Environmental Impact Statement

STATEMENT OF FINDINGS
for
Executive Order 11990: Protection of Wetlands

Executive Order 11988: Floodplain Management

Executive Order 13690: Establishing a Federal Flood Risk Management Standard and a Process for Further Soliciting and Considering Stakeholder Input
for
Proposed Potomac Yard Metrorail Station
City of Alexandria, Virginia

Recommended:

10/24/16

Superintendent, George Washington Memorial Parkway — Date

Certified for Technical Adequacy and Servicewide Consistency:

for Forrest Ed Harvey 24 October 2016

Chief, Water Resources Division — Date
National Park Service

Approved:

11-1-16

Director, National Capital Region — Date
National Park Service

Errata for Statement of Findings for Floodplains and Wetlands: Proposed Potomac Yard Metrorail Station, City of Alexandria, Virginia

1. The Statement of Findings (SOF) for Floodplains and Wetlands was prepared in accordance with the Executive Order 13690 "Establishing a Federal Flood Risk Management Standard and a Process for Further Soliciting and Considering Stakeholder Input," issued on January 30, 201, and amending EO 11988 "Floodplain Management" issued May 24, 1977. However, there were references to EO 11988 at the locations noted below in the SOF:
    a. Page 2, Introduction: Paragraph 2, Sentence 2: Add (EO) 13690 (Establishing a Federal Flood Risk Management Standard and a Process for Further Soliciting and Considering Stakeholder Input) to (EO) 11988 (Floodplain Management).
    b. Page 2, Introduction: Paragraph 2, Sentence 2: Add EO 13690 to EO 11988.

2. The Draft Statement of Findings stated that "the City of Alexandria anticipates that selection of [B-CSX Design Option] would cause a three-year delay to construct the project." This estimate was based on the additional construction time required to move the CSXT tracks (1 year) as well as the need to wait until the existing lease on the movie theater had expired, meaning construction could not begin until January 2019. At the time of preparation of the Statement of Findings, the project sponsor assumed that construction on the other alternatives could begin as early as January 2017, based on completing the NEPA process by January 2016. It now appears likely that construction will not begin until early 2018. However, it should be noted that implementation of the B-CSX Design Option would require negotiations with CSXT which could take considerable time with no certainty that an agreement could be reached. Accordingly, it is not certain that the B-CSX Design Option could be implemented and even pursuing the B-CSX Design Option exposes the project to substantial risk, uncertainty, and delay while an agreement with CSXT is pursued.

3. The Draft Statement of Findings stated that the B-CSX Design Option is opposed by Amtrak. Amtrak's letter of May 12, 2015 did not state opposition to any specific alternative. However, it did ask that "train schedules be considered during construction of any alternative so there is no impact on Amtrak operations." The B-CSX Design Option was opposed by DRPT and VRE based on impacts to railroad operations.

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1 Introduction

The Federal Transit Administration (FTA) and the City of Alexandria have prepared a Draft Environmental Impact Statement (Draft EIS) for construction of a Metrorail Station to serve the Potomac Yard area of Alexandria. The National Park Service (NPS) is a cooperating agency, in accordance with the Council on Environmental Quality and U.S. Department of Transportation regulations (40 CFR 1501.6 and 23 CFR 771.111).

The purpose of this combined Statement of Findings document is to comply with NPS wetland protection and floodplain management procedures. Executive Orders (EO) 11988 (Floodplain Management) and 11990 (Protection of Wetlands) require the NPS and other federal agencies to evaluate the likely impacts of actions in floodplains and wetlands. NPS Director's Order #77-1: Wetland Protection and NPS Procedural Manual #77-1 provide NPS policies and procedures to comply with EO 11990. NPS Procedural Manual #77-2 provide procedures to comply with EO 11988. The Statement of Findings will be published with the Final EIS.

2 The Project and National Park Service Boundary

Figure 1 shows the project location and study area. The total study area is 377 acres in area, which includes approximately 37 acres of NPS parkland and a 15.27-acre scenic easement administered by NPS. **Figure 2** shows the relationship of the project to National Park Service lands, which are described below. Section 3 describes the project and the preferred alternative in more detail.

