Open Burning. If project activities include the open burning of construction material or the use of special incineration devices, this activity must meet the requirements under 9 VAC 5-130 *et seq.* of the *Regulations* for open burning, and may require a permit. The *Regulations* provide for, but do not require, the local adoption of a model ordinance concerning open burning. The applicant should contact local fire officials to determine what local requirements, if any, exist.

6(c)(iv) Asphalt Paving. A precaution, which typically applies to road construction and paving work (9 VAC 5-45-780 *et seq*.), places limitations on the use of “cut-back” (liquefied asphalt cement, blended with petroleum solvents), and may apply to the project. The asphalt must be “emulsified” (predominantly cement and water with a small amount of emulsifying agent) except when specified circumstances apply. Moreover, there are time-of-year restrictions on its use from April through October in VOC emission control areas.

6(d) Agency Recommendation. The project involves a large volume of construction work. **Take precautions to restrict the emissions of VOCs and NOx during construction, principally by controlling or limiting the burning of fossil fuels**.

6(e) CZMA Federal Consistency. The project will be consistent to the maximum extent practicable with the Point Source Air Pollution enforceable policy of the Virginia CZM Program, provided adherence to the above requirements (see Federal Consistency under the CZMA section above for additional information).

7. Solid and Hazardous Wastes and Materials. The EA (page 137) notes that due to potential for groundwater contamination due to historic landfilling and/or nearby

chemical/petroleum spills at the various project locations, there is a risk that contaminated groundwater could be encountered during construction. Further investigations are needed to determine the presence of contamination. If contamination is encountered, safety precautions and appropriate disposal of contaminated material would be implemented.

7(a) Agency Jurisdiction. On behalf of the Virginia Waste Management Board, the DEQ Division of Land Protection and Revitalization is responsible for carrying out the mandates of the Virginia Waste Management Act (Virginia Code §10.1-1400 *et seq*.), as well as meeting Virginia's federal obligations under the Resource Conservation and Recovery Act and the Comprehensive Environmental Response Compensation Liability Act (CERCLA), commonly known as Superfund. The DEQ Division of Land Protection and Revitalization also administers those laws and regulations on behalf of the State Water Control Board governing Petroleum Storage Tanks (Virginia Code §62.1-44.34:8 *et seq*.), including Aboveground Storage Tanks (9VAC25-91 *et seq*.) and Underground Storage Tanks (9VAC25-580 *et seq*. and 9VAC25-580-370 *et seq*.), also known as 'Virginia Tank Regulations', and § 62.1-44.34:14 et seq. which covers oil spills.

Virginia:

- Virginia Waste Management Act, Virginia Code § 10.1-1400 *et seq.*
- *Virginia Solid Waste Management Regulations*, 9 VAC 20-81
  - (9 VAC 20-81-620 applies to asbestos-containing materials)
- *Virginia Hazardous Waste Management Regulations*, 9 VAC 20-60
  - (9 VAC 20-60-261 applies to lead-based paints)
- *Virginia Regulations for the Transportation of Hazardous Materials*, 9 VAC 20-110.

Federal:

- Resource Conservation and Recovery Act (RCRA), 42 U.S. Code sections 6901 *et seq.*
- U.S. Department of Transportation *Rules for Transportation of Hazardous Materials*, 49 *Code of Federal Regulations*, Part 107
- Applicable rules contained in Title 40, *Code of Federal Regulations*.

7(b) Requirements.

7(b)(i) Waste Management. Any soil or groundwater that is suspected of contamination or wastes that are generated during construction-related activities must be tested and disposed of in accordance with applicable federal, state, and local laws and regulations. All construction waste, including excess soil, must be characterized in accordance with the *Virginia Hazardous Waste Management Regulations* prior to disposal at an appropriate facility. It is the generator's responsibility to determine if solid waste meets the criteria of a hazardous waste and is subsequently managed appropriately.

7(b)(ii) Petroleum Releases. If evidence of a petroleum release is discovered during implementation of this project, it must be reported to DEQ, as authorized by Virginia Code § 62.1-44.34.8 through 9 and 9 VAC 25-580-10 *et seq*.

7(b)(iii) Asbestos-containing Material and Lead-based Paint. All structures being demolished/renovated/removed must be checked for asbestos-containing materials (ACM) and lead-based paint (LBP) prior to demolition. If ACM or LBP materials are identified all federal and state requirements must be followed.

7(c) Recommendations.

7(c)(i) Pollution Prevention, DEQ recommends that the Army implement pollution prevention principles, including the reduction, reuse, and recycling of all solid wastes generated. All generation of hazardous wastes should be minimized and handled appropriately.

7(c)(ii) Database Search. DLPR staff recommends a search (at least 200 ft. radius) of any land-based project areas using the following solid and hazardous waste databases to identify waste sites (including petroleum releases) in close proximity to those project areas:

- Environmental Protection Agency (EPA) Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) Database: Superfund Information Systems Information on hazardous waste sites, potentially hazardous waste sites and remedial activities across the nation, including sites that are on the National Priorities List (NPL) or being considered for the NPL:
    - www.epa.gov/superfund/sites/cursites/index.htm
- DEQ Online Database: Virginia Environmental Geographic Information Systems Information on Permitted Solid Waste Management Facilities, Impaired Waters, Petroleum Releases, Registered Petroleum Facilities, Permitted Discharge (Virginia Pollution Discharge Elimination System Permits) Facilities, Resource Conservation and Recovery Act (RCRA) Sites, Water Monitoring Stations, National Wetlands Inventory:
    - www.deq.virginia.gov/ConnectWithDEQ/VEGIS.aspx

8. Pesticides and Herbicides. DEQ recommends that the use of herbicides or pesticides for construction or landscape maintenance should be in accordance with the principles of integrated pest management. The least toxic pesticides that are effective in controlling the target species should be used to the extent feasible. Contact the Department of Agriculture and Consumer Services at (804) 786-3501 for more

information.

9. Natural Heritage Resources. The EA (page 125) states that the project alternatives would have no effect on federal and state-listed threatened and endangered species due to the lack of suitable habitat conditions and/or the lack of documented observances in the locations where the effects are likely to occur.

9(a) Agency Jurisdiction.

9(a)(i) The Virginia Department of Conservation and Recreation's (DCR) Division of Natural Heritage (DNH). DNH's mission is conserving Virginia's biodiversity through inventory, protection and stewardship. The Virginia Natural Area Preserves Act (Virginia Code §10.1-209 through 217), authorized DCR to maintain a statewide database for conservation planning and project review, protect land for the conservation of biodiversity, and the protect and ecologically manage the natural heritage resources of Virginia (the habitats of rare, threatened and endangered species, significant natural communities, geologic sites, and other natural features).

9(a)(ii) Virginia Department of Agriculture and Consumer Services (VDACS): The Endangered Plant and Insect Species Act of 1979 (Virginia Code Chapter 39 §3.1-1020 through 1030) authorizes VDACS to conserve, protect and manage endangered and threatened species of plants and insects. Under a Memorandum of Agreement established between VDACS and the DCR, DCR represents VDACS in comments regarding potential impacts on state-listed threatened and endangered plant and insect species.

9(b) Agency Findings. DCR's Division of Natural Heritage (DNH) searched its Biotics Data System (Biotics) for occurrences of natural heritage resources from the area outlined on the submitted map.

Bell Haven Floodwall: Biotics documents the presence of natural heritage resources within the project boundary including a 100-foot buffer. However, due to the scope of the activity DCR does not anticipate that this project will adversely impact these natural heritage resources.

Bell Haven Staging Area: According to the information currently in Biotics, natural heritage resources have not been documented within the submitted project boundary including a 100-foot buffer. The absence of data may indicate that the project area has not been surveyed, rather than confirm that the area lacks natural heritage resources. In addition, the project boundary does not intersect any of the predictive models identifying potential habitat for natural heritage resources.

Arlington Water Pollution Control Plant Floodwall and Staging Area: According to the information currently in Biotics, natural heritage resources have not been documented within the submitted project boundary including a 100-foot buffer. The absence of data may indicate that the project area has not been surveyed, rather than

confirm that the area lacks natural heritage resources. In addition, the project boundary does not intersect any of the predictive models identifying potential habitat for natural heritage resources.

9(b)(i) State-listed Plant and Insect Species. DCR found that the proposed project will not affect any documented state-listed plants or insects.

9(b)(ii) State Natural Area Preserves. There are no State Natural Area Preserves under DCR's jurisdiction in the project vicinity.

9(c) Recommendation. Contact DCR-DNH to secure updated information on natural heritage resources if the scope of the project changes and/or six months has passed before it is utilized. New and updated information is continually added to the Biotics Data System.

10. Floodplain Management. According to the EA (page 124), there is no natural floodplain in the footprint of the structural measures or landward of the proposed structures that would be affected. Therefore, although the structural measures would reduce the effective volume of available floodplain for floodwaters, the structural measures would not affect any natural floodplains.

10(a) Agency Jurisdiction. The DCR Division of Dam Safety and Floodplain Management is the lead coordinating agency for the Commonwealth's floodplain management program and the National Flood Insurance Program (Executive Order 45). The National Flood Insurance Program (NFIP) is administered by the Federal Emergency Management Agency (FEMA), and communities who elect to participate in this voluntary program manage and enforce the program on the local level through that community's local floodplain ordinance. Each local floodplain ordinance must comply with the minimum standards of the NFIP, outlined in 44 CFR 60.3; however, local communities may adopt more restrictive requirements in their local floodplain ordinance, such as regulating the 0.2% annual chance flood zone (shaded Zone X).

10(b) DGS- Department of Engineering and Buildings (DEB) Comments. DGS DEB notes that the proposed project in the Metropolitan Washington, DC area affects multiple localities in Virginia. Floodwalls are proposed in Arlington County and Fairfax County. In a February 2022 report by the Army Corps of Engineers, ownership of affected properties is listed as Federal, private, local county entities. Construction on any State owned properties would be governed by Executive Order 45 (2019). Because there is no planned building construction, a variance from the Director of DGS is not required. However, any development on State-owned properties requires compliance with local floodplain management ordinances. DGS-DEB takes no exception to the construction of floodwalls as proposed.

10(c) Requirement. Projects conducted by federal agencies within the Special Flood Hazard Area must comply with federal Executive Order 11988: Floodplain Management.

For federal projects, the applicant/developer is encouraged to reach out to the local floodplain administrator and comply with the community's local floodplain ordinance.

11. Historic and Archeological Resources. The Draft EA (page 138) notes that the Corps evaluated the direct and indirect effects to cultural resources for the proposed alternatives.

11(a) Agency Jurisdiction. The Department of Historic Resources (DHR) conducts reviews of projects to determine their effect on historic structures or cultural resources under its jurisdiction. DHR, as the designated State's Historic Preservation Office, ensures that federal actions comply with Section 106 of the National Historic Preservation Act of 1962 (NHPA), as amended, and its implementing regulation at 36 CFR Part 800. The NHPA requires federal agencies to consider the effects of federal projects on properties that are listed or eligible for listing on the National Register of Historic Places. Section 106 also applies if there are any federal involvements, such as licenses, permits, approvals or funding. DHR also provides comments to DEQ through the state environmental impact report review process.

11(b) Agency Finding. DHR has been in consultation with the U.S. Army Corps of Engineers regarding this project.

11(c) Requirement. DHR requests that the Corps continue to consult directly with DHR, as necessary, pursuant to Section 106 of the National Historic Preservation Act (as amended) and its implementing regulations codified at 36 CFR Part 800 which require Federal agencies to consider the effects of their undertakings on historic properties.

12. Pollution Prevention. DEQ advocates that principles of pollution prevention and sustainability be used in all construction projects as well as in operations. Effective siting, planning, and on-site BMPs will help to ensure that environmental impacts are minimized. However, pollution prevention and sustainability techniques also include decisions related to construction materials, design, and operational procedures that will facilitate the reduction of wastes at the source.

12(a) Recommendations. We have several pollution prevention recommendations that may be helpful in the implementation of this project:

- Consider environmental attributes when purchasing materials. For example, the extent of recycled material content, toxicity level, and amount of packaging should be considered and can be specified in purchasing contracts.
- Consider contractors' commitment to the environment when choosing contractors. Specifications regarding raw materials and construction practices can be included in contract documents and requests for proposals.

DEQ's Office of Pollution Prevention provides information and technical assistance

relating to pollution prevention techniques and EMS. For more information, contact DEQ's Office of Pollution Prevention, Meghann Quinn at (804) 774-9076.

13. Public Water Supply. The EA does not indicate that public water supplies will be affected.

13(a) Agency Jurisdiction. The Virginia Department of Health (VDH) Office of Drinking Water reviews projects for the potential to impact public drinking water sources (groundwater wells, springs and surface water intakes). VDH administers both federal and state laws governing waterworks operation.

13(b) Agency Findings. VDH ODW reviewed the project and determined that there are no apparent impacts to public drinking water sources due to this project.

13(c) Requirement. Potential impacts to public water distribution systems or sanitary sewage collection systems must be verified by the local utility.

14. Aviation. The DEA (page 6) states that one of the problems identified in the study area includes critical infrastructure disruption resulting from storm surge inundation caused by coastal storms, including to aviation properties. Runways are essential components of the infrastructure system at any airport. Staff at Reagan National Airport indicated that regulations would prohibit the use of any runway if any portion were inundated. At Reagan National Airport, runways are among the first infrastructure components to be flooded (page 80). One of the goals of the project is to reduce risk to critical infrastructure through structural features including levees and floodwalls. Alternative 4b proposes raising the perimeter road of Reagan National Airport to be an earthen levee topped with heavy duty pavement. In two areas where there is limited land available to raise the road (along the water's edge south of the airport and along the GWMP), a floodwall is proposed in lieu of an earthen levee. Stop log closures would be used at the end of the runways to avoid impacts to airport operations (page 105).

14(a) Agency Jurisdiction. The Virginia Department of Aviation is a state agency that plans for the development of the state aviation system; promotes aviation; grants aircraft and airports licenses; and provides financial and technical assistance to cities, towns, counties and other governmental subdivisions for the planning, development, construction and operation of airports, and other aviation facilities.

14(b) Agency Findings. The Virginia Department of Aviation has reviewed the document and believes that, when developed, the projects will help provide resilience, allow for a safer, more secure airport, and contribute to the overall utility of Ronald Reagan Washington National Airport.

15. Locality Comments.

15(a) Agency Jurisdiction. In accordance with CFR 930, Subpart A, § 930.6(b) of the *Federal Consistency Regulations*, DEQ, on behalf of the state, is responsible for

securing necessary review and comment from other state agencies, the public, regional government agencies, and local government agencies, in determining the Commonwealth's concurrence or objection to a federal consistency determination.

15(b) Fairfax County Comments. The Fairfax County Department of Planning and Development Review Branch indicated that it will provide comments directly to the Corps.

15(c) City of Alexandria Comments. The City of Alexandria notes that the current Feasibility Study does not include any flood control projects with the City of Alexandria, and therefore the City has no comments.

The City does have questions about the potential impact of the proposed Arlington Water Pollution Control Plant (WPCP) Floodwall may have on City properties located south of Four Mile Run, and will await the submittal of the modeling effort to comment on those potential impacts.

REGULATORY AND COORDINATION NEEDS

1. Surface Waters and Wetlands. Contact DEQ NRO (Christoph Quansey, VWP Permit Manager, 571-719-0843) to discuss the need for a VWP permit for this project. The VMRC is the clearinghouse for JPAs and it will distribute the application to participating agencies; contact VMRC (Mark Eversole, 757-247-8028) with questions regarding the JPA review process.

Upon receipt of a Joint Permit Application for the proposed surface water impacts, DEQ VWP Permit staff will review the proposed project in accordance with the VWP permit program regulations and current VWP permit program guidance. Coordinate with the DEQ NRO VWP Permit program manager with questions regarding VWP permitting requirements.

Coordinate with VMRC (Mark Eversole, 757-247-8028) with questions regarding the need for tidal wetlands permits from the Fairfax County Wetlands Board and VMRC.

2. Subaqueous Lands. Coordinate with VMRC (Mark Eversole, 757-247-8028) with questions regarding the required subaqueous lands permits from VMRC or with questions about the JPA process.

3. Erosion and Sediment Control and Stormwater Management.

3(a) Erosion and Sediment Control and Stormwater Management. This project must comply with Virginia's *Erosion and Sediment Control Law* (Virginia Code § 62.1-44.15:61) and *Regulations* (9 VAC 25-840-30 *et seq*.) and *Stormwater Management Law* (Virginia Code § 62.1-44.15:31) and *Regulations* (9 VAC 25-870-210 *et seq*.) as administered by DEQ. Activities that disturb equal to or greater than 10,000 square feet (2,500 square feet in a Chesapeake Bay Preservation Area) would be regulated by

VESCL&R and *VSWML&R*. Erosion and sediment control, and stormwater management requirements should be coordinated with the DEQ Northern Regional Office (Mark Remsberg, 703-583-3874).

3(b) Virginia Stormwater Management Program General Permit for Stormwater Discharges from Construction Activities (VAR10). For projects involving land-disturbing activities of equal to or greater than one acre the project owner is required to register for coverage under the Virginia Stormwater Management Program General Permit for Discharges of Stormwater from Construction Activities (9 VAC 25-870-1 *et seq.*). Specific questions regarding the Stormwater Management Program requirements should be directed to DEQ, Mark Remsberg (703-583-3874).

4. Point Source Water Pollution. Coordinate with the DEQ NRO Water Permitting Program (Edward Stuart, 571-866-6184) for questions about the VAG83 permit applicability.

5. Chesapeake Bay Preservation Areas. The project must be consistent with the Chesapeake Bay Preservation Act (VA Code §62.1-44.15:67 *et seq*.) and the Chesapeake Bay Preservation Area Designation and Management Regulations (9VAC25-830 *et seq.*). For more information regarding the requirements, contact DEQ (Daniel Moore, 804-774-9577).

6. Air Quality Regulations*.* Activities associated with this project may be subject to air regulations administered by DEQ. The state air pollution regulations that may apply to the construction phase of the project are:

- fugitive dust and emissions control (9VAC5-50-60 *et seq*.);
- open burning (9VAC5-130 *et seq.*);
- asphalt paving operations (9VAC5-45-760 *et seq*.); and
- permits for fuel-burning equipment (9VAC5-80-1100 *et seq*.).

For additional information and coordination, contact DEQ NRO, David Hartshorn at 571-408-1778.

7. Solid and Hazardous Wastes*.* All solid waste, hazardous waste, and hazardous materials must be managed in accordance with all applicable federal, state, and local environmental regulations. For additional information concerning location and availability of suitable waste management facilities in the project area or if free product, discolored soils, or other evidence of contaminated soils are encountered, contact DEQ NRO, Richard Doucette at 571-866-6063.

7(a) Asbestos-Containing Material. It is the responsibility of the owner or operator of a renovation or demolition activity, prior to the commencement of the renovation or demolition, to thoroughly inspect the affected part of the facility where the operation will occur for the presence of asbestos, including Category I and Category II nonfriable

asbestos-containing material (as applicable). Upon classification as friable or non-friable, all asbestos-containing material shall be disposed of in accordance with the Virginia Solid Waste Management Regulations (9VAC20-81-640) and transported in accordance with the Virginia regulations governing Transportation of Hazardous Materials (9VAC20-110-10 et seq.). Contact the DEQ Division of Land Protection and Revitalization (Carlos Martinez at 804- 350-9962) and the Department of Labor and Industry (Richard Wiggins, 540-562-3580 Ext. 131) for additional information.

7(b) Lead-Based Paint. If applicable, this project must comply with the U.S. Department of Labor Occupational Safety and Health Administration (OSHA) regulations and with the Virginia Lead-Based Paint Activities Rules and Regulations. For additional information regarding these requirements, contact the Department of Professional and Occupational Regulation (804-367-8500).

7(c) Petroleum Release. If evidence of a petroleum release is discovered during implementation of this project, it must be reported to DEQ in accordance with Virginia Code §62.1-44.34.8 through 19 and 9 VAC 25-580-10 *et seq*. Contact DEQ NRO, Richard Doucette at 571-866-6063, for additional information and coordination.

8. Natural Heritage Resources. Contact DCR-DNH, Rene Hypes at (804) 371-2708, to secure updated information on natural heritage resources if the scope of the project changes and/or six months has passed before the project is implemented, since new and updated information is continually added to the Biotics Data System.

9. Floodplain Management. The Corps should reach out to the local floodplain administrator for an official floodplain determination and comply with the local floodplain ordinance.

To find flood zone information, use the Virginia Flood Risk Information System (VFRIS): www.dcr.virginia.gov/vfris

To find community NFIP participation and local floodplain administrator contact information, use DCR's Local Floodplain Management Directory: www.dcr.virginia.gov/dam-safety-and-floodplains/floodplain-directory

10. Historic Resources. The Corps must continue to consult directly with DHR (Sam Henderson, Samantha.Henderson@dhr.virginia.gov), as necessary, pursuant to Section 106 of the National Historic Preservation Act (as amended) and its implementing regulations codified at 36 CFR Part 800 which require Federal agencies to consider the effects of their undertakings on historic properties.

Thank you for the opportunity to review and respond to the Draft Environmental Assessment and Federal Consistency Determination for the Metropolitan Washington District of Columbia Coastal Storm Risk Management Feasibility Study. Detailed comments of reviewing agencies are attached for your review. Please contact me at (804) 659-1915 or Janine Howard at (804) 659-1916 for clarification of these comments.

Sincerely,

Bettina Rayfield, Program Manager
Environmental Impact Review

Ec: Amy Ewing, DWR
Robbie Rhur, DCR
Arlene Warren, VDH
Roger Kirchen, DHR
Tiffany Birge, VMRC
Heather Williams, VDOT
Rusty Harrington, DOAV
Fred Kirby, DGS
Denise James, Fairfax County
Mark Schwartz, Arlington County
James Parajon, City of Alexandria
Elijah Johnson, Prince William County
Robert Lazaro, Northern Virginia Regional Commission

COMMONWEALTH of VIRGINIA
Marine Resources Commission
380 Fenwick Road
Bldg 96
Fort Monroe, VA 23651-1064

Jamie L. Green
Commissioner

June 30, 2022

Department of Environmental Quality
Attn: Janine Howard
1111 East Main St.
Richmond, VA 23219

Re: Metropolitan Washington District of Columbia Coastal Storm Risk Management Feasibility Study, DEQ#22-084F

Dear Ms. Howard,

This will respond to the request for comments regarding the Federal Consistency Determination for the Metropolitan Washington District of Columbia Coastal Storm Risk Management Feasibility Study (DEQ #22-084F), prepared by the US Army Corps of Engineers, Baltimore Division (ACOE). Specifically, the ACOE has proposed construction, operation and maintenance of two primary floodwalls for the purpose of storm risk management. The proposed construction includes a 6,725 linear foot (LF) concrete floodwall and earthen levee at the Bell Haven site and a 1,160 LF concrete floodwall along the Arlington Water Pollution Control Plant. Associated culvert crossings at both proposed site locations will involve permanent fill impacts totaling 7,110 square feet (SF). The project is located in Arlington and Fairfax Counties, Virginia.

Please be advised that the Virginia Marine Resources Commission (VMRC) pursuant to Chapters 12, 13, and 14 of Title 28.2 of the Code of Virginia administers permits required for submerged lands, tidal wetlands, and beaches and dunes. Additionally, the VMRC administers the enforceable policies of fisheries management, subaqueous lands, tidal wetlands, and coastal primary sand dunes and beaches, which comprise some of Virginia's Coastal Zone Management Program. VMRC staff has reviewed the submittal and offers the following comments:

Fisheries and Shellfish: The applicant will implement all practicable best management practices to limit temporary turbidity impacts at the culvert construction and permanent fill sites.

Submerged Lands: As proposed, the project will result in a total of 7,110 SF of permanent fill of state-owned bottoms in association with culvert crossing construction. A permit from VMRC will be required for this proposed encroachment over jurisdictional subaqueous bottom.

Tidal Wetlands: Impacts are proposed to tidal wetlands adjacent to the project sites. Therefore, a permit may be required from the Fairfax County Wetlands Board for impacts associated with Belle Haven and Four Mile Run, and from VMRC for impacts associated with the Arlington Water Pollution Control Plant.

Beaches and Coastal Primary Sand Dunes: None in close proximity to the project area.

As proposed, we have no objection to the consistency findings provided by the applicant. Should the proposed project change, a new review by this agency may be required relative to these jurisdictional areas.

Please contact me at (757) 247-8028 or by email at mark.eversole@mrc.virginia.gov if you have questions. Thank you for the opportunity to comment.

Sincerely,

Mark Eversole
Environmental Engineer, Habitat Management

ME/al
HM

DEPARTMENT OF ENVIRONMENTAL QUALITY
DIVISION OF AIR PROGRAM COORDINATION

ENVIRONMENTAL REVIEW COMMENTS APPLICABLE TO AIR QUALITY

TO: Janine Howard

We thank **OEIR** for providing DEQ-AIR an opportunity to review the following project:
Accordingly, I am providing following comments for consideration.

Document Type: Draft Environmental Assessment/Federal Consistency Determination
Project Sponsor: Army Corps of Engineers
Project Title: Metropolitan Washington District of Columbia Coastal Storm Risk Management Feasibility Study
Location: Arlington County, Fairfax County, City of Alexandria, Prince William County
Project Number: DEQ #22-084F

PROJECT LOCATION: **X OZONE NON ATTAINMENT AND EMISSION CONTROL AREA FOR NOX & VOC**

REGULATORY REQUIREMENTSMAY BE APPLICABLE TO: X MANAGEMENT STUDY
☐ OPERATION

STATE AIR POLLUTION CONTROL BOARD REGULATIONS THAT MAY APPLY:

1. ☐ 9 VAC 5-40-5200 C & 9 VAC 5-40-5220 E – STAGE I
2. ☐ 9 VAC 5-45-760 et seq. – Asphalt Paving operations
3. **X 9 VAC 5-130 et seq. – Open Burning**
4. **X 9 VAC 5-50-60 et seq. Fugitive Dust Emissions**
5. ☐ 9 VAC 5-50-130 et seq. - Odorous Emissions; Applicable to_____
6. ☐ 9 VAC 5-60-300 et seq. – Standards of Performance for Toxic Pollutants
7. ☐ 9 VAC 5-50-400 Subpart_____, Standards of Performance for New Stationary Sources, designates standards of performance for the_____
8. ☐ 9 VAC 5-80-1100 et seq. of the regulations – Permits for Stationary Sources
9. ☐ 9 VAC 5-80-1605 et seq. Of the regulations – Major or Modified Sources located in PSD areas. This rule may be applicable to the _____
10. ☐ 9 VAC 5-80-2000 et seq. of the regulations – New and modified sources located in non-attainment areas
11. ☐ 9 VAC 5-80-800 et seq. Of the regulations – State Operating Permits. This rule may be applicable to _____

COMMENTS SPECIFIC TO THE PROJECT:

Implementation of the project reveals large volume construction work. During such construction, in addition to all precautions are necessary to restrict the emissions of volatile organic compounds (VOC) and oxides of nitrogen (NO_X), besides conforming to above highlighted state regulations.

