

Appendix A

Issues Dismissed from Detailed Analysis

The following issues were initially considered but ultimately dismissed from detailed analysis in this EA because they were determined not central to the proposal or not of critical importance to the decision. Additional reasons that detailed analysis was not warranted are provided for each issue.

Issue: The proposed project could generate air emissions. Heavy equipment, generators, and other diesel-powered equipment would produce exhaust-related emissions during construction that have the potential to exceed ambient air levels. To prevent the release of odorous emissions to the surface during the construction of the diversion chambers, closed flumes and/or temporary odor control measures would be implemented at the construction areas, if necessary. Any construction or demolition activities that are likely to create exhaust emissions and fugitive dust would be subject to VDEQ Air Division review and oversight, in accordance with Virginia's Air Pollution Control Law. Over the long term, below-grade, passive ventilation controls would regulate air flow within the tunnel system and capture fugitive odors. By implementing the aforementioned minimization and mitigation measures during construction and tunnel operation, RiverRenew would have minimal short- and long-term impacts to air quality. Based on these considerations, this issue has been dismissed from detailed analysis.

Issue: Construction could disturb federally listed species and critical habitat. During project planning, the NPS and AlexRenew determined that construction of the Outfall 001 Diversion Facility would result in disturbances in and along the west bank of the Potomac River within Oronoco Bay. A review of the National Oceanic and Atmospheric Administration, National Marine Fisheries Service data noted the study area contains critical habitat for the Atlantic sturgeon (*Acipenser oxyrinchus*), and documented occurrences of the shortnose sturgeon (*Acipenser brevirostrum*) in the Potomac River and just downstream of the project in Hunting Creek. These species are listed as Endangered and are protected under the Endangered Species Act. To avoid the potential for adverse effects to sturgeon, AlexRenew would avoid working within the Potomac River during the annual time of year restriction (TOYR) on in-stream work between February 15 to June 30. Note that once a cofferdam is in place, work can occur landward of the cofferdam during the TOYR.

Issue: Portions of the project area are within the regulated base flood elevation (100-year floodplain) of the Potomac River and Hooffs Run. Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map panel 5155190041E (revised June 16, 2011) details the portions of the study area that are within the regulated 100-year floodplain of the Potomac River or Hooffs Run. Given the location of the existing combined sewer outfalls, project encroachments into the 100-year floodplain are unavoidable. The proposed action could result in disturbances during construction and may also add permanent structures and minor amounts of fill within the regulated floodplain.

Any floodplain encroachments would be minimal in relation to the overall area of the floodplain. Preliminary hydraulic modeling has indicated there would be no-rise in the base flood elevations and AlexRenew is in the process of obtaining a no-rise certification from the City of Alexandria. Also, AlexRenew would design supporting tunnel infrastructure to be resilient to the effects of flooding, taking into consideration the potential effects of climate change. Based on these considerations, the proposed project would not result in a negative impact to human health, capital investment, or natural and beneficial floodplain values. Therefore, this project is anticipated to conform to the requirements of Executive Order 11988 Floodplain Management, and this issue has been dismissed from detailed analysis and a Floodplain Statement of Findings is not necessary.

Issue: The proposed tunnel and sewer systems could be impacted by climate change. The proposed action is designed to account for anticipated water elevation increases due to climate change. It is not anticipated to be a significant source of greenhouse gas emissions, or be a contributing factor to climate change.

Issue: Minority or low-income populations could be disproportionately impacted. Communities in the vicinity of the project contain both minority and low-income populations; however, this issue has been dismissed from detailed analysis because equal consideration was given to all public input from persons regardless of age, race, income status, or other socioeconomic or demographic factors. The proposed action would not result in any identifiable adverse human health effects, but is expected to result in beneficial effects from water quality improvements. Additionally, the proposed action would not disproportionately affect any minority or low-income communities. None of the considered alternatives encroach upon communities or structures with protected populations and the project is not anticipated to cause changes in the regional labor market.

Issue: The proposed project could impact prime farmland. No areas meeting the definition of prime farmland occur in the study area.

Issue: Lands held in trust by the Secretary of the Interior for the benefit of Indians. There are no lands held in trust for the benefit of Indians located within the study area.

Issue: The proposed project could impact high density seismic zones or sole source aquifers. According to the Virginia Department of Mines Mineral and Energy, the study area does not fall within any of the three high density seismic zones documented in Virginia. There are no documented faults in the study area. USEPA mapping noted the study area is not served by a sole source aquifer; therefore, no impacts are anticipated.

Issue: The proposed project could impact navigation in the Potomac River. The project is not anticipated to encroach into the adjacent federal navigation channel or cause and adverse impact on existing commercial and recreational uses reliant upon navigation.

Appendix B

Construction Haul Routes

Potential construction haul routes (**Figure B-1**) have been identified to support construction activities associated with each RiverRenew system component. Haul routes will be coordinated with the City of Alexandria and NPS, and will take traffic, road conditions, and bridge capacities into consideration. The proposed haul routes would not utilize George Washington Memorial Parkway, or any roads within Jones Point Park. Within the City of Alexandria, final haul routes are at the discretion of the Department of Transportation and Environmental Services. Additional information regarding potential haul routes for each RiverRenew system component is provided below.

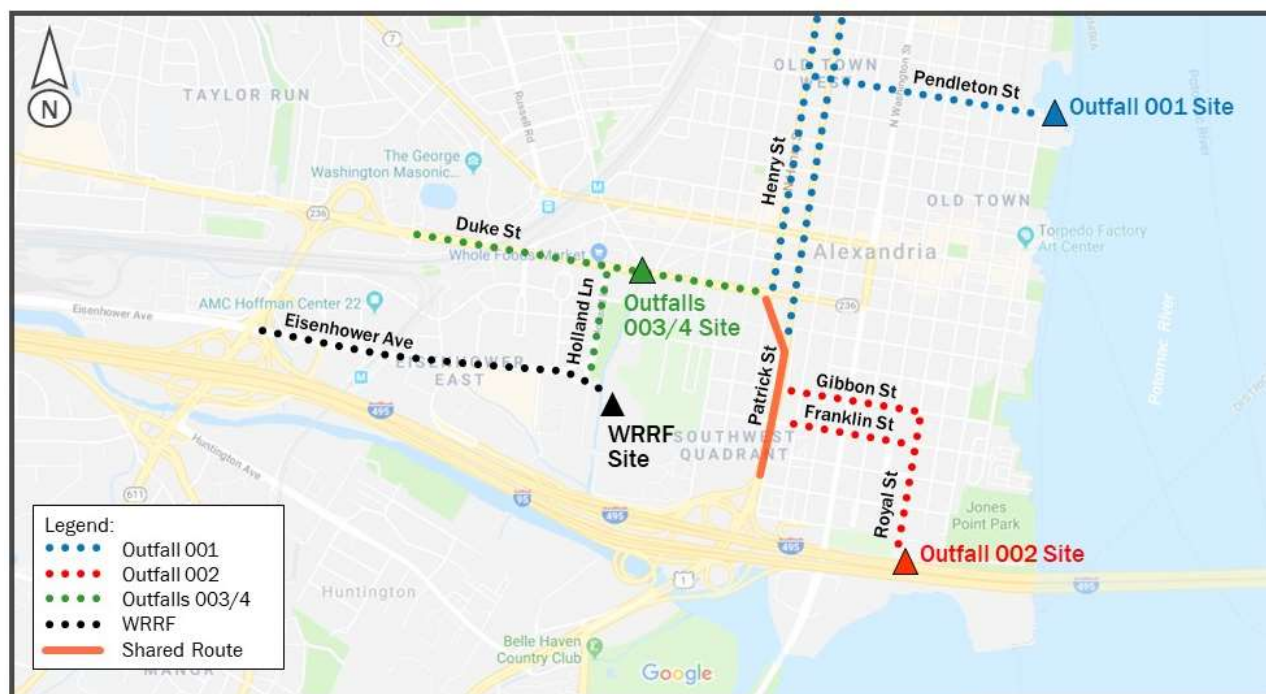


Figure B-1. Potential Construction Haul Routes

Outfall 001 Diversion Facility

The outbound haul route to points north would leave the site via Pendleton Street and continue onto U.S. Route 1 North to access I-395. The outbound haul route to points south would leave the site via Pendleton Street and continue onto U.S. Route 1 South to access I-95/I-495. Inbound haul routes from the north or south would be the reverse of the outbound routes.

Outfall 002 Diversion Facility

The inbound haul route would access the site from U.S. Route 1 via Franklin Street, then turn right onto S. Royal Street. The outbound haul route would leave the site via S. Royal Street, turn left onto Gibbon Street and then left onto U.S. Route 1 South to access I-95/I-495.

