



RiverRenew Tunnel System Combined Sewer Remediation Project

DSUP #2018-0020

City Council Public Hearing
July 9, 2019

DSUP 2018-0020

Purpose of Application

To construct new sewer infrastructure to mitigate the discharge of combined sewage into Alexandria's waterways.

Project Request

Development Special Use Permit (DSUP) consisting of:

- ☐ Special Use Permit for *Special Use Utilities*.
- ☐ Site Development Plan for above ground structures and alteration of grade.

Alexandria's Combined Sewer System and 2017 Law

544

Acres of combined sewer system area

390

Acres of impervious area

4

Combined sewer outfalls

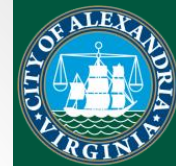


Outfall	Requirement
001	4-6 overflows per year
002	80% bacteria reduction
003	99% bacteria reduction
004	99% bacteria reduction
HRJC*	100% reduction of sanitary sewer overflows

New controls must be in place by July 1, 2025

*HRJC: Hooffs Run Junction Chamber

RiverRenew Program Snapshot



Major Components:

- Tunnel System to capture flows from Outfalls 001-004 and Hooffs Run Junction Chamber
- Tunnel Dewatering Pumping Station and Superstructure (at AlexRenew)
- Increase of peak primary pumping capacity (at AlexRenew)
- Lab relocation and administrative building demolition (at AlexRenew)
- Wet weather treatment (at AlexRenew)
- Site security (at AlexRenew)

Estimated Capital Cost:

- \$370M - \$555M (conceptual design)

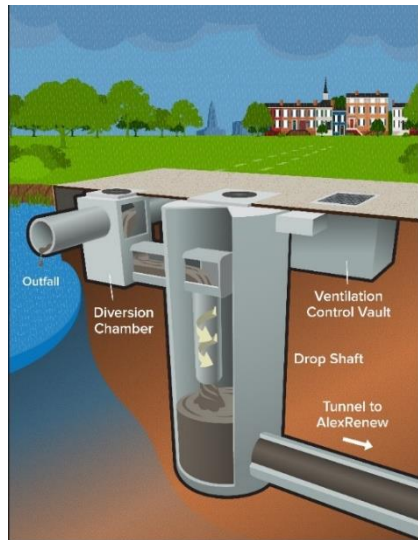
Schedule:

- Work at AlexRenew: 7/19 – 3/21
- Tunnel System: 12/20 – 7/25



Major RiverRenew Tunnel System Components to be Constructed

**Diversion Chambers and Drop Shafts
(at existing outfall locations)**

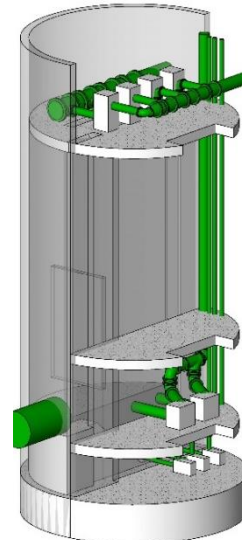


Focus of DSUP #2018-0020

**Hooffs Run Tunnel
(open-cut)**



**Pumping Station
(at AlexRenew)**



Focus of DSUP #2019-0013

Waterfront Tunnel



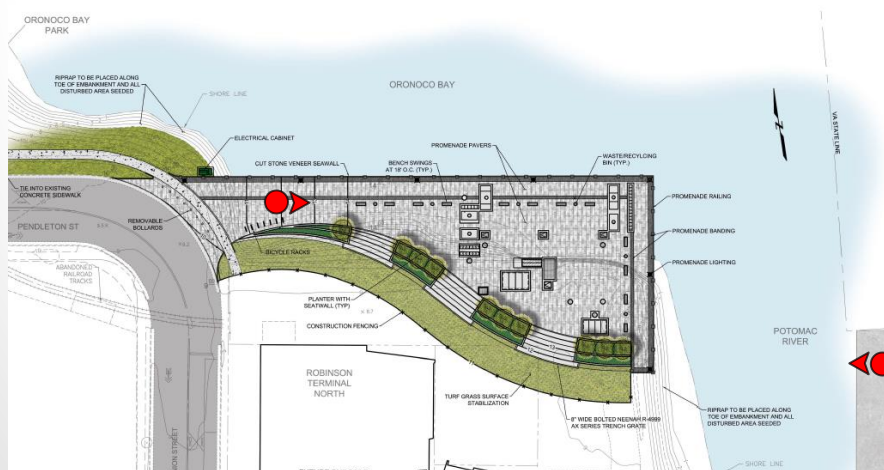
Outfall 001 Diversion Facility: Robinson Terminal North



Site Plan



Rendering, looking east at Robinson Terminal North



Illustrative Landscaping Plan

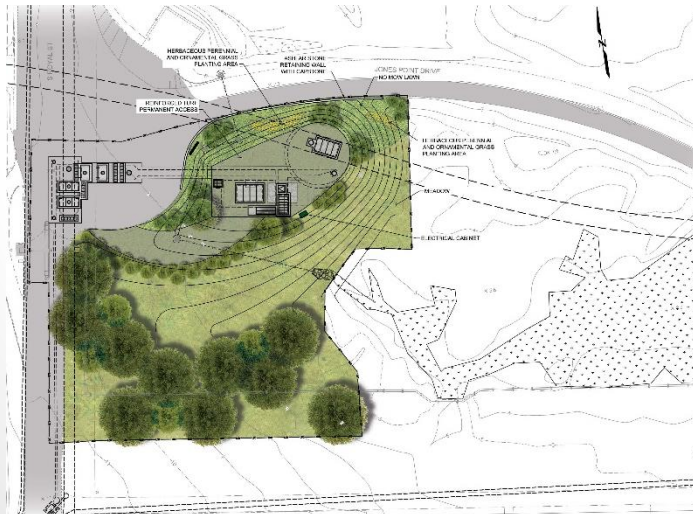


Rendering, looking west at Robinson Terminal North

Outfall 002 Diversion Facility: Royal Street North



Site Plan

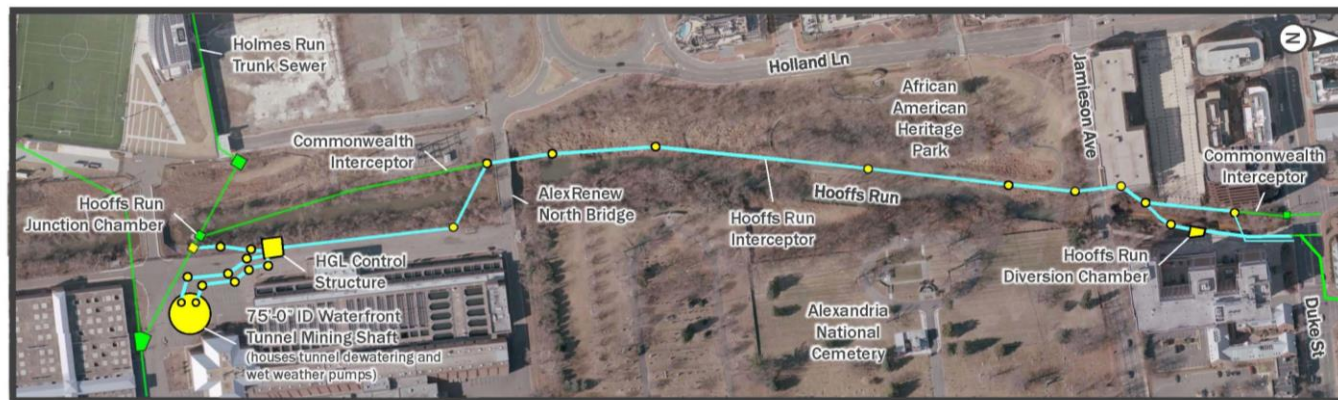


Illustrative Landscaping Plan

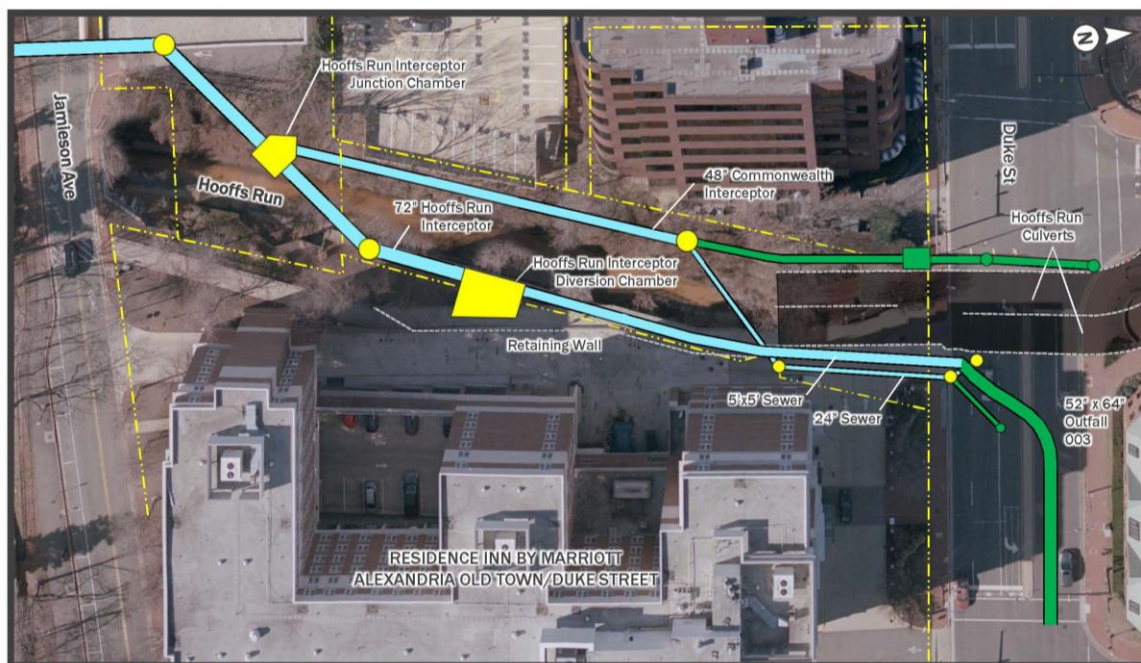


Rendering, looking East from South Royal Street

Hooffs Run Tunnel: Open Cut Interceptor Replacement



Site Plan: Overall



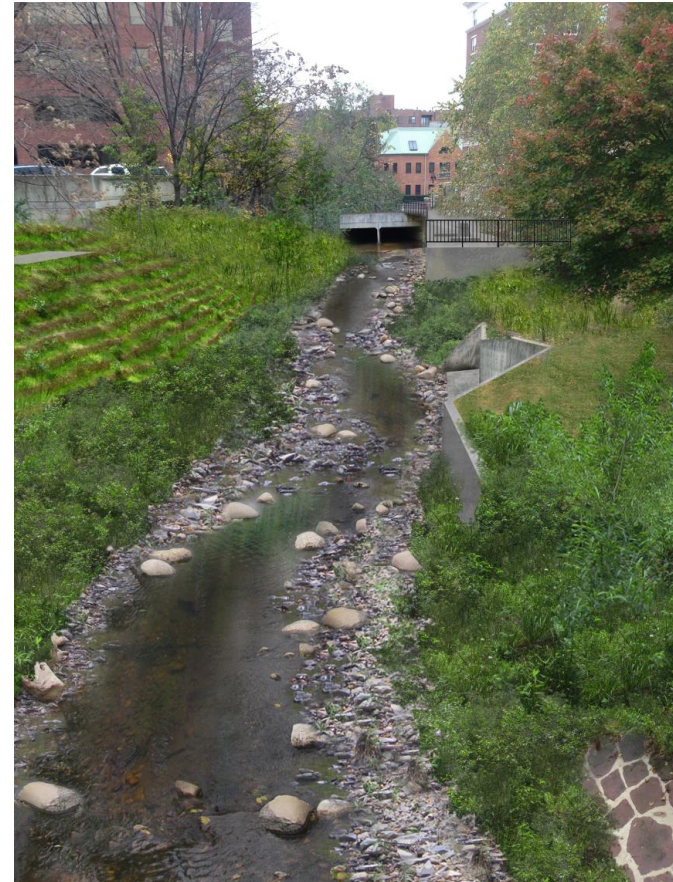
Site Plan: Jamieson Avenue to Duke Street