(Kotur S. Narasimhan)
Office of Air Data Analysis **DATE: June 3, 2022**

Commonwealth of Virginia

Howard, Janine <janine.howard@deq.virginia.gov>

RE: NEW PROJECT ACOE Coastal Storm Risk Management, DEQ 22-084F

1 message

Jesse Maines <Jesse.Maines@alexandriava.gov> Mon, Jul 11, 2022 at 11:11 AM
To: "Howard, Janine" <janine.howard@deq.virginia.gov>
Cc: Yon Lambert <Yon.Lambert@alexandriava.gov>, William Skrabak <William.Skrabak@alexandriava.gov>, Brian Rahal <Brian.Rahal@alexandriava.gov>, Jim Parajon <jim.parajon@alexandriava.gov>, Sermaine McLean <Sermaine.McLean@alexandriava.gov>

Good morning Janine,

Given that the current Feasibility Study does not include any flood control projects with the City of Alexandria, the City has no comments on FCD in Appendix G "Environmental Appendix". The City does have questions about the potential impact of the proposed Arlington WPCP Floodwall may have on City properties located south of Four Mile Run, and will await the submittal of the modeling effort to comment on those potential impacts.

Thanks,

Jesse

Jesse E. Maines, MPA, PMP

Division Chief

T&ES, Stormwater Management

Direct: 703.746.4643

Mobile: 571.414.8237

Main: 703.746.6499

From: Howard, Janine <janine.howard@deq.virginia.gov>
Sent: Tuesday, July 5, 2022 12:28 PM
To: Jesse Maines <Jesse.Maines@alexandriava.gov>
Cc: Yon Lambert <Yon.Lambert@alexandriava.gov>; William Skrabak <William.Skrabak@alexandriava.gov>; Brian Rahal <Brian.Rahal@alexandriava.gov>;

Matthew S. Wells
Director

Frank N. Stovall
Deputy Director for Operations

Darryl Glover
Deputy Director for Dam Safety, Floodplain Management and Soil and Water Conservation

Laura Ellis
Interim Deputy Director for Administration and Finance

COMMONWEALTH of VIRGINIA
DEPARTMENT OF CONSERVATION AND RECREATION

MEMORANDUM

DATE**:** July 6, 2022

TO: Janine Howard

FROM: Kristal McKelvey, Environmental Impact Review Coordinator

SUBJECT**:** **DEQ 22-084F, Metro DC Coastal Storm Risk Management Feasibility Study-Tentatively Selected Plan**

Division of Planning and Recreation Resources

The Department of Conservation and Recreation (DCR), Division of Planning and Recreational Resources (PRR), develops the *Virginia Outdoors Plan* and coordinates a broad range of recreational and environmental programs throughout Virginia. These include the Virginia Scenic Rivers program; Trails, Greenways, and Blueways; Virginia State Park Master Planning and State Park Design and Construction. PRR also administers the Land & Water Conservation Fund (LWCF) program in Virginia.

Division of Natural Heritage

The Department of Conservation and Recreation's Division of Natural Heritage (DCR) has searched its Biotics Data System for occurrences of natural heritage resources from the area outlined on the submitted map. Natural heritage resources are defined as the habitat of rare, threatened, or endangered plant and animal species, unique or exemplary natural communities, and significant geologic formations.

Bell Haven Floodwall
Biotics documents the presence of natural heritage resources within the project boundary including a 100ft buffer. However, due to the scope of the activity we do not anticipate that this project will adversely impact these natural heritage resources.

Bell Haven Staging Area
According to the information currently in Biotics, natural heritage resources have not been documented within the submitted project boundary including a 100 foot buffer. The absence of data may indicate that the project area has not been surveyed, rather than confirm that the area lacks natural heritage resources. In addition, the project boundary does not intersect any of the predictive models identifying potential habitat for natural heritage resources.

Arlington Water Pollution Control Plant Floodwall and Staging Area
According to the information currently in Biotics, natural heritage resources have not been documented within the submitted project boundary including a 100 foot buffer. The absence of data may indicate that the project area has not been surveyed, rather than confirm that the area lacks natural heritage

resources. In addition, the project boundary does not intersect any of the predictive models identifying potential habitat for natural heritage resources.

There are no State Natural Area Preserves under DCR's jurisdiction in the project vicinity.

Under a Memorandum of Agreement established between the Virginia Department of Agriculture and Consumer Services (VDACS) and the DCR, DCR represents VDACS in comments regarding potential impacts on state-listed threatened and endangered plant and insect species. The current activity will not affect any documented state-listed plants or insects.

New and updated information is continually added to Biotics. Please re-submit project information and map for an update on this natural heritage information if the scope of the project changes and/or six months has passed before it is utilized.

The Virginia Department of Wildlife Resources (VDWR) maintains a database of wildlife locations, including threatened and endangered species, trout streams, and anadromous fish waters that may contain information not documented in this letter. Their database may be accessed from http://vafwis.org/fwis/ or contact Amy Martin at (804-367-2211) or amy.martin@dwr.virginia.gov.

Division of State Parks

DCR's Division of State Parks is responsible for acquiring and managing, state parks. Park development and master planning are managed by the Division of Planning and Recreation Resources. Master plans are required prior to a parks opening and are updated every ten years (Virginia Code § 10.1-200 *et seq.*).

Division of Dam Safety and Floodplain Management

Dam Safety Program:
The Dam Safety program was established to provide proper and safe design, construction, operation and maintenance of dams to protect public safety. Authority is bestowed upon the program according to *The Virginia Dam Safety Act*, Article 2, Chapter 6, Title 10.1 (10.1-604 et seq) of the Code of Virginia and Dam Safety Impounding Structure Regulations (Dam Safety Regulations), established and published by the Virginia Soil and Water Conservation Board (VSWCB).

Floodplain Management Program:
The National Flood Insurance Program (NFIP) is administered by the Federal Emergency Management Agency (FEMA), and communities who elect to participate in this voluntary program manage and enforce the program on the local level through that community's local floodplain ordinance. Each local floodplain ordinance must comply with the minimum standards of the NFIP, outlined in 44 CFR 60.3; however, local communities may adopt more restrictive requirements in their local floodplain ordinance, such as regulating the 0.2% annual chance flood zone (Shaded X Zone).

All development within a Special Flood Hazard Area (SFHA), as shown on the locality's Flood Insurance Rate Map (FIRM), must be permitted and comply with the requirements of the local floodplain ordinance.

State Agency Projects Only
Executive Order 45, signed by Governor Northam and effective on November 15, 2019, establishes mandatory standards for development of state-owned properties in Flood-Prone Areas, which include

Special Flood Hazard Areas, Shaded X Zones, and the Sea Level Rise Inundation Area. These standards shall apply to all state agencies.

1. Development in Special Flood Hazard Areas and Shaded X Zones
    A. All development, including buildings, on state-owned property shall comply with the locally-adopted floodplain management ordinance of the community in which the state-owned property is located and any flood-related standards identified in the Virginia Uniform Statewide Building Code.
    B. If any state-owned property is located in a community that does not participate in the NFIP, all development, including buildings, on such state-owned property shall comply with the NFIP requirements as defined in 44 CFR §§ 60.3, 60.4, and 60.5 and any flood-related standards identified in the Virginia Uniform Statewide Building Code.
        (1) These projects shall be submitted to the Department of General Services (DGS), for review and approval.
        (2) DGS shall not approve any project until the State NFIP Coordinator has reviewed and approved the application for NFIP compliance.
        (3) DGS shall provide a written determination on project requests to the applicant and the State NFIP Coordinator. The State NFIP Coordinator shall maintain all documentation associated with the project in perpetuity.
    C. No new state-owned buildings, or buildings constructed on state-owned property, shall be constructed, reconstructed, purchased, or acquired by the Commonwealth within a Special Flood Hazard Area or Shaded X Zone in any community unless a variance is granted by the Director of DGS, as outlined in this Order.

The following definitions are from Executive Order 45:

Development for NFIP purposes is defined in 44 CFR § 59.1 as "Any man-made change to improved or unimproved real estate, including but not limited to buildings or other structures, mining, dredging, filling, grading, paving, excavation or drilling operations or storage of equipment or materials."

The Special Flood Hazard Area may also be referred to as the 1% annual chance floodplain or the 100-year floodplain, as identified on the effective Flood Insurance Rate Map and Flood Insurance Study. This includes the following flood zones: A, AO, AH, AE, A99, AR, AR/AE, AR/AO, AR/AH, AR/A, VO, VE, or V.

The Shaded X Zone may also be referred to as the 0.2% annual chance floodplain or the 500- year floodplain, as identified on the effective Flood Insurance Rate Map and Flood Insurance Study.

The Sea Level Rise Inundation Area referenced in this Order shall be mapped based on the National Oceanic and Atmospheric Administration Intermediate-High scenario curve for 2100, last updated in 2017, and is intended to denote the maximum inland boundary of anticipated sea level rise.

"State agency" shall mean all entities in the executive branch, including agencies, offices, authorities, commissions, departments, and all institutions of higher education.

"Reconstructed" means a building that has been substantially damaged or substantially improved, as defined by the NFIP and the Virginia Uniform Statewide Building Code.

<u>Federal Agency Projects Only</u>

Projects conducted by federal agencies within the SFHA must comply with federal Executive Order 11988: Floodplain Management.

DCR's Floodplain Management Program does not have regulatory authority for projects in the SFHA. The applicant/developer must reach out to the local floodplain administrator for an official floodplain determination and comply with the community's local floodplain ordinance, including receiving a local permit. Failure to comply with the local floodplain ordinance could result in enforcement action from the locality. For state projects, DCR recommends that compliance documentation be provided prior to the project being funded. For federal projects, the applicant/developer is encouraged reach out to the local floodplain administrator and comply with the community's local floodplain ordinance.

To find flood zone information, use the Virginia Flood Risk Information System (VFRIS): www.dcr.virginia.gov/vfris

To find community NFIP participation and local floodplain administrator contact information, use DCR's Local Floodplain Management Directory: www.dcr.virginia.gov/dam-safety-and-floodplains/floodplain-directory

The remaining DCR divisions have no comments regarding the scope of this project. Thank you for the opportunity to comment.

Commonwealth of Virginia

Howard, Janine <janine.howard@deq.virginia.gov>

2022-06-07 ACOE Coastal Storm Risk Management, DEQ 22-084F

1 message

Fred Kirby <fred.kirby@dgs.virginia.gov> Tue, Jun 7, 2022 at 3:25 PM
To: "Howard, Janine" <janine.howard@deq.virginia.gov>
Cc: "Coppa, Mike" <mike.coppa@dgs.virginia.gov>, Raka Goyal <raka.goyal@dgs.virginia.gov>

Dear Janine,

Thank you for the opportunity to review the EIR for the Metropolitan Washington, DC Coastal Storm Risk Management Feasibility Study, DEQ #22-084F.

The proposed project in the Metropolitan Washington, DC area affects multiple localities in Virginia. Floodwalls are proposed in Arlington County and Fairfax County. In a February 2022 report by the Army Corps of Engineers, ownership of affected properties are listed as Federal, private, local county entities. Construction on any State owned properties would be governed by Executive Order 45 (2019). Because there is no planned building construction, a variance from the Director of DGS is not required. However any development on State owned properties requires compliance with local floodplain management ordinances. DGS-DEB takes no exception to the construction of floodwalls as proposed.

Blessings,

Fred S. Kirby, P.E.

State Review Civil/Structural Engineer

Division of Engineering & Buildings

Department of General Services

Office: 804.371.8842 | Fax: 804.225.4709

1100 Bank St., Suite 600, Richmond, VA 23219

Webpage | Newsletter

---------- Forwarded message ---------
From: **Fulcher, Valerie** <valerie.fulcher@deq.virginia.gov>
Date: Wed, Jun 1, 2022 at 3:47 PM
Subject: NEW PROJECT ACOE Coastal Storm Risk Management, DEQ 22-084F
To: rr dgif-ESS Projects <essprojects@dgif.virginia.gov>, rr DCR-PRR Environmental Review <envreview@dcr.virginia.gov>, odwreview (VDH) <odwreview@vdh.virginia.gov>, Roger Kirchen

Commonwealth of Virginia

Howard, Janine <janine.howard@deq.virginia.gov>

Fwd: NEW PROJECT ACOE Coastal Storm Risk Management, DEQ 22-084F

1 message

Henderson, Samantha <samantha.henderson@dhr.virginia.gov> Wed, Jun 22, 2022 at 10:56 AM
To: Janine Howard <janine.howard@deq.virginia.gov>

Dear Ms. Howard:

Thank you for requesting comments from the Department of Historic Resources (DHR) on this project. DHR has been in consultation with the *US Army Corps of Engineers (Corps)* regarding this project. We request that the *Corps* continue to consult directly with DHR, as necessary, pursuant to Section 106 of the National Historic Preservation Act (as amended) and its implementing regulations codified at 36 CFR Part 800 which require Federal agencies to consider the effects of their undertakings on historic properties.

Regards,
Regards,
Sam Henderson, Archaeologist
Division of Review and Compliance

---------- Forwarded message ---------
From: **Fulcher, Valerie** <valerie.fulcher@deq.virginia.gov>
Date: Wed, Jun 1, 2022 at 3:47 PM
Subject: NEW PROJECT ACOE Coastal Storm Risk Management, DEQ 22-084F
To: rr dgif-ESS Projects <essprojects@dgif.virginia.gov>, rr DCR-PRR Environmental Review <envreview@dcr.virginia.gov>, odwreview (VDH) <odwreview@vdh.virginia.gov>, Roger Kirchen <roger.kirchen@dhr.virginia.gov>, rr MRC - Scoping <scoping@mrc.virginia.gov>, rr EIR Coordination <eir.coordination@vdot.virginia.gov>, Russell Harrington <rusty.harrington@doav.virginia.gov>, rr capout <capout@dgs.virginia.gov>, Bob Lazaro <rlazaro@novaregion.org>, <countymanager@arlingtonva.us>, <jspatton@pwcgov.org>, Atkinson, Kelly <Kelly.Atkinson@fairfaxcounty.gov>, <james.parajon@alexandriava.gov>, Carlos Martinez <carlos.martinez@deq.virginia.gov>, Kotur Narasimhan <kotur.narasimhan@deq.virginia.gov>, Lawrence Gavan <larry.gavan@deq.virginia.gov>, Daniel Moore <daniel.moore@deq.virginia.gov>, Mark Miller <mark.miller@deq.virginia.gov>
Cc: Howard, Janine (DEQ) <janine.howard@deq.virginia.gov>

Good afternoon - this is a new OEIR review request/project:

Document Type: Draft Environmental Assessment/Federal Consistency Determination
Project Sponsor: Army Corps of Engineers
Project Title: Metropolitan Washington District of Columbia Coastal Storm Risk Management Feasibility Study
Location: Arlington County, Fairfax County, City of Alexandria, Prince William County
Project Number: DEQ #22-084F

The document is available at https://public.deq.virginia.gov/OEIR/ in the ACOE folder.

The due date for comments is JULY 1, 2022. You can send your comments either directly to JANINE HOWARD by email (Janine.Howard@deq.virginia.gov), or you can send your comments by regular interagency/U.S. mail to the Department of Environmental Quality, Office of Environmental Impact Review, P.O. Box 1105, Richmond, VA 23218.

Commonwealth of Virginia

Howard, Janine <janine.howard@deq.virginia.gov>

DEQ #22-084F

1 message

Rusty Harrington <rusty.harrington@doav.virginia.gov> Tue, Jul 5, 2022 at 12:39 PM
To: Janine Howard <Janine.Howard@deq.virginia.gov>

Good Afternoon, Janine-

Thank you for requesting our comments regarding the US Army Corps of Engineers, Metropolitan Washington District of Columbia Coastal Storm Risk Management Feasibility Study, Project Number #22-084F.

The Virginia Department of Aviation has reviewed the document and based upon our review, the Department believes that when developed, the projects will help provide resilience, allow for a safer, more secure airport, and contribute to the overall utility of Ronald Reagan Washington National Airport. The Department is also aware that there is further study forthcoming and would like to offer further comment on that study as appropriate.

The Department appreciates the consideration you have given to us by requesting our comments on this project. Please do not hesitate to contact me should you have any questions or require further assistance regarding the Department's review of these projects.

--

R.N. (Rusty) Harrington, MBA
Manager, Planning and Environmental Section
Virginia Department of Aviation
5702 Gulfstream Road
Richmond, Virginia 23250
(804) 236-3522

Commonwealth of Virginia

Howard, Janine <janine.howard@deq.virginia.gov>

RE: NEW PROJECT ACOE Coastal Storm Risk Management, DEQ 22-084F

1 message

Atkinson, Kelly <Kelly.Atkinson@fairfaxcounty.gov> Tue, Jul 5, 2022 at 8:42 AM
To: "Howard, Janine" <janine.howard@deq.virginia.gov>
Cc: "Hermann, Katherine" <Katherine.Hermann@fairfaxcounty.gov>, "Torgersen, Catherine S" <Catherine.Torgersen@fairfaxcounty.gov>

Janine – I wanted to let you know that the ACOE extended the deadline for comments to July 31, 2022. We will be providing comments directly to them and our Department of Public Works and Environmental Services is taking the lead on preparing Fairfax County's response.

Thanks,

Kelly

Kelly M. Atkinson, AICP (she/her/hers)

Branch Chief, Environment and Development Review Branch

Fairfax County Department of Planning and Development

12055 Government Center Parkway, 7th Floor

Fairfax, VA 22035

(703) 324-1380 (Main)

(571) 595-4238 (Mobile)

Note: My working hours may not be the same as your working hours. Please do not feel obligated to reply outside of your current work schedule.

From: Howard, Janine <janine.howard@deq.virginia.gov>
Sent: Tuesday, July 5, 2022 6:47 AM
To: Janine Howard <janine.howard@deq.virginia.gov>
Cc: rr dgif-ESS Projects <essprojects@dgif.virginia.gov>; rr DCR-PRR Environmental Review <envreview@dcr.virginia.gov>; rr EIR Coordination <eir.coordination@vdot.virginia.gov>; Russell Harrington <rusty.harrington@doav.virginia.gov>; Robert Lazaro <rlazaro@novaregion.org>; countymanager@arlingtonva.us; Justin S. <jspatton@pwcgov.org>; Atkinson, Kelly <Kelly.Atkinson@fairfaxcounty.gov>; james.parajon@alexandriava.gov
Subject: Re: NEW PROJECT ACOE Coastal Storm Risk Management, DEQ 22-084F

VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY

MEMORANDUM

TO: Janine Howard, DEQ/EIR Environmental Program Planner

FROM: Carlos A. Martinez, Division of Land Protection & Revitalization Review Coordinator

DATE: June 28, 2022

COPIES: Sanjay Thirunagari, Division of Land Protection & Revitalization Review Manager; file

SUBJECT: Environmental Impact Review: 22-084F Metropolitan Washington District of Columbia Coastal Storm Risk Management Feasibility Study in Arlington, Fairfax, and Prince William Counties, and the City of Alexandria, Virginia.

The Division of Land Protection & Revitalization (DLPR) has completed its review of the Army Corps of Engineers' June 1, 2022 EIR for Metropolitan Washington District of Columbia Coastal Storm Risk Management Feasibility Study in Arlington, Fairfax, and Prince William Counties, and the City of Alexandria, Virginia.

DLPR staff recommends a search (at least 200 ft. radius) of any land-based project areas using the following solid and hazardous waste databases to identify waste sites (including petroleum releases) in close proximity to those project areas:

- Environmental Protection Agency (EPA) Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) Database: Superfund Information Systems Information on hazardous waste sites, potentially hazardous waste sites and remedial activities across the nation, including sites that are on the National Priorities List (NPL) or being considered for the NPL:
    - www.epa.gov/superfund/sites/cursites/index.htm
- DEQ Online Database: Virginia Environmental Geographic Information Systems Information on Permitted Solid Waste Management Facilities, Impaired Waters, Petroleum Releases, Registered Petroleum Facilities, Permitted Discharge (Virginia Pollution Discharge Elimination System Permits) Facilities, Resource Conservation and Recovery Act (RCRA) Sites, Water Monitoring Stations, National Wetlands Inventory:

- www.deq.virginia.gov/ConnectWithDEQ/VEGIS.aspx

PROJECT SPECIFIC COMMENTS

None

GENERAL COMMENTS

Soil, Sediment, Groundwater, and Waste Management

Any soil, sediment or groundwater that is suspected of contamination or wastes that are generated must be tested and disposed of in accordance with applicable Federal, State, and local laws and regulations. Some of the applicable state laws and regulations are: Virginia Waste Management Act, Code of Virginia Section 10.1-1400 *et seq.*; Virginia Hazardous Waste Management Regulations (VHWMR) (9VAC 20-60); Virginia Solid Waste Management Regulations (VSWMR) (9VAC 20-81); Virginia Regulations for the Transportation of Hazardous Materials (9VAC 20-110). Some of the applicable Federal laws and regulations are: the Resource Conservation and Recovery Act (RCRA), 42 U.S.C. Section 6901 *et seq.*, and the applicable regulations contained in Title 40 of the Code of Federal Regulations; and the U.S. Department of Transportation Rules for Transportation of Hazardous Materials, 49 CFR Part 107.

Asbestos and/or Lead-based Paint

Any structures being demolished/renovated/removed should be checked for asbestos-containing materials (ACM) and lead-based paint (LBP) prior to demolition. If ACM or LBP are found, in addition to the federal waste-related regulations mentioned above, State regulations 9VAC 20-81-620 for ACM and 9VAC 20-60-261 for LBP must be followed. Questions may be directed to the waste compliance staff at the appropriate DEQ's Regional Office.

Pollution Prevention – Reuse - Recycling

Please note that DEQ encourages all construction projects and facilities to implement pollution prevention principles, including the reduction, reuse, and recycling of all solid wastes generated. All generation of hazardous wastes should be minimized and handled appropriately.

If you have any questions or need further information, please contact Carlos A. Martinez by phone at (804) 350-9962 or email Carlos.Martinez@DEQ.Virginia.Gov.

Commonwealth of Virginia

VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY

1111 E. Main Street, Suite 1400, Richmond, Virginia 23219
P.O. Box 1105, Richmond, Virginia 23218
(800) 592-5482 FAX (804) 698-4178
www.deq.virginia.gov

Travis A. Voyles
Secretary of Natural and Historic Resources

Michael S. Rolband, PE, PWD, PWS Emeritus
Director
(804) 698-4020

MEMORANDUM

TO: Janine Howard, DEQ Office of Environmental Impact Review

FROM: Daniel Moore, DEQ Principal Environmental Planner

DATE: June 3, 2022

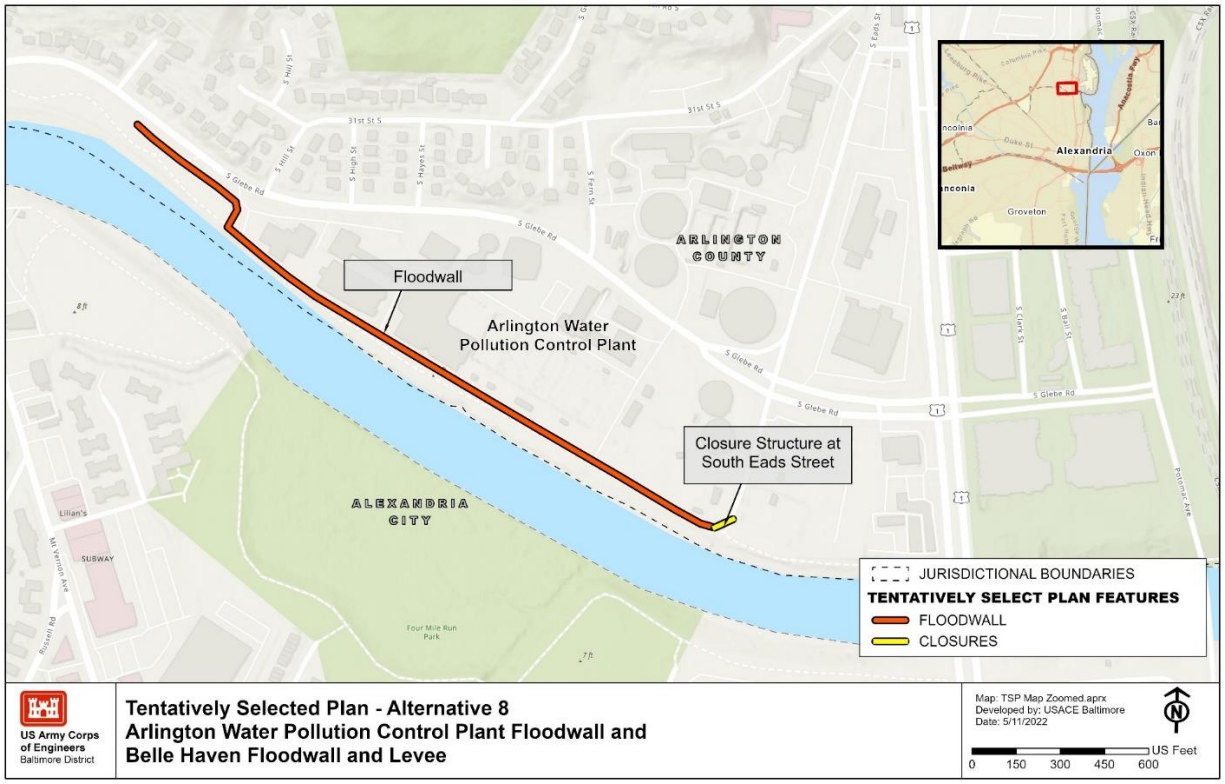
SUBJECT: DEQ #22-084F – US ACOE and Metro Washington Council of Governments: District of Columbia Coastal Storm Risk Management Feasibility Study, City of Alexandria and Arlington, Fairfax and Prince William Counties

We have reviewed the Federal Consistency Determination for the proposed feasibility study and flood control infrastructure project and offer the following comments regarding consistency with the provisions of the Chesapeake Bay Preservation Area Designation and Management Regulations (Regulations):

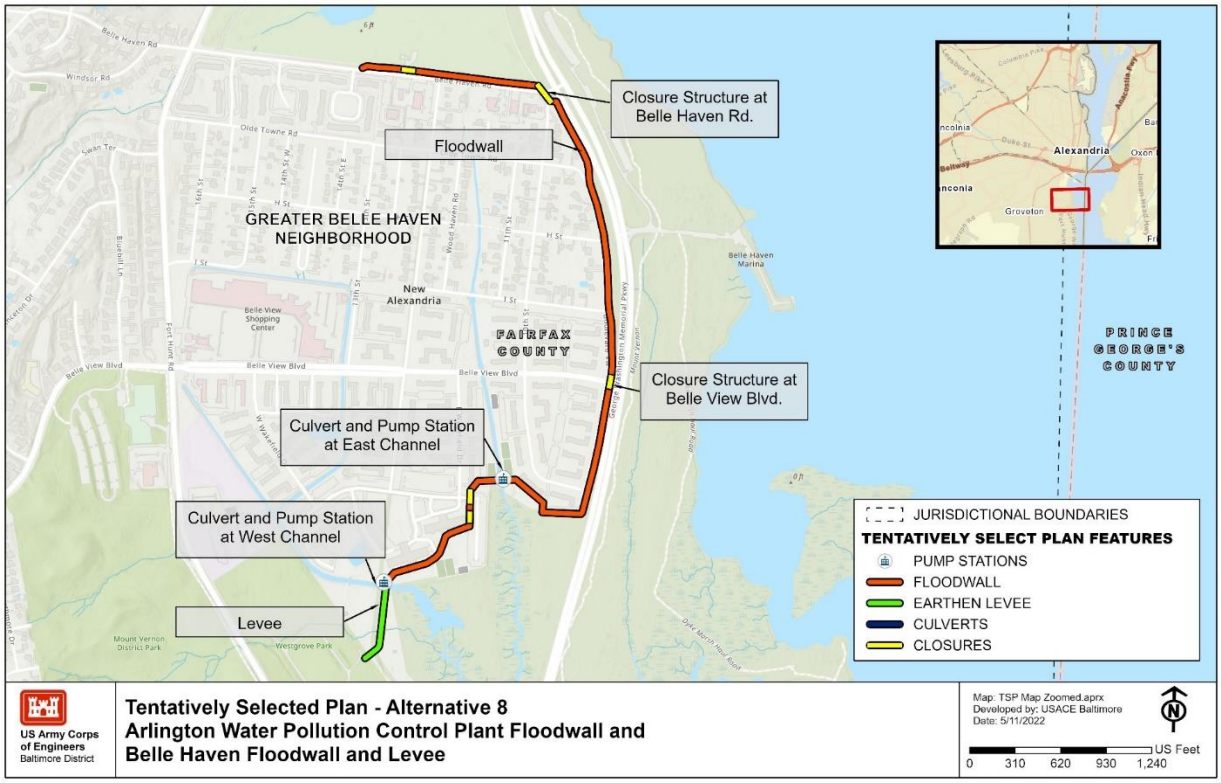
In the City of Alexandria and in Arlington, Fairfax and Prince William Counties, the areas protected by the *Chesapeake Bay Preservation Act* (CBPA), as locally implemented, require conformance with performance criteria. These areas include Resource Protection Areas (RPAs) and Resource Management Areas (RMAs) as designated by each of the four local governments. RPAs include tidal wetlands, certain non-tidal wetlands, tidal shores, and a 100-foot vegetated buffer area located adjacent to and landward of these features and along both sides of any water body with perennial flow. All lands within the City of Alexandria and Arlington, Fairfax and Prince William Counties not located within the RPA are designated as RMA. Resource Management Areas require less stringent performance criteria than RPAs.