George Washington Memorial Parkway

The George Washington Memorial Parkway (GWMP), a unit of the National Park System, serves as a memorial to George Washington. The GWMP was originally conceived as a route connecting Washington's home at Mount Vernon and the Patowmack Canal in Great Falls, Virginia. Beginning in 1929, the original segments of the Mount Vernon Memorial Highway, now part of the GWMP, were constructed between the Arlington Memorial Bridge (in Arlington County) and Mount Vernon.

In continuation of the intent of the Mount Vernon Memorial Highway, the purpose of the GWMP is to commemorate the first president, preserve the natural setting of the shoreline of the Potomac River, and provide a high-quality entryway to Washington, DC. Construction of the remainder of the GWMP (beyond the Mount Vernon Memorial Highway) continued from 1930 through 1965. The GWMP is also listed in the National Register of Historic Places.

The GWMP comprises a total of 7,146 acres and extends 38.3 miles on both sides of the Potomac River in Virginia and Maryland. The project study area contains approximately 37 acres of GWMP parkland and two miles of the Parkway length. Beyond the project study area, the northern section of the GWMP includes both sides of the Potomac River from Arlington Memorial Bridge to the Capital Beltway/Interstate 495, comprising 9.7 miles of the GWMP in Virginia and 6.6 miles of the Clara Barton Parkway (a unit of the GWMP) in Maryland.

The project study area contains the portion of the GWMP in northern Alexandria and southern Arlington County (see **Figure 1**). The project site is adjacent to and extends onto a portion of GWMP property (see **Figure 2**).

Greens Scenic Area Easement

NPS administers a 15.27-acre easement within the project study area, known as the Greens Scenic Area easement, which is shown in **Figure 2**. The scenic easement was established in March 2000, for the purpose of conserving and preserving the natural vegetation, topography, habitat, and other natural features. The easement is within a portion of a City of Alexandria park, Potomac Greens Park. Wetland and Floodplain resources within the Greens Scenic Area easement are assessed in this document together with those within the GWMP property.

Other Study Area Features and History

To the west of the GWMP and Greens Scenic Area easement are the WMATA Metrorail tracks, CSX Transportation (CSXT) railroad tracks, Potomac Yard area, and Potomac Greens neighborhood. These developed areas comprise approximately 318 acres of the study area. Within these developed portions of the study area are approximately 38 acres of existing or planned local government parkland. The study area also contains approximately seven acres of surface waters associated with Four Mile Run.

Potomac Yard currently contains a mix of retail, residential, office, and vacant parcels planned for mixed-use redevelopment. It was formerly a large rail yard during most of the twentieth century until it was phased out in the late 1980s. As such, portions of the project study area west of the GWMP have a history of transportation and associated industrial uses, and the project site has a history of prior land disturbance. Portions of the station site in the current Greens Scenic Area north of the Potomac Greens neighborhood, although not part of the rail yard, were used for oil and water separator ponds from the adjacent rail yard operations and also for disposal of fly ash by a local power utility. The oil/water separator ponds and associated soils were removed in the 1990s, and refilled under the oversight of the Virginia Department of Environmental Quality. The *Phase I Environmental Site Assessment and Hazardous and Contaminated Materials Technical Memorandum (February 2013)* for the project documents prior uses on the site. Residual contamination from these prior uses was assessed in the *Phase II Environmental Site Assessment (November 2015)*. Currently, the project area within the Greens Scenic Area easement consists of forested upland and wetland areas with walking trails.