Hooffs Run Stream Restoration

Plan and Rendering of Jamieson Avenue to Duke Street

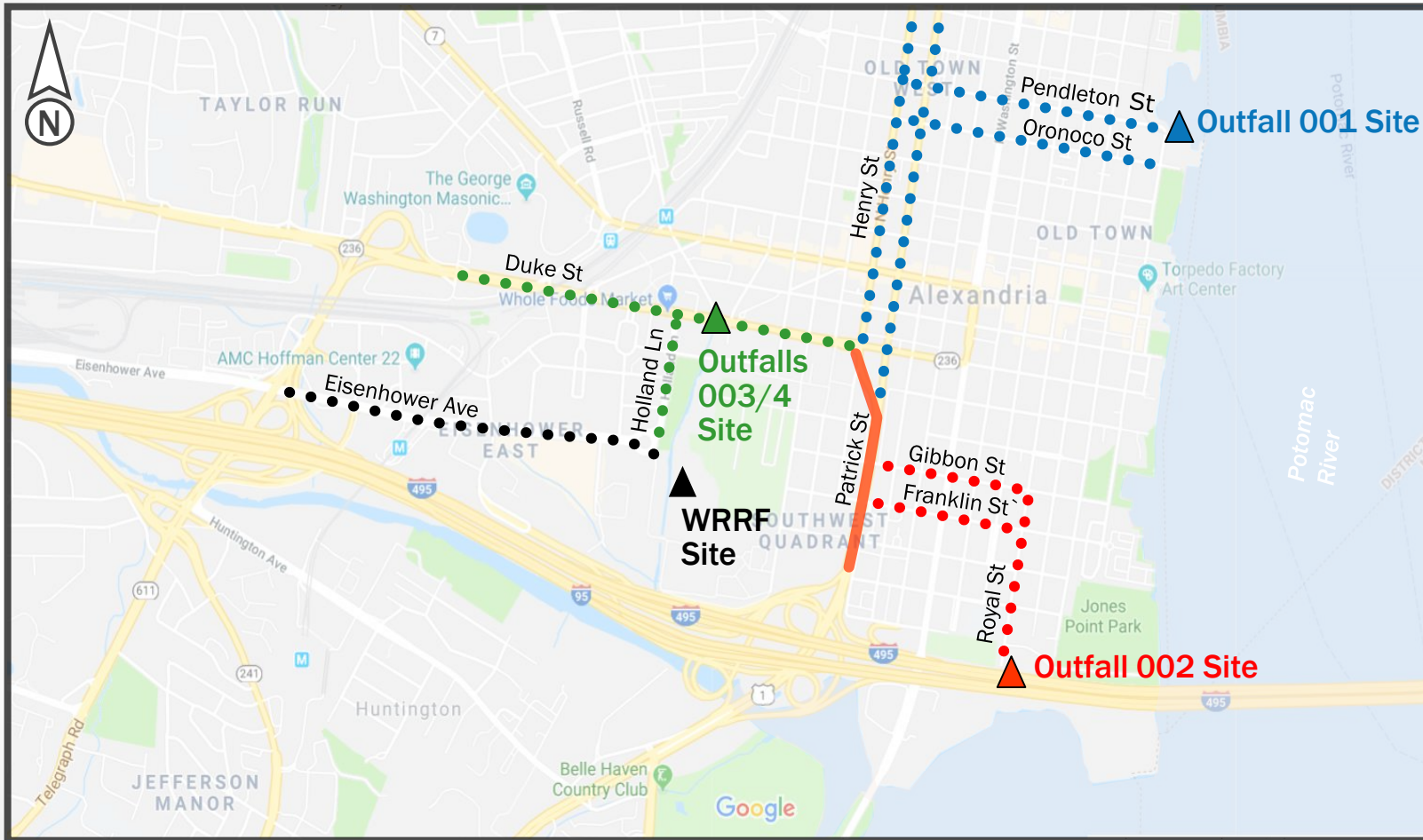


Plan View, Jamieson Avenue to Duke Street



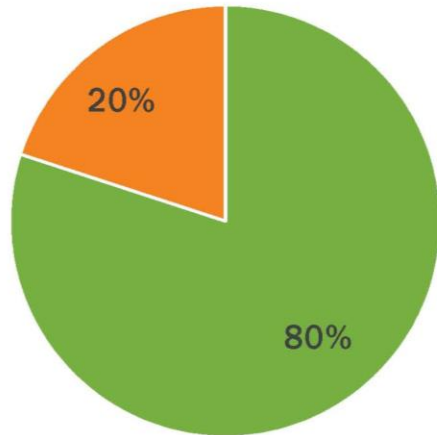
Rendering, looking North
from Jamieson Avenue

Proposed Haul Routes



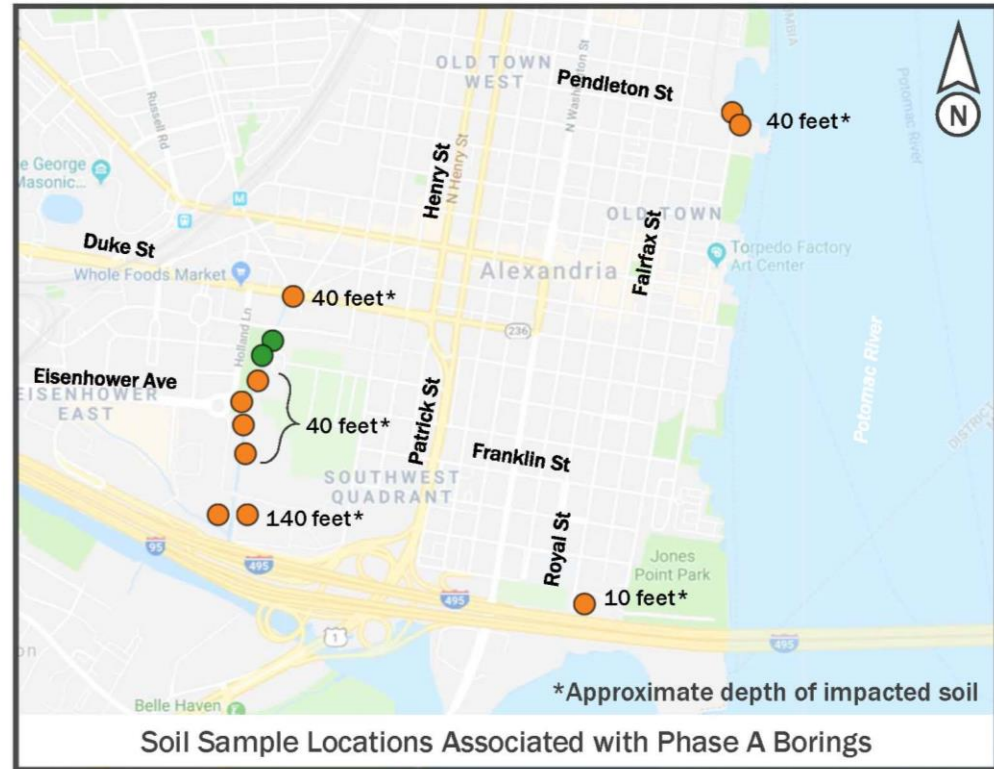
Final haul routes will be determined by Department of Transportation & Environmental Services.

80% of Excavated Soil from Diversion Facilities is Anticipated to be Clean



■ Clean ■ Impacted (Hauled to Landfill)

Impacted soil limits based Virginia Department of Environmental Quality standards



- Environmental testing identified petroleum and naturally-occurring levels of arsenic in proposed excavation areas.
- Additional environmental testing is ongoing as part of the boring program.
- Site-specific health and safety plans will be developed to further minimize risks associated with impacted soil and groundwater during construction.

RiverRenew requires many levels of agency coordination

Federal Agency Approvals



- NEPA/Section 106
- Special Use Permit
- Construction and Right of Way Permit
- ARPA Permit



US Army Corps of Engineers®

- Clean Water Act Permit/Section 106

Consulting Federal Agencies



United States Environmental Protection Agency



U.S. Department of Transportation
Federal Highway Administration



State Agency Approvals



- Clean Water Act Permit
- Construction General Permit
- VPDES Permit



- Submerged Lands Permit



- Land Use Permit



- Consent for Encroachment

Consulting State Agencies



City Approvals



- DSUP
- Excavation Permit
- Grading Permit
- Building Permit
- Right-of-Way Permit
- Archaeology
- Landowner Easements
- Hauling Permit
- Demolition Permit
- Mechanical Permit



Community Outreach

RiverRenew Stakeholder Advisory Group	RiverRenew Council-Board Workgroup	RiverRenew Rates Outreach	RiverRenew Environmental Assessment	Ongoing RiverRenew Activities
Feb 27: Program Overview and Facility Construction	Jan 31: Program Progress Summary and Tunnel Naming	Mar 28: Press Release	Sep 2018: Community Listening Sessions	Apr 10: 2nd edition of the <i>River Renewer</i> eNewsletter
Mar 26: Approach to Minimize Community Impacts and Rates	Apr 24: Rate Adjustment Summary, Technical and Permitting Updates	Apr 2019: Outreach to Condos, HOAs, and Civic Associations	June 2019: EA Release and Community Listening Sessions	RiverRenew.com Regular Program Updates
May 1: Preparation for Community Listening Sessions	Jul 24: Next Meeting	Apr 27: Earth Day Apr 28: Open House	Aug 2019: Decision Document*	Social Media
June 20: Climate Change, Environmental Data, and Environmental Assessment				

* Schedule dependent on National Park Service

- Over **40 presentations** to City and Community Groups
- Over **20 events** to inform community about RiverRenew
- Quarterly newsletters
- Door-to-door canvassing to support soil borings and site surveys
- Naming campaign for tunnels