Outfall 003/4 System

Multiple haul routes are proposed for Outfall 003/4 System construction activities. All options include construction activities near Duke Street between Dangerfield Road and Holland Lane, as well as at the WRRF. The Holland Lane Diversion Sewer option would also include construction activities within

Holland Lane. The Hooffs Run Diversion Sewer option would also include construction activities within Hooffs Run. Outbound haul routes would access Duke Street and/or Eisenhower Avenue to I-95/I-495. Inbound haul routes would be the reverse of the outbound routes.

WRRF Site (Tunnel Dewatering Pumping Station and Wet Weather Treatment Facility)

The Tunnel Dewatering Pumping Station (TDPS) and Wet Weather Treatment Facility components are located at the WRRF. The tunnel Mining Shaft is one element of the TDPS component, and all material mined from the Outfall 001/2 tunnel will be hauled from the WRRF. The outbound haul route would utilize Eisenhower Avenue to access I-95/I-495. The inbound haul route would be the reverse of the outbound haul route.

Appendix C

Component Options Considered but Dismissed

The following component options were initially considered but ultimately dismissed from detailed analysis in this EA. Justification for eliminating these options from further analysis was based on one or more of the following factors: the option would not satisfy the project purpose and need; the option would not be technically, logistically, or economically feasible; or similar options would be less environmentally damaging, would have reduced community impacts and/or would be less expensive.

Outfall 001/2 System

Tunnel Alignment Options

AlexRenew evaluated a tunnel alignment option located below Fairfax Street to collect flows at Outfalls 001 and 002, as shown on **Figure C-1** below. The proposed Fairfax Street alignment was eliminated from further consideration because it would require locating a diversion facility in the densely developed residential area at the intersection of Pendleton Street and North Fairfax Street. A diversion facility in this location would require the removal of existing buildings and the closure of the intersection for approximately 2.5 years. Additionally, due to the greater distance from Outfall 001, this alignment and associated diversion facility would require a larger construction staging area within the Pendleton Street right of way to the east of Fairfax Street, when compared to the other options discussed in *Chapter 2* of this EA. The Fairfax-Green alignment alternative would locate the tunnel underneath 23 residential properties, and would include 358 buildings within the 200-foot tunnel buffer area around the tunnel centerline. The Fairfax-Church alignment alternative would locate the tunnel underneath 21 residential properties, and would include 338 buildings within the 200-foot tunnel buffer area around the tunnel centerline. Both alternatives would require a 500-foot TBM turning radius, which could cause undesirable design and construction conditions. For these reasons, the Fairfax Street tunnel alignment option was eliminated from further consideration.

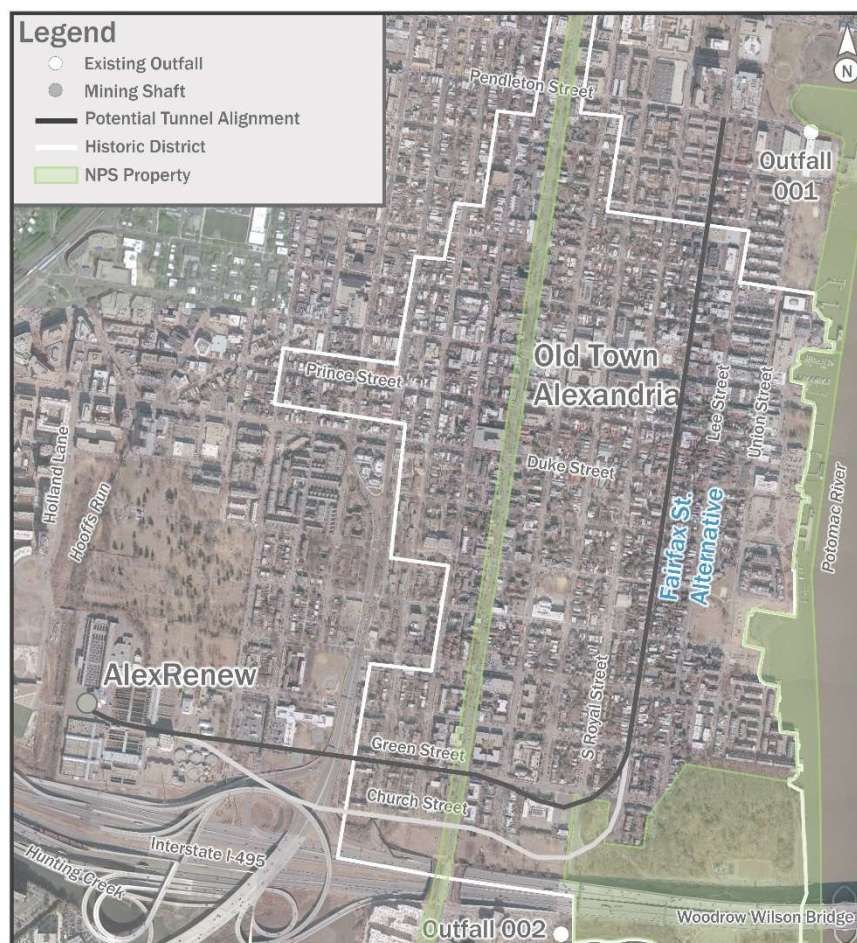


Figure C-1. Fairfax Street Dismissed Tunnel Alignment Option

Diversion Facility Options

AlexRenew previously evaluated diversion facility options to service Outfall 002 located within the existing Basilica School of Saint Mary parking lot, as shown on **Figure C-2**, and within Green Street, west of South Royal Street, as shown on **Figure C-3**. These diversion facility locations were not anticipated to directly impact NPS land; however, the main entrance to Jones Point Park would be inaccessible during construction activities in South Royal Street. A temporary entrance to Jones Point Park would need to be constructed in advance of RiverRenew construction activities. In addition, each option would result in adverse impacts to vehicular traffic, the Basilica School of Saint Mary, and the surrounding residential community. Due to the potential for Jones Point Park access disruption and community impacts identified below, these options have been eliminated from further consideration.

Outfall 002 Diversion Facility Basilica School of Saint Mary Dismissed Option

The Basilica School of Saint Mary Diversion Facility would be constructed in the northern portion of the Basilica School of Saint Mary's (Basilica School) parking lot, near the intersection of South Royal Street and Green Street. The anticipated construction staging area would total approximately 1.0 acre (**Figure C-2**). The diversion facility would be constructed just south of Green Street and west of the existing combined sewer under South Royal Street. The diversion chamber would be retrofitted to the existing 84-inch by 64-inch combined sewer to divert wet weather to the tunnel for storage. An

approach channel would be constructed to convey flow from the diversion chamber to the drop shaft. Pending detailed design, a below-ground ventilation control vault would be constructed to mitigate fugitive emissions from the shaft.

Construction of the diversion facility and connection to the tunnel would take approximately 2.5 years. South Royal Street would be closed south of Green Street during most of this period to construct the diversion chamber on the existing combined sewer. A clearway through the construction site would be maintained to allow emergency vehicles to access underneath the Woodrow Wilson Bridge; however, the main entrance to Jones Point Park would be inaccessible during construction activities in South Royal Street. A temporary entrance to Jones Point Park would need to be constructed in advance of RiverRenew construction activities. This portion of South Royal Street is also utilized heavily by The Basilica School during morning drop off and afternoon pickup, and to enter the school parking lot. It is estimated that approximately 400 vehicles per day use South Royal Street to access the Basilica School. Additionally, parking for school events would be impacted by the loss of approximately 65 parking spaces within the construction staging area and a new parking lot entrance would need to be constructed off Green Street. Alternate arrangements for student drop off, pickup and event parking would need to be arranged with Basilica School and coordinated with the community if this option was selected.

To allow the tunnel system to have efficient hydraulic flows and be properly vented, the top of the diversion facility would be at approximately elevation +14 feet. This elevation would keep the drop shaft hatches and odor control equipment at or above the 500-year floodplain elevation and make the tunnel system more resilient to climate change, as recommended by the LTCPU stakeholder group. The Basilica School parking lot currently ranges from elevation +10 feet along South Royal Street to elevation +20 feet adjacent to the school building. Thus, it is anticipated that the parking lot would need to be regraded, and a 4-foot retaining wall added along South Royal Street to accommodate the diversion facility. Permanent access to the Basilica School parking lot would be required for long-term maintenance needs.

This site would be located adjacent to the Basilica School, and across the street from community gardens and a residential neighborhood within the Alexandria Historic District. This option is not anticipated to impact any jurisdictional wetlands or other waters of the U.S. The majority of the construction staging area is currently paved, but it is anticipated that this alternative would result in the removal of approximately eight (8) trees.

Following construction, construction manholes, hatches and other structure access points would be flush with grade. The only anticipated above-grade component would be an electrical cabinet to serve the ventilation control vault equipment. The site would be restored in coordination with the Basilica School.