The submitted Draft Integrated Feasibility Report and Environmental Assessment (IFR/EA) evaluates the feasibility of federal participation in the "implementation of solutions to reduce long-term coastal flooding risks to vulnerable populations, properties, infrastructure and environmental and cultural resources considering future climate and sea level change scenarios to support resilient communities in Northern Virginia within the Middle Potomac River watershed."

At the Arlington Water Pollution Control Plant (WPCP), a proposed floodwall would be constructed along the left bank of Four Mile Run between Four Mile Run and the Arlington WPCP. The proposed floodwall would tie into the bank to the east just past South Eads Street. The floodwall would wrap around the Arlington WPCP to the west where a stop log closure structure is located along South Glebe Road. (See map below.)



At Belle Haven, a proposed floodwall would be constructed just north of Belle Haven Road from Barrister Place to 10th Street with a closure structure at 10th Street and at the George Washington Memorial Parkway (GWMP). Closure structures would be constructed along Belle Haven Road and Belle View Boulevard. The floodwall would tie into the closure structure at 10th Street and run south along the west side of the GWMP, curving around Belle View Boulevard to 10th Street. The floodwall would then run west to East Wakefield Drive tying into both sides of a closure structure on Potomac Avenue. The floodwall would continue west to West Wakefield Drive and tie into a small portion of earthen levee ending at Westgrove Dog Park. (See map on page 3.)



The submitted IFR/EA shows no evidence that the applicant has considered the impacts of the proposed feasibility study and construction activities on locally-designated CBPA lands in the proposed project areas. While the CZMP Enforceable Policies section of Appendix A3 (pp. 18-22) includes considerations of Tidal & Non-Tidal Wetlands, Subaqueous Lands, Wildlife & Inland Fisheries, Point Source Air Pollution and Non-point Source Water Pollution, there is no mention made (and no analysis of) the CBPA as a CZMA enforceable policy. The proposed study area and the locations of proposed construction activities associated with the proposed floodwalls are both within locally-designated CBPA lands, and are as such subject to the Regulations.

Per 9VAC25-830-110 of the Regulations (Site-specific Refinement of Chesapeake Bay Preservation Area Boundaries), the applicant must confirm that (i) a reliable, site-specific evaluation is conducted to determine whether water bodies on or adjacent to the development site have perennial flow and (ii) RPA boundaries are adjusted, as necessary, on the site, based on this evaluation of the site.

Per 9VAC25-830-140 1 vi of the Regulations (Development Criteria For Resource Protection Areas), land development activities that meet the definition of a flood control or stormwater management facility may be allowed on designated RPA lands if the proposed activities satisfy the conditions set forth in 9VAC25-830-140 1 e, including the following:

i. that the local government has conclusively established that location of the facility within the RPA is the optimum location;
ii. the size of the facility is the minimum necessary to provide necessary flood control or stormwater treatment, or both;

iii. (if applicable) the facility must be consistent with a comprehensive stormwater treatment stormwater management plan developed and approved in accordance with 9VAC25-870-92 of the Virginia Stormwater Management Program (VSMP) regulations;
iv. all applicable permits for construction in state and federal waters must be obtained from the appropriate state and federal agencies, such as the U.S. Army Corps of Engineers, DEQ, and the Virginia Marine Resources Commission;
v. approval must be received from the local government prior to construction; and
vi. routine maintenance is allowed to be performed on such facilities to assure that they continue to function as designed.

Per 9VAC25-830-140 6, a Water Quality Impact Assessment (WQIA) shall be required for any proposed development within the RPA and for any other development in CBPAs that may warrant such assessment because of the unique characteristics of the site or intensity of the proposed use or development.

The proposed project must also adhere to (i) regulations promulgated pursuant to the Erosion and Sediment Control Law and the Virginia Stormwater Management Act; (ii) an erosion and sediment control plan and a stormwater management plan approved by the Department of Environmental Quality; or (iii) local water quality protection criteria at least as stringent as the above state requirements. To the degree possible and where applicable, the staging of equipment and supplies associated with all proposed land disturbing and land development activities should be outside of the RPA.

Provided adherence to the above requirements, the proposed activity would be consistent with the *Chesapeake Bay Preservation Act* and the Regulations.

Commonwealth of Virginia

Howard, Janine <janine.howard@deq.virginia.gov>

Fwd: NEW PROJECT ACOE Coastal Storm Risk Management, DEQ 22-084F

1 message

Miller, Mark <mark.miller@deq.virginia.gov> Fri, Jun 24, 2022 at 3:46 PM
To: Janine Howard <janine.howard@deq.virginia.gov>

Northern Regional Office comments regarding the environmental assessment request for, *ACOE Coastal Storm Risk Management, DEQ 22-084F* are as follows:

Land Protection Division – The project manager is reminded that if any solid or hazardous waste is generated/encountered during construction, the project manager would follow applicable federal, state, and local regulations for their disposal. For additional Land Ptotection/Waste questions, please contact the regional waste program manager Richard Doucette at 571.866.6063 or richard.doucette@deq.virginia.gov.

Air Compliance/Permitting - The project manager is reminded that during the construction phases that occur with this project; the project is subject to the Fugitive Dust/Fugitive Emissions Rule 9 VAC 5-50-60 through 9 VAC 5-50-120. In addition, should any open burning or use of special incineration devices be employed in the disposal of land clearing debris during demolition and construction, the operation would be subject to the Open Burning Regulation 9 VAC 5-130-10 through 9 VAC 5-130-60 and 9 VAC 5-130-100. For additional air questions please contact the regional air compliance manager David Hartshorn at 571.408.1778 or r.david.hartshorn@deq.virginia.gov.

Virginia Water Protection Permit (VWPP) Program – The project manager is reminded that a VWP permit from DEQ may be required should impacts to surface waters be necessary. Measures should be taken to avoid and minimize impacts to surface waters and wetlands during construction activities. The disturbance of surface waters or wetlands may require prior approval by DEQ and/or the U.S. Army Corps of Engineers. The Army Corps of Engineers is the authority for an official confirmation of whether there are federal jurisdictional waters, including wetlands, which may be impacted by the proposed project. DEQ may confirm additional waters as jurisdictional beyond those under federal authority. Review of National Wetland Inventory maps or topographic maps for locating wetlands or streams may not be sufficient; there may need to be a site-specific review of the site by a qualified professional. Even if there will be no intentional placement of fill material in jurisdictional waters, potential water quality impacts resulting from construction site surface runoff must be minimized. This can be achieved by using Best Management Practices (BMPs). If construction activities will occur in or along any streams (perennial, intermittent, or ephemeral), open water or wetlands, the applicant should contact DEQ-NRO VWPP staff to determine the need for any permits prior to commencing work that could impact surface waters or wetlands. Upon receipt of a Joint Permit Application for the proposed surface water impacts, DEQ VWP Permit staff will review the proposed project in accordance with the VWP permit program regulations and current VWP permit program guidance. VWPP staff reserve the right to provide comment upon receipt of a permit application requesting authorization to impact state surface waters, and at such time that a wetland delineation has been conducted and associated jurisdiction determination made by the U.S. Army Corps of Engineers. For additional water protection questions please contact the regional water protection program manager Christoph Quansey at 571.719.0843 or christoph.quansey@deq.virginia.gov.

Erosion and Sediment Control, Storm Water Management – DEQ has regulatory authority for the Virginia Pollutant Discharge Elimination System (VPDES) programs related to municipal separate storm sewer systems (MS4s) and construction activities. Erosion and sediment control measures are addressed in local ordinances and State regulations. Additional information is available at http://www.deq.virginia.gov/Programs/Water/StormwaterManagement.aspx. Non-point source pollution resulting from this project should be minimized by using effective erosion and sediment control practices and structures. Consideration should also be given to using

permeable paving for parking areas and walkways where appropriate, and denuded areas should be promptly revegetated following construction work. If the total land disturbance exceeds 10,000 square feet, an erosion and sediment control plan will be required. Some localities also require an E&S plan for disturbances less than 10,000 square feet. A stormwater management plan may also be required. For any land disturbing activities equal to one acre or more, you are required to apply for coverage under the VPDES General Permit for Discharges of Storm Water from Construction Activities. The Virginia Stormwater Management Permit Authority may be DEQ or the locality. For additional storm water construction questions please contact the regional storm water program manager Mark Remsberg at 703.583.3874 or mark.remmsberg@deq.virginia.gov.

Other VPDES Permitting – A construction project may require coverage under the VAG83 permit for discharges from petroleum contaminated sites, groundwater remediation, and hydrostatic tests for any hydrostatics tests on any new piping installed, or for any potential dewatering during construction if petroleum contamination is encountered. For additional water permitting/compliance questions please contact the regional water compliance manager Edward Stuart at 571.866.6184 or edward.stuart@deq.virginia.gov.

Mark Miller
Environmental Manager II
Enforcement/Pollution Response/Environmental Review
VDEQ-NRO
13901 Crown Ct, Woodbridge, VA 22193
Main# 703.583.3800; Cell# 571.866.6487
Email: mark.miller@deq.virginia.gov

---------- Forwarded message ---------
From: **Fulcher, Valerie** <valerie.fulcher@deq.virginia.gov>
Date: Wed, Jun 1, 2022 at 3:47 PM
Subject: NEW PROJECT ACOE Coastal Storm Risk Management, DEQ 22-084F
To: rr dgif-ESS Projects <essprojects@dgif.virginia.gov>, rr DCR-PRR Environmental Review <envreview@dcr.virginia.gov>, odwreview (VDH) <odwreview@vdh.virginia.gov>, Roger Kirchen <roger.kirchen@dhr.virginia.gov>, rr MRC - Scoping <scoping@mrc.virginia.gov>, rr EIR Coordination <eir.coordination@vdot.virginia.gov>, Russell Harrington <rusty.harrington@doav.virginia.gov>, rr capout <capout@dgs.virginia.gov>, Bob Lazaro <rlazaro@novaregion.org>, <countymanager@arlingtonva.us>, <jspatton@pwcgov.org>, Atkinson, Kelly <Kelly.Atkinson@fairfaxcounty.gov>, <james.parajon@alexandriava.gov>, Carlos Martinez <carlos.martinez@deq.virginia.gov>, Kotur Narasimhan <kotur.narasimhan@deq.virginia.gov>, Lawrence Gavan <larry.gavan@deq.virginia.gov>, Daniel Moore <daniel.moore@deq.virginia.gov>, Mark Miller <mark.miller@deq.virginia.gov>
Cc: Howard, Janine (DEQ) <janine.howard@deq.virginia.gov>

Good afternoon - this is a new OEIR review request/project:

Document Type: Draft Environmental Assessment/Federal Consistency Determination
Project Sponsor: Army Corps of Engineers
Project Title: Metropolitan Washington District of Columbia Coastal Storm Risk Management Feasibility Study
Location: Arlington County, Fairfax County, City of Alexandria, Prince William County
Project Number: DEQ #22-084F

The document is available at https://public.deq.virginia.gov/OEIR/ in the ACOE folder.

The due date for comments is JULY 1, 2022. You can send your comments either directly to JANINE HOWARD by email (Janine.Howard@deq.virginia.gov), or you can send your comments by regular interagency/U.S. mail to the Department of Environmental Quality, Office of Environmental Impact Review, P.O. Box 1105, Richmond, VA 23218.

Commonwealth of Virginia

Howard, Janine <janine.howard@deq.virginia.gov>

Re: NEW PROJECT ACOE Coastal Storm Risk Management, DEQ 22-084F

1 message

Gavan, Lawrence <larry.gavan@deq.virginia.gov> Tue, Jun 7, 2022 at 12:23 PM
To: Janine Howard <janine.howard@deq.virginia.gov>

(a) Agency Jurisdiction. The Department of Environmental Quality (DEQ) administers the *Virginia Erosion and Sediment Control Law and Regulations* (*VESCL&R*) and *Virginia Stormwater Management Law and Regulations* (*VSWML&R*).

(b) Erosion and Sediment Control and Stormwater Management Plans. The Applicant and its authorized agents conducting regulated land-disturbing activities on private and public lands in the state must comply with *VESCL&R* and *VSWML&R*, including coverage under the general permit for stormwater discharge from construction activities, and other applicable federal nonpoint source pollution mandates (e.g. Clean Water Act-Section 313, federal consistency under the Coastal Zone Management Act). Clearing and grading activities, installation of staging areas, parking lots, roads, buildings, utilities, borrow areas, soil stockpiles, and related land-disturbing activities that result in the total land disturbance of equal to or greater than 10,000 square feet (2,500 square feet in Chesapeake Bay Preservation Area) would be regulated by *VESCL&R*. Accordingly, the Applicant must prepare and implement an erosion and sediment control (ESC) plan to ensure compliance with state law and regulations. Land-disturbing activities that result in the total land disturbance of equal to or greater than 1 acre (2,500 square feet in Chesapeake Bay Preservation Area) would be regulated by *VSWML&R*. Accordingly, the Applicant must prepare and implement a Stormwater Management (SWM) plan to ensure compliance with state law and regulations. The ESC/SWM plan is submitted to the DEQ Regional Office that serves the area where the project is located for review for compliance. The Applicant is ultimately responsible for achieving project compliance through oversight of on-site contractors, regular field inspection, prompt action against non-compliant sites, and other mechanisms consistent with agency policy. [Reference: VESCL 62.1-44.15 et seq.]

(c) General Permit for Stormwater Discharges from Construction Activities (VAR10). DEQ is responsible for the issuance, denial, revocation, termination and enforcement of the Virginia Stormwater Management Program (VSMP) General Permit for Stormwater Discharges from Construction Activities related to municipal separate storm sewer systems (MS4s) and construction activities for the control of stormwater discharges from MS4s and land disturbing activities under the Virginia Stormwater Management Program.

The owner or operator of projects involving land-disturbing activities of equal to or greater than 1 acre is required to register for coverage under the General Permit for Discharges of Stormwater from Construction Activities and develop a project-specific Stormwater Pollution Prevention Plan. Construction activities requiring registration also include land disturbance of less than one acre of total land area that is part of a larger common plan of development or sale if the larger common plan of development will collectively disturb equal to or greater than one acre The SWPPP must be prepared prior to submission of the registration statement for coverage under the general permit and the SWPPP must address water quality and quantity in accordance with the *VSMP Permit Regulations*.
[Reference: Virginia Stormwater Management Act 62.1-44.15 et seq.; VSMP Permit Regulations *9*VAC25-880 *et seq.]*

Commonwealth of Virginia

Howard, Janine <janine.howard@deq.virginia.gov>

Re: NEW PROJECT ACOE Coastal Storm Risk Management, DEQ 22-084F

1 message

Warren, Arlene <arlene.warren@vdh.virginia.gov> Wed, Jun 29, 2022 at 10:47 AM
To: Janine Howard <janine.howard@deq.virginia.gov>
Cc: rr Environmental Impact Review <eir@deq.virginia.gov>

Project Name: Metropolitan Washington District of Columbia Coastal Storm Risk Management Feasibility Study
Project #: 22-084 F
UPC #: N/A
Location: **Arlington County, Fairfax County, City of Alexandria, Prince William County**

VDH – Office of Drinking Water has reviewed the above project. Below are our comments as they relate to proximity to **public drinking water sources** (groundwater wells, springs and surface water intakes). Potential impacts to public water distribution systems or sanitary sewage collection systems **must be verified by the local utility.**

There are no public groundwater wells within a 1-mile radius of the project site.

There are no surface water intakes located within a 5-mile radius of the project site.

The project is not within the watershed of any public surface water intakes.

There are no apparent impacts to public drinking water sources due to this project.

The Virginia Department of Health – Office of Drinking Water appreciates the opportunity to provide comments. If you have any questions, please let me know.

Best Regards,

Arlene F. Warren
GIS Program Support Technician
Virginia Department of Health, Office of Drinking Water
109 Governor Street, 6th Floor
Richmond, VA 23219
804-356-6658 (office/cell/text)

On Wed, Jun 1, 2022 at 3:47 PM Fulcher, Valerie <valerie.fulcher@deq.virginia.gov> wrote:

> **Good afternoon - this is a new OEIR review request/project:**
>
> **Document Type: Draft Environmental Assessment/Federal Consistency Determination**
> **Project Sponsor: Army Corps of Engineers**
> **Project Title: Metropolitan Washington District of Columbia Coastal Storm Risk Management Feasibility Study**
> **Location: Arlington County, Fairfax County, City of Alexandria, Prince William County**
> **Project Number: DEQ #22-084F**
>
> **The document is available at https://public.deq.virginia.gov/OEIR/ in the ACOE folder.**

From:	Brann, LEE
To:	May, Kristina K CIV USARMY CENAB (USA); Janine Howard
Cc:	Tamara Doucette; Martin, Amy; Stephen Reeser; Jaime Sajecki
Subject:	[URL Verdict: Unknown][Non-DoD Source] ESSLog# 42210_22-084F_Metropolitan DC Coastal Storm Risk Management Feasibility Study_DWR_HLB20220728
Date:	Thursday, July 28, 2022 1:01:30 PM

Ms. May,

We have reviewed the project that proposes constructing a floodwall and stoplog closure in Arlington County as well as a levee and floodwall system with pump stations in Alexandria. In the Arlington project area, Four Mile Run and the Potomac River are designated confirmed anadromous fish use streams known to support several species of anadromous fish. In the Alexandria project area, Cameron Run is a designated potential anadromous fish use stream and the Potomac River is a designated confirmed anadromous fish use stream. We also document Bald Eagle nests from the Alexandria project area.

To best protect anadromous fish in the Arlington and Alexandria project areas, we recommend a time of year restriction on any instream work from February 15 through June 30 of any year in Four Mile Run and/or the Potomac River as well as any tributaries in which work sites are located within one rivermile upstream of Four Mile Run and/or the Potomac River.

While we are recommending protections for the aforementioned species and resources, from the immediate impacts of construction activities associated with this project, we are also concerned about longer-term impacts that the altered hydrology and sedimentation patterns, resulting from the installed coastal stormwater infrastructure, might have on resources under our jurisdiction. These concerns extend to wildlife resources in the Arlington and Alexandria project areas as well as those in connected systems. We recommend continued investigation into any such impacts, particularly those upon wetland and riverine systems in the Potomac watershed, and application of the best available science on the ecological impacts of coastal stormwater management infrastructure (still in early development) to project plans and implementation.

We recommend conducting any in-stream activities during low or no-flow conditions, using non-erodible cofferdams or turbidity curtains to isolate the construction area, blocking no more than 50% of the streamflow at any given time (minimal overlap of construction footprint notwithstanding), stockpiling excavated material in a manner that prevents reentry into the stream, restoring original streambed and streambank contours, revegetating barren areas with native vegetation, and implementing strict erosion and sediment control measures. We recommend that instream work be designed and performed in a manner that minimizes impacts upon natural streamflow and movement of resident aquatic species. If a dam and pump-around must be used, we recommend it be used for as limited a time as possible and that water returned to the stream be free of sediment and excess turbidity. To minimize potential wildlife entanglements resulting from use of synthetic/plastic erosion and sediment control matting, we recommend use of matting made from natural/organic materials such as coir fiber, jute, and/or burlap. To minimize harm to the aquatic environment and its residents resulting from use of the Tremie method to install concrete, installation of grout bags, and traditional pouring of concrete, we recommend that such activities occur only in the dry, allowing all concrete to harden and cure prior to contact with open water. Due to future maintenance costs associated with culverts, and the loss of riparian and aquatic habitat, we prefer stream crossings to be constructed via clear-span bridges. However, if this is not possible, we recommend countersinking any culverts below the streambed at least 6 inches, or the use of bottomless culverts, to allow passage of aquatic organisms. We also recommend the installation of floodplain culverts to carry bankfull discharges.

The Alexandria project site is located within close proximity of historic and/or active bald eagle nests. To ensure protection of bald eagles in compliance with the Bald and Golden Eagle Act, we recommend using the Center for Conservation Biology (CCB) Eagle Nest Locator to determine if any active eagle nests are known from the project area. If active bald eagle nests have been documented from the project area, we recommend that the project proceed in a manner consistent with state and federal guidelines for protection of bald eagles; including coordination, if indicated, with the U.S. Fish and Wildlife Service regarding possible impacts upon bald eagles or the need for a federal bald eagle take

permit.

To minimize overall impacts to wildlife and our natural resources, we offer the following comments about development activities: we recommend that the applicant avoid and minimize impacts to undisturbed forest, wetlands, and streams to the fullest extent practicable. Avoidance and minimization of impact may include relocating stream channels as opposed to filling or channelizing as well as using, and incorporating into the development plan, a natural stream channel design and forested riparian buffers. We recommend maintaining undisturbed naturally vegetated buffers of at least 100 feet in width around all on-site wetlands and on both sides of all perennial and intermittent streams. We recommend maintaining wooded lots to the fullest extent possible. We generally do not support proposals to mitigate wetland impacts through the construction of stormwater management ponds, nor do we support the creation of in-stream stormwater management ponds.

We recommend that the stormwater controls for this project be designed to replicate and maintain the hydrographic condition of the site prior to the change in landscape. This should include, but not be limited to, utilizing bioretention areas, and minimizing the use of curb and gutter in favor of grassed swales. Bioretention areas (also called rain gardens) and grass swales are components of Low Impact Development (LID). They are designed to capture stormwater runoff as close to the source as possible and allow it to slowly infiltrate into the surrounding soil. They benefit natural resources by filtering pollutants and decreasing downstream runoff volumes.

We recommend that all tree removal and ground clearing adhere to a time of year restriction (TOYR) protective of resident and migratory songbird nesting from March 15 through August 15 of any year.

We recommend adherence to erosion and sediment controls during ground disturbance. To minimize potential wildlife entanglements resulting from use of synthetic/plastic erosion and sediment control matting, we recommend use of matting made from natural/organic materials such as coir fiber, jute, and/or burlap.

In addition to the listed species and wildlife resources mentioned above, a number of species designated as Species of Greatest Conservation Need in Virginia's Wildlife Action Plan are likely to occur, if suitable habitat exists, in and around the project area. We recommend that the Virginia Wildlife Action Plan (available through www.bewildvirginia.gov) be reviewed to determine what threats are known to these species, what constitutes suitable habitat for these species, and how to best protect them and their habitats from harm.

This project is located within 2 miles of a documented occurrence of a state or federal threatened or endangered plant or insect species and/or other Natural Heritage coordination species. Therefore, we recommend coordination with VDCR-DNH regarding protection of these resources.

Assuming strict adherence to best management practices for erosion and sediment control is maintained, we find this project to be consistent with the Wildlife and Inland Fisheries and Commonwealth Lands Enforceable Policies of the Coastal Zone Management Program.

Thank you,

--

Lee Brann
Environmental Services Biologist
Wildlife Information and Environmental Services
he/him/his
P 804.367.1295
Department of Wildlife Resources
CONSERVE. CONNECT. PROTECT.
A 7870 Villa Park Drive, P.O. Box 90778, Henrico, VA 23228

www.VirginiaWildlife.gov

County of Fairfax, Virginia

To protect and enrich the quality of life for the people, neighborhoods and diverse communities of Fairfax County

July 28, 2022

Catherine J. Perkins, PE
Project Manager
Civil PPMD
2 Hopkins Plaza
Baltimore, MD 21201

Reference: Coastal Storm Risk Management Study Draft Integrated Feasibility Report and Environmental Assessment

Dear Ms. Perkins,

This letter provides comments from Fairfax County, Virginia regarding the Coastal Storm Risk Management Study Draft Integrated Feasibility Report and Environmental Assessment dated May 2022. Responses were coordinated with the Fairfax County Departments of Planning and Development, Public Works and Environmental Services, and Transportation and the Park Authority.