Community Benefits

	# of Overflow Events	Total Overflow Volume (millions of gallons)
Now	70	140
After Implementation	<4	16.7

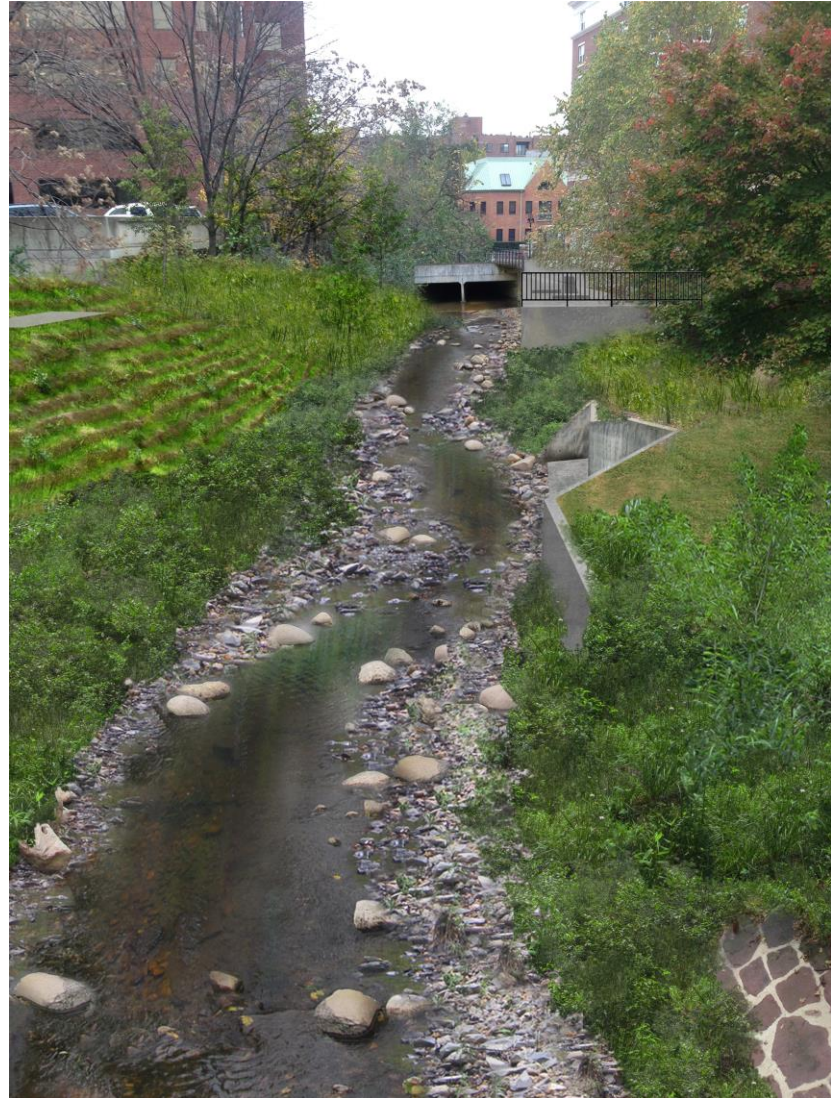
Summary of estimated performance
(average over 2000-2016 Study Period)

Other Benefits

- 98% capture of combined sewer overflows
- Mitigation of sewer surcharging and basement backups during wet weather along Holmes Run Trunk Sewer and Commonwealth Interceptor
- Significant reduction of bacteria, trash, and nutrient discharge to our waterways
- Hooffs Run stream restoration

Recommendation

Staff and the Planning Commission recommend approval of the development special use permit with site plan subject to compliance with all applicable codes and staff recommendations.



EXTRA SLIDES

RiverRenew and Climate Change: Is RiverRenew Adaptable and Resilient?

RiverRenew and Climate Change Is RiverRenew Adaptable and Resilient?

RiverRenew is a major infrastructure project designed to address the discharge of sewage mixed with rainwater to Alexandria, Virginia's waterways. It is being implemented in response to a 2017 Virginia Law that requires completion by July 2025.

Current climate models show that changing global conditions will trend toward increased rainfall and rising seas in our area. These effects of climate change are being considered as part of the planning process for RiverRenew facilities to ensure the design is adaptable and resilient to future conditions.



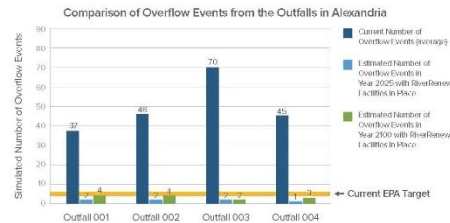
Planning for Increased Rainfall



Rising temperatures will intensify Earth's water cycle, resulting in increased frequency and greater intensity of rainfall in our area.

To determine the impacts of increased rainfall due to climate change, RiverRenew:

- Estimated future rainfall in 2100* based on current climate models.
- Simulated RiverRenew facilities under these future rainfall conditions.
- Determined that RiverRenew facilities would meet or exceed the Environmental Protection Agency's (EPA) current targets under future climate conditions.



* Engineers typically plan infrastructure based on its useful life. The useful life of the proposed RiverRenew facilities is at least 100 years. 2100 is the last year for which climate projections are available from international scientific community, and is within the useful life of the proposed RiverRenew facilities.

With RiverRenew facilities in place, it is estimated that the outfalls will discharge less than four times per year in 2100, compared to 70 times per year under current conditions.

RiverRenew facilities will be designed to include:

- Safety factors
- Operational flexibility
- Components to hold back the tide
- Increased capacity at AlexRenew to better handle future additional flows
- Tunnel relief points to protect the existing sewer system

Staying Above Rising Seas

Rising temperatures will melt ice sheets and cause seawater to expand. This will result in sea level rise, especially in coastal areas.



To determine the impacts of sea level rise due to climate change, RiverRenew estimated the future 100-year flood event** in 2100* based on climate models and curves developed by the U.S. Army Corps of Engineers and National Oceanic and Atmospheric Administration.

The map below shows current (2019) and future (2100) 100-year flood events. Currently the Potomac River rises to 11 feet above sea level during a 100-year flood event. In 2100, that elevation is anticipated to increase to 14 feet above sea level.

Elevations of the 100-Year Flood Event in the City of Alexandria



Proposed RiverRenew facilities will be built at an elevation higher than the future 100-year flood event.

- 100-Year Flood Elevation (2019)
- 100-Year Flood Elevation (2100)
- Current Shoreline

* Engineers typically plan infrastructure based on its useful life. The useful life of the proposed RiverRenew facilities is at least 100 years. 2100 is the last year for which climate projections are available from international scientific community, and is within the useful life of the proposed RiverRenew facilities.

** The 100-year flood event has a 1 percent chance of occurring in any given year.

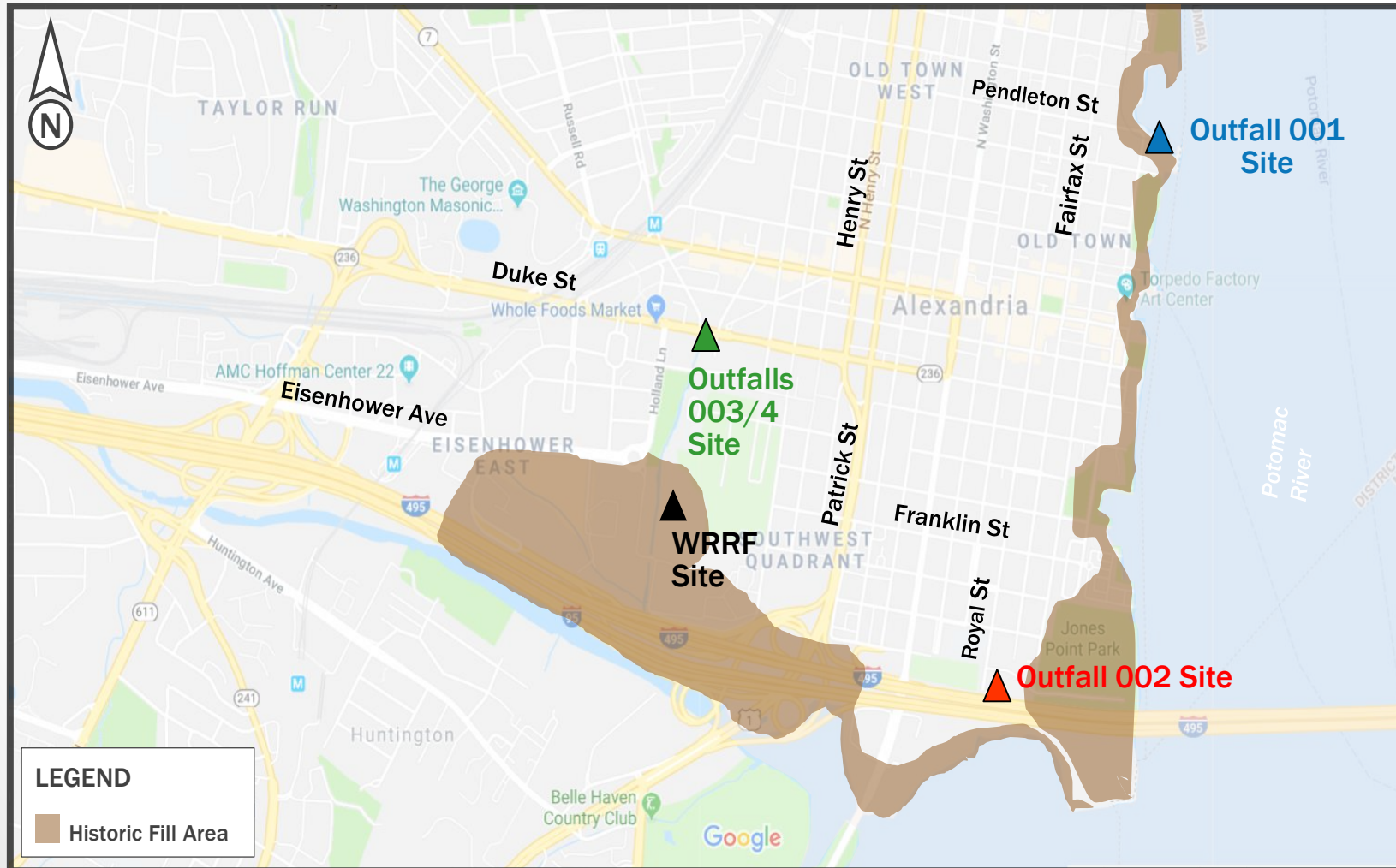


June 2019

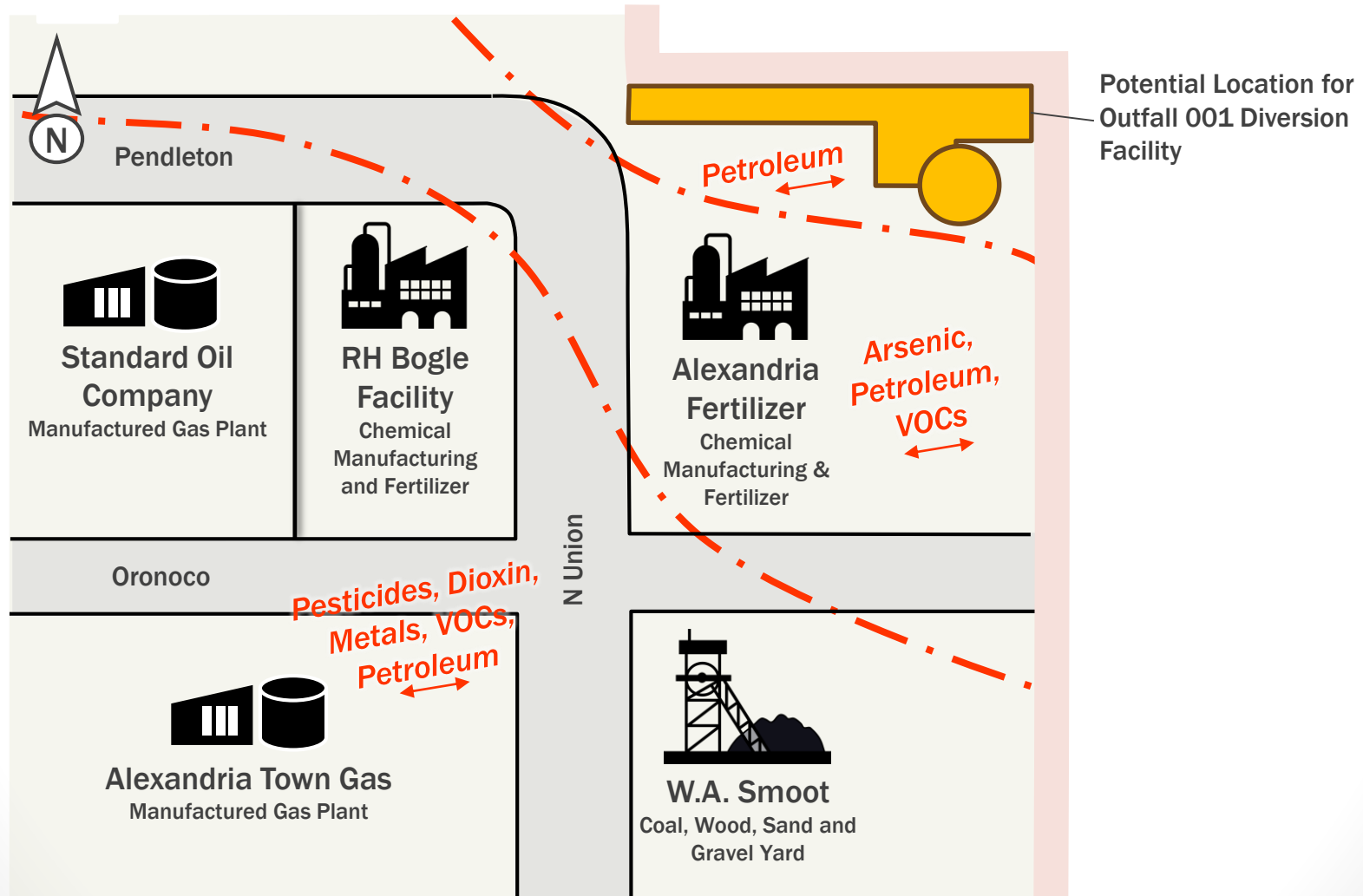
RiverRenew is a program owned and implemented by Alexandria Renew Enterprises with support from the City of Alexandria. 1800 Limerick Street, Alexandria, VA 22314 | 703.518.6030 | RiverRenew.com