Due to the direct operational impacts to the Basilica School and other community impacts described above, the Basilica School of Saint Mary diversion facility option was eliminated from further consideration.

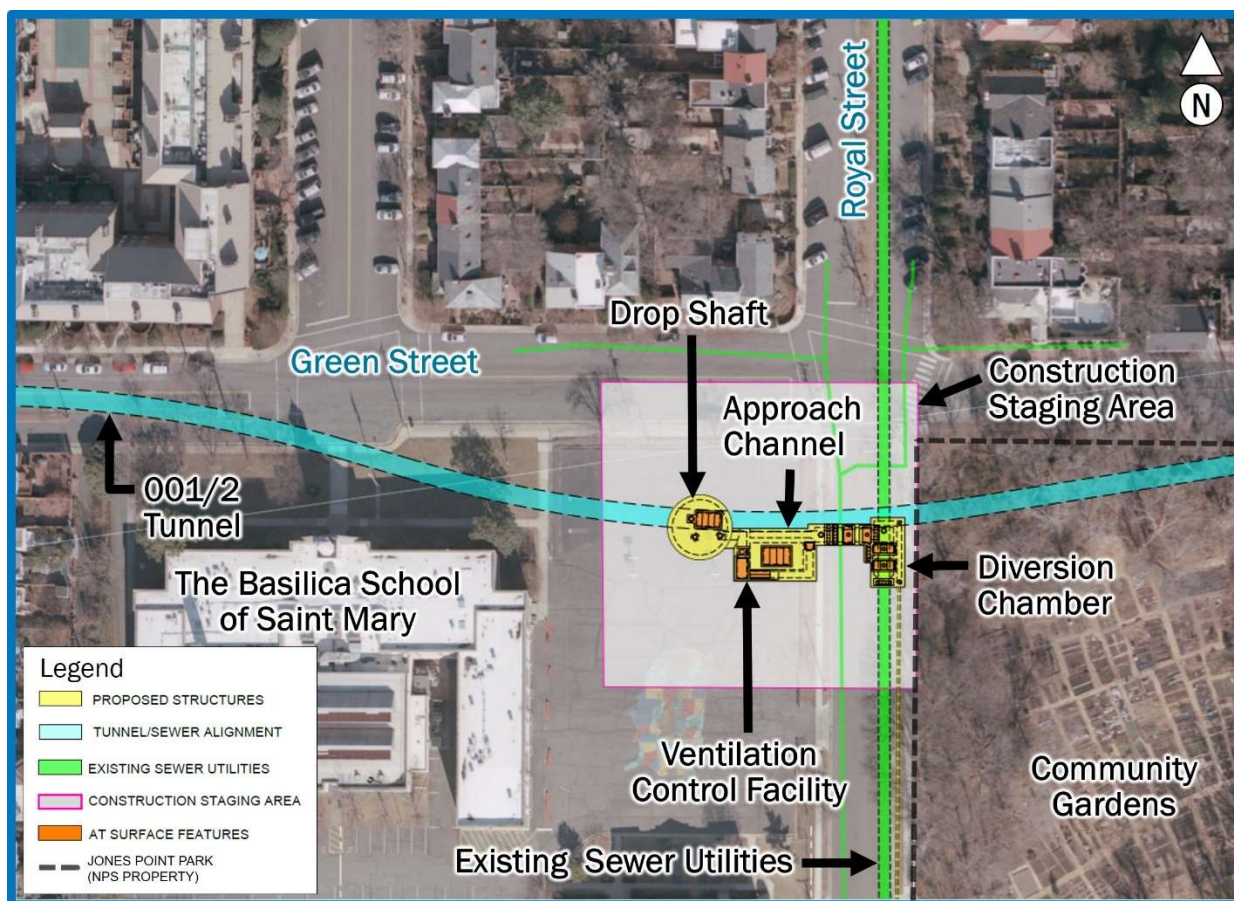


Figure C-2. Basilica School of Saint Mary Dismissed Diversion Facility Option

Outfall 002 Diversion Facility Green Street West Dismissed Option

The Green Street West Diversion Facility would be constructed within Green Street, just west of South Royal Street. The anticipated construction staging area would total approximately 1.0 acre (**Figure D-3**) and would occupy a portion of the Basilica School parking lot. The components of the diversion facility would be the same as the Basilica School of Saint Mary option. As discussed in further detail below, this option would require raising the intersection of Green Street and South Royal Street by approximately four (4) feet to accommodate the diversion facility at a higher elevation than the existing road.

Construction of the diversion facility and connection to the tunnel would take approximately 2.5 years. The portions of Green Street and South Royal Street within the construction staging area would be closed during most of this period to construct the diversion chamber on the existing combined sewer. A clearway through the construction site in South Royal Street would be maintained to allow emergency vehicles to access underneath the Woodrow Wilson Bridge; however, the main entrance to Jones Point Park would be inaccessible during construction activities. A temporary entrance to Jones Point Park would need to be constructed in advance of RiverRenew construction activities. This portion of South Royal Street is also utilized heavily by The Basilica School during morning drop off and afternoon pickup and to enter the school parking lot. It is estimated that approximately 400 vehicles per day use South Royal Street to access the Basilica School. Additionally, parking for school events would be impacted by the loss of approximately 55 parking

spaces within the construction staging area and a new parking lot entrance would need to be constructed off Green Street. Alternate arrangements for student drop off, pickup and event parking would need to be arranged with Basilica School and coordinated with the community if this option was selected.

To allow the tunnel system to have efficient hydraulic flows and be properly vented, the top of the diversion facility would be at approximately elevation +14 feet. This elevation would keep the drop shaft hatches and odor control equipment at or above the 500-year floodplain elevation and make the tunnel system more resilient to climate change, as recommended by the LTCPU stakeholder group. The intersection of Green Street and South Royal Street is currently at elevation +10 feet. Thus, Green Street and South Royal Street would need to be regraded to accommodate the diversion facility, which could result in new retaining walls in front of the homes closest to the intersection of Green Street and South Royal Street.

This site would be located adjacent to the Basilica School and a residential neighborhood within the Alexandria Historic District, as well as across the street from community gardens. This option is not anticipated to impact any jurisdictional wetlands or other waters of the U.S. The majority of the construction staging area is currently paved, but it is anticipated that this alternative would result in the removal of approximately eight (8) trees.

Following construction, construction manholes, hatches and other structure access points would be flush with grade. The only anticipated above-grade component would be an electrical cabinet to serve the ventilation control vault equipment. The site would be restored in coordination with the Basilica School.

Due to the direct operational impacts to the Basilica School and other community impacts described above, the Green Street West diversion facility option was eliminated from further consideration.