Figure 1: Project Study Area

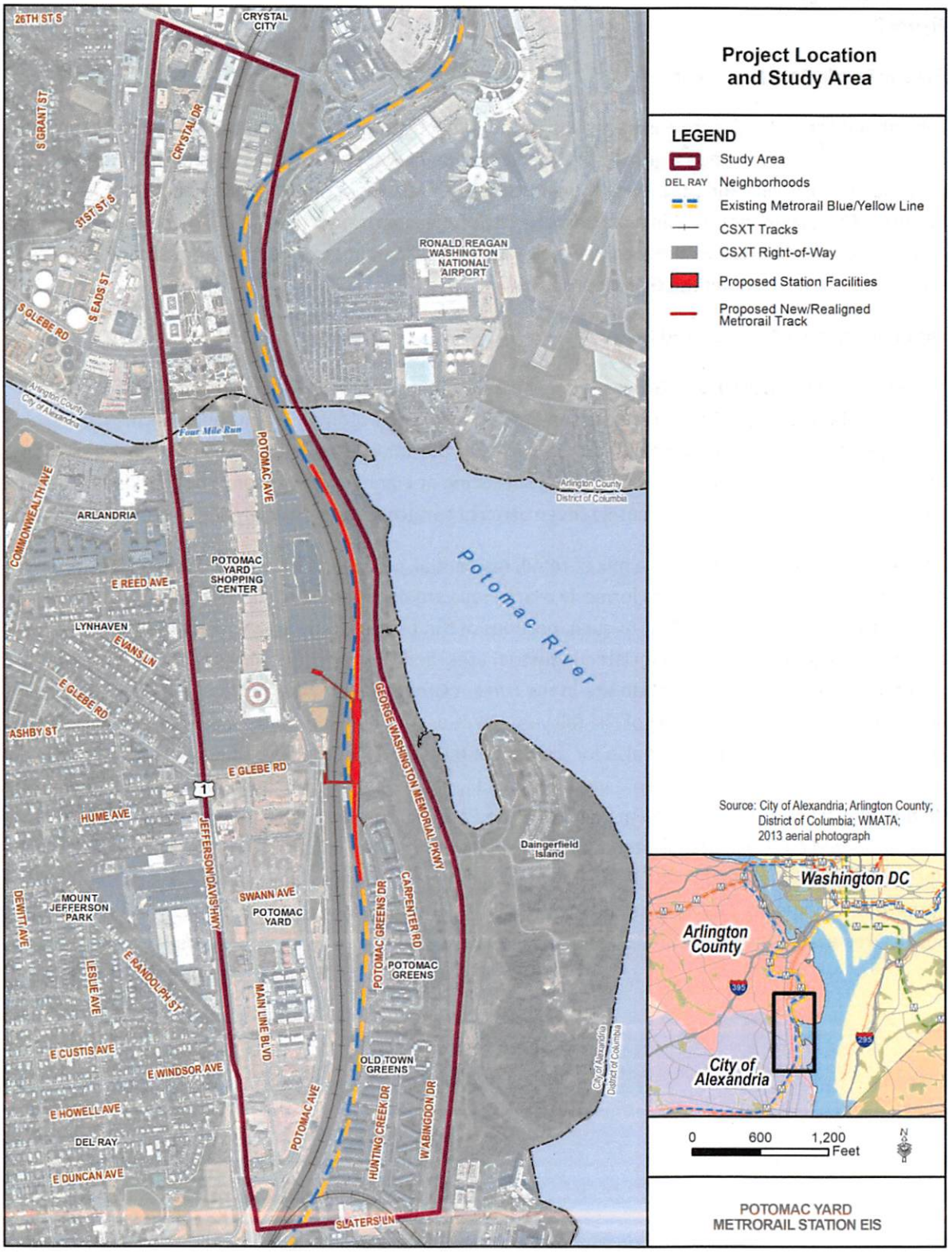
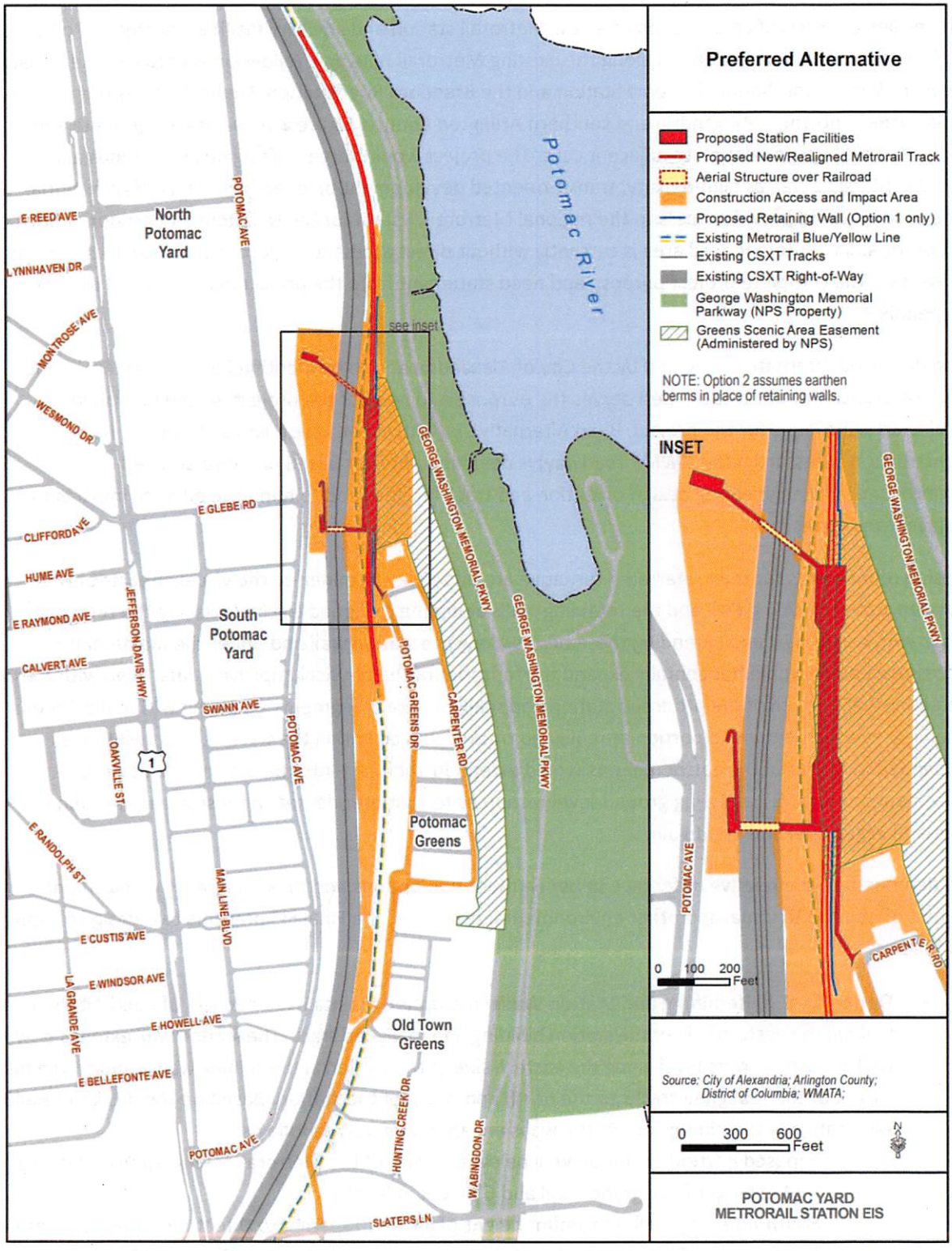