Environmental Data at Outfall 001

Areas of Historic Fill in Relation to Potential Construction Sites

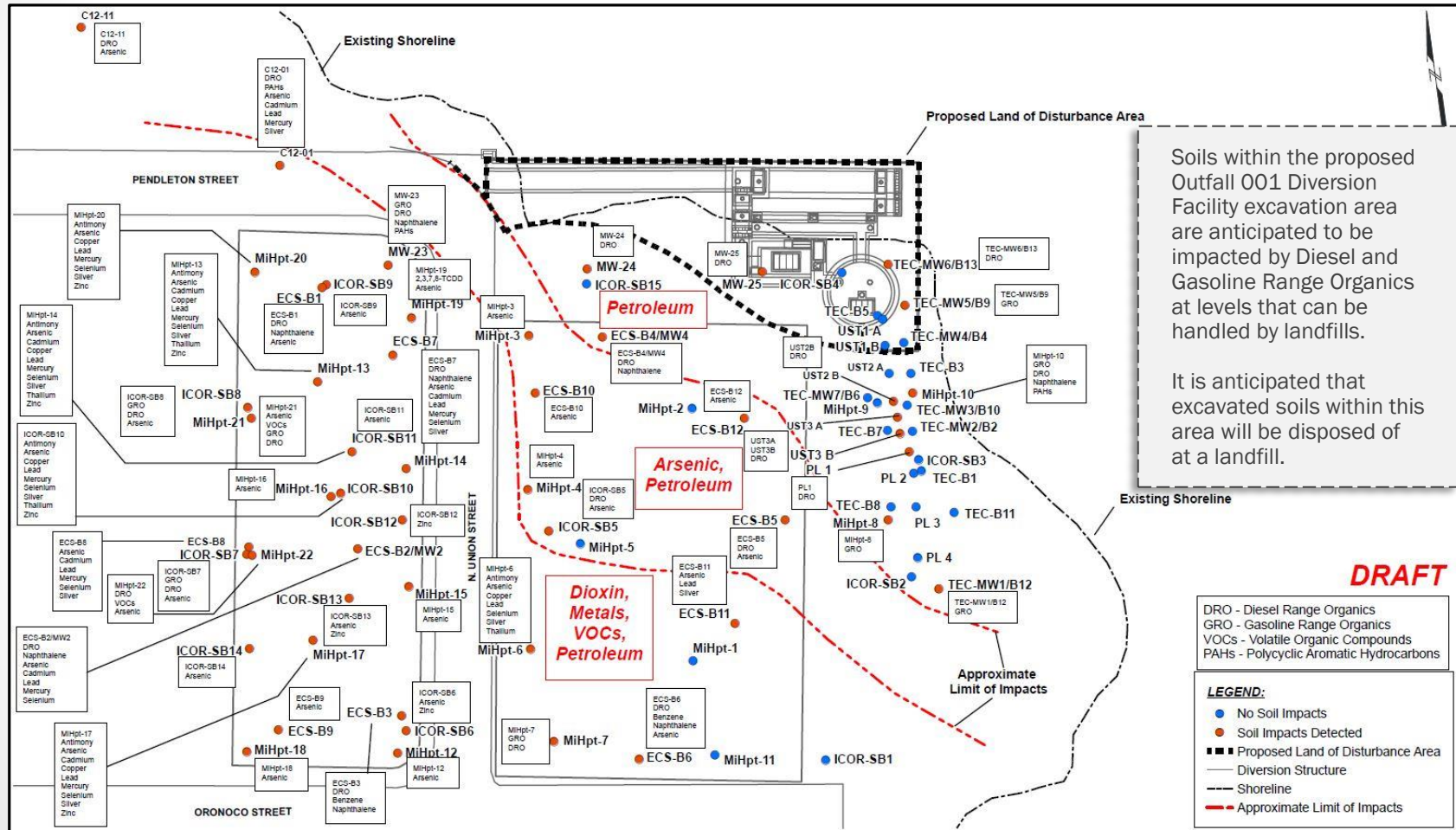


Historic Operations in the Vicinity of Outfall 001



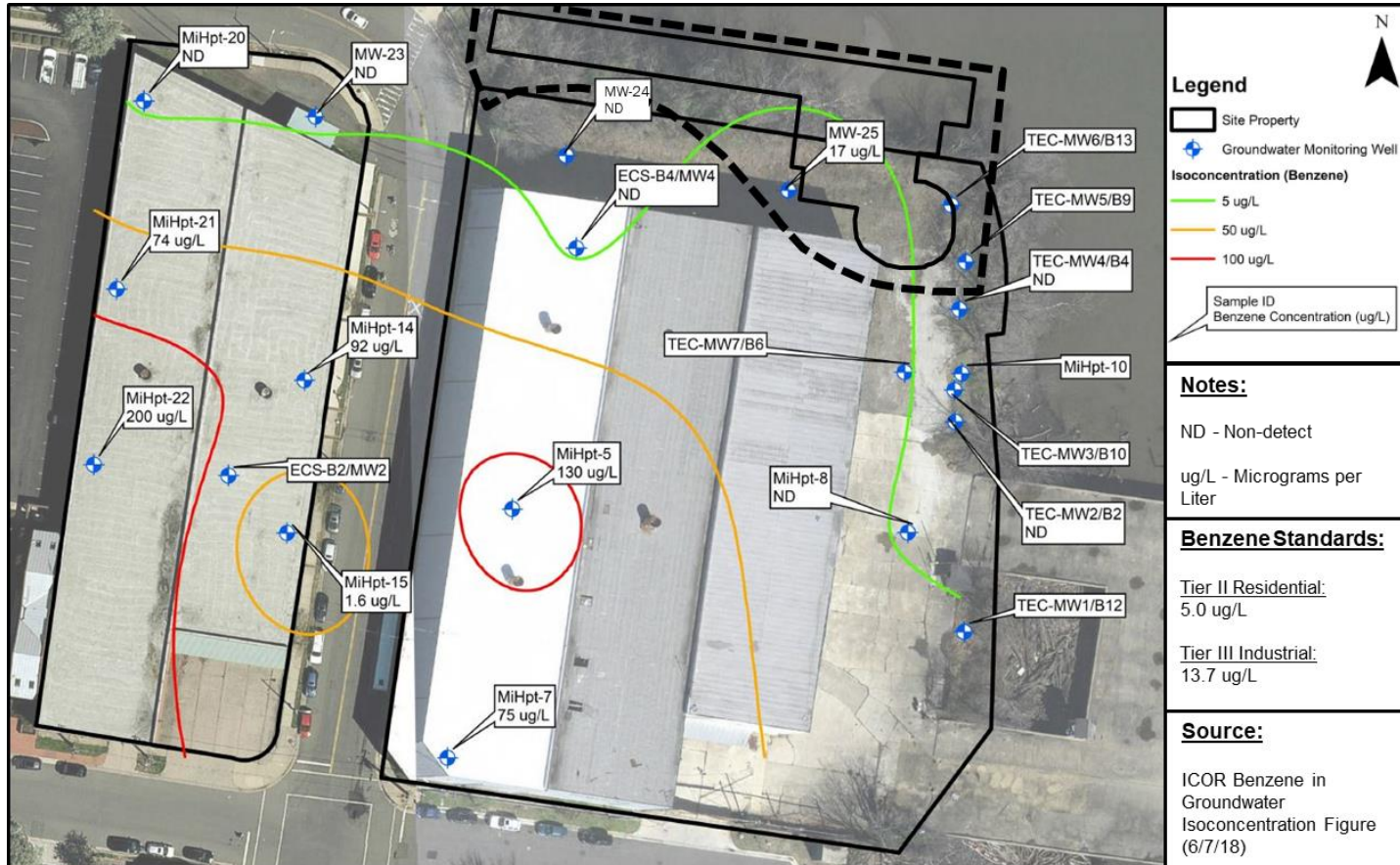
Arsenic attributed to primarily naturally occurring levels

Soil Impacts in the Vicinity of Outfall 001 based on Available Data





Groundwater Impacted by Benzene in the Vicinity of Outfall 001 based on Available Data