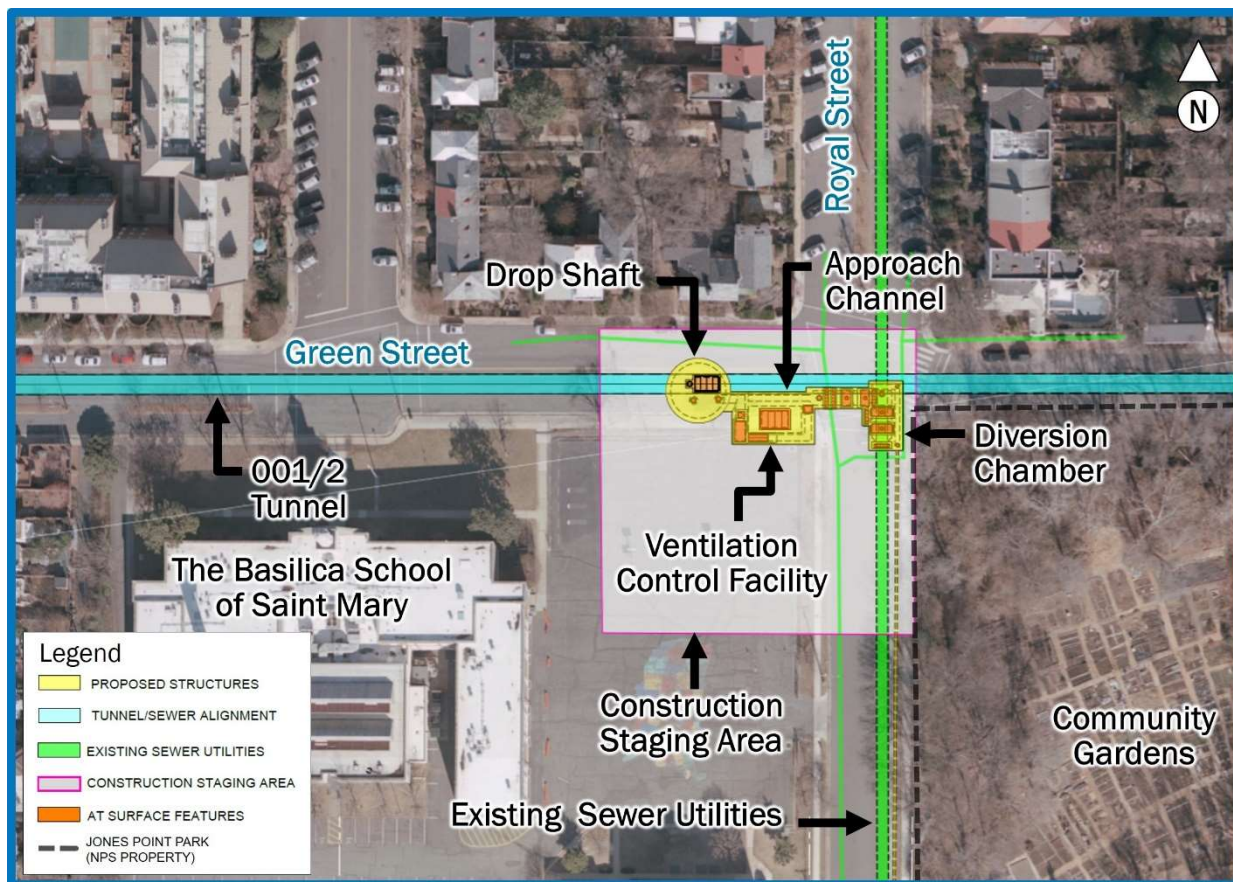


Figure C-3. Green Street West Dismissed Diversion Facility Option

Appendix D

Wetland Statement of Findings

Introduction

The City of Alexandria was established in 1749 along the western bank of the Potomac River. Alexandria has a high percentage of impervious surfaces and a mixture of combined and separate sewer systems. There are four combined sewer outfalls (Outfalls 001-004) within the City that discharge rainwater mixed with untreated sewage into the Potomac River and its tributaries when the capacity of the combined sewer system is exceeded during wet weather storm events. Alexandria Renew Enterprises (AlexRenew), with support from the City of Alexandria is proposing to implement RiverRenew, a major infrastructure project designed to substantially reduce combined sewer discharges to the Potomac River, Hunting Creek, and Hooffs Run. RiverRenew is needed to comply with the Commonwealth of Virginia's 2017 Legislation which requires that Alexandria's four existing combined sewer outfalls be brought into compliance with Virginia law by July 1, 2025. A portion of the study area, as shown in **Figure D-1**, falls within Jones Point Park, George Washington Memorial Parkway and the bed of the Potomac River, which are administrative units of the National Park Service (NPS).

Pursuant to the National Environmental Policy Act of 1969 (NEPA), AlexRenew and the NPS are evaluating the proposed construction of RiverRenew through an Environmental Assessment (RiverRenew Environmental Assessment 2019). Additionally, Executive Order (EO) 11990 - Protection of Wetlands requires the NPS and other federal agencies to consider the potential impacts to wetlands that may result from implementing the project. This Statement of Findings was prepared per Director's Order #77-1: *Wetland Protection* for the proposed RiverRenew project and documents compliance with NPS wetland protection procedures. A Statement of Findings has been completed because some of the proposed construction associated with Outfall 001 improvements would take place in the Potomac River, and some of the Outfall 002 improvements would take place in jurisdictional waters of the US (WOTUS) within Jones Point Park.



Figure D-1. RiverRenew Study Area

Proposed Action

The proposed action would include a combination of surface facilities, deep shafts, tunnels, diversion sewers and treatment facility upgrades to store, pump and treat flows from Outfalls 001-004 along two separate areas; one to capture both Outfalls 001 and 002 along the Potomac River and Hunting Creek, and the other to capture Outfalls 003 and 004 along Hooffs Run. The tunnel system will capture and redirect combined sewer discharges from the existing combined sewer system to a new storage and conveyance tunnel system when the capacity of the existing sewer system is exceeded during rain events. Captured combined sewer flows would be conveyed by gravity to the AlexRenew Water Resource Recovery Facility (WRRF) for treatment prior to discharge. Other infrastructure, including upgrades to the WRRF, wet weather treatment facility, pumping stations, ventilation control facilities, and residuals management systems would also be constructed in support of RiverRenew. It is anticipated that implementation of RiverRenew would capture 98% of combined sewer flows and limit discharges to 4-6 times per year, based on the average climate period of 2000-2016, resulting in significant water quality benefits. RiverRenew construction activities will include surface disturbance at four distinct locations: Outfall 001 Diversion Facility, Outfall 002 Diversion Facility, Outfall 003/4 Diversion Sewer and the WRRF Upgrades. Construction of the Outfall 001 and 002 Diversion Facilities would result in impacts to riverine and palustrine wetlands, respectively, on NPS lands. These impacts would require Section 10 of the Rivers and Harbors Act and Section 404 of the Clean Water Act (CWA) permits from the U.S. Army Corps of Engineers (USACE), Section 401 of the Clean Water Act water quality certification from the Virginia Department of Environmental Quality (VDEQ), and would require compliance with NPS Director's Order #77-1: *Wetland Protection*. Construction of the Outfall 003/4 Diversion Sewer and WRRF Upgrades would result in impacts to palustrine wetlands and other tidal and non-tidal WOUS; however, these activities are not located on NPS lands. These impacts would require Section 10 of the Rivers and Harbors Act and Section 404 of the CWA permits, as well as Section 401 of the CWA water quality certification.

Wetland Delineations

In order to assess impacts of the project alternatives on riverine, tidal and non-tidal wetlands, the project team conducted jurisdictional wetland and waters delineations within the study area April 2018 and December 2018. These delineations were conducted in accordance with methodology set forth in the 1987 *U.S. Army Corps of Engineers Wetland Delineation Manual* and the 2012 *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region* and associated guidance documents. Additionally, riverine wetlands were identified in accordance with the Federal Geographic Data Committee Wetlands Classification Standard (FGDC-STD-004-2013). The FGDC Wetlands Classification Standard defines riverine wetlands as the areas within a waterway of a depth of 2.5 meters (8.2 feet) or less at low water, or at the limits of emergent or woody vegetation extending beyond this depth. Riverine wetlands were identified utilizing the National Oceanic and Atmospheric Administration (NOAA) predicted Mean High Water at the Alexandria Station and measured approximately 3.25 feet above Mean Low Water Station ID 8634214. Extents of jurisdictional wetlands and waters of the United States (as regulated under Section 401 and 404 of the CWA as well as Section 10 of the Rivers and Harbor Act) are depicted on **Figure D-2**.



Figure D-2. Jurisdictional Wetlands in the Study Area

Table D-1 provides a summary of the types of wetlands located in the project study area utilizing the Cowardin classification¹, and the approximate sizes/lengths of the wetland areas are noted in parentheses.

Table D-1. Types and Sizes of Wetlands in the Study Area

RiverRenew Surface Disturbance Locations	Number and Approximate Area (acres) of Wetlands						Number and Approximate Length (linear feet) of WOUS			
	PFO	PEM	PSS	POW	EEM	R1EM	EPH	R4	R1/ R3	R2 UB3
Outfall 001 Diversion Facility (Potomac River)	-	-	-	-	-	1 (8.11)	-	-	-	-
Outfall 002 Diversion Facility (Jones Point Park)	15 (6.21)	5 (0.91)	2 (0.28)	1 (0.32)	-	3 (0.38)	1 (297)	3 (452)	-	1 (167)
Total Number of Wetlands and Acres/LF	15 (6.21)	5 (0.91)	2 (0.28)	1 (0.32)		4 (8.49)	1 (297)	3 (452)		1 (167)

Evaluation of Wetland Functions and Values

A functional assessment has been conducted in general accordance with a combination of several methodologies that utilize common primary analysis topics and professional judgement. Functional Assessment methodologies utilized include the NC-CREWS Functional Assessment (NCDEQ), North Carolina Wetland Assessment Method, (NCWAM version 5) NCDEQ, U.S. Fish and Wildlife Service Habitat Evaluation Procedures (1980), and the Ohio Rapid Assessment Method (ORAM) Ohio EPA 2/2001. Given the highly urbanized nature of the study area and the long history of manipulation within the project area wetlands, no wetland areas were classified as “exceptional”.