Background

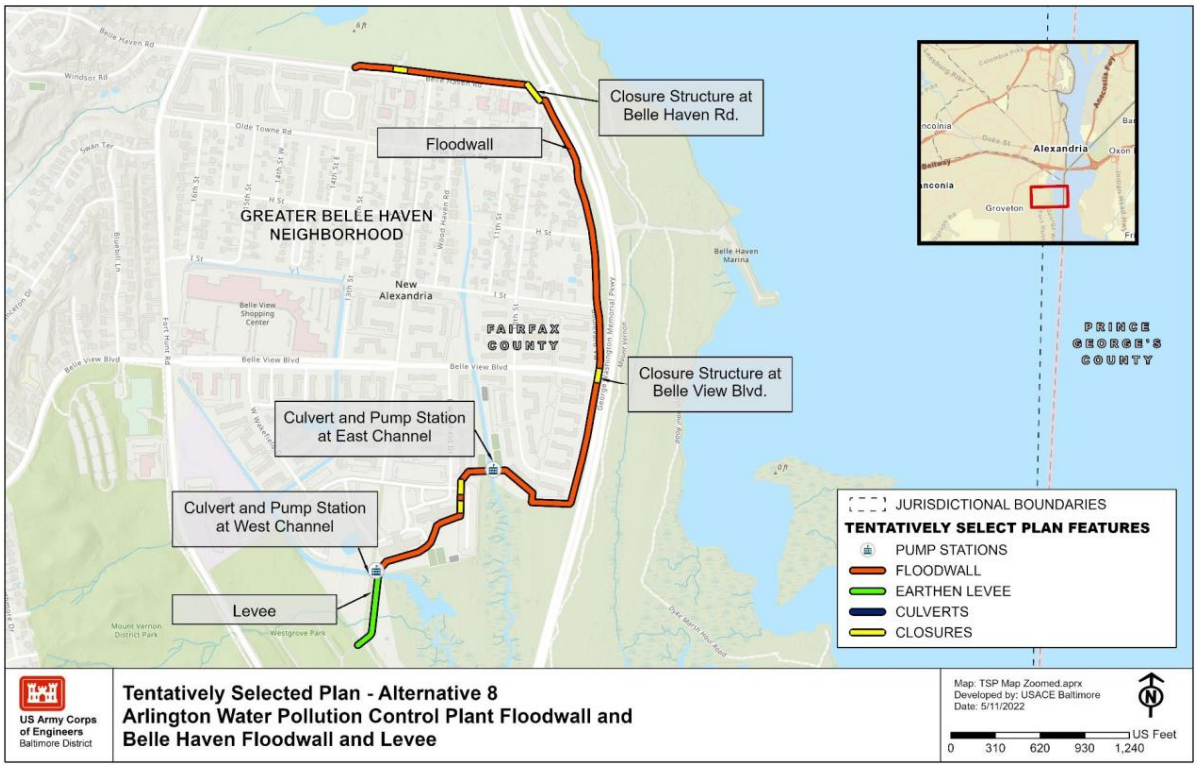
The United States Army Corps of Engineers (USACE) has released a Draft Integrated Feasibility Report and Environmental Assessment (IFR/EA) for the Metropolitan Washington District of Columbia Coastal Storm Risk Management Feasibility Study, in compliance with the National Environmental Policy Act and other environmental laws. The purpose of the study was to evaluate the feasibility of Federal participation in the implementation of solutions to reduce long-term coastal flood risk to vulnerable populations, properties, infrastructure, and environmental and cultural resources with consideration of future climate and sea level change scenarios to support resilient communities in Northern Virginia within the Middle Potomac River watershed.

The USACE's development and screening of measures and formulation of alternatives went through several iterations starting with an initial array of 11 alternatives, in addition to the no-action plan. After the USACE reviewed various possible projects, a Tentatively Selected Plan for the Belle Haven/Belle View area of Fairfax County was selected as the best solution, which is referred to as "Alternative 8." Alternative 8 includes the construction of a floodwall just north of Belle Haven Road from Barrister Place to 10th Street with a closure structure at 10th Street and at the George Washington Memorial Parkway (GWMP). Closure structures would

Department of Public Works and Environmental Services
Stormwater Planning Division
12000 Government Center Parkway, Suite 449
Fairfax, VA 22035-0052
Phone: 703-324-5500, TTY 711, Fax: 703-802-5955
www.fairfaxcounty.gov/publicworks

also be constructed along Belle Haven Road and Belle View Boulevard. A floodwall would tie into the closure structure at 10th Street and run south along the west side of the GWMP, curving around Belle View Boulevard to 10th Street. The floodwall would then run west to East Wakefield Drive, tying into both sides of a closure structure on Potomac Avenue. The floodwall would continue west to West Wakefield Drive and tie into a small portion of earthen levee ending at Westgrove Dog Park. The proposed alignment length is 6,725 linear feet. 1,900 feet of I-walls, 3,715 feet T-walls, and 400 feet of earthen levee are anticipated, which may be as tall as eight feet. The Alternative #8 structure would be designed to provide protection for the 100-year Coastal Storm Event and Sea Level Rise (2080) with three feet of freeboard. Below is a graphical depiction of the approximate location of the proposed project.

Proposed Tentatively Selected Plan- Alternative 8
Belle Haven Floodwall and Levee



Source: Draft Integrated Feasibility Report and Environmental Assessment (USACE)

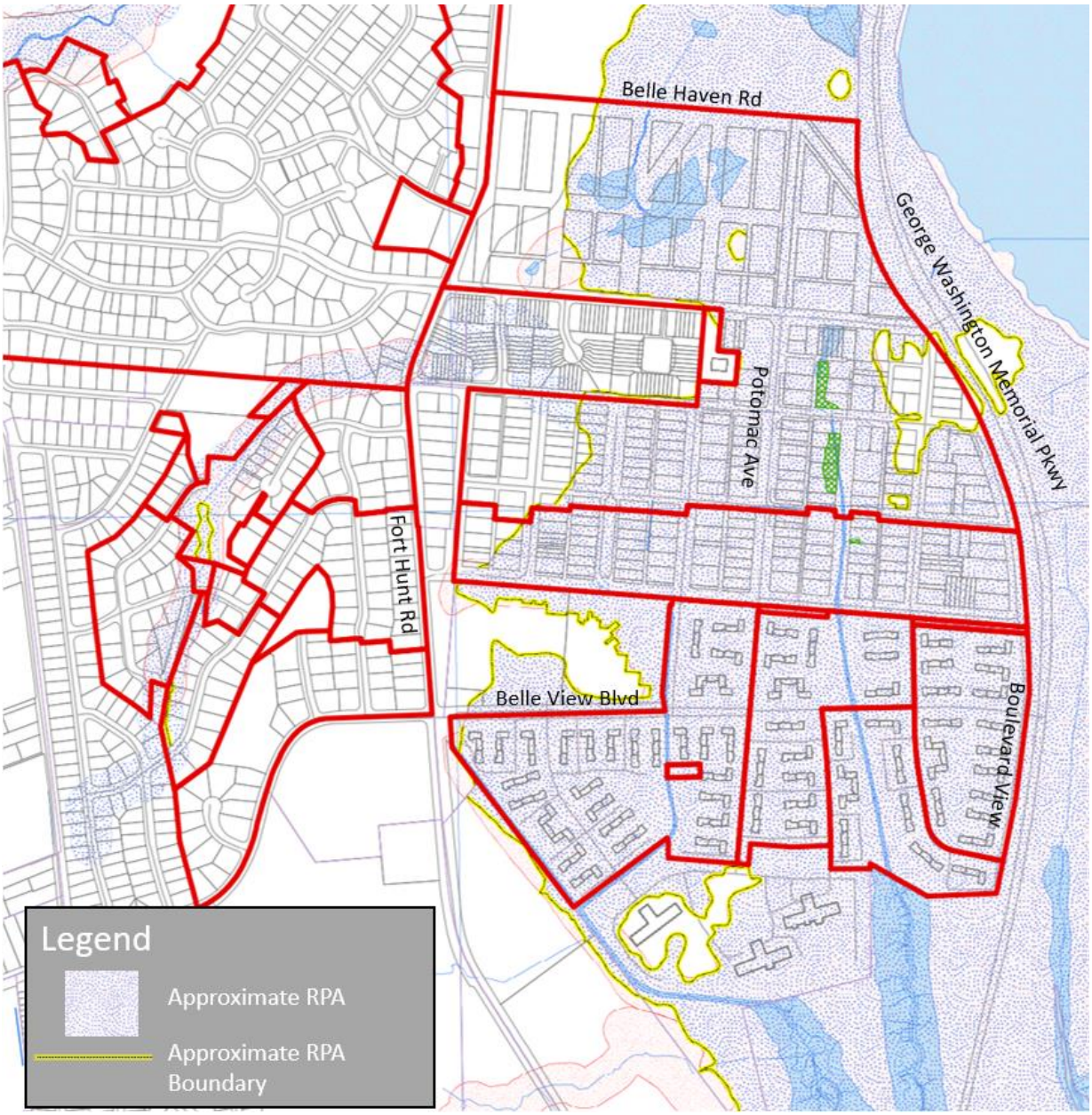
Comments

Department of Planning and Development

Water Resources Protection
The Environment Element of the Comprehensive Plan Policy Plan states that the protection and restoration of the ecological integrity of streams is expected in Fairfax County. In order to minimize the impacts that new development and redevelopment projects may have on County streams, the Comprehensive Plan encourages the protection of stream channels and buffer areas along stream channels, and the restoration of degraded stream channels and riparian buffer areas. (Fairfax County Comprehensive Plan, 2019 Edition, Policy Plan, Environment, Amended through 11-9-2021, Pages 7-9).

The Mount Vernon Planning District, located within Area IV, as defined by the County's Comprehensive Plan, includes substantial portions of the Cameron Run, Belle Haven, Little Hunting Creek, and Dogue Creek watersheds. The County has developed several recommendations to support stream protection and restoration, reduction of pollution flowing into the County's waterways, attainment of state and federal water quality standards, and the restoration of the Chesapeake Bay and its tributaries. These recommendations include the following for new development: improvements in stormwater facilities and management, including "*low impact development (LID) practices, projects to restore riparian buffers and streams, [and] outreach and education to improve residents' activities that affect water quality*." (Fairfax County Comprehensive Plan, 2017 Edition, Mount Vernon Planning District, Overview, Amended through 1-25-2022, Page 7). Sensitive areas such as tidal and non-tidal wetlands, streams, 100-year Floodplains, Resource Protection Areas (RPAs), and Environmental Quality Corridors (EQCs) are likely to be impacted by proposed Alternative #8. The proposed area of Alternative #8 experiences flooding from the Potomac River and includes RPA and floodplain areas. Below is a graphical depiction of the approximate location of RPAs in this area.

Approximate RPA Locations



Source: Fairfax County, Department of Planning and Development

Fairfax County recognizes that the USACE is not subject to the provisions of the Chesapeake Bay Preservation Ordinance (CBPO) or County policies. Environmental Quality Corridors (EQCs) as defined in the Policy Plan Element of Fairfax County's Comprehensive Plan should also be considered for preservation. Land areas that include all 100-year floodplains, areas of 15% or greater slopes adjacent to the floodplain, and all wetlands qualify for designation as

EQCs and should be considered for limited disturbance. (Fairfax County Comprehensive Plan, 2019 Edition, Policy Plan, Environment, Amended through 11-9-2021, Pages 15-18). This draft IFR/EA includes proposed environmental impact mitigation actions that would be prioritized for the project, which include sediment control during construction, minimizing impacts to the local Bald Eagle population through the use of buffers, and changes to water levels in nearby wetlands and streams.

Staff has the following recommendations for the USACE's consideration:

- Maintain vegetated buffers and improve stream water quality; minimize disturbance within floodplains, RPAs, and EQCs to the extent feasible; and include restoration of impacted RPAs using native plantings and the treatment and removal of non-native invasive vegetation.
- Strive to limit land disturbance activities through enhanced floodwall designs in sensitive areas, as described in the County's CBPO (Chapter 118 of the County Code), including conformance with the requirements for areas designated as RPAs.
- Exercise caution during construction for roads within vegetated areas. Such disturbance and vegetation removal would increase the vulnerability of soil to water and wind erosion and potentially result in the corresponding sedimentation and pollution of downstream watercourses during construction.
- Since large portions of the proposed development are within the FEMA 100-year floodplain, preservation and restoration practices are recommended, such as buffer restoration, which would include the reforestation of upland and riparian buffer areas. These practices help filter pollutants and reduce runoff by intercepting the water and increasing surface storage and infiltration.
- If any stormwater controls are required, these should include LID techniques such as bioretention facilities and grassed swales.
- Any tidal wetlands within the Mean Low Water and Mean High Water lines that may be disturbed should be restored with 'living shoreline' concepts to encourage nature-based stabilization techniques. Contiguous living shoreline stabilization projects allow for the highest likelihood of the continued longevity of and benefits to local subaqueous ecosystems.

Soils

The Mount Vernon Planning District "*is within the Coastal Plain geologic province. Consequently, soils are marginal for septic tank usage. Slippage-prone swelling clays underlie most of the district. Any development in areas with these conditions should be based on the latest technologies for stabilizing marine clays from soil slippage. Assurances which protect the county and affected properties should be provided."* (Fairfax County Comprehensive Plan, 2017Edition, Mount Vernon Planning District, Overview, Amended through 1-25-2022, Page 7).

There is the potential for Grist Mill-Woodstown Complex soils in the northern portions of the project site and Mattapex soils in southern areas. These soil types can be highly variable.

Unstable slopes can lead to serious land slippage. The seasonal high-water table is between 1½ and 3½ feet below the surface. Depth to hard bedrock ranges from 50 to more than 300 feet. Problematic clay soils may be present as well. USACE should evaluate the soil characteristics during a geotechnical evaluation in support of the proposed construction. Hydric soils that might be supportive of wetlands would be evaluated as part of the wetland delineation and permitting efforts. Staff recommends USACE continue to test and evaluate these problematic soils as the design and construction of this project progresses.

Forest Resources Policies and Impacts
The Comprehensive Plan anticipates that new development will include an urban forestry program and be designed in a manner that retains and restores meaningful amounts of tree cover, consistent with planned land use and good silvicultural practices. Good quality vegetation should be preserved and enhanced, and lost vegetation restored through replanting. (Fairfax County Comprehensive Plan, 2019 Edition, Policy Plan, Environment, Amended through 11-9-2021, Pages 17-18).

In order to ensure the viability of the proposed plantings, staff recommends tree protection, to include adequate supervision during construction, to ensure that tree protection measures are implemented as planned. Additionally, staff recommends that the project avoid the following, where feasible: significant changes to elevations (both "cut" and "fill" operations); changes to water flow; and excavation within the critical root zones of surrounding trees to be protected. Additionally, staff recommends vegetative screening of the proposed structures, where feasible, featuring native and non-invasive trees, shrubs, perennial grasses and grass-like plants, and forbs for each planting area in the project design. Fairfax County recently published Technical Bulletin 22-04, regarding seeding guidelines, to promote the use of native plant species and to limit the use of invasive plant species in seeding applications for soil stabilization, restoration, agriculture, turf, and landscaping (see Fairfax County Seeding Guidelines). Additionally, staff recommends soil rebuilding for areas impacted by construction to help ensure the viability of the proposed plantings.

Heritage Resources
Staff notes that in the Belle Haven area, there are no County designated historic overlay districts. However, one resource is located on the County Inventory of Historic Sites: the George Washington Memorial Parkway. This resource is also on the Virginia Landmarks Register and in the National Register of Historic Places. Additionally, the Belle Haven community, immediately adjacent to the proposal, is more than 50 years old. There is a potential for archaeological significance in this area. Staff has the following recommendations for the USACE consideration:

- Staff notes that the proposal may negatively impact the George Washington Memorial Parkway, which would be located on the river side (to the east) of the proposed flood walls. Staff recommends that future environmental analysis of the project consider locations both to the east and west of the George Washington Memorial Parkway for the

construction of the flood walls and levees to determine how to best respect the historic resource.

- Staff recommends that the Belle Haven/New Alexandria community be analyzed for further historic significance as part of any future environmental analysis, given that the community is more than 50 years old and an early suburb of Fairfax County.

Other Considerations
Only minimal vehicular and construction equipment operations would be anticipated during construction. The associated noise impacts would be considered temporary.

Department of Public Works and Environmental Services (DPWES)

Operation and Maintenance

- Pages V and 171 of the IFR/EA estimates annual operation and maintenance costs to be $16,000 for the floodwall, earthen levee, and pump stations. This cost seems very low. Fairfax County pays $585 per month for SCADA communication at the Huntington Levee and the electric bill can vary from $700 to $2,500 per month. These utility costs alone cost more than $16,000 per year for a single pump station. Additional staff resources should also be factored into the maintenance cost. DPWES currently have pump station staff onsite at Huntington Levee and New Alexandria Pump Station during large storm events (12-hour shifts). DPWES may need additional personnel to staff the proposed pump stations and floodwall during major storm events.
- Page 19 of Appendix G and Page 121 of the IFR/EA state, "It is only during times of extreme flooding due to a coastal event or a massive storm occurring within the entire Potomac River watershed that the pump stations would be utilized. During these scenarios, the water level of the Potomac River would be so high that it would reach the riverside of the floodwall, which would result in the closure of the flap and sluice gates of the floodwall's drainage pipes." How will the existing pump station and tide gate function during "massive" storm events in conjunction with the proposed floodwall and pump stations? Will they be decommissioned if the project moves forward?
- Figure E-3 in the draft IFR/EA shows the proposed floodwall terminating at the northern end adjacent to the existing F Street Wastewater Pumping Station and the levee at the southern end terminating at the existing River Towers Wastewater Pump Station. The design should ensure that the floodwall and levee do not create adverse conditions that could impede normal operations or otherwise impact the existing wastewater pump stations.

Land Acquisition

- Page V of the IFR/EA and Appendix F: Real Estate Plan estimates lands and damages real estate costs at $1,167,000. If the wall is largely located on private land (i.e., Belle View Condos, River Towers, and private residential properties) then this estimate seems very low.
- A portion of the proposed floodwall appears to be in Virginia Department of Transportation (VDOT) Right-of-Way. Has USACE initiated coordination with VDOT on the IFR/EA?

Trees

- Tree resources are only mentioned in the assessment with respect to minimizing impacts to birds. Trees are a valuable resource, providing numerous environmental services and ecological, economic, social, and human health benefits. Not only should the proposed floodwall avoid removal of trees, but consideration should be given to protecting trees with other infrastructure from inundation during flooding events.

Department of Transportation

In addition to the safety and financial benefits to Belle Haven residents from reduced flood risk, Alternative 8 is expected to improve the flood resilience of roads, bus service (Connector routes 101 and 152), and active transportation within the community. Alternative 8 would decrease flooding impacts and increase functioning of road infrastructure (and bus service) during flood events. Alternative 8 may propose to close the intersections of Belle Haven Road-10th Street-George Washington Memorial Pkwy (GWMP) and Belle View Boulevard-GWMP, which would cause significant impacts to the vehicle, transit, and active transportation in this community. A future design should clarify the type of road closure structures that are intended for this project. If temporary closures will not be used, and various transportation crossings are closed permanently, then staff have the following comments:

- The design should be reviewed to determine if pedestrian and bicycle access across the GWMP at Belle Haven Road-10th Street-GWMP and/or Belle View Boulevard-GWMP locations can be maintained, or nearby alternative routes can be improved and/or constructed. If this is not possible, Belle Haven residents will be significantly inhibited from accessing the GWMP trail, which is a major transportation route and recreation amenity. The alternative route for accessing the trail to the south is Westgrove Boulevard-Park Terrace Dr-Tulane Dr – 1.25 miles. The alternative route for accessing the trail to the north is Fort Hunt Road-Richmond Highway-Richmond Highway/Old Town ramp trail – 1.75 miles. Notably, Fort Hunt Road lacks a sidewalk or trail between Belle Haven Road and Huntington Avenue and would have to be improved to provide an acceptable alternative.

  - This would also inhibit pedestrians from accessing two bus stops for the Washington Metropolitan Area Transit Authority Route 11C, which are located along the GWMP.

- The proposal to sever the vehicle connections at the Belle Haven Road-10th Street-GWMP and Belle View Boulevard-GWMP intersections, would likely result in negative impacts to vehicle operations. Belle Haven Road (7,200 AADT) and Belle View Boulevard (8,100 AADT) are both secondary roads that carry traffic to GWMP, Fort Hunt Road, and Richmond Highway. If the GWMP intersections are closed, all traffic leaving the Belle Haven community must leave the community accessing Fort Hunt Road and most northbound and southbound traffic would be rerouted to Fort Hunt Road. This could increase delay at the Fort Hunt Road-Belle View Boulevard/Beacon Hill Road, Fort Hunt Road-Belle Haven Road, Fort Hunt Road-Huntington Avenue, and Fort Hunt Road-Richmond Highway intersections. Traffic operations should be evaluated, and appropriate mitigations provided if the intersections are closed. https://www.virginiadot.org/info/resources/Traffic_2019/AADT_029_Fairfax_2019.pdf

- If vacation and abandonment of road right-of-way are eventually required, they will proceed under Virginia State Codes §15.2-2272(2) and §33.2-909. Fairfax County Department of Transportation processes for vacation and abandonment must be followed, which would include review by utility companies, the Virginia Department of Transportation (VDOT), and other Fairfax County agencies. Closing intersections may also necessitate building VDOT-approved turnarounds.

- Please note that the Belle Haven Road-10th Street-GWMP and Belle View Boulevard-GWMP intersections were restriped during Fall 2021 as part of the *Southern George Washington Memorial Parkway Safety Study*. The intersection design changes were intended to improve safety over the old design, but the data on the crash risk of the new intersection condition is limited due to the short timeframe. https://www.nps.gov/gwmp/learn/management/south-parkway-safety-study.htm

Park Authority (FCPA)

The provided documents show the southern end of an earthen levee extending into Westgrove Park. Westgrove Park will experience direct impacts of lost land, recreation facilities, vegetation, and habitat, increased storm water discharge, invasive species, as well as wildlife habitat quality impacts. Therefore, FCPA staff would like to review all future documents and plans at the earliest opportunity as the project progresses. Additionally, the FCPA requests the opportunity to review the future submission of the Section 106 of the National Historic Preservation Act consultation as it progresses.

Thank you for the opportunity to comment on the IFR/EA. If you have any questions regarding these comments, please contact Craig Carinci at craig.carinci@fairfaxcounty.gov or 703-324-5500.

Sincerely,

Craig Carinci
Director
Stormwater Planning Division
Department of Public Works and Environmental Services

Cc: Kelly Atkinson, Branch Chief, Environmental and Development Review Branch, Department of Planning and Development
Katie Hermann, Planner III, Environmental and Development Review Branch, Department of Planning and Development
Zachary Krohmal, Transportation Planner II, Transportation Planning Division, Department of Transportation
Andy Galusha, Landscape Architect II, Park Authority
Hugh Whitehead, Urban Forest III, Urban Forest Management Division, Department of Public Works and Environmental Services

July 31, 2022

Katie Perkins, Project Manager,
U.S. Army Corps of Engineers,
Baltimore District (CENAB)-OPN
DC-Metro-CSRM-Study@usace.army.mil

SUBJECT: EA-ACOE IGR-2022-00006, Coastal Storm Risk Management (Army Corps of Engineers), Metropolitan Washington District of Columbia Draft Integrated Feasibility Report & Environmental Assessment

The Fairfax County Park Authority (FCPA) has reviewed the Metropolitan Washington District of Columbia Draft Integrated Feasibility Report & Environmental Assessment (DIFR & EA). The DIFR & EA identifies the Tentatively Selected Plan (TSP) as Alternative 8, which includes plan components showing the southern end of the "Belle Haven Floodwall and Levee" extending approximately 100 linear feet into FCPA's Westgrove Park.

If this levee is constructed as shown in the TSP, Westgrove Park will experience direct impacts of lost land, recreation facilities, public access, vegetation, and habitat, increased storm water discharge, invasive species, as well as wildlife habitat quality impacts. The DIFR & EA includes limited information regarding Westgrove Park in the analysis of environmental effects and consequences. FCPA requests further coordination and consultation to ensure impacts to Westgrove Park by the proposed project are avoided, minimized, or mitigated.

Effort should be made to minimize the impact to parkland from clearing and land disturbance. Mitigation should occur on parkland to the greatest extent possible. Land disturbance from stormwater projects, including levees typically results in an increase in invasive species coverage without proper treatment prior to and following construction. To minimize the impacts of this project to parkland and the native habitats of Fairfax County, all vegetation impacted by this project should be replaced with only locally common species native to Fairfax County, following county standards. This includes woody plants and shrubs, as well as seed mixes for short and long-term soil stabilization.

1. Woody planting specifications should include at least a 4-year warranty with three annual monitoring events, annual control of non-native invasive plant species by a licensed contractor, and annual replanting to maintain a minimum 80% survival rate of all woody plantings.
2. Shrubs should be planted around the periphery of the levee structure to provide increased bank stabilization.

3. For restoration on parkland, herbaceous planting specifications will be provided by Fairfax County Park Authority. Ideally, the same native seed mix would be used along the entire project length to reduce invasive plant impacts throughout.

FCPA is concerned that further engineering requirements of this project will pose additional adverse impacts on parkland than is currently known. To accurately determine the extent of the proposed impacts to Westgrove Park and the appropriate amount of mitigation, a full plan set is needed. This plan set will need to show engineered alignments of the levee, stream/wetland restoration, tree canopy impacts, stormwater management, utility relocations, and limits of disturbance. The plan set will also need to show all construction access routes, necessary staging areas, land takings, permanent and temporary easements, revegetation plantings, and replacement of all impacted park signage, fences, and recreation features. All temporary and permanent easements, takings, and maintenance agreements will need to be negotiated at a later date, based on additional engineering.

Westgrove Park, including the proposed location for the end of the levee, may be the location of a demolished Wastewater Treatment Center, elements of which may still be present under potentially unstable soils. Further site analysis is recommended to verify the site's former use and to determine appropriate geotechnical requirements.

Since this land is owned by the Park Authority, the applicant must first acquire a Right of Entry License, Easement, and/or Construction Permit prior to performing any site work or studies on parkland. This includes, but is not limited to surveying, test boring, wetland flagging, clearing, grading, geotechnical studies, utility relocations, staging, construction, or any other related activities. Land rights on Park Authority owned property are requested from the Easement Coordinator, Fairfax County Park Authority, Planning and Development Division, 12055 Government Center Parkway, Suite 421, Fairfax, Virginia 22035. The main telephone number is (703) 324-8741. Please advise any contractors and subcontractors of this requirement.

A maintenance agreement will be needed for all areas and facilities within the easements conveyed by the Park Authority to the applicant relating to the construction, operation, and maintenance of the levee and related infrastructure. Such maintenance shall be as required with the standard maintenance terms set forth in such easements and by applicable governmental requirements relating to the operation of the levee. To allow staff an adequate time to distribute, review, and compile comments, the Park Authority requests that cases be sent directly to the Park Authority Planning and Development Division, with a minimum of 30 days to review each submission.

The provided report references consulting with Alexandria Parks and Recreation, the National Park Service, as well as the Fairfax County Department of Public Works and Environmental Services, Fairfax County Department of Planning and Development (Planning and Evaluation Branch), and Fairfax County Fire and Hazardous Materials Bureau. While there is a reference to the Westgrove Park Master Plan, there is no mention of consultation with FCPA. Since the proposed levee impacts an FCPA park, the applicant will need to coordinate with the FCPA Planning and Development Division.