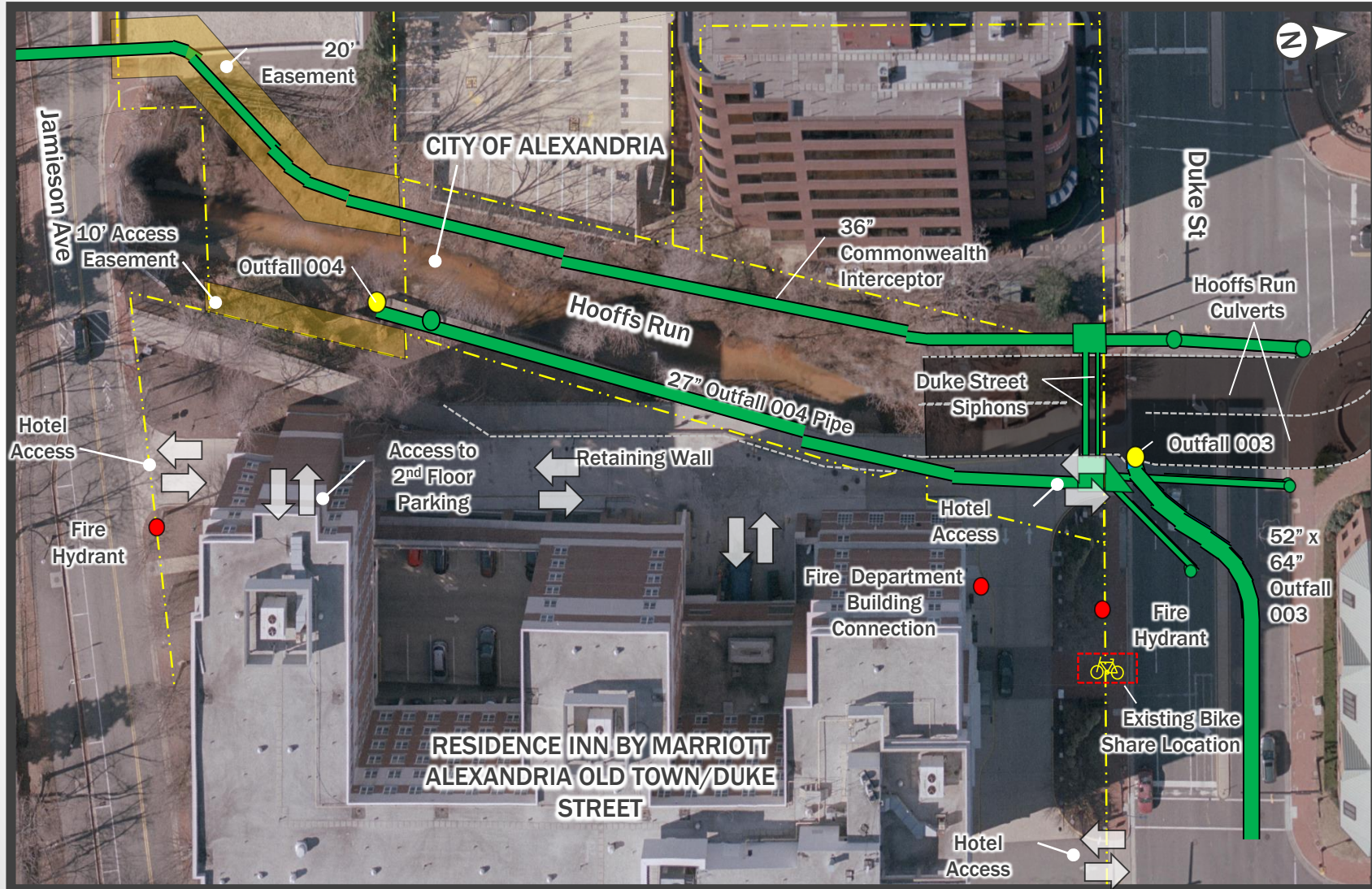


Based on available data, benzene was detected in one well within the proposed Outfall 001 Diversion Facility excavation area.

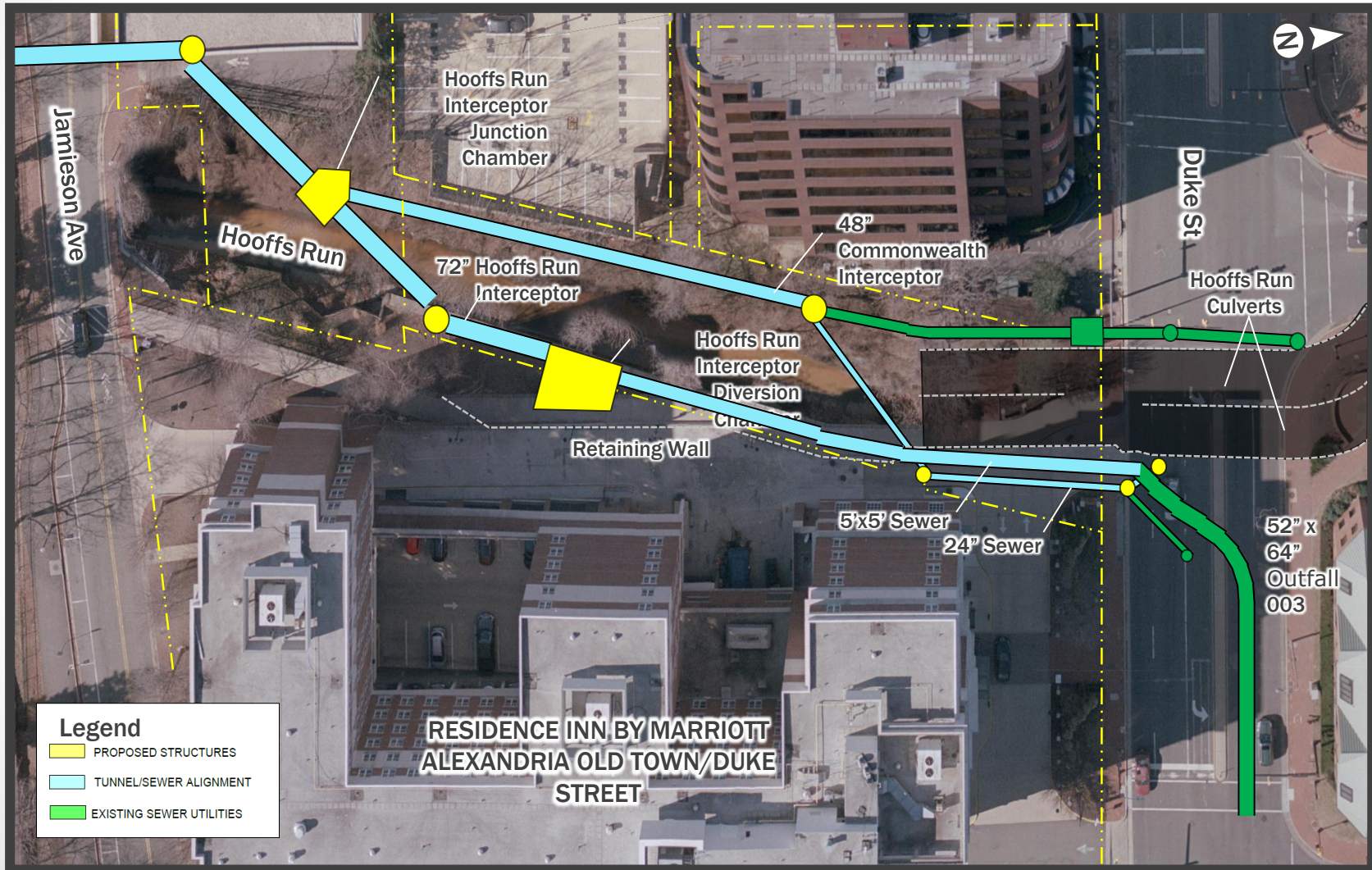
At the concentrations of benzene detected, the groundwater can be treated using typical construction methods like granular activated carbon treatment and tested prior to discharge to the existing sewer system.