Riverine Wetlands - Potomac River (Outfall 001 Diversion Facility)

Given the highly urbanized landscape of Alexandria, many wetland functions have been previously impacted through shoreline hardening with riprap and bulkheads, channelization of streambeds and shorelines, invasive species domination, and existing infrastructure. The shoreline areas of the Potomac River along the Alexandria waterfront (including Oronoco Bay Park) are hardened with bulkheads, riprap, steel and concrete, and only support sparsely vegetated rubble areas. While

¹ The Cowardin classification system is based on the type of primary hydrologic regime and setting of the wetland or Waters of the U.S. (WOTUS) as well as the predominant vegetation community found in the wetland or WOUS. The first letter denotes the setting of the wetland and includes R=Riverine, P=Palustrine, E=Estuarine, and even EPH= ephemeral (only flows during storm events). The following letters represent the vegetation types: FO=Forest, EM=Emergent, SS=Scrub Shrub, OW=Open Water, UB=unconsolidated bottom. Numbers are associated with the hydrologic frequency, the lower the number the larger the order of the system (e.g. R4 is an intermittent riverine tributary, whereas R1/2 represents the Potomac River in tidal and non-tidal sections, respectively).

shoreline erosion prevention is addressed by the hardening, the performance of other important functions typically associated with tidal riverine wetlands including, fish and shellfish nurseries, and sediment retention have been limited by the prior hardening. Aquatic productivity in the Potomac River at the Outfall 001 Diversion Facility project area is low due to prior industrial uses and existing combined sewer discharges into Oronoco Bay. Recreation does occur, but is limited to activities along the upland shoreline within the proposed limits of work. An assessment of the wetland functional values before and after project implementation are summarized in the tables below.

Table D-2. Impacts to Functional Value for Potomac River

Riverine Systems: Outfall 001 R1EM		
<u>Functional Value Parameter</u>	<u>Score Before Project</u>	<u>Score After Project</u>
Water Storage/Flood Protection	Medium	Medium
Water Quality	Low	Medium
Shoreline Erosion Control	Medium	Medium
Aquatic Productivity	Low	Medium
Fish and Wildlife Habitat	Low	Low/Medium
Vegetative Composition & Aesthetics	Low/Medium	Medium
Recreation	Low	Medium/High
Average Score	Medium	Medium

Palustrine Wetlands - Jones Point Park (Outfall 002 Diversion Facility – Royal Street North Option)

The proposed surface area wetland impacts at Jones Point Park are located within an undeveloped passive use portion of the park absent of trails or pathways for access. It has heavy urban intrusions from the adjacent recycling area, overhead and underground utilities and the adjacent Woodrow Wilson Bridge (WWB). However, the area around the wetland is forested with a multistoried canopy. The wetland area contains a straightened intermittent (R4) channel, which conveys roadside drainage from Royal Street and drainage from the Jones Point Park Royal Street Garden plot, through a culvert under Jones Point Drive, south toward flatter topography where a palustrine forested (PFO) wetland is found. This PFO wetland then drains into a culvert where it abuts the utility corridor and easement adjacent to the WWB. The proposed project may increase recreation in the project area as access is difficult through the shrubs and invasive species.

Table D-3. Impacts to Functional Value for Jones Point Park PFO Wetland Systems

Wetland Systems: Outfall 002 Royal Street North PFO		
<u>Functional Value Parameter</u>	<u>Score Before Project</u>	<u>Score After Project</u>
Water Storage/Flood Protection	Medium	Medium
Water Quality	Low/Medium	Low/Medium
Shoreline Erosion Control	Low	Low
Aquatic Productivity	Low	Low
Fish and Wildlife Habitat	Medium	Medium
Vegetative Composition & Aesthetics	Medium	Medium
Recreation	Low	Medium
Average Score	Medium	Medium

Table D-4. Impacts to Functional Values for Jones Point Park R4 WOTUS Systems

WOTUS Systems: Outfall 002 Royal Street North System LL Intermittent Stream (R4)		
<u>Functional Value Parameter</u>	<u>Score Before Project</u>	<u>Score After Project</u>
Water Storage/Flood Protection	Medium	Medium
Water Quality	Low	Low
Shoreline Erosion Control	Low	Low
Aquatic Productivity	Low	Low
Fish and Wildlife Habitat	Medium	Medium
Vegetative Composition & Aesthetics	Medium	Medium
Recreation	Low	Medium
Average Score	Medium	Medium

Impacts to Wetlands and other WOTUS

Potential impacts to wetlands and other WOTUS are detailed in the **Tables D-5** and **D-6**, and depicted on **Figures D-3** through **D-6** for each surface disturbance area within NPS lands. Note that the tunnel that would connect to the Outfall 001 and 002 Diversion Facilities would be located over 100 feet below the ground surface, and therefore is not anticipated to impact any riverine or palustrine wetlands or other WOTUS.

Only the wetland impacts associated with the preferred alternative are included as the no-action alternative would not cause direct impacts to wetlands. Wetland impacts are based on preliminary design and may vary slightly from the final design. Wetland impact numbers will be well defined at the

project permitting stage. The project design has minimized impacts to wetlands and other WOTUS to the maximum extent practicable; however, due to the locations of existing sewers and outfalls, some impacts are unavoidable.

Table D-5. Outfall 001 Diversion Facility – Two Possible Options (Potomac River Bed)

Temporary				
R1EM (Robinson Terminal North Alternative)	0.12	N/A	0.28	N/A
R1EM (Oronoco Bay East Alternative)	0.73	N/A	0.29	N/A

**Note: Only one of the above options will be constructed.

Table D-6. Outfall 002 Diversion Facility – Royal Street North Option (Jones Point Park)

Wetland/WOTUS Cowardin Classification	Temporary		Permanent	
	Acres	Stream Length (ft)	Acres	Stream Length (ft)
R4	N/A	N/A	0.01	107
PFO	N/A	N/A	N/A	N/A

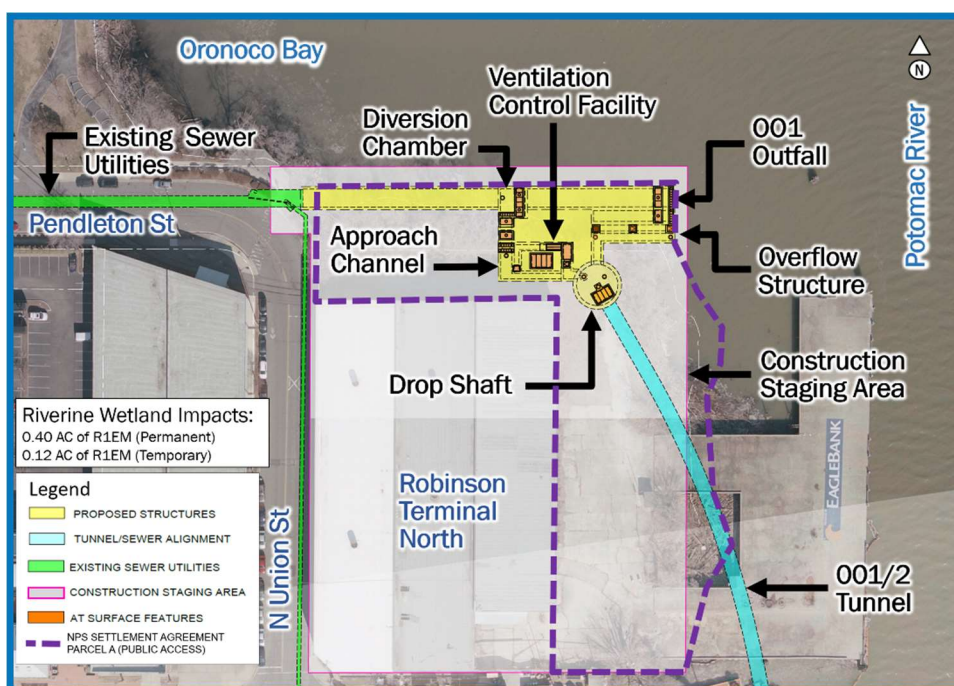


Figure D-3. Riverine Wetland Impacts, Outfall 001 Diversion Facility – Robinson Terminal North Option