Table 2-9. Recreation Amenities in the Study Area on page 35 of the DIFR & EA, lists several nearby parks including Mount Vernon District Park. However, it does not list Westgrove Park,

which will contain part of the proposed levee. Please include Westgrove Park in Table 2-9 and include the potential impacts to Westgrove Park in the analysis for this project.

Page 53 of the Draft Integrated Feasibility Report and Environmental Assessment states that "Fairfax County constructed a levee along Cameron Run, in front of Huntington Park." Please update this reference to say "… through Huntington Park."

Due to the above listed concerns, FCPA staff would like to review all future documents and plans at the earliest opportunity as the project progresses. Thank you for the opportunity to comment on this DIFR & EA report. We look forward to participating in the study as it moves forward. The Park Authority's point of contact for this project is Andy Galusha, Park Planner, who can be reached at 703-324-8755 or at Andrew.Galusha@fairfaxcounty.gov.

Sincerely,

Samantha Hudson, Manager, Park Planning Branch, Planning and Development Division (PDD)

eCopy: Aimee Vosper, Deputy Director/CBD
John Burke, Manager, Natural Resources Branch
Dan Sutherland, Manager, Grounds Management, Park Operations Division
Cindy McNeal, Project Coordinator, Real Estate Services Branch
Randall Farren, Development Review Section Chief, Park Planning Branch, PDD
Andy Royse, Engineer IV, Real Estate Services Branch, PDD
Lynne Johnson, Planning Tech, Park Planning Branch
Kelly Atkinson, Chief, Environment and Development Review Branch, DPD
Katie Hermann, Environmental Planner, DPD
Andy Galusha, Park Planner, Park Planning Branch

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From:	Brian Philiben
To:	May, Kristina K CIV USARMY CENAB (USA)
Cc:	Wollard, Gregg; Rutyna, Mark; Neumann, Gil; Jitin Sahni
Subject:	[URL Verdict: Neutral][Non-DoD Source] RE: Notice of Availability of Draft Report and Environmental Assessment - DC Coastal Storm Risk Management Study
Date:	Friday, August 12, 2022 3:49:50 PM
Attachments:	MWAA Revised Alternative.pdf

Hi Kristina,

Please see comments on the Draft Storm Risk Management Study below. I have attached an exhibit to accompany these comments. Please let us know if you would like to coordinate further discussions. Thanks, have a great weekend.

Brian

Global Comments:

- MWAA would like the opportunity to have further discussions and/or web conference calls to review potential measures applicable to DCA, the limitations and logistics involved in implementation, and capital costs associated with proposed measures. MWAA would like to ensure the US Army Corps is fully aware of the constraints that exist at DCA.
- The measures included in Alternative 4B would lead to capital expenditures that MWAA does not have funding allocated for these capital improvements. Are federal funds available for any recommendations that are adopted? It appears Army Corps is recommending to raise levee road, MWAA Concerns include: 1. Operational capabilities of three runways cannot be impacted, 2. MWAA has concerns over implementation and constructability, 3. MWAA has concerns of capital expenditures for Alternative 4b.
- It is not clear what a stop log closure is. Additional information is needed. Are these relocatable/temporary and if so what is required to make them operational? What is the capital cost to incorporate? What is the proposed new elevation of Levee Road?

Planning Scenario Comments:

- Need to fully understand flood risk scenario used for planning, likelihood, and potential flood depths specific to DCA (1 percent Annual Exceedance Probability **Figure 3-2, PDF page 109**). What year storm is the 'design storm'?
- Need to fully evaluate critical infrastructure that needs to be protected during storm surge. Equipment that would be difficult to recover quickly to resume operations:
    - Electronic infrastructure
    - Fuel farm
    - Localizer
    - EMAS
    - Airport ingress/egress

Runways would not be able to operate with "stop log closures" as shown, so would stop log closures be necessary? Alternatively, measures could allow for runways to be temporarily inundated and focus on protecting critical infrastructure.

- Existing levee road along east side of DCA is shown as not being inundated during 1 percent Annual Exceedance Probability (Report **Figure 3-2**). Therefore, is there a need to raise levee road in these areas? Could improvements concentrate in south and north airport areas to protect critical infrastructure?
- **Figure 3-2** Provide further clarification on the different flood depths (blue/light blue/dark blue).

Alternative 4B Comments/Concerns:

- Need to fully understand logistics of "deployable" "stop log closures". A description of these measures is needed. These may not be feasible for MWAA to implement. May result in unacceptable runway closure periods. Particularly difficult to deploy if levee road is raised.
- Potential Permanent Alternatives to "Deployable" measures:
    - Need to look into additional opportunities to raise levee road or construct floodwalls around Runway 1-19 ends, at the outer end of the Runway Safety Areas.
    - Possibly raise Runway Safety Areas
    - Additional permanent floodwalls may be possible
- Need to understand logistics of implementation/construction of Alternative 4B. How would implementation impact airport operations? Barges and cranes are included in construction description (**PDF page 152**). These may require airspace analysis.
- Staging Area as shown may not be feasible. A staging area on a different part of the airport probably would be more feasible.
- **Figure 3-15** illustrates stop log closures/deployable measures at the runway ends. These measures are illustrated crossing runway ends, EMAS beds, and runway safety areas. These areas at runway ends are critical to aircraft operations at DCA. Measures should be shown at the furthest perimeter of DCA around runway ends to allow for safe aircraft operations. Additionally, elevations at these areas may allow for floodwalls up to a certain elevation. See the attached exhibit. Further discussions with MWAA are recommended to understand airfield and airspace constraints.

Brian Philiben | Managing Consultant

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From: May, Kristina K CIV USARMY CENAB (USA) <Kristina.K.May@usace.army.mil>
Sent: Monday, August 1, 2022 3:23 PM
To: Brian Philiben <bphiliben@ricondo.com>
Cc: Wollard, Gregg <Gregg.Wollard@MWAA.com>; Rutyna, Mark <Mark.Rutyna@mwaa.com>; Neumann, Gil <Gil.Neumann@MWAA.com>; Jitin Sahni <jsahni@ricondo.com>
Subject: RE: Notice of Availability of Draft Report and Environmental Assessment - DC Coastal Storm Risk Management Study

Brian,

Yes - MWAA can have until August 12 to submit comments.

Thanks,
Kristina May
Biologist, Planning Division

Baltimore District, U.S. Army Corps of Engineers
Office: 410-962-6100
Cell: 410-920-6507
2 Hopkins Plaza, Baltimore, MD 21201
Email: kristina.k.may@usace.army.mil

From: Brian Philiben <bphiliben@ricondo.com>
Sent: Monday, August 1, 2022 12:09 PM
To: May, Kristina K CIV USARMY CENAB (USA) <Kristina.K.May@usace.army.mil>
Cc: Wollard, Gregg <Gregg.Wollard@MWAA.com>; Rutyna, Mark <Mark.Rutyna@mwaa.com>; Neumann, Gil <Gil.Neumann@MWAA.com>; Jitin Sahni <jsahni@ricondo.com>
Subject: [URL Verdict: Neutral][Non-DoD Source] RE: Notice of Availability of Draft Report and Environmental Assessment - DC Coastal Storm Risk Management Study

Hi Kristina,

As mentioned below, Metropolitan Washington Airports Authority (MWAA) has had personnel turnover as well as absences due to COVID/COVID protocol. With that in mind, MWAA is requesting additional review time for the DC Coastal Storm Risk Management Study, to the end of next week (August 12), if possible.

Please let us know if this would be possible and if you have any questions/concerns. Thank you for your understanding.

Brian Philiben | Managing Consultant

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From: May, Kristina K CIV USARMY CENAB (USA) <Kristina.K.May@usace.army.mil>
Sent: Wednesday, June 29, 2022 8:25 AM
To: Brian Philiben <bphiliben@ricondo.com>
Subject: RE: Notice of Availability of Draft Report and Environmental Assessment - DC Coastal Storm Risk Management Study

Thanks for letting me know. I updated our contact list for this study.

Kristina May
Biologist, Planning Division

Baltimore District, U.S. Army Corps of Engineers
Office: 410-962-6100
Cell: 410-920-6507
2 Hopkins Plaza, Baltimore, MD 21201
Email: kristina.k.may@usace.army.mil

From: Brian Philiben <bphiliben@ricondo.com>
Sent: Tuesday, June 28, 2022 10:02 AM
To: May, Kristina K CIV USARMY CENAB (USA) <Kristina.K.May@usace.army.mil>
Subject: [URL Verdict: Neutral][Non-DoD Source] RE: Notice of Availability of Draft Report and Environmental Assessment - DC Coastal Storm Risk Management Study

Hi Kristina,

Tom Wasaff is no longer with the Metropolitan Washington Airports Authority (MWAA). For the time being, please add me to your distribution list on this project as I will be filling in as interim Environmental Planning staff with MWAA. Please continue to include Gregg Wollard on correspondence as well.

Thank you,

Brian Philiben | Managing Consultant

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From: Wollard, Gregg
Sent: Monday, June 27, 2022 8:36 AM
To: Brian Philiben <bphiliben@ricondo.com>
Cc: Jitin Sahni <jsahni@ricondo.com>
Subject: FW: Notice of Availability of Draft Report and Environmental Assessment - DC Coastal Storm Risk Management Study

Brian-

Not sure if you are plugged into this or not. Tom was our rep. If not, please reach out to Kristina and have her put you on the distro list and future meetings. This is something we need to keep an eye on since it will have impacts at DCA.

From: May, Kristina K CIV USARMY CENAB (USA) <Kristina.K.May@usace.army.mil>
Sent: Monday, June 27, 2022 8:28 AM
To: LaRouche, Genevieve <genevieve_larouche@fws.gov>; Pinkney, Fred <fred_pinkney@fws.gov>; Christine Vaccaro - NOAA Federal <christine.vaccaro@noaa.gov>; David.L.O'Brien@noaa.gov; nmfs.gar.esa.section7@noaa.gov; Karen Greene - NOAA Federal <karen.greene@noaa.gov>; Traver, Carrie <Traver.Carrie@epa.gov>; Joseph, Maureen <Maureen_Joseph@nps.gov>; Virta, Matthew <Matthew_Virta@nps.gov>; Mocko, Robert <Robert_Mocko@nps.gov>; Gorder, Joel S <Joel_Gorder@nps.gov>; Young, Allison M <Allison_Young@nps.gov>; susan.stafford@faa.gov; Wollard, Gregg <Gregg.Wollard@MWAA.com>; Keough, Dorothy E <dorothy.e.keough.civ@mail.mil>; bradley.s.hancock.civ@mail.mil; laura.grape@fairfaxcounty.gov
Cc: Perkins, Catherine J (Katie) CIV USARMY CENAB (USA) <Catherine.J.Perkins@usace.army.mil>; Metallo, Amber C CIV USARMY CENAB (USA) <Amber.C.Metallo@usace.army.mil>
Subject: RE: Notice of Availability of Draft Report and Environmental Assessment - DC Coastal Storm Risk Management Study

The public and agency comment period has been extended for an additional 30 days. Please provide comments by July 31, 2022.

Thank you,
Kristina May
Biologist, Planning Division

Baltimore District, U.S. Army Corps of Engineers
Office: 410-962-6100
Cell: 410-920-6507
2 Hopkins Plaza, Baltimore, MD 21201
Email: kristina.k.may@usace.army.mil

From: May, Kristina K CIV USARMY CENAB (USA)
Sent: Tuesday, May 31, 2022 3:00 PM
To: LaRouche, Genevieve <genevieve_larouche@fws.gov>; Pinkney, Fred <fred_pinkney@fws.gov>; Christine Vaccaro - NOAA Federal <christine.vaccaro@noaa.gov>; David.L.O'Brien@noaa.gov; nmfs.gar.esa.section7@noaa.gov; Karen Greene - NOAA Federal <karen.greene@noaa.gov>; Traver, Carrie <Traver.Carrie@epa.gov>; Joseph, Maureen <Maureen_Joseph@nps.gov>; Virta, Matthew <Matthew_Virta@nps.gov>; Mocko, Robert <Robert_Mocko@nps.gov>; Gorder, Joel S <Joel_Gorder@nps.gov>; Young, Allison M <Allison_Young@nps.gov>; susan.stafford@faa.gov; gregg.wollard@mwaa.com; Keough, Dorothy E <dorothy.e.keough.civ@mail.mil>; bradley.s.hancock.civ@mail.mil; laura.grape@fairfaxcounty.gov
Cc: Perkins, Catherine J (Katie) CIV USARMY CENAB (USA) <Catherine.J.Perkins@usace.army.mil>; Metallo, Amber C CIV USARMY CENAB (USA) <Amber.C.Metallo@usace.army.mil>
Subject: Notice of Availability of Draft Report and Environmental Assessment - DC Coastal Storm Risk Management Study

Greetings,

The Metropolitan Washington, District of Columbia, Coastal Storm Risk Management Feasibility Study Draft Integrated Feasibility Report and Environmental Assessment is available for public review for a period of 30 days. The documents are available via the USACE website at: https://www.nab.usace.army.mil/DC_Coastal_Study/. Please submit comments to: DC-Metro-CSRM-Study@usace.army.mil by June 30, 2022.

The U.S. Army Corps of Engineers, Baltimore District and the non-federal sponsor, the Metropolitan Washington Council of Governments, will hold a public meeting on June 14, 2022 at Belle View Elementary School from 6:00 pm to 8:00 pm to present the draft report and receive comments.

Please see the attached Public Notice for additional details.

Thank you,
Kristina May
Biologist, Planning Division

Baltimore District, U.S. Army Corps of Engineers
Office: 410-962-6100
Cell: 410-920-6507
2 Hopkins Plaza, Baltimore, MD 21201
Email: kristina.k.may@usace.army.mil

USACE RESPONSES TO AGENCY COMMENTS

Comments Received from Arlington County during the Public Review of the Draft Report

Emailed by Jennifer Tastad jtastad@arlingtonva.us on 22 July 2022

USACE Initial Responses in Red

1. Will the floodwall be located on the northern or southern side of the trail? Will the trail need to be closed during construction, and if so, where will the detour be located?
   The floodwall would be on the northern side of the trail and may have the security fence for the WPCP placed on top of it based on previous discussions. It is likely that the trail would be closed during construction, but a more definitive footprint and laydown for construction materials would be determined during the design phase.

2. The wall will cross several existing stormwater outfalls to Four Mile Run, and possibly sanitary sewer and/or water lines, particularly as it bends towards Glebe Road. Will these utilities require relocation?
   Additional coordination with our Real Estate office would occur during feasibility level design (November 2022-September 2023) to determine if any relocations are anticipated for this project.

3. The existing Four Mile Run Flood Control Project requires regular maintenance, which will need to be coordinated with construction of the proposed floodwall.
   Acknowledged.

4. The wall will impact the FEMA floodplain in certain areas.
   We did not compare how riverine flooding from FEMA Flood Insurance Rate Map (FIRM) will be impacted by the proposed floodwalls along Four Mile Run. We can do some review of FEMA floodplain and figure out the impact as necessary.

5. The Dominion project, which will soon be under construction, begins just east of the end of the proposed floodwall (at the substation on S Eads St.). Work at the WPCP will need to coordinated with them.
   Acknowledged. The anticipated start of construction (pending receipt of design and constructed funds) is expected to be in the late 2020s.

6. This area of Four Mile Run was part of a "living shoreline" enhancement approximately 6 years ago. Components of this project included public art installed on the metal fence surrounding the WPCP, a public art bench (imported from the Netherlands) located along this fence, an observation platform, as well as fish murals painted occasionally along the trail. These items, as well as the shoreline itself, are all likely to be impacted by the proposed floodwall and should be protected/relocated.
   Acknowledged. It would be helpful to see a map/figure with these components so we can determine whether they would need to be relocated.

7. Depending on the exact locations of the transition points between wall heights, there is some concern that the wall may not be high enough.

The top of the wall will be a constant elevation (14.3 ft relative to NAVD88), which is based on the 500-year Water Surface Elevation with approximately 95% confidence level and intermediate Sea Level Change through 2080. The wall height (stick up above existing ground) will vary along the length of the project but all transitions and overall elevation should be sufficient to meet the 14.3 ft Level of Performance identified in the Study.

8. The wall will block off the natural overland flow path from approximately 61.5 upstream acres that currently runoff directly to Four Mile Run. During a future predicted large storm event (500-year flood in the year 2070), it is estimated that up to almost 3 million cubic feet of runoff could accumulate behind the wall. The project will need to include some type of detention facility to temporarily store this water, or provide a one-way valve/louvre system in the wall to allow for upstream runoff to pass through, without allowing rising stream channel levels to flood the plant. The addition of these features may affect the cost-benefit analysis for the project.
   We do not have any schedule for the interior flooding analysis yet but will be completed before the feasibility study is completed. We can look into this interior flooding issue when detailed interior flooding analysis is performed in future.

9. It was indicated during the public meeting that coastal surge with sea level rise was used for analysis, as it was more conservative than riverine flooding. We would be interested to know how the proposed floodwall performs during a joint probability analysis.
   This study is focused on the coastal storm risk. We did not perform joint probability analysis for both coastal and riverine flooding. We can perform joint probability analysis before the feasibility study is finalized.

VADWR Comments	USACE Responses
To protect anadromous fish, recommend TOY restriction for any in-water work from February 15 - June 30 in Four Mile Run and the Potomac River and in any tributaries in which work sites are located within one river mile upstream of Four Mile Run and the Potomac River.	No in-water work will occur as part of the Recommended Plan. The Recommended Plan is the construction of a floodwall at the Arlington Water Pollution Control Plant (WPCP). Work at Belle Haven has been removed from the Recommended Plan.
Recommend that all tree removal and ground clearing adhere to a TOY restriction protective of resident and migratory songbird nesting from March 15 - August 15.	USACE will make a best effort to avoid all tree removal and ground clearing from March 15 - August 15.
Recommend continued investigation into long-term effects that the altered hydrology and sedimentation patterns might have on wetland and riverine resources including wildlife, and application of the best available science on the ecological impacts of the TSP.	USACE is currently performing an interior drainage analysis for the Recommended Plan (Arlington WPCP). This analysis represents all water runoff, seepage, and water collection on the landward side of the floodwall. This analysis identifies and demonstrates potential runoff paths from the impacted drainage areas.
Recommend conducting any in-stream activities during low or no-flow conditions, using non-erodible coffer dams or turbidity curtains to isolate the construction area, blocking no more than 50% of stream flow at any given time, stockpiling excavated material in a manner that prevents reentry into the stream, restoring orginal streambed and streamback contours, revegetating barren areas with native plants, and implementing strict sediment and erosion control measures.	No in-water work will occur as part of the Recommended Plan.
Recommend that in-stream work be designed and performed in a manner that minimizes impacts upon natural stream flow and movement of resident aquatic species. If a dam and pump-around must be used, we recommend it be used for as limited a time as possible and that water returned to the stream be free of sediment and excess turbidity.	No in-water work will occur as part of the Recommended Plan.
Recommend adherence to erosion and sediment controls during ground disturbance. To minimize potential wildlife entanglements resulting from use of synthetic/plastic erosion and sediment control matting, we recommend use of matting made from natural/organic materials such as coir fiber, jute, and/or burlap.	USACE acknowledges this comment and will addressed by the contractor.
To minimize harm to the aquatic environment and its residents resulting from use of the Tremie method to install concrete, installation of grout bags, and traditional pouring of concrete, we recommend that such activities occur only in the dry, allowing all concrete to harden and cure prior to contact with open water.	No in-water work will occur as part of the Recommended Plan.
Due to future maintenance costs associated with culverts, and the loss of riparian and aquatic habitat, we prefer stream crossings to be constructed via clear-span bridges. However, if this is not possible, we recommend countersinking any culverts below the streambed at least 6 inches, or the use of bottomless culverts, to allow passage of aquatic organisms. We also recommend the installation of floodplain culverts to carry bankfull discharges.	No in-water work will occur as part of the Recommended Plan.
Recommend using the Center for Conservation Biology (CCB) Eagle Nest Locator to determine if any active eagle nests are known in the project area. If active bald eagle nests have been documented in the project area, we recommend that the project proceed in a manner consistent with state and federal guidelines for protection of bald eagles; including coordination, if indicated, with the U.S. Fish and Wildlife Service regarding possible impacts upon bald eagles or the need for a federal bald eagle take permit.	Using the Center for Conservation Biology's Eagle Nest Locator, it was determined the two eagle nests are located in the Dyke Marsh wetlands adjacent to the Belle Haven alternative. Construction would occur outside of the primary and secondary buffers of the two eagle nests. No eagle nests are located within primary or secondary buffers of the Arlington WPCP. The project will be conducted in a manner consistent with state and federal guidelines for the protection of bald eagle and coordination with the U.S. Fish and Wildlife Service will be conducted prior to construction.

VADWR Comments	USACE Responses
To minimize overall impacts to wildlife and our natural resources, we offer the following comments about development activities: we recommend that the applicant avoid and minimize impacts to undisturbed forest, wetlands, and streams to the fullest extent practicable. Avoidance and minimization of impact may include relocating stream channels as opposed to filling or channelizing as well as using, and incorporating into the development plan, a natural stream channel design and forested riparian buffers. We recommend maintaining undisturbed naturally vegetated buffers of at least 100 feet in width around all on-site wetlands and on both sides of all perennial and intermittent streams. We recommend maintaining wooded lots to the fullest extent possible. We generally do not support proposals to mitigate wetland impacts through the construction of stormwater management ponds, nor do we support the creation of in-stream stormwater management ponds.	Table 4-3 in the report explains how the effects to each resource was minimized to the greatest extent practicable. If the effects could not be reduced, mitigation has been proposed. Mitigation does not include the construction of stormwater management ponds.
We recommend that the stormwater controls for this project be designed to replicate and maintain the hydrographic condition of the site prior to the change in landscape. This should include, but not be limited to, utilizing bioretention areas, and minimizing the use of curb and gutter in favor of grassed swales.	USACE acknowledges this comment and it will addressed by the contractor.
A number of species designated as Species of Greatest Conservation Need in Virginia's Wildlife Action Plan are likely to occur, if suitable habitat exists, in and around the project area. We recommend that the Virginia Wildlife Action Plan (available through www.bewildvirginia.gov) be reviewed to determine what threats are known to these species, what constitutes suitable habitat for these species, and how to best protect them and their habitats from harm.	The report has been updated to include information from the 2015 Virginia Wildlife Action Plan and an evaluation of effects to these species.

VADEQ Comments	USACE Responses
DEQ concurs that the proposal will be consistent to the maximum extent practicable with the CZM Program provided all applicable permits and approvals are obtained as described below in the Regulatory and Coordination Needs section.	Acknowledged.
Provided VWP, VMRC and Wetlands Board authorization is received, as required, for impacts to surface waters and/or wetlands, this project will be consistent to the maximum extent practicable with the Tidal and Non-tidal Wetlands enforceable policy of the Virginia Coastal Zone Management (CZM) Program (see Federal Consistency under the CZMA section above for additional information).	Acknowledged.
A Virginia Water Protection Permit (VWP) from DEQ may be required for impacts to surface waters. The VWP program at the DEQ Northern Regional Office (NRO) recommends the avoidance and minimization of surface water impacts to the maximum extent practicable. Even if there will be no intentional placement of fill material in jurisdictional waters, potential water quality impacts resulting from construction site surface runoff must be minimized. This can be achieved by using Best Management Practices (BMPs). The Corps should contact DEQ NRO VWP staff to determine the need for any permits prior to commencing work. Contact DEQ NRO (Christoph Quansey, VWP Permit Manager, 571-719-0843) to discuss the need for a VWP permit for this project.	Acknowledged. USACE will be in contact with DEQ regarding the need for a VWP permit for this project.
A permit may be required from the Fairfax County Wetlands Board for impacts associated with Belle Haven and Four Mile Run, and from VMRC for impacts associated with the Arlington Water Pollution Control Plant. Coordinate with VMRC (Mark Eversole, 757-247-8028) with questions regarding the need for tidal wetlands permits from the Fairfax County Wetlands Board and VMRC.	Acknowledged. USACE will be in contact with VMRC regarding the need for a tidal wetlands permit from the Fairfax County Wetlands Board and VMRC.
A permit from VMRC will be required for this proposed encroachment over jurisdictional subaqueous bottom. The VMRC is the clearinghouse for JPAs and it will distribute the application to participating agencies; contact VMRC (Mark Eversole, 757-247-8028) with questions regarding the JPA review process.	Acknowledged. USACE will be in contact with VMRC to dicsuss the pemit application process.
Provided the required VMRC subaqueous lands permit is obtained, the project will be consistent to the maximum extent practicable with the Subaqueous Lands enforceable policy of the Virginia CZM Program (see Federal Consistency under the CZMA section above for additional information).	Acknowledged.
The Corps and its authorized agencts conducting regulated land-disturbing activities on private and public lands in the state must comply with VESCL&R and Virginia Stormwater Management Law and Regulations (VSWML&R), including coverage under the general permit for stormwater discharge from construction activities, and other applicable federal nonpoint source pollution mandates (e.g. Clean Water Act-Section 313, federal consistency under the Coastal Zone Management Act). Clearing and grading activities, installation of staging areas, parking lots, roads, buildings, utilities, borrow areas, soil stockpiles, and related land-disturbing activities that result in the total land disturbance of equal to or greater than 10,000 square feet (2,500 square feet in a Chesapeake Bay Preservation Area) would be regulated by VESCL&R. Accordingly, the Corps must prepare and implement an erosion and sediment control (ESC) plan to ensure compliance with state law and regulations. Land-disturbing activities that result in the total land disturbance of equal to or greater than 1 acre (2,500 square feet in Chesapeake Bay Preservation Area) would be regulated by VSWML&R. Accordingly, the Corps must prepare and implement a Stormwater Management (SWM) plan to ensure compliance with state law and regulations. The ESC/SWM plan is submitted to the DEQ Regional Office that serves the area where the project is located for review for compliance. The Corps is ultimately responsible for achieving project compliance through oversight of on-site contractors, regular field inspection, prompt action against non-compliant sites, and other mechanisms consistent with agency policy. Erosion and sediment control, and stormwater management requirements should be coordinated with the DEQ Northern Regional Office (Mark Remsberg, 703-583-3874).	USACE will comply VESCL&R and Virginia Stormwater Management Law and Regulations. If needed, a General VPDES Permit for Discharges of Stormwater for Construction Activities will be obtained during the Pre-Construction, Engineering and Design Phase (PED Phase) of this project.