Existing and Proposed Conditions at Outfalls 003/4

Existing Sewer Facilities Near Duke St and Daingerfield Rd

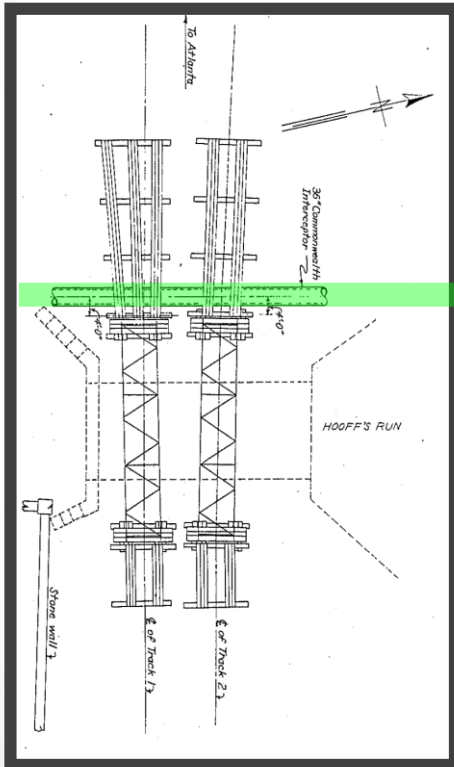


Proposed Sewer Facilities Near Duke St and Daingerfield Rd



Record Drawings of Commonwealth Interceptor Crossing of Jamieson Avenue

Commonwealth Interceptor Record Drawings - 1954

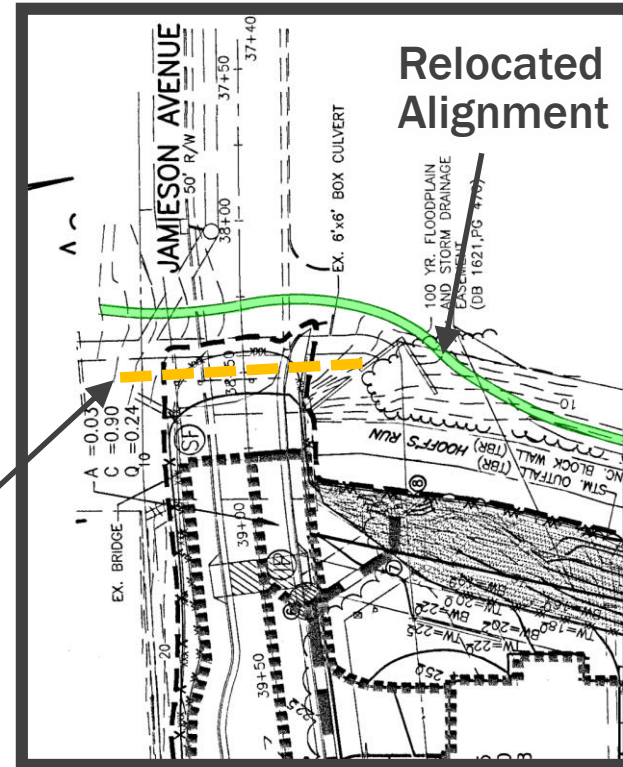


Jamieson Avenue Bridge Replacement - 1994

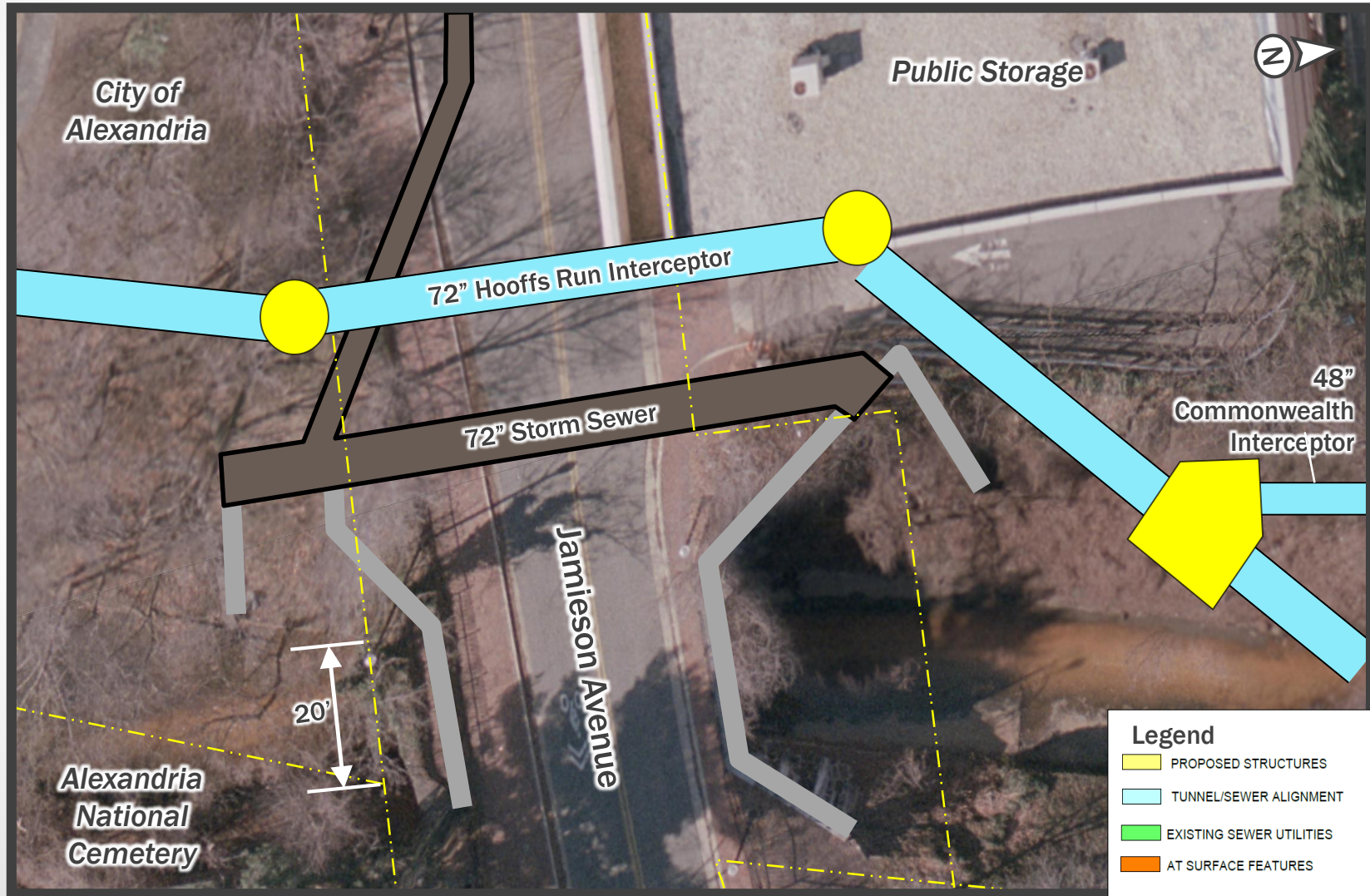


Previous Alignment

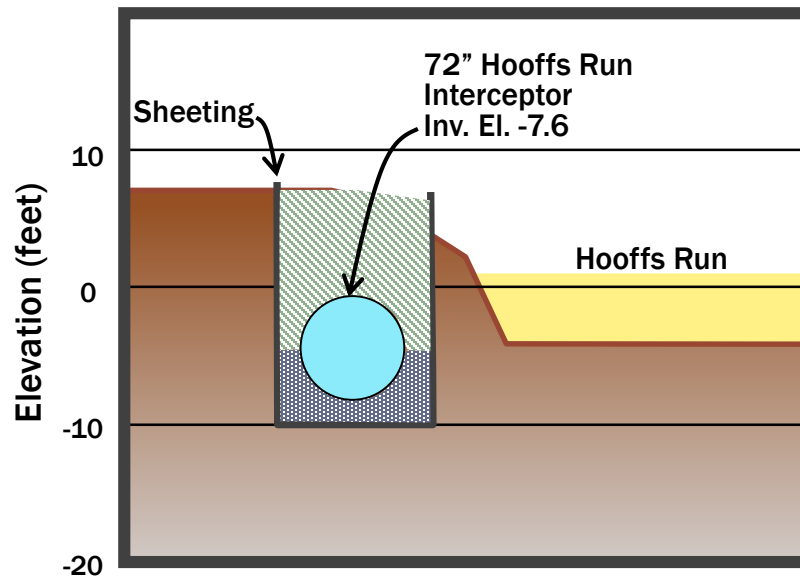
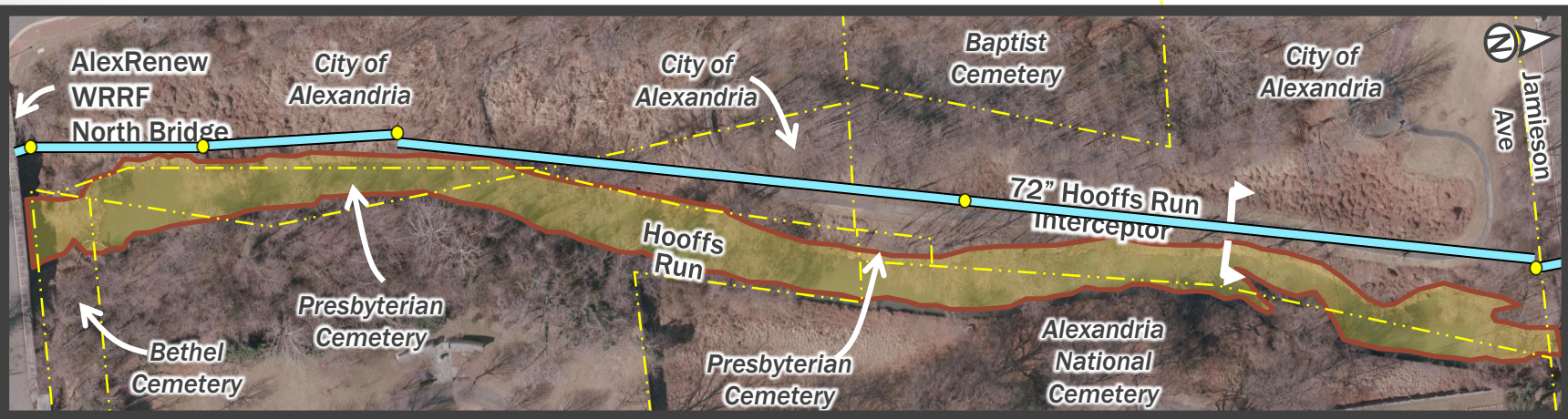
Marriot Hotel Drawings - 2000



Hooffs Run Interceptor Crossing of Jamieson Avenue



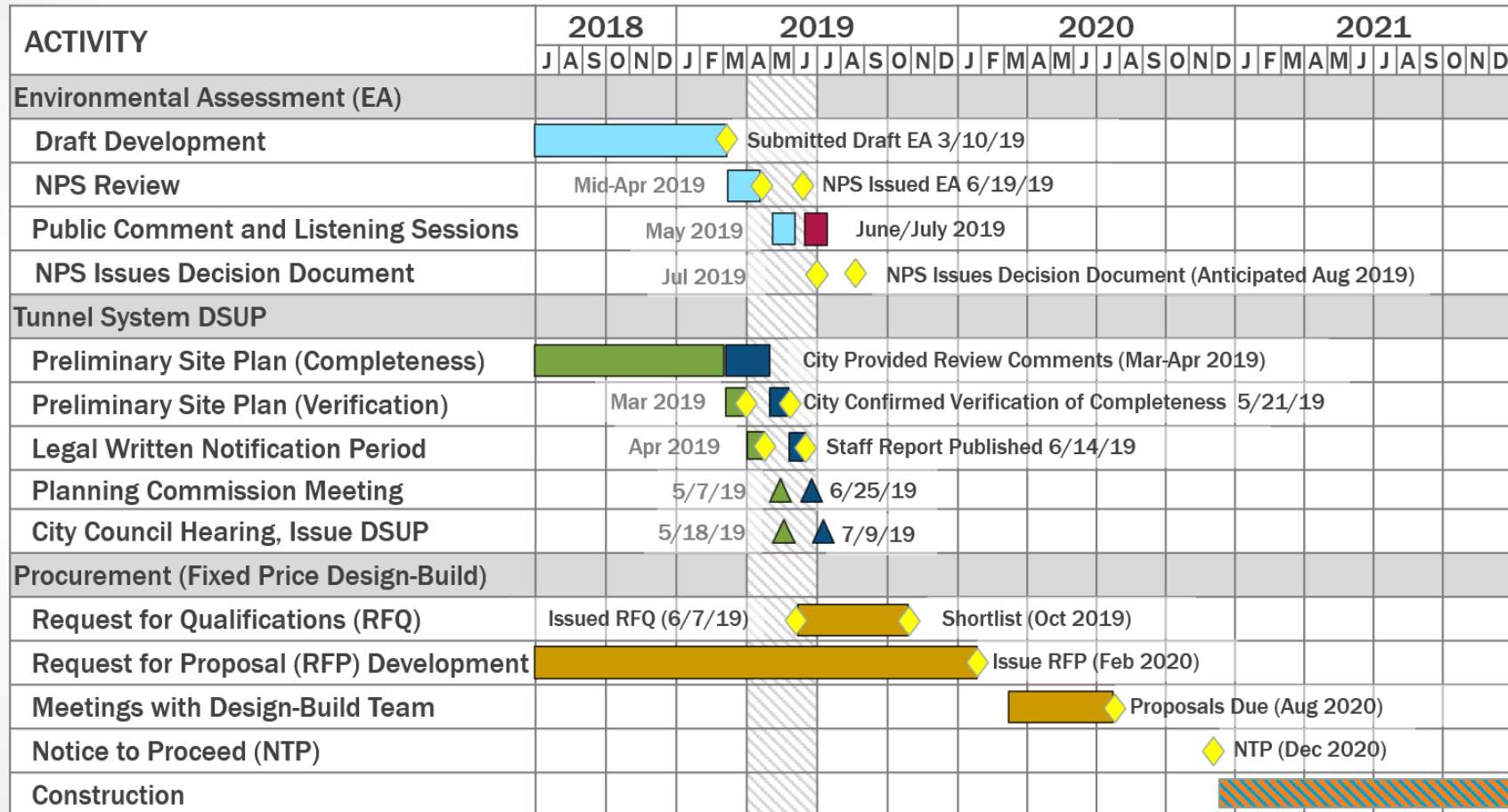
Hooffs Run Interceptor between Jamieson Ave and AlexRenew