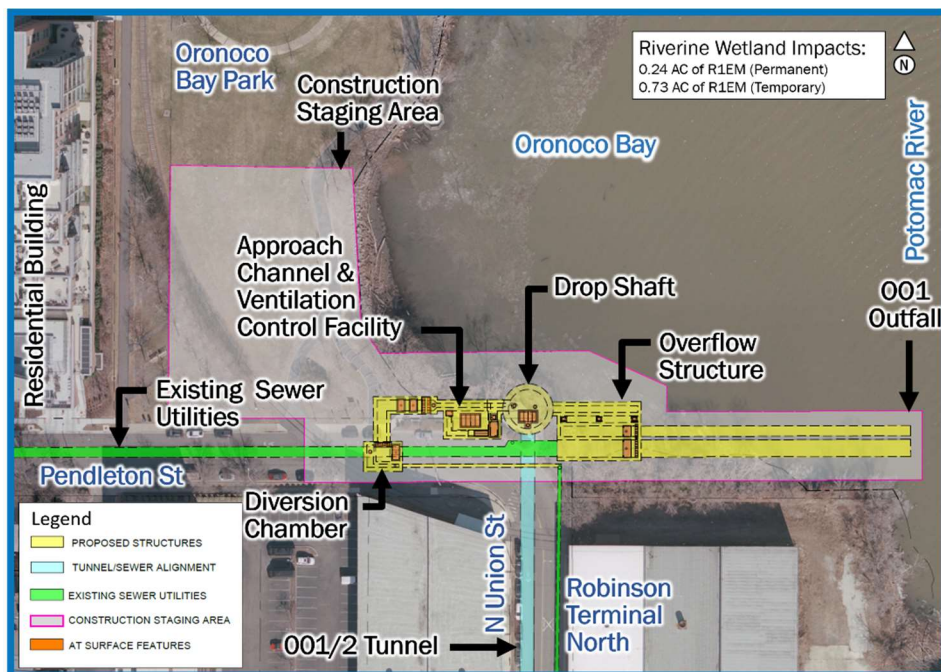
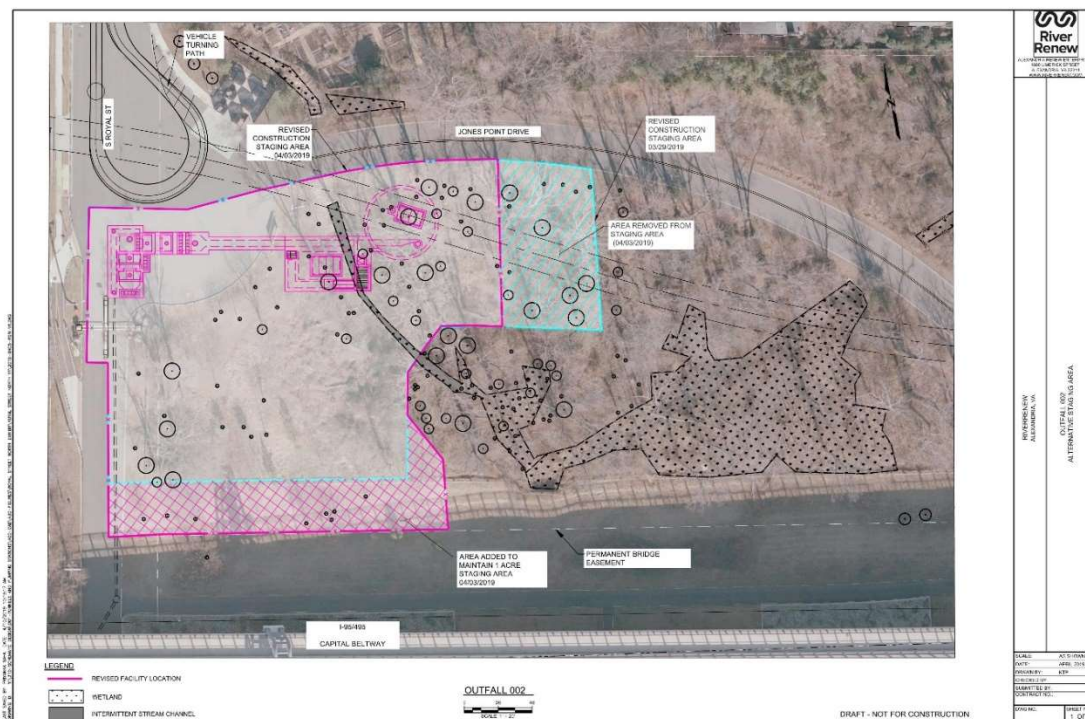


Figure D-4. Riverine Wetland Impacts, Outfall 001 Diversion Facility – Oronoco Bay East Option



Figure D-5. Palustrine Wetland and other WOTUS Impacts, Outfall 002 Diversion Facility – Royal Street North Option



**Figure D-6. Outfall 002 Diversion Facility – Royal Street North Option
(Revised Construction Staging Area to Minimize Tree Clearing)**

Wetland Impacts

Construction activities associated with the Outfall 001 Diversion Facility would result in impacts to the bed of the Potomac River. A new diversion chamber would be retrofitted to the existing 7-foot by 6-foot combined sewer underneath Pendleton Street to divert wet weather flow to a new approach channel that would convey flow to the drop shaft and ultimately the deep tunnel. Pending detailed design, a below-ground ventilation control vault would be constructed to mitigate fugitive emissions from the drop shaft. Approximately 12,100 square feet (0.28 acre) of permanent riverbed impacts are anticipated for the proposed alternative.

Construction activities associated with the Outfall 002 Diversion Facility would result in impacts to approximately 107 linear feet (0.01 acre) of intermittent stream channel within Jones Point Park. Given the fill required to raise the grade up to elevation +14 feet and keep the structural access points above the 100-year floodplain elevation, it would be difficult to realign the stream channel around the diversion facility. The current plan would place the stream in a culvert through the work area; essentially tying into and extending the existing culvert under Jones Point Drive, and daylighting the stream on the southeast side of the diversion facility into the downstream wetland swale.

Mitigation

Avoidance and minimization measures were incorporated throughout the project design to reduce impacts to sensitive resources, including a big reduction in permanent loss of riverbed and tree clearing, as well as complete avoidance of palustrine forested wetlands within Jones Point Park. General mitigative measures would also include the use of standard best management practices and erosion and sediment control measures throughout the construction period.

Floodplain Mitigation

It is not anticipated that the proposed action would significantly alter the natural and beneficial functions of the floodplain; therefore, no floodplain mitigation would be required. Proposed infrastructure would be designed to be resistant to flood flows and velocities (it would be raised to approximately elevation +14 feet to be approximately 2 feet above the 100-year floodplain), and the design would ensure that there would be no increase to the 100-year water surface on adjoining properties.

Wetland Mitigation

The proposed activity would result in approximately 12,100 square feet (0.28 acre) of unavoidable permanent impacts to the river bed of the Potomac River. As Per D.O. #77-1, NPS would compensate for unavoidable impacts to wetlands through a mitigation project. Because the wetlands are classified as riverine and open water tidal wetlands, it is inherently difficult to restore the functions and values for these types of wetlands (i.e., open water, unconsolidated river bottom). The difficulty lies in restoring lost wetland functions on the bottom of the Potomac River over a relatively small area when compared to the total area comprised of these types of wetland, and the fact that it's in a riverine system creates a situation where the potential for success is low. In addition, if the Virginia Marine Resources Commission (VMRC) does not allow further wetland creation at Dyke Marsh, the Park would be out of locations to create wetlands.

As a result, it was determined that in lieu of a typical 1:1 mitigation ratio for the restoration of lost wetland functions and values, NPS would employ a 10:1 mitigation ratio (requiring 2.8 acres minimum) aimed at improving the overall functionality and values of near-by wetlands through the removal of invasive plant species. The NPS has identified approximately 4.41 acres of available wetlands in the proximity of Jones Point Park for removal of invasive plant species (see **Figure D-7** for details).

The invasive species removal within Jones Point Park would target *Ampelopsis brevipedunculata* (Porcelain Berry), *Hedera helix* (English Ivy), *Euonymus fortunei* (Winter Creeper), and *Phragmites australis* (Common Reed). The Common Reed is located in the newly created tidal wetlands, which were made as part of the Woodrow Wilson Bridge Project, as well as wetlands along the shoreline. Prior to implementation, the Park would determine which wetlands would be treated and timing of treatment to best meet the required mitigations and to maximize the potential treatment of the invasive plant species. This treatment would commence within one year of the completion of the project, and last for 2-5 years (with at least two treatments a year). Any pesticides or other treatment types used would have to be approved in advance by NPS. Pesticide Use Log maintained for all applications would be required and submitted to NPS.