VADEQ Comments	USACE Responses
The operator or owner of a construction activity involving land disturbance of equal to or greater than 1 acre is required to register for coverage under the General VPDES Permit for Discharges of Stormwater from Construction Activities and develop a project specific stormwater pollution prevention plan (SWPPP). The SWPPP must be prepared prior to submission of the registration statement for coverage under the General Permit, and it must address water quality and quantity in accordance with the Virginia Stormwater Management Program Regulations. Construction activities requiring registration also include land disturbance of less than one acre of total land area that is part of a larger common plan of development or sale if the larger common plan of development will collectively disturb equal to or greater than one acre. The SWPPP must be prepared prior to submission of the registration statement for coverage under the general permit and the SWPPP must address water quality and quantity in accordance with the VSMP Permit Regulations.	If needed, a General VPDES Permit for Discharges of Stormwater for Construction Activities will be obtained during the Pre-Construction, Engineering and Design Phase (PED Phase) of this project.
Consider using permeable paving for parking and walkways where appropriate. Denuded areas should be promptly revegetated following construction work.	USACE acknowledges this comment and it will addressed by the contractor.
The project will be consistent to the maximum extent practicable with the Nonpoint Source Water Pollution enforceable policy of the Virginia CZM Program, provided the activities comply with the above requirements, and applicable permits are obtained as necessary	Acknowledged.
A construction project may require coverage under the VPDES General Permit for Petroleum Contaminated Sites, Groundwater Remediation, and Hydrostatic Tests (VAG83) for any hydrostatics tests on any new piping installed, or for any potential dewatering during construction if petroleum contamination is encountered. Coordinate with the DEQ NRO Water Permitting Program or visit DEQ's website at Discharge to Surface Waters - Virginia Pollutant Discharge Elimination System | Virginia DEQ to determine the applicability of the VAG83 permit. Coordinate with the DEQ NRO Water Permitting Program (Edward Stuart, 571-866-6184) for questions about the VAG83 permit applicability.	If needed, a VPDES General Permit for Petroleum Contaminated Sites, Groundwater Remediation, and Hydrostatic Tests (VAG83) will be obtained during the PED Phase of ths project.
Provided the VAG83 permit is obtained and adhered to, as necessary, the project will be consistent to the maximum extent practicable with the Point Source Water Pollution enforceable policy of the Virginia CZM Program	Acknowledged.
Provided adherence to the above requirements, the project will be consistent to the maximum extent practicable with the Chesapeake Bay Preservation Areas enforceable policy of the Virginia CZM Program	Acknowledged.
During construction, fugitive dust must be kept to a minimum by using control methods outlined in 9 VAC 5-50-60 et seq. of the Regulations for the Control and Abatement of Air Pollution. These precautions include, but are not limited to, the following: □Use e e ssi e te c e ic s for dust control; □□st ti use s s ic ite s t e c se e t t e i ust te i s □□ e i e e ui e t c e i te i s □□ t e s i e t c e it t e te i s e st eets e ie se i e ts esu ti s i e si	USACE acknowledges this comment and it will addressed by the contractor.

VADEQ Comments	USACE Responses
The submitted Draft Integrated Feasibility Report and EA shows no evidence that the Corps has considered the impacts of the proposed feasibility study and construction activities on locally-designated CBPA lands in the proposed project areas. While the CZMA Enforceable Policies section of the FCD includes considerations of Tidal and Non-Tidal Wetlands, Subaqueous Lands, Wildlife and Inland Fisheries, Point Source Air Pollution and Non-point Source Water Pollution, there is no mention made (and no analysis of) the Chesapeake Bay Preservation Areas enforceable policy. The proposed study area and the locations of proposed construction activities associated with the proposed floodwalls are both within locally-designated CBPA lands, and are as such subject to the Regulations. Requirement. Per 9VAC25-830-110 of the Regulations (Site-specific Refinement of Chesapeake Bay Preservation Area Boundaries), the applicant must confirm that (i) a reliable, site-specific evaluation is conducted to determine whether water bodies on or adjacent to the development site have perennial flow and (ii) RPA boundaries are adjusted, as necessary, on the site, based on this evaluation of the site. Per 9VAC25-830-140 1 vi of the Regulations (Development Criteria For Resource Protection Areas), land development activities that meet the definition of a flood control or stormwater management facility may be allowed on designated RPA lands if the proposed activities satisfy the conditions set forth in 9VAC25-830-140 1 e, including the following: i. that the local government has conclusively established that location of the facility within the RPA is the optimum location; ii. the size of the facility is the minimum necessary to provide necessary flood control or stormwater treatment, or both; iii. (if applicable) the facility must be consistent with a comprehensive stormwater treatment stormwater management plan developed and approved in accordance with 9VAC25-870-92 of the Virginia Stormwater Management Program (VSMP) regulations; iv. all applicable permits for construction in state and federal waters must be obtained from the appropriate state and federal agencies, such as the U.S. Army Corps of Engineers, DEQ, and the Virginia Marine Resources Commission; v. approval must be received from the local government prior to construction; and vi. routine maintenance is allowed to be performed on such facilities to assure that they continue to function as designed. Per 9VAC25-830-140 6, a Water Quality Impact Assessment (WQIA) shall be required for any proposed development within the RPA and for any other development in CBPAs that may warrant such assessment because of the unique characteristics of the site or intensity of the proposed use or development. The proposed project must also adhere to: (i) regulations promulgated pursuant to the Erosion and Sediment Control Law and the Virginia Stormwater Management Act; (ii) an erosion and sediment control plan and a stormwater management plan approved by the Department of Environmental Quality; or (iii) local water quality protection criteria at least as stringent as the above state requirements. To the degree possible and where applicable, the staging of equipment and supplies associated with all proposed land disturbing and land development activities should be outside of the RPA.	The EA has been updated to discuss the project within the Chesapeake Bay Preservation Area. Sections 2.4.13 (Existing and Future Without Project Conditions) and 4.2.12 (Effects) have been added to the EA. Tables 4-2 and 6-3 have also been updated to include the CBPA. The proposed project will be a flood control structure and will meet the conditions in 9VAC25-830-140 1 e. A Fairfax County Water Quality Impacts Assessment Application will be done during the Pre-Construction, Engineering and Design Phase of the project.
Fuel-burning equipment (boilers, generators, compressors, etc.) or any other air-pollution-emitting equipment may be subject to registration or permitting requirements under 9 VAC5-80, Article 6, Permits for New and Modified Sources.	USACE acknowledges this comment and it will addressed by the contractor.
If project activities include the open burning of construction material or the use of special incineration devices, this activity must meet the requirements under 9 VAC 5-130 et seq. of the Regulations for open burning, and may require a permit. The Regulations provide for, but do not require, the local adoption of a model ordinance concerning open burning. The applicant should contact local fire officials to determine what local requirements, if any, exist.	USACE acknowledges this comment and it will addressed by the contractor.

VADEQ Comments	USACE Responses
A precaution, which typically applies to road construction and paving work (9 VAC 5-45-780 et seq.), places limitations on the use of “cut-back” (liquefied asphalt cement, blended with petroleum solvents), and may apply to the project. The asphalt must be “emulsified” (predominantly cement and water with a small amount of emulsifying agent) except when specified circumstances apply. Moreover, there are time-of-year restrictions on its use from April through October in VOC emission control areas.	The paving specifications will be a part of the PED phase and VADEQ will have the opportunity to review the plan. We don't expect there to be asphalt replacement on public roads, only on private property and don't see this as a mjor issue.
The project involves a large volume of construction work. Take precautions to restrict the emissions of VOCs and NOx during construction, principally by controlling or limiting the burning of fossil fuels. For additional information and coordination, contact DEQ NRO, David Hartshorn at 571-408-1778.	USACE will take precautions to restrict the emissions VOCs and Nox during construction.
The project will be consistent to the maximum extent practicable with the Point Source Air Pollution enforceable policy of the Virginia CZM Program, provided adherence to the above requirements	Acknowledged.
Any soil or groundwater that is suspected of contamination or wastes that are generated during construction-related activities must be tested and disposed of in accordance with applicable federal, state, and local laws and regulations. All construction waste, including excess soil, must be characterized in accordance with the Virginia Hazardous Waste Management Regulations prior to disposal at an appropriate facility. It is the generator’s responsibility to determine if solid waste meets the criteria of a hazardous waste and is subsequently managed appropriately. For additional information concerning location and availability of suitable waste management facilities in the project area or if free product, discolored soils, or other evidence of contaminated soils are encountered, contact DEQ NRO, Richard Doucette at 571-866-6063.	USACE acknowledges this comment and it will addressed by the contractor.
If evidence of a petroleum release is discovered during implementation of this project, it must be reported to DEQ, as authorized by Virginia Code § 62.1-44.34.8 through 9 and 9 VAC 25-580-10 et seq. Contact DEQ NRO, Richard Doucette at 571-866-6063, for additional information and coordination.	USACE acknowledges this comment and it will addressed by the contractor.
All structures being demolished/renovated/removed must be checked for asbestos-containing materials (ACM) and lead-based paint (LBP) prior to demolition. If ACM or LBP materials are identified all federal and state requirements must be followed. Contact the DEQ Division of Land Protection and Revitalization (Carlos Martinez at 804- 350-9962) and the Department of Labor and Industry (Richard Wiggins, 540-562-3580 Ext. 131) for additional information. For additional information regarding these requirements, contact the Department of Professional and Occupational Regulation (804-367-8500).	There shouldn't be any lead based paint on the fence that will be removed since it was installed not that long ago. No asbestos-containing materials and lead-based paint is expected to be encountered.
DEQ recommends that the Army implement pollution prevention principles, including the reduction, reuse, and recycling of all solid wastes generated. All generation of hazardous wastes should be minimized and handled appropriately.	Acknowledged. Specifications will address this.
DLPR staff recommends a search (at least 200 ft. radius) of any land-based project areas using the following solid and hazardous waste databases to identify waste sites (including petroleum releases) in close proximity to those project areas: □□ i e t tecti e c e e si e Environmental Response, Compensation, and Liability Information System (CERCLIS) Database: Superfund Information Systems Information on hazardous waste sites, potentially hazardous waste sites and remedial activities across the nation, including sites that are on the National Priorities List (NPL) or being considered for the NPL: □ e su e u sites cu sites i e t □□ i e t se i i i i e t e ic ti ste s ti e itte i ste e e t ci ities Impaired Waters, Petroleum Releases, Registered Petroleum Facilities, Permitted Discharge (Virginia Pollution Discharge Elimination System Permits) Facilities, Resource Conservation and Recovery Act (RCRA) Sites, Water Monitoring Stations, National Wetlands Inventory: □ e i i i ect it s	Please refer to Section 2.4.6.1 of the main report for a discussion of petroleum releases for the study alternatives.

VADEQ Comments	USACE Responses
DEQ recommends that the use of herbicides or pesticides for construction or landscape maintenance should be in accordance with the principles of integrated pest management. The least toxic pesticides that are effective in controlling the target species should be used to the extent feasible. Contact the Department of Agriculture and Consumer Services at (804) 786-3501 for more information.	USACE acknowledges this comment and it will addressed by the contractor.
DCR's Division of Natural Heritage (DNH) searched its Biotics Data System (Biotics) for occurrences of natural heritage resources from the area outlined on the submitted map. Bell Haven Floodwall: Biotics documents the presence of natural heritage resources within the project boundary including a 100-foot buffer. However, due to the scope of the activity DCR does not anticipate that this project will adversely impact these natural heritage resources. Bell Haven Staging Area: According to the information currently in Biotics, natural heritage resources have not been documented within the submitted project boundary including a 100-foot buffer. The absence of data may indicate that the project area has not been surveyed, rather than confirm that the area lacks natural heritage resources. In addition, the project boundary does not intersect any of the predictive models identifying potential habitat for natural heritage resources. Arlington Water Pollution Control Plant Floodwall and Staging Area: According to the information currently in Biotics, natural heritage resources have not been documented within the submitted project boundary including a 100-foot buffer. The absence of data may indicate that the project area has not been surveyed, rather than confirm that the area lacks natural heritage resources. In addition, the project boundary does not intersect any of the predictive models identifying potential habitat for natural heritage resources. Contact DCR-DNH, Rene Hypes at (804) 371-2708, to secure updated information on natural heritage resources if the scope of the project changes and/or six months has passed before the project is implemented, since new and updated information is continually added to the Biotics Data System.	Acknowledged.
DCR found that the proposed project will not affect any documented state-listed plants or insects.	Acknowledged.
There are no State Natural Area Preserves under DCR's jurisdiction in the project vicinity.	Acknowledged.
Contact DCR-DNH to secure updated information on natural heritage resources if the scope of the project changes and/or six months has passed before it is utilized. New and updated information is continually added to the Biotics Data System.	Acknowledged.
Projects conducted by federal agencies within the Special Flood Hazard Area must comply with federal Executive Order 11988: Floodplain Management. To find flood zone information, use the Virginia Flood Risk Information System (VFRIS): www.dcr.virginia.gov/vfris	Acknowledged.
For federal projects, the applicant/developer is encouraged to reach out to the local floodplain administrator and comply with the community's local floodplain ordinance.	Working with the local sponsor on this study. Project is in compliance with the local floodplain ordinance. Purpose of the project is to mitigate flooding.
DHR requests that the Corps continue to consult directly with DHR, as necessary, pursuant to Section 106 of the National Historic Preservation Act (as amended) and its implementing regulations codified at 36 CFR Part 800 which require Federal agencies to consider the effects of their undertakings on historic properties.	USACE has consulted and is consulting with the VA DHR (VA SHPO) for this project to fulfill Section 106 responsibilities.
We have several pollution prevention recommendations that may be helpful in the implementation of this project: □□ si e e i e t tt i utes when purchasing materials. For example, the extent of recycled material content, toxicity level, and amount of packaging should be considered and can be specified in purchasing contracts. □□ si e c t ct s c it e t t t e e i e t e c si c t ct s eci ic ti s e i te i s c st ucti ctices can be included in contract documents and requests for proposals.	USACE acknowledges this comment and it will addressed by the contractor.
VDH ODW reviewed the project and determined that there are no apparent impacts to public drinking water sources due to this project.	Acknowledged.

VADEQ Comments	USACE Responses
The Virginia Department of Aviation has reviewed the document and believes that, when developed, the projects will help provide resilience, allow for a safer, more secure airport, and contribute to the overall utility of Ronald Reagan Washington National Airport.	Acknowledged.
The City does have questions about the potential impact of the proposed Arlington Water Pollution Control Plant (WPCP) Floodwall may have on City properties located south of Four Mile Run, and will await the submittal of the modeling effort to comment on those potential impacts.	With-project condition modeling shows that the water surface elevation will not increase for the 100-year and the 500-year coastal storm (not for riverine) from construction of the floodwall at the Arlington WPCP.

NPS Comments	USACE Responses
NPS property for the GW Parkway is located on the west side of the airport property. The EA does not offer the location of such floodwalls; therefore, it is unclear if there are impacts to NPS resources.	No project is being recommended at Reagan Airport due to lack of benefits, therefore, there are no impacts to NPS resources.
The EA does not offer the precise location of such floodwall or closures; therefore, it is unclear if there are impacts to NPS resources.	Based on the 4 Oct 2022 meeting with NPS, the alignment has been moved off of NPS property and instead the County will need to acquire 7 properties for project implementation.
For the NPS to provide meaningful comment, we would need to better understand the potential to impact NPS resources. If there is infrastructure proposed on the GW Parkway or if GW Parkway land would be temporarily required for the construction of infrastructure, then the EA would need to be explicit regarding what infrastructure, where it would be located, and how much land is required. Furthermore, the amount of impacts to NPS resources would need to be evaluated. As written, the EA is insufficient to adopt should the NPS be required to make a federal decision on the use of its properties.	Based on the 4 Oct 2022 meeting with NPS, the alignment has been moved off of NPS property and instead the County will need to acquire 7 properties for project implementation. During project construction, an easement may be needed for temporary impacts to NPS property for access etc. but this determination would be made in PED once a final design is prepared.
If there is no new infrastructure proposed on the GW Parkway and no land temporarily required for the construction of infrastructure, then the only impact of concern would be related to viewshed due to construction adjacent to the GW Parkway. This construction has been evaluated in the EA but no determination as to effect was made. Under these circumstances, the NPS would still wish to continue as a Consulting Party under Section 106 of the National Historic Protection Act since there appears to be the potential to effect viewsheds of importance to the NPS.	It is correct that the impact of concern in this instance would be to the viewshed and landscape integrity. An effect determination has not been made due to the current level of design details. A Programmatic Agreement is being drafted that stipulates additional investigations to take place when funding and more detailed designs are available. The NPS is currently a consulting party and is aiding in the development of this Programmatic Agreement.
The NPS continues to be concerned with impacts to NPS resources but remains open to ongoing coordination with the USACE to explore potential measures that limit the effects of coastal flooding. Specifically, the NPS would like USACE to consider how Dyke Marsh might assist with mitigations to flooding impacts in the Belle Haven area.	Meeting held with NPS on 4 Oct 2022 to discuss their comments and concerns regrding the Belle Haven Alternative. Outcome of this meeting was to move the alignment off of NPS land. Dyke Marsh is an on-going project and has maximized FRM benefits.

NMFS Comments	USACE Responses
Design proposed culverts to allow for the movement of aquatic organisms	No in-water work will occur as part of the Recommended Plan.
Incorporate measures to minimize the amount of turbidity generated by in-water work, notably during the anadromous fish spawning season (March 1 - June 15).	USACE will make a best effort to avoid any in-water work from March 1 - June 15.

EPA Comments	USACE Responses
EPA recommends clarifying the evaluation and assessment of nonstructural and NNBF measures. It is unclear how the models used for evaluating the alternatives have considered the benefits provided by nature-based infrastructure. Table 3-2. indicates that nonstructural measures such wetland restoration, reefs, and beach restoration did not meet the planning objectives for the Study, but it is not evident how this was determined.	The focus of this study is storm surge. NNBF features may enhance a project and add additional CSRM benefit, but as standalone measures would not provide a 13 feet or 14.3 feet level of performance to protect critical infrastructure during a storm event. Each measure is first compared alone to determine if it could address the problem and objectives and then combined with other measures and evaluated again to determine reduction in damages, level of performance etc.
EPA recommends the addition of NNBF to the TSP in the Final IFR/EA. As stated in Section 3.0, NNBF will be added as a design consideration to enhance the performance and effectiveness of the final array of alternatives. However, specific opportunities for adding NNBF were not identified in the Draft IFR/EA.	Five NNBF measures were evaluated for this study and three were identified as possible measures for the Belle Haven plan (SAVs, Wetland Restoration and Living Shoreline). Through coordination with NPS, it was determined that the alignment for Belle Haven would need to move further inland to avoid NPS property and there is no opportunity for SAVs, Wetland Restoration or Living Shorelines. There is a very limited footprint for a project between NPS property and residences and businesses, so USACE has optimized the alignment to work within these constraints. Dyke Marsh could offer opportunity for NNBF, however, it is an on-going USACE project and has maximized FRM benefits with the current NNBF being implemented.
As indicated in Section 2.4.4.1, the Washington, DC-MD-VA region is designated as a nonattainment area for 8-hour ozone 2015 standard as well as maintenance for the 2008 standard. The project area also appears to be in an Ozone Transport Region (OTR). Specifically, the Consolidated Metropolitan Statistical Area that includes the District of Columbia is in the OTR. For the OTR, the applicable de minimis emission threshold for maintenance and nonattainment (as listed in Table 2-1 in Appendix A4) is 50 tpy for VOCs and 100 tpy of NOx. We recommend that Section 4.2.3 be updated and clarified.	Sections 2.4.4.1 and 4.2.3 have been updated.
In addition to meeting requirements of General Conformity, we recommend that localized air quality impacts from construction on local communities be addressed. The EA indicates high ozone; other EJScreen indicators such as Diesel Particulate Matter and Air Toxics Respiratory Hazard Index show existing high air pollution relative to the nation. We recommend consideration of BMPs and how they will be implemented. (For example, anti-idling restrictions may be helpful, but how will they be enforced?)	USACE acknowledges this comment and it will addressed by the contractor.
By using the 80th percentile or greater nationally, people of color populations may not be sufficiently evaluated. For an initial screening, EPA recommends following the guidance provided regarding EO 12898 in Environmental Justice under the National Policy Act and identifying all census block groups where the minority populations either exceed 50 percent or determining what minority population percentage lower than 50% would be meaningfully greater. Comparing to state and regional percentiles may be more informative than using the national percentiles.	Sections 2.4.11 and 4.2.10 have been updated to identify and analyze effects to minority and low-income communities located within and adjacent to the study alternatives.
We recommend that the selection of the screening criteria to identify low-income populations be clarified. The IFR/EA uses the 80th percentile or greater nationally for percent of the population that is at or below 200% of the federal poverty line. While 200% of the federal poverty line may be appropriate given the cost of living in the metropolitan Washington D.C. area, it is unclear whether the 80th percentile should be used in this analysis.	Sections 2.4.11 and 4.2.10 have been updated to identify and analyze effects to minority and low-income communities located within and adjacent to the study alternatives.
As the very large study area makes it difficult to conduct a full analysis of potential EJ concerns, we recommend that the communities impacted by the final array of alternatives be evaluated in greater detail. We recommend using this information to tailor outreach to underserved communities or potential communities with EJ concerns, if appropriate.	Section 4.2.10 has been updated to better describe the effects to EJ communities located in or near the TSP. Two public meetings were held in June 2022. The meeting at Belle Haven was in-person and approximately 250 people attended. The meeting for the Arlington WWTP was virtual. Many public comments were received during the meetings.
Section 2.3 did not include a discussion of terrestrial vegetation in the study area, although 4.2.1 does describe some riparian vegetation in the area of the proposed structural measures.	Sections 2.3.4 and 4.1.4 have been added to describe existing conditions and effects to upland vegetation.

EPA Comments	USACE Responses
The EA indicates that removal of live and dead trees and saplings and shrubs would be avoided to the greatest extent practicable to minimize impacts on migratory birds. We concur that this is an important minimization measure but note that conversion of vegetation may have additional impacts which should be evaluated, including stormwater and water quality, aesthetics, shade/temperature, and habitat for a range of fauna.	The Belle Haven alternative has been removed from the Recommended Plan. The Belle Haven alternative included the removal of approximately 150 trees. Installation of the floodwall at the Arlington WPCP may involve the removal of approximately 10-20 trees located on the west side of the WPCP. Effects to birds from removal of these trees has been included in Section 4.1.7.
A potential change in inundation depth in the wetlands following construction of the floodwall/levee is currently not expected to affect the wetlands. However, providing the modeling results that confirm this assumption in the Final IFR/EA would be helpful.	Section 4.2.1 has been updated to include effects to the wetlands south of Belle Haven due to an increased inundation depth from a 100-year storm event with the levee/fllodwall in place. The future with-project conditions modeling is also included in the Appendix B, the Hydrology and Hydaulics Analysis.
Construction of the proposed culvert crossings in two streams in Belle Haven would result in roughly 2,250 sqft of new permanent fill impacts and 2,000 sqft of temporary impacts. Section 6.8.1 indicates that the amount of fill material placed into the channels was minimized to the greatest extent practicable. In addition, the culvert design should be considered to minimize potential impacts, including prevention of barriers to passage of aquatic and semi-aquatic species during low-flow conditions.	No in-water work will occur as part of the Recommended Plan.
Section 2.4.1.2 indicates that Arlington County, Fairfax County, and the City of Alexandria have identified opportunities for both structural and non-structural improvement projects to address accelerated stream erosion and sedimentation from stormwater runoff. We recommend evaluating opportunities to incorporate green infrastructure in conjunction with the TSP to enhance the plan. Likewise, we recommend consideration of additional activities that may enhance floodplains or wetlands such as Dyke Marsh to increase resilience from storms and flooding.	Section 2.4.1.2 refers to the local partners reports. Five NNBF measures were evaluated and three were identified as possible measures for the Belle Haven plan (SAVs, Wetland Restoration and Living Shoreline). Through coordination with NPS, it was determined that the alignment for Belle Haven would need to move further inland to avoid NPS property and there is no opportunity for SAVs, Wetland Restoration or Living Shorelines. There is a very limited footprint for a project between NPS property and residences and businesses, so USACE has optimized the alignment to work within these constraints. Dyke Marsh could offer opportunity for NNBF, however, it is an on-going USACE project and has maximized FRM benefits with the current NNBF being implemented.
The potential impacts to resources under Section 106 of the National Historic Preservation Act are current unclear. The Belle Haven neighborhood may need to be formally evaluated for listing on the National Register of Historic Places, archaeological surveys may be needed in the footprint of the proposed levee and floodwall, and the proposed floodwall may have viewshed impacts from historic resources such as the George Washington Memorial Parkway (GWMP) and the Mount Vernon Trail. Based on Sections 6.9 and 6.10, a Programmatic Agreement is currently being developed or will be developed with the Section 106 consulting parties for impacts. We recommend that the Final IFR/EA be updated with the status of consultation, the draft or final PA, resource impacts, and other relevant information.	Acknowledged. The final IFR/EA will be updated with the details recommended here.
Due to the close proximity of the proposed floodwall and levee to several of the condominium buildings in Belle Haven, construction would adversely affect the residents of Belle Haven during the daytime. The IFR/EA states that this adverse effect would not be significant because noise is not expected to exceed 80 dB (although it was stated the crane would “average 81 dB”) and would be temporary. We recommend additional evaluation of noise on nearby residences and other sensitive receptors, including metrics that factor in noise perception and impacts based on equipment, distance, and shielding and consideration of noise mitigation measures, particularly at Belle Haven given the lengthy construction time frame.	The Recommended Plan is the construction of a floodwall at the Arlington WPCP. Work at Belle Haven has been removed from the Recommended Plan.
Section 4.2.9 indicates that noise in the location of the Arlington WPCP may be higher than other urban residential areas due to the amount of surrounding commercial activity on Mount Vernon Avenue and Route 1 and aircraft noise from the nearby Reagan National Airport. As noise is an additive stressor, we recommend further analysis to support the conclusion that construction noise would not be significant.	
We recommend consideration of noise BMPs and mitigation, including screening, mufflers, time-of-day restrictions, etc.	USACE acknowledges this comment and it will addressed by the contractor.