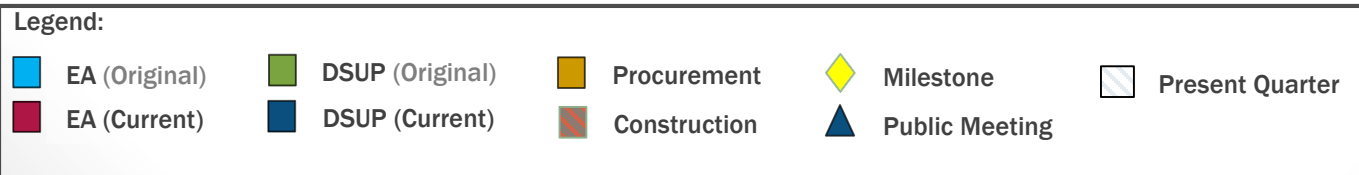
Permit and Procurement Schedule



RiverRenew Tunnel System Permit and Procurement Schedule

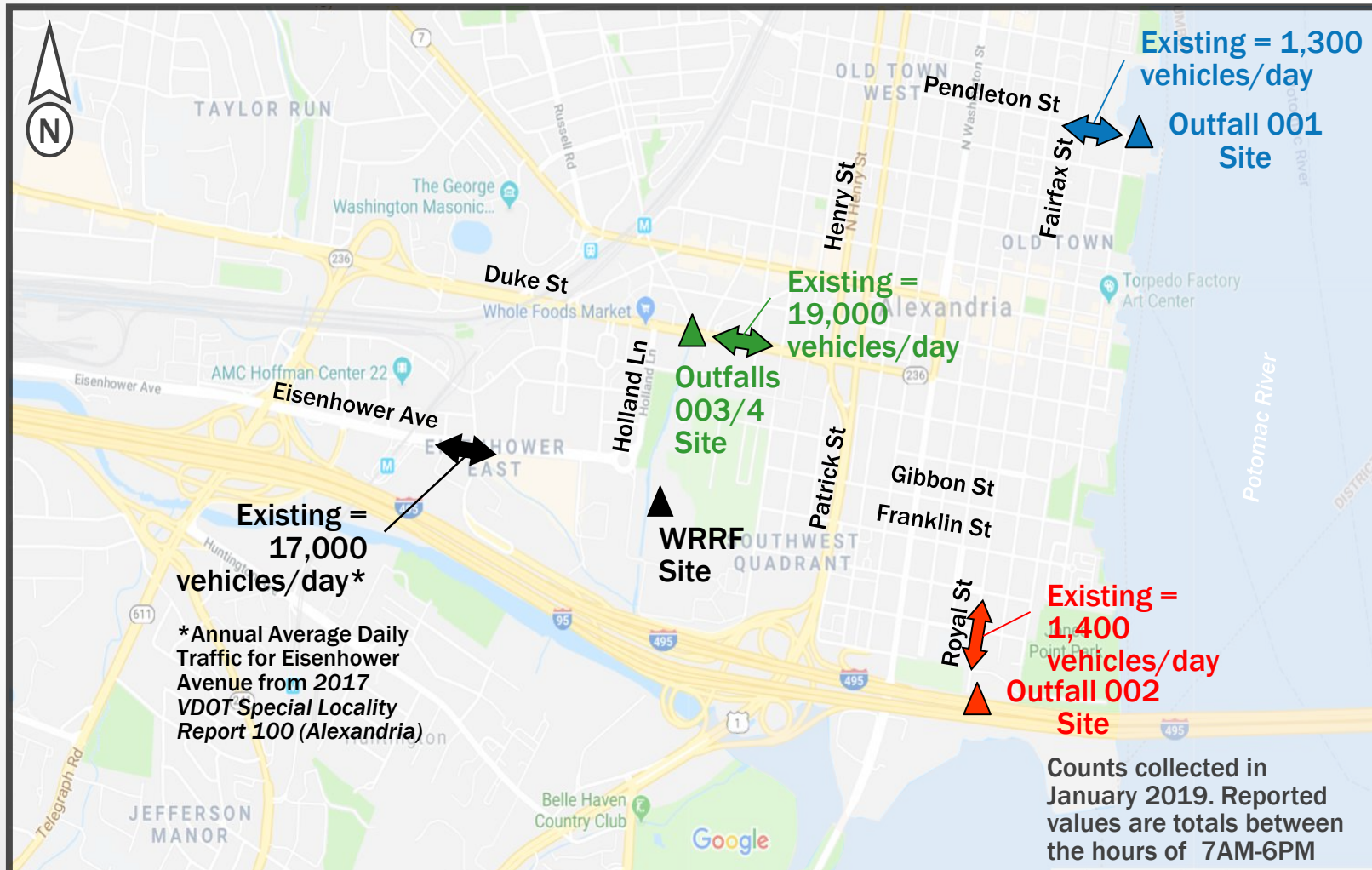


DSUP: Development Special Use Permit

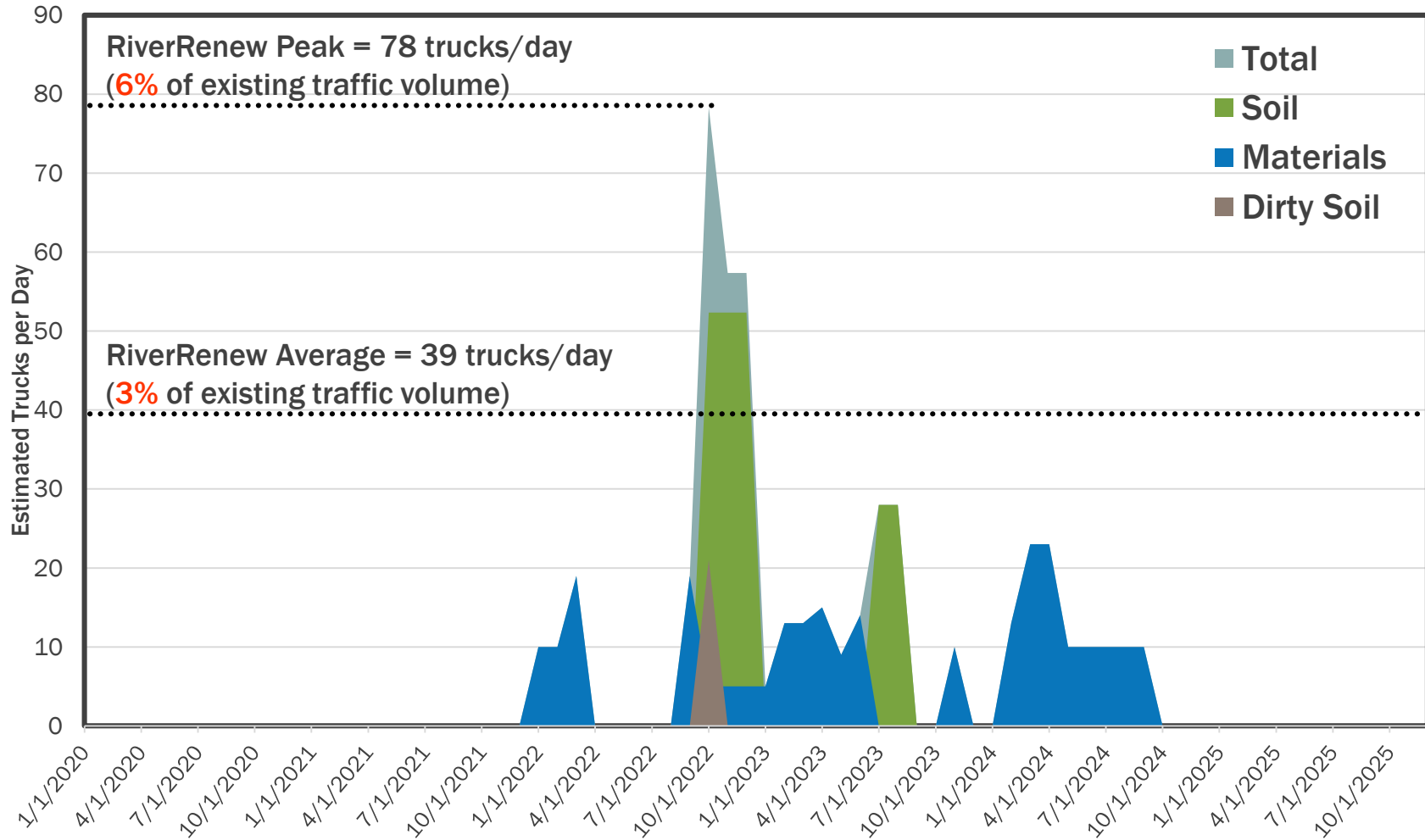


Proposed Haul Routes and Rates

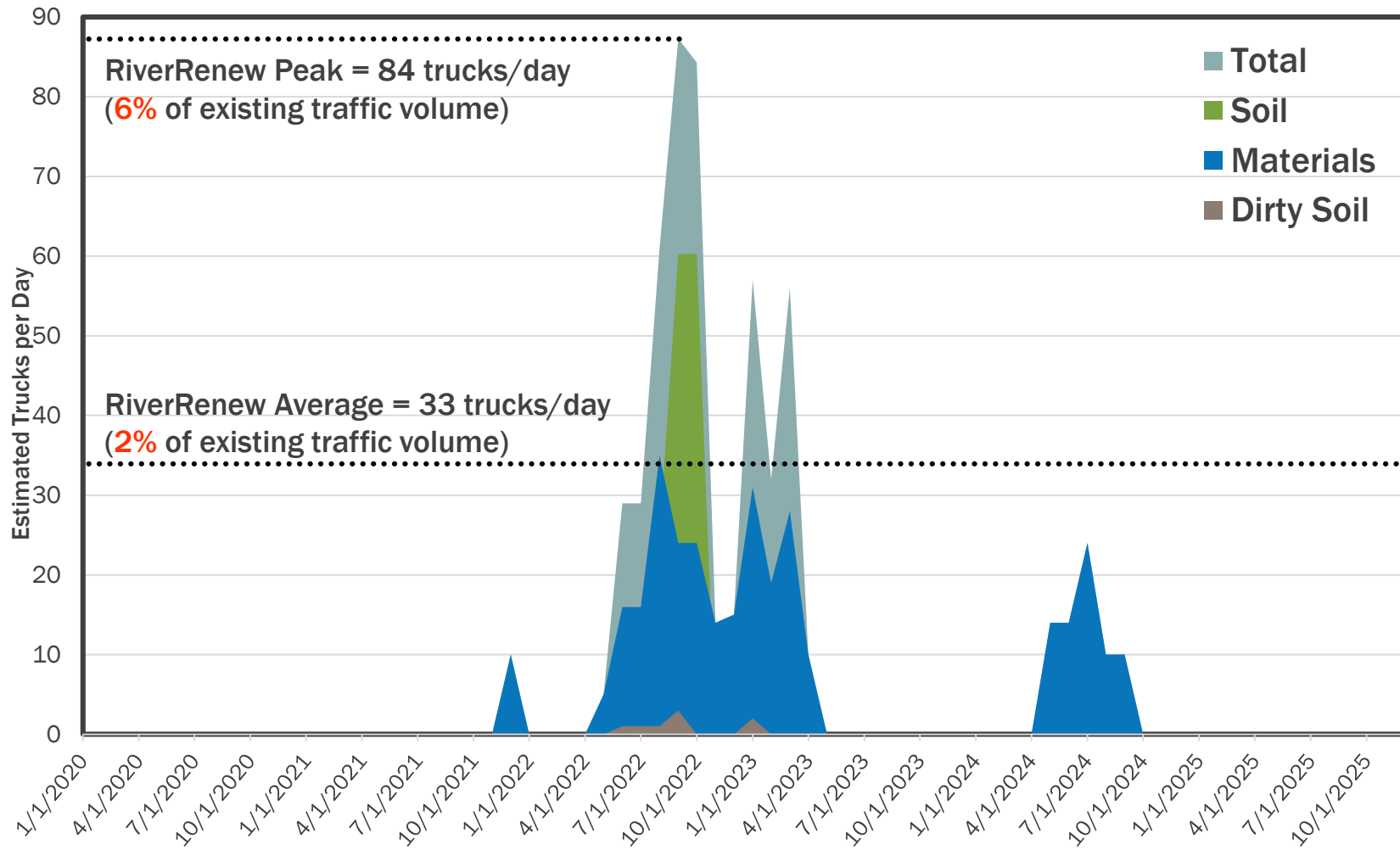
Existing Traffic Volumes near Construction Sites