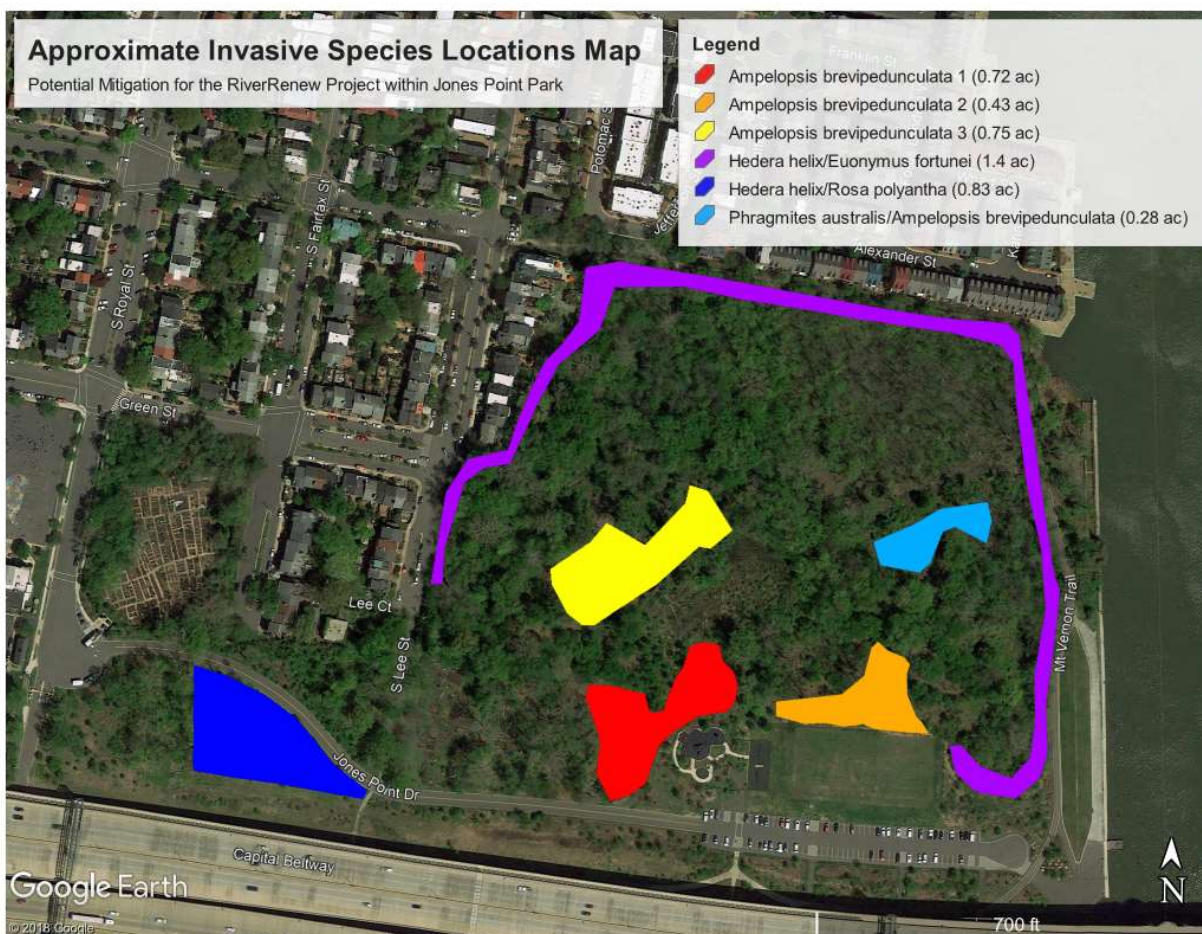


Figure D-7. Approximate Invasive Species Locations at Jones Point Park

Conclusion

As part of the RiverRenew project, AlexRenew would construct the Outfall 001 Diversion Facility along the west bank of the Potomac River at Oronoco Bay, and the Outfall 002 Diversion Facility in Jones Point Park that would impact wetlands and other WOTUS on NPS lands. The construction of the Outfall 001 Diversion Facility (Option 4 – Robinson Terminal North) would result in approximately 0.28 acre of permanent impact and 0.12 acre of temporary impact to riverine wetlands. The construction of the Outfall 002 Diversion Facility (Option 2 – Royal Street North) would result in permanent impacts to approximately 107 linear feet (0.01 acre) of intermittent stream channel. To mitigate for these impacts, AlexRenew would conduct invasive plant species removal activities, covering a minimum of 2.8 acres of wetlands within Jones Point Park. Note that these impacts would also require authorization through the issuance of permits from the NPS, USACE and/or VDEQ.

Appendix E

Supplemental Information Regarding Historic Structures, Archeological Resources, and Cultural Landscapes

The following information, tables and figures are intended to supplement Chapter 3 of this EA.

Historic Structures and Districts

As depicted on **Figure 3-8**, there are ten architectural resources within, or immediately adjacent to the APE. These resources are listed on **Table E-1**.

Table E-1. Listed/Eligible Architectural Resources Within the Area of Potential Effect (APE)*

No.	Resource Name [†]	VDHR ID	VLR	NRHP	NHL	Eligible for Listing	Historic District(s) Contributing To [^]
1	Bruin's Slave Jail, 1707 Duke Street	100-0047	X	X	-	-	-
2	Orange and Alexandria Railroad Hooffs Run Bridge	100-0149	X	X	-	-	100-Year-Old Building List
3	Alexandria National (Soldiers) Cemetery	100-0138	X	X	-	-	-
4	Gunston Hall Apartments, 901-915 S Washington Street	100-0121-1006	-	-	-	X	Alexandria Historic District
5	Freedmen's Cemetery (Contraband Cemetery)	100-0121-1085	X	X	-	-	Alexandria Historic District
6	Mount Vernon Memorial Highway (portion of GWMP)	029-0218	X	X	-	-	GWMP; Mount Vernon Memorial Parkway
7	Fairfax-Moore House, 207 Prince Street (George William Fairfax House)	100-0022	X	X	-	-	Alexandria Historic District
8	Old Dominion Bank Building/Athenaeum, 201 Prince St	100-0002	X	X	-	-	-
9	Bank of Alexandria, 133 N. Fairfax Street	100-0004	X	X	-	-	Alexandria Historic District
10	John Carlyle House, 121 N. Fairfax Street (Carlyle House Historic Park)	100-0010	X	X	-	-	Alexandria Historic District

* The APE was determined primarily utilizing a 200-foot-wide corridor, centered on the proposed tunnel/diversion sewer alignment, in combination with proposed laydown areas.

[†]Data evaluated from VDHR's cultural resource database June 2018

[^]Contributing properties are defined by VDHR as buildings, objects or structures that add to the historical integrity or architectural qualities that make a historic district significant. A property is listed as 'Contributing to' a historic district if it is listed by VDHR as being associated with that district.

NHL - National Historic Landmark; NRHP - National Register of Historic Places; VLR- Virginia Landmarks Register

Archeological Resources

A list of previously recorded archeological resources within the APE is provided within **Table E-2**. Note that the location of these resources has been withheld from any figures in this EA to protect the archeological site. Note that recently discovered sites may not be included in the VDHR VCRIS data depicted on **Table E-2**.

Table E-2. Archeological Resources Within the APE

No.	Resource Name	VDHR ID	VLR	NRHP	Evaluated	Eligible
1	Bruin Slave Jail	44AX0172				
2	N/A	44AX0188				
3	N/A; Railroad Bridge	44AX0148				
4	N/A; Cemetery	44AX0136				
5	N/A	44AX0103				
6	St. Mary's Catholic Cemetery	44AX0040				
7	N/A; Military/Defense	44AX0149				
8	N/A; Dwelling, single	44AX0104				
9	N/A; Dwelling, single	44AX0050				
10	N/A; Dwelling, single	44AX0064				
11	N/A; Dwelling, single	44AX0071				
12	N/A; Dwelling, single	44AX0056				
13	N/A; Dwelling, single	44AX0107				
14	N/A; Dwelling, single	44AX0085				
15	N/A; Dwelling, single	44AX0106				
16	N/A; Domestic, Subsistence/Agriculture	44AX0110				
17	N/A	44AX0117				
18	N/A; Dwelling, single	44AX0116				
19	N/A; Dwelling, single	44AX0049				
20	N/A	44AX0003				
21	N/A; Dwelling, single	44AX0046				
22	N/A	44AX0042				
23	Lee Street Site	44AX0180				
24	N/A; Warehouse	44AX0120				
25	N/A; Wharf	44AX0123				
26	N/A; Wharf	44AX0081				
27	N/A; Warehouse, Wharf	44AX0146				
28	N/A	44AX0098				
29	N/A; Artifact scatter, Dwelling, multiple, Other, Warehouse	44AX0229				
30	Robinson Terminal South	44AX0235				
31	Harborside	44AX0114				
32	N/A; Distillery	44AX0126				
33	N/A; Wharf	44AX0119				
34	Virginia Shipbuilding Site	44AX0078			X	Not Eligible
35	Freedmen's Cemetery, Contraband Cemetery	44AX0179			X	Potentially Eligible

Cultural Landscapes

As noted in **Chapter 3** of the EA, Jones Point Park is considered to be a cultural landscape by the NPS-GWMP. Additionally, outside of NPS lands, Alexandria National Cemetery and the Alexandria African American Heritage Park may be considered cultural landscapes. These cultural landscapes are listed in **Table E-3**, and a brief description of the general boundaries, background and significance of each are provided in this section.

Table E-3. Potentially Affected Cultural Landscapes

Cultural Landscape	Location	Historic District(s) Contributing To	NPS Inventoried
Jones Point Park	Jones Point Drive	George Washington Memorial Parkway (GWMP) Historic District	Y
Alexandria National Cemetery	1450 Wilkes Street	None	N
Alexandria African American Heritage Park	500 Holland Lane	None	N

Jones Point Park

According to an updated 2017 draft nomination for the GWMP Historic District, Jones Point Park was identified as a discontinuous contributing resource to the district. The land is contributing for its role in conserving the shoreline of the Potomac River and the scenic qualities of the GWMP. The restored lighthouse, trails, playgrounds, fishing piers, canoe launch, and other recreation areas are considered non-contributing resources.