EPA Comments	USACE Responses
We also recommend addressing operational and maintenance noise from the pump stations.	The Recommended Plan is the construction of a floodwall at the Arlington WPCP. Work at Belle Haven has been removed from the Recommended Plan. Pump stations have not been identified for the Arlington WPCP alternative.
The proposed levee/floodwall at Belle Haven may permanently obstruct the view of the natural areas located south of Belle Haven and the GWMP. The IFR/EA indicates that the view from the lower floors of the River Towers Condominiums and from the community grounds and recreational areas would be obstructed. It appears that there may be both temporary and permanent impacts to aesthetics, but the severity of the impacts is currently unclear.	The Recommended Plan is the construction of a floodwall at the Arlington WPCP. Work at Belle Haven has been removed from the Recommended Plan.
Recreational impacts associated with the TSP should be fully evaluated, including impacts from temporary closures. For example, Section 4.2.8 indicates that the portion of the existing asphalt pedestrian path between the Arlington WPCP and Four Mile Run may need to be removed or temporarily closed in order to construct the floodwall. Would closure of the path have impacts beyond recreation, such as commuting by foot or bike? For the Belle Haven Levee and Floodwall, 4 years is a substantial amount of time to disrupt access to recreational facilities and outdoor enjoyment for community residents. Further, it is unclear if there is an area to replace the tennis courts that will be removed.	The proposed floodwall at the Arlington WPCP will be located on the north side of the trail along the existing fence. It is possible that a portion of the trail will be closed during construction. Not planning at this time to reroute the trail. Will work with the non-federal sponsor (Arlington County) if rerouting the trail will be necessary.
As the TSP will impact communities, quality of life issues such as noise, aesthetics, and recreation are important and should be fully considered. We thank the USACE for providing additional time for public comment, and we recommend additional and continued outreach to work with impacted communities to refine the plan and reduce potential impacts to residents and businesses.	The cumulative impacts section of the EA has been updated to include additional discussion on impacts.
Section 3.3 notes that USACE recommended a combination levee/floodwall as the most cost-effective solution for the Belle Haven planning unit in 2008 and 2014, but a project was not implemented due to community opposition. It is currently unclear if the community is supportive of the proposed Belle Haven floodwall and levee; we recommend additional meetings and stakeholder communication.	The community is still opposed to a floodwall, however, the County has asked USACE to move forward with the proposed recommendation while the County conducts a public outreach campaign to inform the community of their flood risk.
EPA recommends that the determination of duration and significance of environmental consequences summarized in Section 6.7 be supported with further detail, particularly for the alternatives carried forward as the TSP.	New Section 6.8 has been updated to provide a more thorough description of the environmental consequences of the Recommended Plan (Arlington WPCP).
To support the findings of impacts to water quality, habitat, and other resources, we recommend estimating potential temporary and permanent impacts earth disturbance, vegetation clearing, conversion, and increases in impervious area from the construction of the levee and floodwalls, pump stations, and parking areas.	Section 6.6.6.2, Recommended Plan has been updated with this information.
Construction of the proposed culvert crossings is expected to result in roughly 2,250 sqft of new permanent fill impacts to two streams. The draft plan for compensatory mitigation is to purchase credits from an approved mitigation bank or an approved in-lieu fee program in the Middle Potomac River Watershed. Appendix G indicates that the USACE is in the process of identifying the appropriate mitigation bank to meet the need for this mitigation plan. We recommend that available banks with appropriate credits be listed in the Final EA/IFR. As the Middle Potomac watershed is quite large and the urban watersheds have suffered degradation, mitigation that offsets impacts at a local level should be assessed.	The Recommended Plan is the construction of a floodwall at the Arlington WPCP. Work at Belle Haven has been removed from the Recommended Plan. Therefore, no mitigation is required and the mitigation plan has been removed from the report.
As the proposal is refined, cumulative effects should be more fully explored. We support including the modeling results of evaluating potential cumulative effects of induced flooding from the proposed flood protection measures and existing flood protection in the Final IFR/EA and evaluating impacts to environmental and cultural resources from the TSP in more detail.	Seciton 6.9, Cumulative Impacts has been updated.
We understand that many details are still preliminary. Therefore, additional NEPA studies may be necessary to fully evaluate impacts. We recommend clarifying whether additional studies are planned in the Final IFR/EA. Commitment to continued outreach and specific mitigation measures may also be helpful in reducing potential adverse impacts.	No additional NEPA studies are proposed for the Recommended Plan.

FAA Comments	USACE Responses
General Comment - If Alternative 4b is subject to future consideration, or any action involves property within the Metropolitan Washington Airports Authority leasehold, the FAA may have a federal action and will reengage in the project. The FAA may need to concur with the proposed action and issue an approval. Additional analysis will be required to insure the alternatives compliance with FAA advisory circulars and orders pertaining to runway safety areas, protection zones, and approach and departure surface requirements as well as ensuring avoidance of the engineered material arresting systems (EMAS) at the Runways 22, 15, and 33 ends.	Alternative 4B is not being recommended for implementatio due to lack of benefits.
The Executive Summary should include the historic properties at DCA.	A reference to historic properties at DCA has been added to the Executive Summary.
Table 2-5 should include resources 00-9880 - Abingdon Research Station/Department of Transportation Laboratory Buildings – Eligible, and 000-9881 - Jet Engine Test Cell – Eligible.	These resources have been added to Table 2-5.
Section 4.2.6 – Alternative 4b narrative should include Abingdon Research Station/Department of Transportation Laboratory Buildings, Jet Engine Test Cell and Abingdon Ruins.	These resources have been added to Section 4.2.6.

Fairfax County Parks Comments	USACE Responses
The DIFR & EA identifies the Tentatively Selected Plan (TSP) as Alternative 8, which includes plan components showing the southern end of the “Belle Haven Floodwall and Levee” extending approximately 100 linear feet into FCPA’s Westgrove Park. If this levee is constructed as shown in the TSP, Westgrove Park will experience direct impacts of lost land, recreation facilities, public access, vegetation, and habitat, increased storm water discharge, invasive species, as well as wildlife habitat quality impacts. The DIFR & EA includes limited information regarding Westgrove Park in the analysis of environmental effects and consequences. FCPA requests further coordination and consultation to ensure impacts to Westgrove Park by the proposed project are avoided, minimized, or mitigated.	No work will occur in Westgrove Park as part of the Recommended Plan. The Recommended Plan is the construction of a floodwall at the Arlington Water Pollution Control Plant (WPCP). Work at Belle Haven has been removed from the Recommended Plan.
Effort should be made to minimize the impact to parkland from clearing and land disturbance. Mitigation should occur on parkland to the greatest extent possible. Land disturbance from stormwater projects, including levees typically results in an increase in invasive species coverage without proper treatment prior to and following construction. To minimize the impacts of this project to parkland and the native habitats of Fairfax County, all vegetation impacted by this project should be replaced with only locally common species native to Fairfax County, following county standards. This includes woody plants and shrubs, as well as seed mixes for short and long-term soil stabilization.	No work will occur in Westgrove Park as part of the Recommended Plan. The Recommended Plan is the construction of a floodwall at the Arlington WPCP. Work at Belle Haven has been removed from the Recommended Plan.
□ ti s eci ic ti ss u i cu e t e st e t it t ee u it i e e ts annual control of non-native invasive plant species by a licensed contractor, and annual replanting to maintain a minimum 80% survival rate of all woody plantings. □ u ss u e te u t e ei e t e e ee st uctu e t i e i c e se st ii ti □ est ti e ce us ti s eci ic ti s i e i e i u t Authority. Ideally, the same native seed mix would be used along the entire project length to reduce invasive plant impacts throughout.	No work will occur in Westgrove Park as part of the Recommended Plan. The Recommended Plan is the construction of a floodwall at the Arlington WPCP. Work at Belle Haven has been removed from the Recommended Plan.
FCPA is concerned that further engineering requirements of this project will pose additional adverse impacts on parkland than is currently known. To accurately determine the extent of the proposed impacts to Westgrove Park and the appropriate amount of mitigation, a full plan set is needed. This plan set will need to show engineered alignments of the levee, stream/wetland restoration, tree canopy impacts, stormwater management, utility relocations, and limits of disturbance. The plan set will also need to show all construction access routes, necessary staging areas, land takings, permanent and temporary easements, revegetation plantings, and replacement of all impacted park signage, fences, and recreation features. All temporary and permanent easements, takings, and maintenance agreements will need to be negotiated at a later date, based on additional engineering.	The Recommended Plan is the construction of a floodwall at the Arlington Water Pollution Control Plant (WPCP). Work at Belle Haven and at the Westgrove dog park has been removed from the Recommended Plan.
Westgrove Park, including the proposed location for the end of the levee, may be the location of a demolished Wastewater Treatment Center, elements of which may still be present under potentially unstable soils. Further site analysis is recommended to verify the site’s former use and to determine appropriate geotechnical requirements.	The Recommended Plan is the construction of a floodwall at the Arlington Water Pollution Control Plant (WPCP). Work at Belle Haven and at the Westgrove dog park has been removed from the Recommended Plan.
Since this land is owned by the Park Authority, the applicant must first acquire a Right of Entry License, Easement, and/or Construction Permit prior to performing any site work or studies on parkland. This includes, but is not limited to surveying, test boring, wetland flagging, clearing, grading, geotechnical studies, utility relocations, staging, construction, or any other related activities. Land rights on Park Authority owned property are requested from the Easement Coordinator, Fairfax County Park Authority, Planning and Development Division, 12055 Government Center Parkway, Suite 421, Fairfax, Virginia 22035. The main telephone number is (703) 324-8741. Please advise any contractors and subcontractors of this requirement.	For Corps cost shared projects, the Non-Federal Sponsor (NFS) is responsible to acquire all the necessary real estate for the project. After construction by the Corps, the NFS is also responsible for future Operations and Maintenance. In this case, it is anticipated that Fairfax County will be the NFS. Therefore, it will be expected that the County will make whatever internal arrangements necessary in order for the Corps to construct on Fairfax County Park Authority property. The Corps will not construct until the real estate has been acquired by the County and we have received a formal letter providing entry for construction.

Fairfax County Parks Comments	USACE Responses
A maintenance agreement will be needed for all areas and facilities within the easements conveyed by the Park Authority to the applicant relating to the construction, operation, and maintenance of the levee and related infrastructure. Such maintenance shall be as required with the standard maintenance terms set forth in such easements and by applicable governmental requirements relating to the operation of the levee. To allow staff an adequate time to distribute, review, and compile comments, the Park Authority requests that cases be sent directly to the Park Authority Planning and Development Division, with a minimum of 30 days to review each submission.	Acknowledged, County of Fairfax would need to coordinate with the Park Authority on a maintenance agreement prior to construction.
The provided report references consulting with Alexandria Parks and Recreation, the National Park Service, as well as the Fairfax County Department of Public Works and Environmental Services, Fairfax County Department of Planning and Development (Planning and Evaluation Branch), and Fairfax County Fire and Hazardous Materials Bureau. While there is a reference to the Westgrove Park Master Plan, there is no mention of consultation with FCPA. Since the proposed levee impacts an FCPA park, the applicant will need to coordinate with the FCPA Planning and Development Division.	USACE met with FCPA on 02/22/2023 and plans future coordination as the study progresses.
Table 2-9. Recreation Amenities in the Study Area on page 35 of the DIFR & EA, lists several nearby parks including Mount Vernon District Park. However, it does not list Westgrove Park, which will contain part of the proposed levee. Please include Westgrove Park in Table 2-9 and include the potential impacts to Westgrove Park in the analysis for this project.	Westgrove Park has been added to Table 2-9. Potential impacts to Westgrove Park have been added to Section 2.4.8.
Page 53 of the Draft Integrated Feasibility Report and Environmental Assessment states that “Fairfax County constructed a levee along Cameron Run, in front of Huntington Park.” Please update this reference to say “… through Huntington Park.”	This sentence has been updated.
Due to the above listed concerns, FCPA staff would like to review all future documents and plans at the earliest opportunity as the project progresses. Thank you for the opportunity to comment on this DIFR & EA report. We look forward to participating in the study as it moves forward. The Park Authority’s point of contact for this project is Andy Galusha, Park Planner, who can be reached at 703-324-8755 or at Andrew.Galusha@fairfaxcounty.gov.	USACE will provide FCPA staff future documents to review at the earliest opportunity available.

Fairfax County Comments	USACE Responses
Maintain vegetated buffers and improve stream water quality; minimize disturbance within floodplains, RPAs, and EQCs to the extent feasible; and include restoration of impacted RPAs using native plantings and the treatment and removal of non-native invasive vegetation.	The Recommended Plan is the construction of a floodwall at the Arlington Water Pollution Control Plant (WPCP). Work at Belle Haven has been removed from the Recommended Plan.
Strive to limit land disturbance activities through enhanced floodwall designs in sensitive areas, as described in the County's CBPO (Chapter 118 of the County Code), including conformance with the requirements for areas designated as RPAs.	The Recommended Plan is the construction of a floodwall at the Arlington WPCP. Work at Belle Haven has been removed from the Recommended Plan.
Exercise caution during construction for roads within vegetated areas. Such disturbance and vegetation removal would increase the vulnerability of soil to water and wind erosion and potentially result in the corresponding sedimentation and pollution of downstream watercourses during construction.	The Recommended Plan is the construction of a floodwall at the Arlington WPCP. Work at Belle Haven has been removed from the Recommended Plan.
Since large portions of the proposed development are within the FEMA 100-year floodplain, preservation and restoration practices are recommended, such as buffer restoration, which would include the reforestation of upland and riparian buffer areas. These practices help filter pollutants and reduce runoff by intercepting the water and increasing surface storage and infiltration.	The Recommended Plan is the construction of a floodwall at the Arlington WPCP. Work at Belle Haven has been removed from the Recommended Plan.
If any stormwater controls are required, these should include LID techniques such as bioretention facilities and grassed swales.	The Recommended Plan is the construction of a floodwall at the Arlington WPCP. Work at Belle Haven has been removed from the Recommended Plan.
Any tidal wetlands within the Mean Low Water and Mean High Water lines that may be disturbed should be restored with 'living shoreline' concepts to encourage nature-based stabilization techniques. Contiguous living shoreline stabilization projects allow for the highest likelihood of the continued longevity of and benefits to local subaqueous ecosystems.	The Recommended Plan is the construction of a floodwall at the Arlington WPCP. Work at Belle Haven has been removed from the Recommended Plan.
Unstable slopes can lead to serious land slippage. The seasonal high-water table is between 1½ and 3½ feet below the surface. Depth to hard bedrock ranges from 50 to more than 300 feet. Problematic clay soils may be present as well. USACE should evaluate the soil characteristics during a geotechnical evaluation in support of the proposed construction. Hydric soils that might be supportive of wetlands would be evaluated as part of the wetland delineation and permitting efforts. Staff recommends USACE continue to test and evaluate these problematic soils as the design and construction of this project progresses.	The Recommended Plan is the construction of a floodwall at the Arlington WPCP. Work at Belle Haven has been removed from the Recommended Plan.
The Comprehensive Plan anticipates that new development will include an urban forestry program and be designed in a manner that retains and restores meaningful amounts of tree cover, consistent with planned land use and good silvicultural practices. Good quality vegetation should be preserved and enhanced, and lost vegetation restored through replanting. (Fairfax County Comprehensive Plan, 2019 Edition, Policy Plan, Environment, Amended through 11-9-2021, Pages 17-18).	The Recommended Plan is the construction of a floodwall at the Arlington WPCP. Work at Belle Haven has been removed from the Recommended Plan.
In order to ensure the viability of the proposed plantings, staff recommends tree protection, to include adequate supervision during construction, to ensure that tree protection measures are implemented as planned. Additionally, staff recommends that the project avoid the following, where feasible: significant changes to elevations (both "cut" and "fill" operations); changes to water flow; and excavation within the critical root zones of surrounding trees to be protected. Additionally, staff recommends vegetative screening of the proposed structures, where feasible, featuring native and non-invasive trees, shrubs, perennial grasses and grass-like plants, and forbs for each planting area in the project design. Fairfax County recently published Technical Bulletin 22-04, regarding seeding guidelines, to promote the use of native plant species and to limit the use of invasive plant species in seeding applications for soil stabilization, restoration, agriculture, turf, and landscaping (see Fairfax County Seeding Guidelines). Additionally, staff recommends soil rebuilding for areas impacted by construction to help ensure the viability of the proposed plantings.	The Recommended Plan is the construction of a floodwall at the Arlington WPCP. Work at Belle Haven has been removed from the Recommended Plan.
Staff notes that the proposal may negatively impact the George Washington Memorial Parkway, which would be located on the river side (to the east) of the proposed flood walls. Staff recommends that future environmental analysis of the project consider locations both to the east and west of the George Washington Memorial Parkway for the construction of the flood walls and levees to determine how to best respect the historic resource.	Based on the 4 Oct 2022 meeting with NPS, the alignment has been moved off of NPS property and instead the County will need to acquire 7 properties for project implementation.

Fairfax County Comments	USACE Responses
Staff recommends that the Belle Haven/New Alexandria community be analyzed for further historic significance as part of any future environmental analysis, given that the community is more than 50 years old and an early suburb of Fairfax County.	Acknowledged. A Programmatic Agreement is being developed for this project that stipulates additional investigations that would take place when funding and more detailed designs are available.
Pages V and 171 of the IFR/EA estimates annual operation and maintenance costs to be$16,000 for the floodwall, earthen levee, and pump stations. This cost seems very low. Fairfax County pays $585 per month for SCADA communication at the Huntington Levee and the electric bill can vary from $700 to $2,500 per month. These utility costs alone cost more than $16,000 per year for a single pump station. Additional staff resources should also be factored into the maintenance cost. DPWES currently have pump station staff onsite at Huntington Levee and New Alexandria Pump Station during large storm events (12-hour shifts). DPWES may need additional personnel to staff the proposed pump stations and floodwall during major storm events.	O&M estimated in the economic appendix can be seen in this table. Like Amber mentioned, we assumed by the TPS O&M costs to be 1% of the First Cost while waiting to receive an updated figure.
Page 19 of Appendix G and Page 121 of the IFR/EA state, “It is only during times of extreme flooding due to a coastal event or a massive storm occurring within the entire Potomac River watershed that the pump stations would be utilized. During these scenarios, the water level of the Potomac River would be so high that it would reach the riverside of the floodwall, which would result in the closure of the flap and sluice gates of the floodwall’s drainage pipes.” How will the existing pump station and tide gate function during “massive” storm events in conjunction with the proposed floodwall and pump stations? Will they be decommissioned if the project moves forward?	The Recommended Plan is the construction of a floodwall at the Arlington WPCP. Work at Belle Haven has been removed from the Recommended Plan.
Figure E-3 in the draft IFR/EA shows the proposed floodwall terminating at the northern end adjacent to the existing F Street Wastewater Pumping Station and the levee at the southern end terminating at the existing River Towers Wastewater Pump Station. The design should ensure that the floodwall and levee do not create adverse conditions that could impede normal operations or otherwise impact the existing wastewater pump stations.	The Recommended Plan is the construction of a floodwall at the Arlington Water Pollution Control Plant (WPCP). Work at Belle Haven has been removed from the Recommended Plan.
Page V of the IFR/EA and Appendix F: Real Estate Plan estimates lands and damages real estate costs at $1,167,000. If the wall is largely located on private land (i.e., Belle View Condos, River Towers, and private residential properties) then this estimate seems very low.	The NoVA Cost Estimate with an effective date of July 17, 2020 states $1,167,069 for Alternative 5c – Belle Haven Levee & Floodwall. The study estimate takes into account the individual parcels, easement acres, mean value per acre and estimated value. The property is classified as residential/conservation and comps at the time indicate a mean value per Acre of $73,296 for residential/conservation parcels. Other portions are classified as residential and comps at the time of the valuation indicate a mean value per Square Foot of $28.12 for residential parcels. We included a 30% contingency factor, which may cover any damages not considered due to the broad approach of a cost estimate of this magnitude.
A portion of the proposed floodwall appears to be in Virginia Department of Transportation (VDOT) Right-of-Way. Has USACE initiated coordination with VDOT on the IFR/EA?	At this stage of the study, no coordination has yet been made with anticipated property owners. Ultimately, if approved and funded, the Non-Federal Sponsor will be responsible for acquisition of all lands and easement necessary for the project.
Tree resources are only mentioned in the assessment with respect to minimizing impacts to birds. Trees are a valuable resource, providing numerous environmental services and ecological, economic, social, and human health benefits. Not only should the proposed floodwall avoid removal of trees, but consideration should be given to protecting trees with other infrastructure from inundation during flooding events.	The Recommended Plan is the construction of a floodwall at the Arlington Water Pollution Control Plant (WPCP). Work at Belle Haven has been removed from the Recommended Plan.
The design should be reviewed to determine if pedestrian and bicycle access across the GWMP at Belle Haven Road-10th Street-GWMP and/or Belle View Boulevard-GWMP locations can be maintained, or nearby alternative routes can be improved and/or constructed. If this is not possible, Belle Haven residents will be significantly inhibited from accessing the GWMP trail, which is a major transportation route and recreation amenity. The alternative route for accessing the trail to the south is Westgrove Boulevard-Park Terrace Dr-Tulane Dr – 1.25 miles. The alternative route for accessing the trail to the north is Fort Hunt Road-Richmond Highway-Richmond Highway/Old Town ramp trail – 1.75 miles. Notably, Fort Hunt Road lacks a sidewalk or trail between Belle Haven Road and Huntington Avenue and would have to be improved to provide an acceptable alternative.	The Recommended Plan is the construction of a floodwall at the Arlington Water Pollution Control Plant (WPCP). Work at Belle Haven has been removed from the Recommended Plan.

Fairfax County Comments	USACE Responses
This would also inhibit pedestrians from accessing two bus stops for the Washington Metropolitan Area Transit Authority Route 11C, which are located along the GWMP.	The Recommended Plan is the construction of a floodwall at the Arlington Water Pollution Control Plant (WPCP). Work at Belle Haven has been removed from the Recommended Plan.
The proposal to sever the vehicle connections at the Belle Haven Road-10th Street-GWMP and Belle View Boulevard-GWMP intersections, would likely result in negative impacts to vehicle operations. Belle Haven Road (7,200 AADT) and Belle View Boulevard (8,100 AADT) are both secondary roads that carry traffic to GWMP, Fort Hunt Road, and Richmond Highway. If the GWMP intersections are closed, all traffic leaving the Belle Haven community must leave the community accessing Fort Hunt Road and most northbound and southbound traffic would be rerouted to Fort Hunt Road. This could increase delay at the Fort Hunt Road-Belle View Boulevard/Beacon Hill Road, Fort Hunt Road-Belle Haven Road, Fort Hunt Road-Huntington Avenue, and Fort Hunt Road-Richmond Highway intersections. Traffic operations should be evaluated, and appropriate mitigations provided if the intersections are closed. https://www.virginiadot.org/info/resources/Traffic_2019/AADT_029_Fairfax_2019.pdf	The Recommended Plan is the construction of a floodwall at the Arlington Water Pollution Control Plant (WPCP). Work at Belle Haven has been removed from the Recommended Plan.
If vacation and abandonment of road right-of-way are eventually required, they will proceed under Virginia State Codes §15.2-2272(2) and §33.2-909. Fairfax County Department of Transportation processes for vacation and abandonment must be followed, which would include review by utility companies, the Virginia Department of Transportation (VDOT), and other Fairfax County agencies. Closing intersections may also necessitate building VDOT-approved turnarounds.	Noted. Ultimately, the Non-Federal Sponsor will be responsible for acquisition of all lands and easement necessary for the project, including the acquisition/abandonment process for any public road rights-of-way.
Please note that the Belle Haven Road-10th Street-GWMP and Belle View Boulevard-GWMP intersections were restriped during Fall 2021 as part of the Southern George Washington Memorial Parkway Safety Study. The intersection design changes were intended to improve safety over the old design, but the data on the crash risk of the new intersection condition is limited due to the short timeframe. https://www.nps.gov/gwmp/learn/management/south-parkway-safety-study.htm	Acknowledged.

Arlington County Comments	USACE Responses
Will the floodwall be located on the northern or southern side of the trail? Will the trail need to be closed during construction, and if so, where will the detour be located?	It will be located on the north side of the trail along the existing fence. It is possible that a portion of the trail will be closed during construction. Not planning at this time to reroute the trail.
The wall will cross several existing stormwater outfalls to Four Mile Run, and possibly sanitary sewer and/or water lines, particularly as it bends towards Glebe Road. Will these utilities require relocation?	The utilities will not require relocation. The curb will be elevated from 6 inches to 1 foot. Unless utilities are located under the curb and gutter, USACE doesn't see any issues with relocating utilities. Work on the curb and gutter may require some moving around of utilities, but it is not expected to be a major issue.
The existing Four Mile Run Flood Control Project requires regular maintenance, which will need to be coordinated with construction of the proposed floodwall.	Acknowledged.
The wall will impact the FEMA floodplain in certain areas.	Acknowledged. The floodwall will protect the WWTP from future riverine flooding.
The Dominion project, which will soon be under construction, begins just east of the end of the proposed floodwall (at the substation on S Eads St.). Work at the WPCP will need to coordinated with them.	Acknowledged.
This area of Four Mile Run was part of a “living shoreline” enhancement approximately 6 years ago. Components of this project included public art installed on the metal fence surrounding the WPCP, a public art bench (imported from the Netherlands) located along this fence, an observation platform, as well as fish murals painted occasionally along the trail. These items, as well as the shoreline itself, are all likely to be impacted by the proposed floodwall and should be protected/relocated.	Acknowledged, USACE would identify and coordinate any relocations with the sponsor during PED.
Depending on the exact locations of the transition points between wall heights, there is some concern that the wall may not be high enough.	USACE will ensure that the wall will be at the proper height based on a 500-year coastal storm to protect the WWTP.
The wall will block off the natural overland flow path from approximately 61.5 upstream acres that currently runoff directly to Four Mile Run. During a future predicted large storm event (500-year flood in the year 2070), it is estimated that up to almost 3 million cubic feet of runoff could accumulate behind the wall. The project will need to include some type of detention facility to temporarily store this water, or provide a one-way valve/louvre system in the wall to allow for upstream runoff to pass through, without allowing rising stream channel levels to flood the plant. The addition of these features may affect the cost-benefit analysis for the project.	USACE is currently working on the interior drainage analysis and will determine whether there will be any impacts.
It was indicated during the public meeting that coastal surge with sea level rise was used for analysis, as it was more conservative than riverine flooding. We would be interested to know how the proposed floodwall performs during a joint probability analysis.	USACE does not plan to conduct a joint probability analysis at this time. Coastal flooding is a bigger threat and USACE has designed the wall height to be conservative.