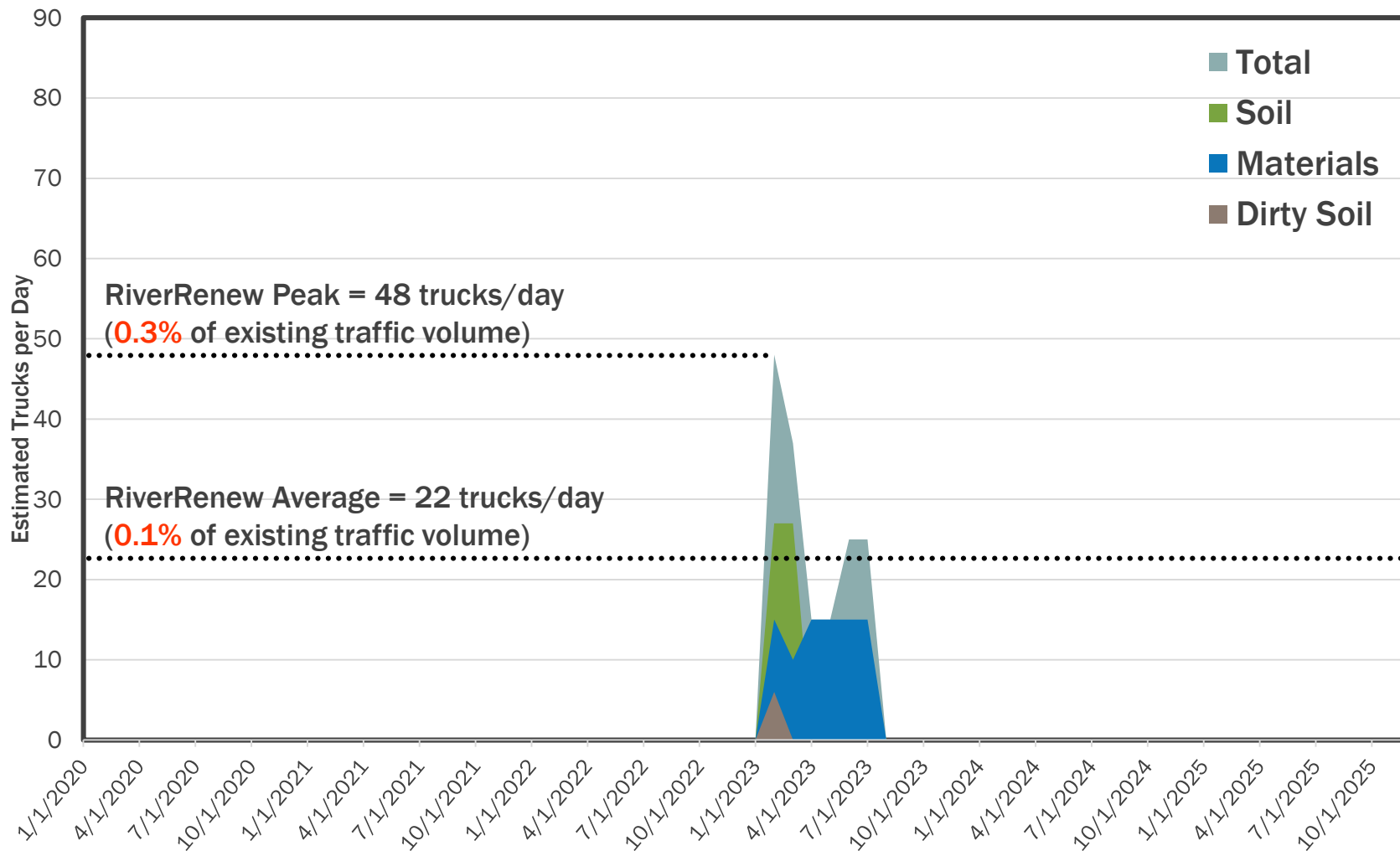
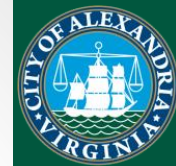
Estimated Outfall 001 Trucks per Day during Construction



Estimated Outfall 002 Trucks per Day during Construction

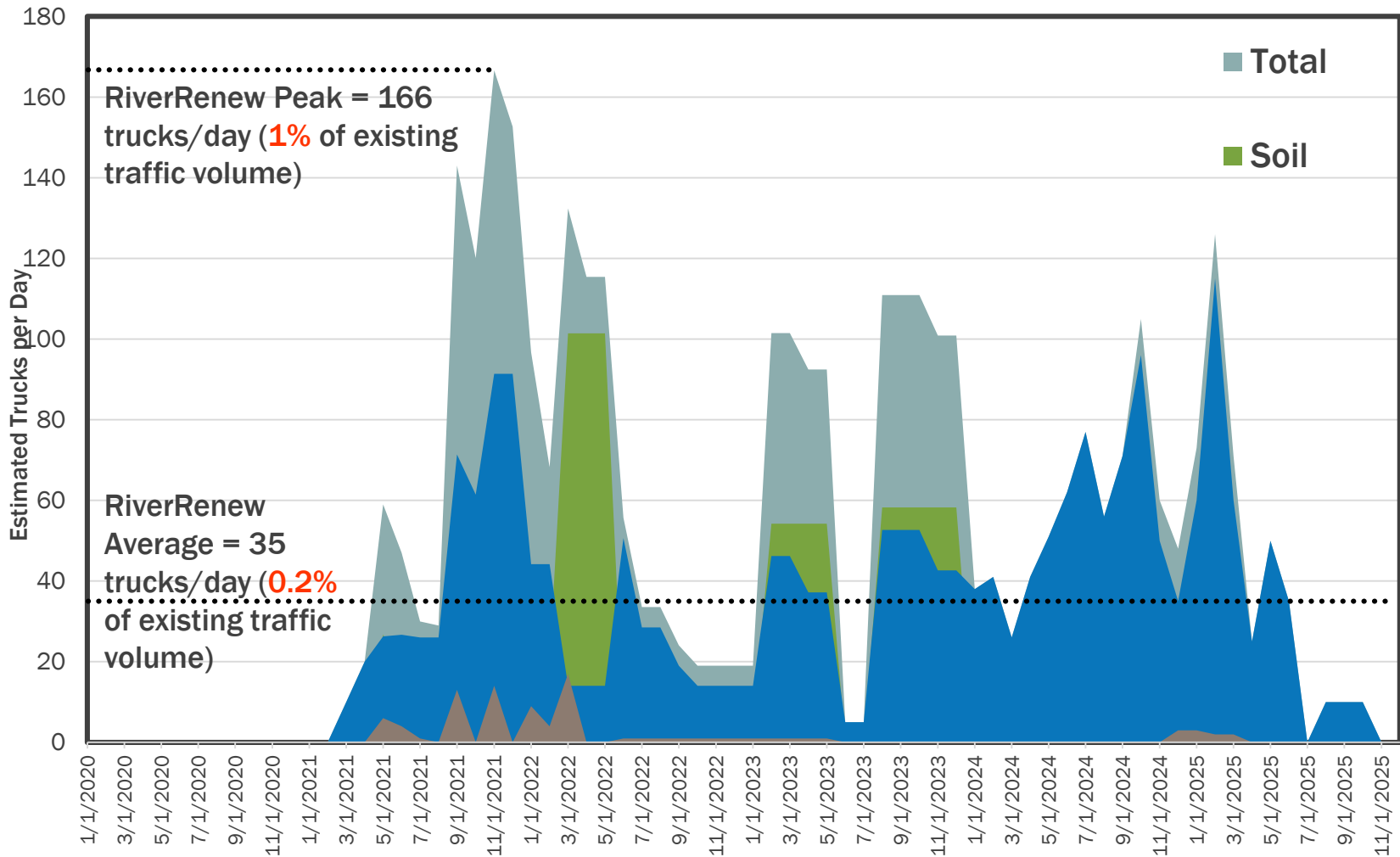


Estimated Duke Street Trucks per Day during Construction



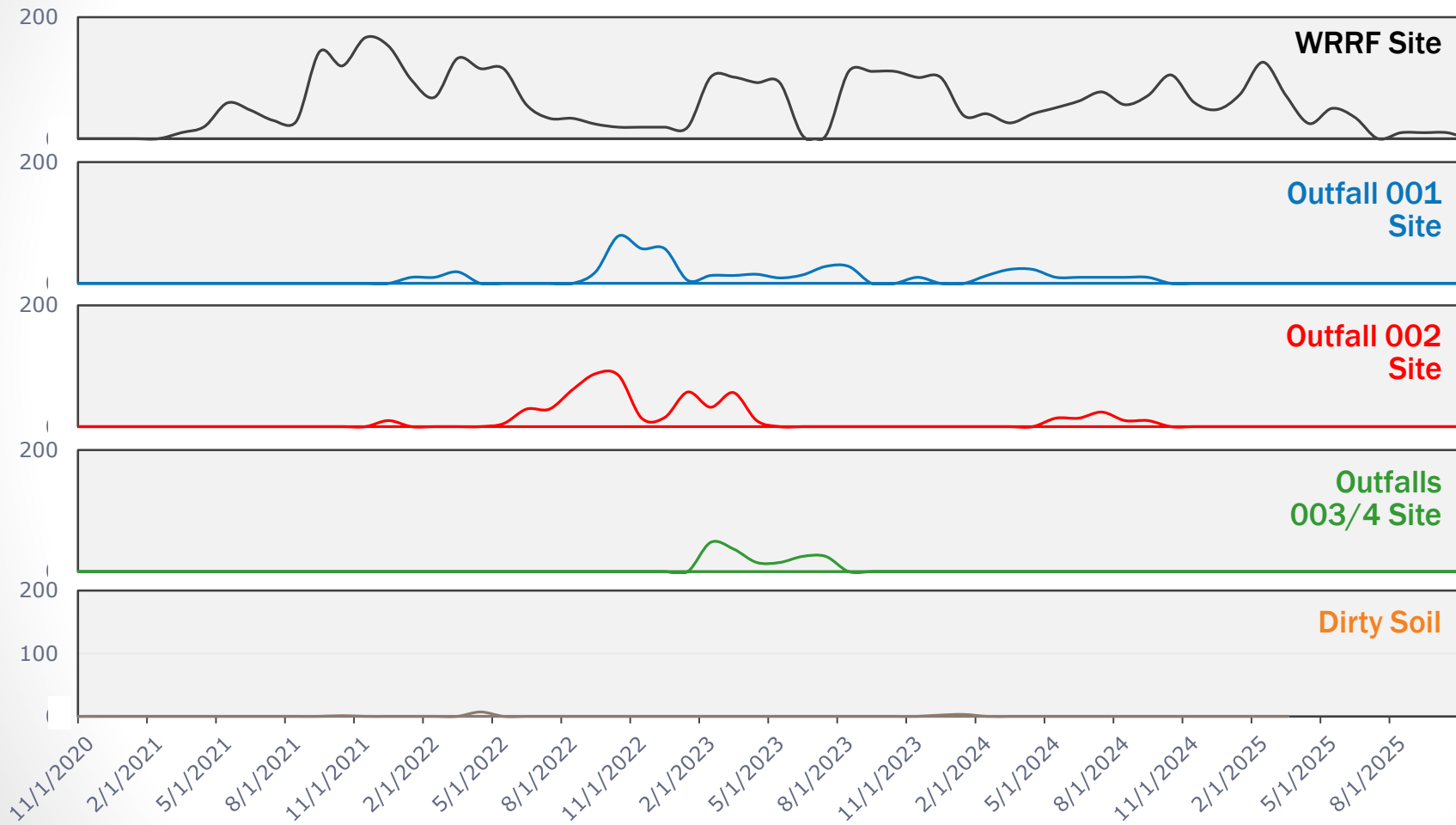


Estimated Outfall 003/4 and WRRF Trucks per Day during Construction





Total RiverRenew Estimated Hauling – All Construction Sites



Potential Construction Practices for Soil Containment

Wheel Wash



Tarping



Street Sweeping



Hauling Inspector



Comparison of Outfall 001 Diversion Facility Soil Volumes to Other Approved Alexandria Waterfront Projects

Outfall 001 Diversion Facility

20,000 CY excavated soil



Robinson Landing

55,000 CY excavated soil + 15,000 imported soil = 70,000 CY



Robinson Terminal North

68,000 CY excavated soil + 17,000 CY imported soils = 85,000 CY



CY = Cubic Yards

Barging Would Require a 500-mile Round Trip for a Small Amount of Soil

Transfer Station	Accepting Excavated Soil?	Approximate Distance from Outfall 001 Diversion Facility (miles)
Port Tobacco	No	70
Craney Island	No	180
Shirley Plantation	Yes	250

Barging Challenges

- Potential schedule impacts
- Cost increases
- Dredging of Potomac River bed may be required
- Pier use restricted
- Additional permitting requirements