As noted in **Chapter 3** of this EA, the existing entrance to Jones Point Park is impacted by several modern visual intrusions directly adjacent to the park (see **Figures E-1** and **E-2**). Following implementation of the preferred alternative, access points to the Outfall 002 Diversion Facility would be visible at grade, and an electrical cabinet, measuring approximately 8-feet long by 4-feet wide by 6-feet tall, would be the only infrastructure visible above-ground. AlexRenew would locate and design visible infrastructure to be appropriate for the site, and consult with NPS to develop a site restoration plan. Therefore, permanent impacts to the historic character and landscape of the immediate vicinity are not anticipated to be significantly more than those from existing constructed infrastructure. A conceptual landscape rendering of post-construction conditions near the entrance to Jones Point Park is provided in **Figure E-3**.



Figure E-1. Looking East from S. Royal Street at Jones Point Drive Entrance (Existing Conditions)



Figure E-2. Looking South along S. Royal Street toward Woodrow Wilson Bridge Approach (Existing Conditions)



Figure E-3. Conceptual Landscape Rendering of Post-Construction Conditions at Outfall 002 Diversion Facility
Alexandria National Cemetery

This cemetery, located at 1450 Wilkes Street, was originally established as the Soldiers' Cemetery in the latter half of 1862 and consisted of more than five (5) acres of land. This became the final resting place for soldiers who died in battle and in the numerous hospitals in the area. The small cemetery was nearly filled to capacity by 1864. It was designated as Alexandria National Cemetery in 1936 and is included as it abuts the proposed areas of disturbance associated with the Outfall 003/4 system. The Alexandria National Cemetery may be part of a larger cultural landscape including its adjacent private cemeteries that are part of the Wilkes Street Cemetery Complex. These cemeteries, however, were outside of the scope of this project.

Alexandria African American Heritage Park

This park, located at 500 Holland Lane, was designed by the architectural firm EDAW and opened in 1995. The nine (9)-acre park incorporated the burial site purchased by the Black Baptist Cemetery Association in 1885 and “was designed as a memorial to the role played by blacks in the city’s history and as a tranquil place for learning and contemplation” (City of Alexandria, 2019; VCRIS. 2018, Cressey. 1995).

Appendix F

Public Outreach and Community Organization Coordination

RiverRenew has developed a public outreach and community organization coordination plan to introduce the program and solicit feedback to better service the local community. A comprehensive list of the public outreach and community organization meetings that were held to support the RiverRenew program is shown in **Table F-1** below.

Table F-1. Public Outreach and Community Organization Coordination

Organization	Meeting Information
VDEQ	Clean Waterways meeting held on 1/10/18, 2/12/18, 3/7/18, 3/14/18, & 4/2/18
	Coordination meeting held on 3/15/18 & 5/14/18
	Pre-application meeting and Hooffs Run site visit held on 7/18/18. Held in conjunction with USACE and VMRC
	Preliminary Engineering Workshop held on 10/29/18 and 12/4/18
	Clean Water Act Pre-application meeting held on 11/13/18
	Met to discuss Outfall 001 Robinson Terminal North diversion facility concept plan on 12/17/18
Community Stakeholder Groups	Community Stakeholder Group meetings held on 2/1/18, 2/22/18,
	Conducted tour of the WRRF facility and held final meeting on 3/19/19
RiverRenew Stakeholder Advisory Group	Meetings held on 2/27/19, 3/26/19, and 5/1/19
NPS	Clean Waterways meeting held on 2/14/18
	Environmental Assessment Kick-off meeting held on 5/8/18
	Clean Water Act/Construction and Right of Way pre-application meeting held on 11/13/18
	Section 106 Discussion on 11/30/18
	Meeting to discuss bed of river impacts on 2/15/19
	Coordination meetings with GWMP and Regional staff held on 3/5/19 and 3/27/19
VDOT	Coordination meetings held on 4/26/18 and 10/16/18
VDHR	Introductory Meeting and Section 106 discussion on 11/30/18
Dominion Energy	Coordination Kick-off meeting held on 6/6/18
	Conducted Easement Encroachment meeting on 6/15/18
	Design coordination meeting held on 10/10/18
	Easement coordination meeting held on 12/6/18
	Design status meeting held on 5/19/19

USACE	Pre-application meeting and Hooffs Run site visit held on 7/18/18. Held in conjunction with VDEQ and VMRC
	Clean Water Act Pre-application meeting held on 11/13/18
VMRC	Pre-application meeting and Hooffs Run site visit held on 7/18/18. Held in conjunction with VDEQ and USACE
	Clean Water Act Pre-application meeting held on 11/13/18
City of Alexandria	Held councilmember two-by-two meetings the week of 3/19/18
	Held meeting with the Mayor of Alexandria on 3/22/18
	Kick-off meeting with the City of Alexandria Fire Department held on 5/7/18
	AlexRenew Board and City Council CSO Project Review workgroup held on 7/23/18
	Workgoup meeting with AlexRenew and the City Council held on 9/5/18, 11/14/2018, 1/31/19, and 4/24/19
	Regulatory team meetings held on 9/13/18, 11/8/18, 11/22/18, 12/6/18, 12/20/18, 1/3/19, 1/17/19, 1/31/19, 2/14/19, 2/28/19, 3/28/19, 4/11/19, 5/09/19, 5/23/19, 6/6/19
	Review meeting for DSUP Concept Plan submittal held on 10/11/2018
	Met to discuss scope of cultural resource studies on 11/20/18
	Met to discuss Old Cameron Run Trail coordination on 11/20/18
	Participated in Earth Day on 4/27/19
Residents	Conducted Town Hall Combined Sewer System Program Update meeting on 4/5/18
	Held Long Term Control Plan Update public meeting on 4/5/18
	Public Listening Session for Outfall 001 held on 9/17/18
	Public Listening Session for Outfall 003/4 held on 9/20/18
	Public Listening Session for Outfall 002 held on 9/24/18
	NPS Scoping Meeting and Program Open House Listening Session held on 9/25/18
Potomac River Keeper	Held meetings on 3/19/18 and 4/8/19
Rivergate	Presentation given on 4/9/18
Old Town Civic Association	Presentation given on 10/10/18
West Old Town Civic Association	Presentation given on 6/14/18
Historic Alexandria Resources Commission	Held Program Update meeting on 6/19/18
The Basilica School of St. Mary	Held RiverRenew Introductory meeting on 6/28/18
	Site walk held on 7/25/18
Robinson Terminal North	Held coordination meetings on 7/19/18, 8/30/18, 1/24/19

Ford's Landing HOA	Held coordination meetings on 7/19/18, 8/13/18
Founders Park Community Association	Program Introduction meeting held on 7/26/18
	Attended Founders Park Community Association Block Party on 9/30/18
Alexandria National Cemetery	Program Introduction meeting held on 9/5/18
Presbyterian Cemetery	Program Introduction meeting held on 9/6/18
	Coordination meeting held on 5/2/19
Residence Inn	Program Introduction meeting held on 9/6/18
	Coordination meetings held on 10/3/18, 5/23/19, 6/7/19
Boulevard Condominiums	Program Introduction meeting held on 3/12/19
Alexandria Renew Enterprises	Participated in Water Discovery Day open house on 10/13/18
	Hosted open house to discuss rate adjustments on 4/28/19
	Hosted public hearing to discuss rate adjustments on 5/11/19
Black History Museum	Presented on Outfall 003/4 design options on 10/17/18
Office of Historic Alexandria	Presented on Outfall 003/4 design options on 10/17/18
	Discussed scope of Documentary Study on 11/20/19
Old Dominion Boat Club	Program Introduction meeting held on 10/24/18
West End Business Association	Presentation given on 10/25/18
Old Town Village	Program introduction meeting held on 11/7/18
Waterfront Commission	Coordination meeting held on 11/20/18 and informational presentation on 5/21/19
	Attended annual Waterfront Walk on 6/8/19
Old and Historic Alexandria District Board of Architectural Review	Informational presentations on 11/28/18 and 5/15/19
Del Ray Civic Association	Program Introduction meeting held on 12/12/18
Alexandria Federation of Civic Association	Presented on RiverRenew program on 1/7/19
Goodwin House	Program Introduction meeting held on 4/2/19
Holmes Run Park Committee	Program Introduction meeting held on 4/4/19
North Ridge Citizens Association	Program Introduction meeting held on 4/8/19
Alexandria Fire Department and Office of Emergency Management	Coordination meetings held on 5/7/18, 11/28/18, and 1/9/19
Alexandria Police Department	Program Introduction meeting held on 4/30/19
Seminary Hill Association	Program Introduction meeting held on 5/9/19
Carlyle Council	Informational meeting held on 5/29/19