MWAA Comments	USACE Reponses
MWAA would like the opportunity to have further discussions and/or web conference calls to review potential measures applicable to DCA, the limitations and logistics involved in implementation, and capital costs associated with proposed measures. MWAA would like to ensure the US Army Corps is fully aware of the constraints that exist at DCA.	PM has reached out to MWAA on multiple occasions requesting additional information. MWCOG has also tried to engage with MWAA.
The measures included in Alternative 4B would lead to capital expenditures that MWAA does not have funding c te t ese c it i e e ts e e e u s i e ec e ti s t t e te It appears Army Corps is recommending to raise levee road, MWAA Concerns include: 1. Operational capabilities of three runways cannot be impacted, 2. MWAA has concerns over implementation and constructability, 3. MWAA has concerns of capital expenditures for Alternative 4b.	Alternative 4B does not have positive net benefits to move forward with recommendation of a project. The PED and Construction cost-share for CSRM projects is 65% Federal/35% non-Federal.
t is t c e t st c su e is iti i ti is ee e e t ese e c t e te i s t is e ui e t e t e e ti t is t e c it c st t i c te t is t e se e elevation of Levee Road?	Stop log closure is aluminum closure structures that includes posts and panels. These are relocatable and require local sponsor to move the posts and panels to their locations and install them in time of need. The capital cost to incorporate is the costs in the current estimate.
Need to fully understand flood risk scenario used for planning, likelihood, and potential flood depths specific to DCA e ce t u cee ce i it i u e e t e st is t e esi st	100-year storm
Need to fully evaluate critical infrastructure that needs to be protected during storm surge. Equipment that would be difficult to recover quickly to resume operations: Electronic infrastructure Fuel farm Localizer EMAS Airport ingress/egress Runways would not be able to operate with “stop log closures” as shown, so would stop log closures be necessary? Alternatively, measures could allow for runways to be temporarily inundated and focus on protecting critical infrastructure.	The team discussed critical infrastructure, specially Reagan National Airport infrastructure. The USACE Engineering, Research and Development Center (ERDC) developed a vulnerability assessment report to evaluate the impact of the storm. The 100-year adaptation horizon evaluation is currently being performed under the three sea level change scenario. No further evaluation of nonstructural measures on infrastructure, fuel farm, EMAS Airport ingress/egress, and any nonstructural measures to provide risk reduction to these structural components will be conducted. The team is developing the ea level change scenarios under low, intermediate, and high curves to re-evaluate the net benefits at the Reagan National Airport.
Existing levee road along east side of DCA is shown as not being inundated during 1 percent Annual Exceedance Probability (Report Figure 3-2). Therefore, is there a need to raise levee road in these areas? Could improvements concentrate in south and north airport areas to protect critical infrastructure?	The alternative at the Reagan Airport has been screened out and is not included in the Recommended Plan. Therefore, additional work on this alternative has stopped.
i u e i e u t e c iic ti t e i e e t e t s ue i t ue ue	This figure has been removed from the report.
Need to fully understand logistics of “deployable” “stop log closures”. A description of these measures is needed. These may not be feasible for MWAA to implement. May result in unacceptable runway closure periods. Particularly difficult to deploy if levee road is raised.	The alternative at the Reagan Airport has been screened out and is not included in the Recommended Plan. Therefore, additional work on this alternative has stopped.
Potential Permanent Alternatives to “Deployable” measures: Need to look into additional opportunities to raise levee road or construct floodwalls around Runway 1-19 ends, at the outer end of the Runway Safety Areas. Possibly raise Runway Safety Areas Additional permanent floodwalls may be possible	The alternative at the Reagan Airport has been screened out and is not included in the Recommended Plan. Therefore, additional work on this alternative has stopped.
Need to understand logistics of implementation/construction of Alternative 4B. How would implementation impact airport operations? Barges and cranes are included in construction description (PDF page 152). These may require airspace analysis.	The alternative at the Reagan Airport has been screened out and is not included in the Recommended Plan. Therefore, additional work on this alternative has stopped.
t i e ss t e e si e st i e i e e t t t e i t u e more feasible.	The alternative at the Reagan Airport has been screened out and is not included in the Recommended Plan. Therefore, additional work on this alternative has stopped.

MWAA Comments	USACE Reponses
Figure 3-15 illustrates stop log closures/deployable measures at the runway ends. These measures are illustrated crossing runway ends, EMAS beds, and runway safety areas. These areas at runway ends are critical to aircraft operations at DCA. Measures should be shown at the furthest perimeter of DCA around runway ends to allow for safe aircraft operations. Additionally, elevations at these areas may allow for floodwalls up to a certain elevation. See the attached exhibit. Further discussions with MWAA are recommended to understand airfield and airspace constraints.	The alternative at the Reagan Airport has been screened out and is not included in the Recommended Plan. Therefore, additional work on this alternative has stopped.

METROPOLITAN WASHINGTON, DISTRICT OF COLUMBIA COASTAL STORM RISK MANAGEMENT FEASIBILITY STUDY

INTEGRATED FEASIBILITY REPORT & ENVIRONMENTAL ASSESSMENT

APPENDIX G13: FAIRFAX COUNTY DECISION EMAIL

From:	Herrington, Christopher S
To:	Danaher, Christine M CIV USARMY CENAB (USA); Torgersen, Catherine S; Codding, Ellie; Carinci, Craig A.
Cc:	Callahan, Justin B CIV USARMY CENAB (USA); Metallo, Amber C CIV USARMY CENAB (USA); Bierly, Daniel M CIV USARMY CENAB (USA)
Subject:	[URL Verdict: Neutral][Non-DoD Source] Re: DC Coastal - Sponsor Letter of Intent (LOI) Template & Self-certification of Financial Capability
Date:	Monday, March 13, 2023 2:56:57 PM

Christine et al.,

Fairfax County will not support the project as proposed at the present time, and thus will not be providing the USACE with a letter of intent.

We were informed on Sunday of the decision not to proceed by the Mount Vernon District Supervisor. Unfortunately, I was unsuccessful in convincing the leaders of the affected community and thus our elected officials to support the project as proposed. Fairfax County appreciates everything the USACE has done to assist our residents and collaborate with us. I am especially grateful for the additional time you provided to allow us to educate our residents about their existing flood risk and attempt to change public opinion.

The USACE remains an incredibly valuable partner, and I look forward to the opportunity to collaborate with you again in the future. As always, please let me or our project team know if you have any questions.

Thank you,
Christopher Herrington, Director
Department of Public Works and Environmental Services
Fairfax County, Virginia
571-396-1957 c

From: Danaher, Christine M CIV USARMY CENAB (USA) <Christine.M.Danaher@usace.army.mil>
Sent: Monday, March 13, 2023 1:13 PM
To: Torgersen, Catherine S <Catherine.Torgersen@fairfaxcounty.gov>; Codding, Ellie <Eleanor.Codding@fairfaxcounty.gov>; Carinci, Craig A. <Craig.Carinci@fairfaxcounty.gov>; Herrington, Christopher S <Christopher.Herrington@fairfaxcounty.gov>
Cc: Callahan, Justin B CIV USARMY CENAB (USA) <Justin.Callahan@usace.army.mil>; Metallo, Amber C CIV USARMY CENAB (USA) <Amber.C.Metallo@usace.army.mil>; Bierly, Daniel M CIV USARMY CENAB (USA) <Daniel.M.Bierly@usace.army.mil>
Subject: RE: DC Coastal - Sponsor Letter of Intent (LOI) Template & Self-certification of Financial Capability

Good morning County of Fairfax team,

I wanted to check on the status of the Letter of Intent and the self-certification of financial

capability. We were tracking a due date of 14 MAR.

For the self-cert of financial capability – Is the County on track for submitting this to us tomorrow?

Letter of Intent/Sponsor Support Letter - We still need to provide you with the revised project cost, which we are working very hard to run and recalculate. As soon as those calculations conclude, I will provide that ASAP and we can determine a revised due date.

Please let me know if there are any issues or continued difficulty with the signing of these documents.

Warm Regards,

Christine Danaher
Project Manager, CENAB – PPC
2 Hopkins Plaza, Baltimore, MD 21201
Mobile: (443) 257-0368
Christine.M.Danaher@usace.army.mil

From: Torgersen, Catherine S <Catherine.Torgersen@fairfaxcounty.gov>
Sent: Monday, February 27, 2023 10:01 AM
To: Danaher, Christine M CIV USARMY CENAB (USA) <Christine.M.Danaher@usace.army.mil>; Carinci, Craig A. <Craig.Carinci@fairfaxcounty.gov>
Cc: Callahan, Justin B CIV USARMY CENAB (USA) <Justin.Callahan@usace.army.mil>; Metallo, Amber C CIV USARMY CENAB (USA) <Amber.C.Metallo@usace.army.mil>
Subject: [URL Verdict: Neutral][Non-DoD Source] RE: DC Coastal - Sponsor Letter of Intent (LOI) Template & Self-certification of Financial Capability

Good morning Christine,

Your response answered our questions and we do not need to set up a call for this afternoon.

Thank you,

Catie Torgersen
Planner
Stormwater Planning Division
Fairfax County DPWES
12000 Government Center Parkway
Fairfax, VA 22035
703-639-7664 (cell)

From: Danaher, Christine M CIV USARMY CENAB (USA) <Christine.M.Danaher@usace.army.mil>
Sent: Sunday, February 26, 2023 9:25 PM
To: Torgersen, Catherine S <Catherine.Torgersen@fairfaxcounty.gov>; Carinci, Craig A.

<Craig.Carinci@fairfaxcounty.gov>
Cc: Callahan, Justin B CIV USARMY CENAB (USA) <Justin.Callahan@usace.army.mil>; Metallo, Amber C CIV USARMY CENAB (USA) <Amber.C.Metallo@usace.army.mil>
Subject: RE: DC Coastal - Sponsor Letter of Intent (LOI) Template & Self-certification of Financial Capability

Hi Catie,

That is correct, Belle Haven would follow the steps outlined in the Planning Community Toolbox. You are also correct, once the Design Agreement (DA) has been executed (Step 14) that is when the County would need to commit funds. Below is some additional information as well as attached examples of a DA and PPA. I'll coordinate with Amber and see if we can get a meeting setup for tomorrow during the window you proposed.

Generally, we request funds at the start of the **Design Phase** and at the start of the **Construction Phase**. There will be two stages and two agreements that the non-federal sponsor and the government will enter into. At each of those stages, each agreement goes into detail about when and how much the non-federal sponsor is financially responsible for and what each party is responsible for:

1. **Design Phase – the government and the non-federal sponsor execute a Design Agreement (DA)**
    a. Model Agreement Link: https://www.usace.army.mil/Missions/Civil-Works/Project-Partnership-Agreements/model_other/
    b. Design Agreement Implementation Memo (attached)
    c. Model Design Agreement, '5517_Design_Agreement_Model.docx' (attached). Please refer to the following section:
        i. ARTICLE III – PAYMENT OF FUNDS

2. **Construction Phase – the government and the non-federal sponsor execute a Project Partnership Agreement (PPA)**
    a. Model Agreement Link: https://www.usace.army.mil/Missions/Civil-Works/Project-Partnership-Agreements/model_sfrm/
    b. PPA Implementation Memo (attached)
    c. Model PPA Agreement, '5525_FRM_Model_PPA.docx' (attached). Please refer to the following sections:
        i. ARTICLE II – OBLIGATIONS OF THE PARTIES
        ii. ARTICLE III REAL PROPERTY INTERESTS, PLACEMENT AREA IMPROVEMENTS, AND RELOCATIONS
        iii. ARTICLE VI – PAYMENT OF FUNDS
            1. Note: USACE will be the contracting agency. At the time of awarding the contract we need to have all funds required for construction to execute the construction contract.
    c. The non-federal sponsor is responsible for all O&M costs
    d. The non-federal sponsor is responsible for LERRDs (lands, easements, Rights-of-way,

Relocations, and Disposal sites). USACE will not acquire RE necessary for the project.

Warm Regards,

Christine Danaher
Project Manager, CENAB – PPC
2 Hopkins Plaza, Baltimore, MD 21201
Mobile: (443) 257-0368
Christine.M.Danaher@usace.army.mil

From: Torgersen, Catherine S <Catherine.Torgersen@fairfaxcounty.gov>
Sent: Saturday, February 25, 2023 7:58 PM
To: Danaher, Christine M CIV USARMY CENAB (USA) <Christine.M.Danaher@usace.army.mil>; Carinci, Craig A. <Craig.Carinci@fairfaxcounty.gov>; Metallo, Amber C CIV USARMY CENAB (USA) <Amber.C.Metallo@usace.army.mil>
Subject: [URL Verdict: Neutral][Non-DoD Source] RE: DC Coastal - Sponsor Letter of Intent (LOI) Template & Self-certification of Financial Capability

Christine and Amber,

While reviewing the LOI Template and Self-Certification of Financial Capability with leadership, a few questions came up regarding when Fairfax County will have to commit to the financial obligation and when the County and residents will have an opportunity to provide input into the design. I found this USACE Planning Community Toolbox. Will the Belle Haven project follow the process outlined in the Toolbox? Step 14 in the Toolbox is "Execute Design Agreement and Secure Sponsor Design Funding." Is Step 14, following the Administration Review of the Chief of Engineer's Report, when the county would commit funds as a non-federal sponsor?

Are you available for a quick phone call on Monday afternoon (2/27), possibly between 2:00 and 5:00 PM? We would just like to clarify the dates related to input and financial obligation.

Thank you,

Catie Torgersen
Planner
Stormwater Planning Division
Fairfax County DPWES
12000 Government Center Parkway
Fairfax, VA 22035
703-639-7664 (cell)

From: Danaher, Christine M CIV USARMY CENAB (USA) <Christine.M.Danaher@usace.army.mil>
Sent: Thursday, February 2, 2023 5:16 PM
To: Torgersen, Catherine S <Catherine.Torgersen@fairfaxcounty.gov>; Codding, Ellie

<Eleanor.Codding@fairfaxcounty.gov>; Carinci, Craig A. <Craig.Carinci@fairfaxcounty.gov>; Herrington, Christopher S <Christopher.Herrington@fairfaxcounty.gov>
Cc: Bierly, Daniel M CIV USARMY CENAB (USA) <Daniel.M.Bierly@usace.army.mil>; Metallo, Amber C CIV USARMY CENAB (USA) <Amber.C.Metallo@usace.army.mil>
Subject: DC Coastal - Sponsor Letter of Intent (LOI) Template & Self-certification of Financial Capability

Hello everyone,

As promised at our check-in meeting today, please see attached templates for the following with some additional guidance:

1. **Sponsor Letter of Intent (LOI) template**:
    a. When the time comes to submit the LOI to us, please use County of Fairfax Letter head
    b. For the highlighted values, we will provide you with the total estimated project costs prior to the submission due date.

2. **Self-certification of financial capability:**
    a. This does not need to be submitted on County of Fairfax letter head
    b. I've also attached a few background documents that helps to explain the self-certification of financial capability.

We kindly request that the signed LOI and self-cert of financial capability be submitted to us **NLT 14 March 2023**.

If you have any questions, please feel free to reach out.

Warm Regards,

Christine Danaher
Project Manager, CENAB – PPC
2 Hopkins Plaza, Baltimore, MD 21201
Mobile: (443) 257-0368
Christine.M.Danaher@usace.army.mil

METROPOLITAN WASHINGTON, DISTRICT OF COLUMBIA COASTAL STORM RISK MANAGEMENT FEASIBILITY STUDY

INTEGRATED FEASIBILITY REPORT & ENVIRONMENTAL ASSESSMENT

APPENDIX G14: ENVIRONMENTAL JUSTICE FOR THE RECOMMENDED PLAN

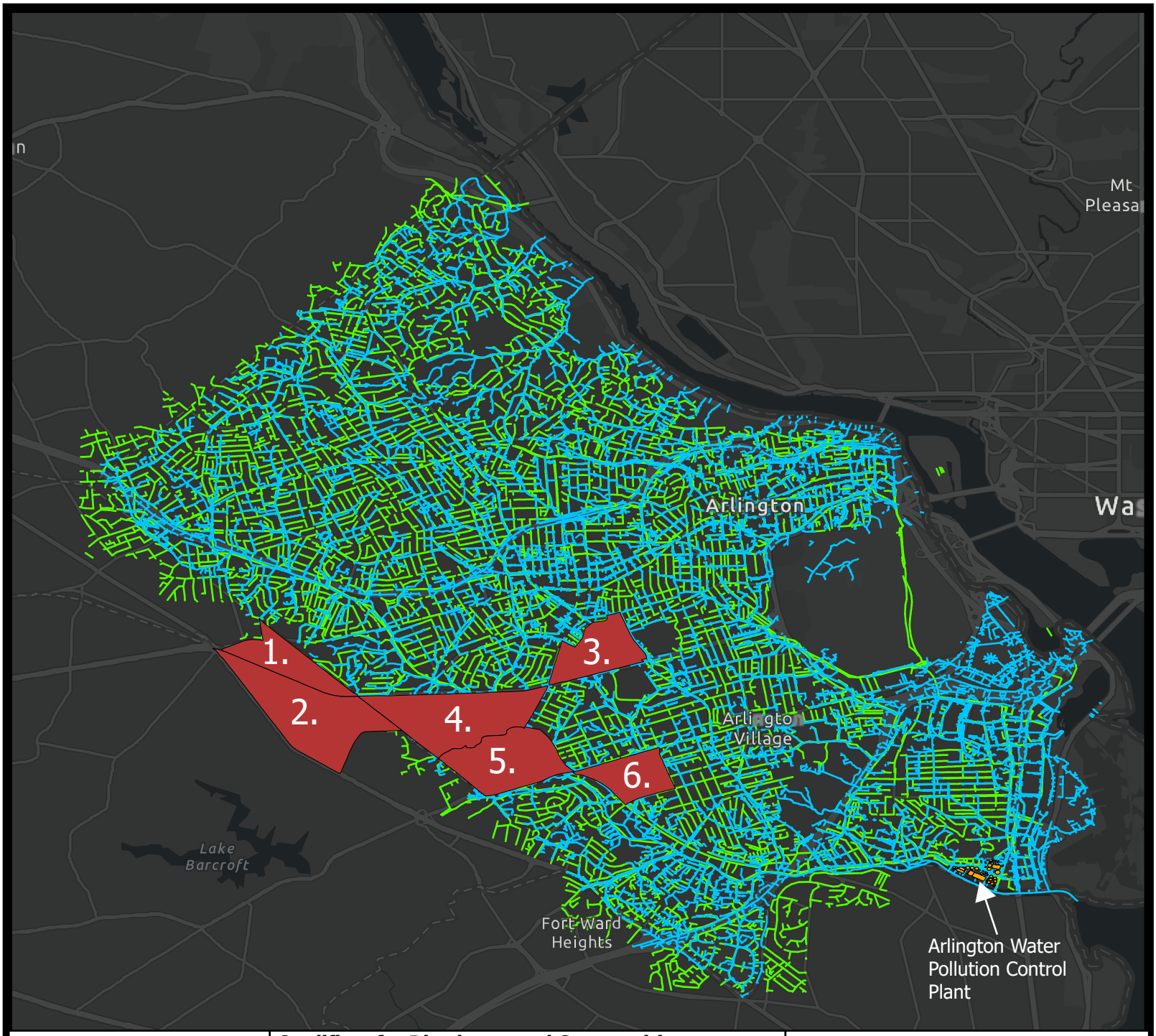
Table 1. Description of Disadvantaged Communities in the Arlington Wastewater Treatment Plant Sewershed

Census Tract	Population	Households	Categories	Percentiles Compared to US (CEQ, 2022)	Percentiles Compared to the state (EPA, 2023)	Virginia Mapping for Environmental Justice
1. 51059451400, Fairfax County, VA	3,159 – This tract contains three shopping centers, the Willston Multicultural center, a portion of Upton Hill Regional Park, apartment/condo complexes, and a waterpark. No single-family residences observed. Adjacent to major roadways.	1,305	**Housing cost -** Share of households making less than 80% of the area median family income and spending more than 30% income on housing	92nd percentile (above 90th percentile)		Highest cumulative EJ impact
			Underground storage tanks and releases - Formula of the density of leaking underground storage tanks and number of all active underground storage tanks within 1500 feet of the census tract boundaries.	91st percentile (above 90th percentile)	90th percentile	
			Linguistic isolation - share of households where no one over 4 yrs. old speaks English very well.	97th percentile (above 90th percentile)	98th percentile	
			High school education - percent of people aged 25 and older whose high school education is less than a high school diploma.	35% (above 10%)	97th percentile	
			Low median income - Comparison of median income in the tract to median incomes in the area.	96th percentile (above 90th percentile)		
			Low Income - people in households where income is less than or equal to twice the federal poverty level.	89th percentile (above 65th percentile)	85th percentile	

Census Tract	Population	Households	Categories	Percentiles Compared to US (CEQ, 2022)	Percentiles Compared to the state (EPA, 2023)	Virginia Mapping for Environmental Justice
2. 51059451501, Fairfax County, VA	5,572 – This tract contains a large shopping center, several other large businesses, a hotel, apartment/condo complexes, and single-family residences. Adjacent to major roadways.	2,282	**Linguistic isolation**	91st percentile (above 90th percentile)	71st percentile	High cumulative EJ impact
			High school education	23% (above 10%)	67th percentile	
			Low income	68th percentile (above 65th percentile)	72nd percentile	
3. 51013102003 – Arlington County, VA	4,041 – This tract contains a shopping center, businesses along N Glebe Rd., apartment/condo complexes, single-family residences, a senior center, several churches, a school, and a couple of parks. Adjacent to major roadways.	2,610	**High school education**	17% (above 10%)	57th percentile	Highest cumulative EJ impact
			Low median income	97th percentile (above 90th percentile)		
			Low income	67th percentile (above 65th percentile)	67th percentile	

Census Tract	Population	Households	Categories	Percentiles Compared to US (CEQ, 2022)	Percentiles Compared to the state (EPA, 2023)	Virginia Mapping for Environmental Justice
4. 51013102100, Arlington County, VA	2,394 – This tract contains primarily single-family residences. Schools, a library, hospital, and several parks are also located in this tract. A large green space (Glencarlyn Park) associated with Four Mile Run is in the SE portion of the tract.	997	**Linguistic isolation**	94th percentile (above 90th percentile)	83rd percentile	High cumulative EJ impact
			High school education	11% (above 10%)	59th percentile	
5. 51013102200 – Arlington County, VA	8,220 – This tract contains apartment/condo complexes, single-family residences, an elementary school, church, and several businesses along Columbia Pike. A large green space (Glencarlyn Park) associated with Four Mile Run is in the north portion of the tract.	3,074	**Housing cost**	97th percentile (above 90th percentile)		Highest cumulative EJ impact
			High school education	25% (above 10 percent)	91st percentile	
			Low median income	92nd percentile (above 90th percentile)		
			Low income	71st percentile (above 65th percentile)	56th percentile	

Census Tract	Population	Households	Categories	Percentiles Compared to US (CEQ, 2022)	Percentiles Compared to the state (EPA, 2023)	Virginia Mapping for Environmental Justice
6. 51013102701 – Arlington County, VA	4,135 – This tract contains primarily apartment/condo complexes, single-family residences, Doctor's Branch Park, and an elementary school.	1,385	**Housing cost**	90th percentile (above 90th percentile)		Highest cumulative EJ impact
			Linguistic isolation	90th percentile (above 90th percentile)	87th percentile	
			Low median income	91st percentile (above 90th percentile)		
			High school education	14% (above 10%)	77th percentile	
			Low income	70th percentile (above 65th percentile)	86th percentile	



Legend

- Arlington Storm Mains
- Arlington Sewer Mains
- ARL Water Pollution Control Plant
- Disadvantaged Communities

Qualifiers for Disadvantaged Communities

1. Housing Cost, Underground Storage Tanks, Linguistic Isolation, Low Income
2. Linguistic Isolation, Low Income
3. High School Education, Low Income
4. Linguistic Isolation, High School Education
5. Housing Cost, High School Education, Low Income
6. Housing Cost, High School Education, Linguistic Isolation, Low Income

Disadvantaged Communities Tracts

1. 51059451400 (pop. 3,159)
2. 51059451501 (pop. 5,572)
3. 51013102003 (pop. 4,041)
4. 51013102100 (pop. 2,394)
5. 51013102200 (pop. 8,220)
6: 51013102701 (pop. 4,135)

TOTAL POPULATION: 27,521

Disadvantaged Communities Served by ARL Water Pollution Control Plant
Washington, DC, Metro Coastal Flooding

Map Created by: CAB
September 13, 2023
Data Source: CEJST

N

0 1.18 2.35 4.7 Miles

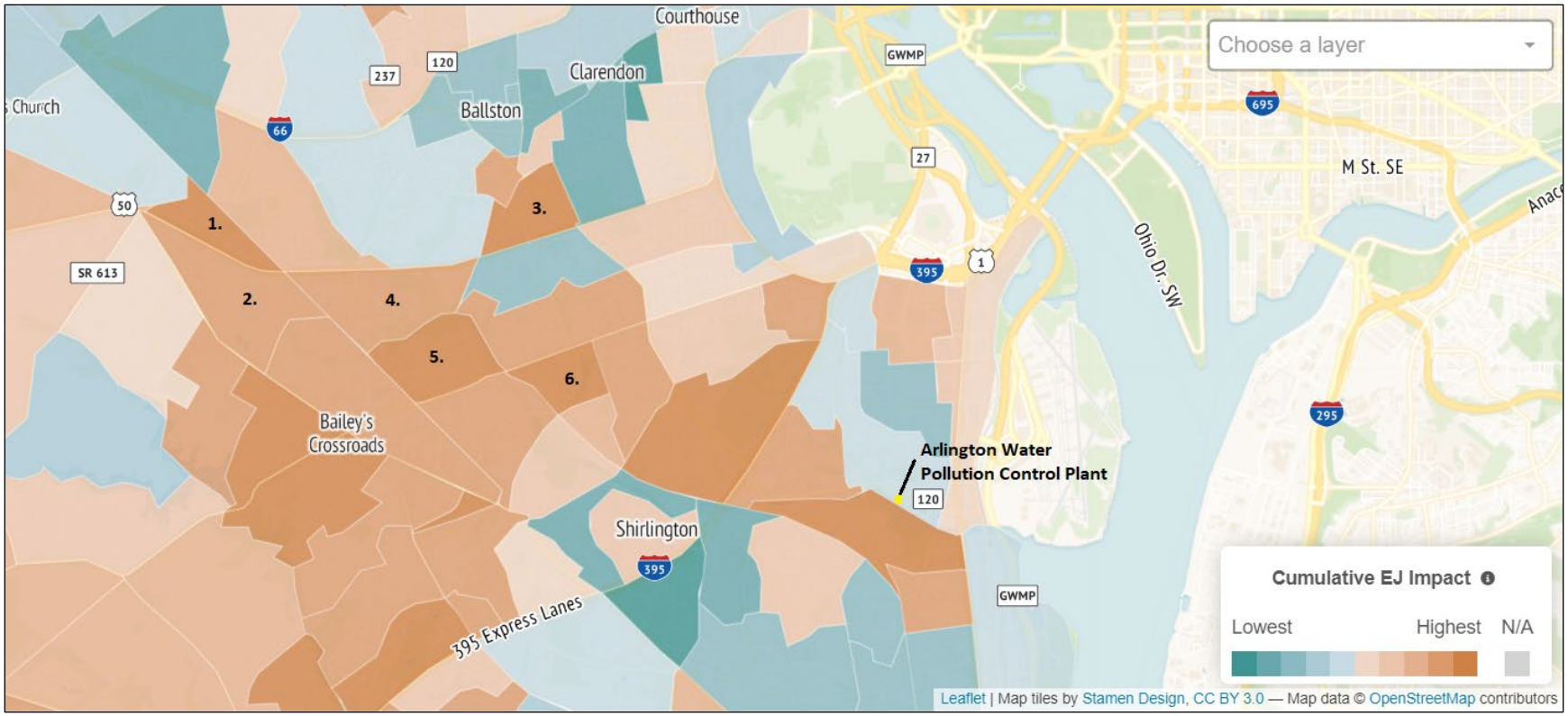


Figure 2. Cumulative Environmental Justice Impacts for the Disadvantaged Communities served by the Arlington Water Pollution Control Plant.