Figure 2: Preferred Alternative



3 Proposed Action

The project consists of construction of a new Metrorail station and ancillary facilities located at Potomac Yard within the City of Alexandria along the existing Metrorail Blue and Yellow Lines between the Ronald Reagan Washington National Airport Station and the Braddock Road Station. **Figure 1** shows the project study area in northern Alexandria and southern Arlington County. **Figure 2** shows the project site and proposed facilities in relation to adjacent uses. The project would serve existing neighborhoods and retail centers, as well as high-density, transit-oriented development planned by the City of Alexandria. The project would provide access to the regional Metrorail system for the U.S. Route 1 corridor of north Alexandria. The Potomac Yard area is currently without direct access to regional transit services, such as Metrorail. The complete project purpose and need statement from the project EIS is included in Appendix A.

The Preferred Alternative, selected by the City of Alexandria and to be identified in the Final EIS by the Federal Transit Administration, best serves the purpose and need of the project. As the identified Preferred Alternative for the project, Build Alternative B (with construction access Option 2, no construction access from the GWMP roadway) is developed further based on more detailed architectural and engineering design of station and track facilities and to minimize adverse impacts to adjacent resources.

Design refinements for the Preferred Alternative are underway to minimize the visual impacts of the eastern station building wall and the retaining walls along the realigned track. Replacing the retaining walls with earthen fill and extending these berms along the station wall and under the maintenance access easement would horizontally expand the footprint of the physical improvements. Even with the retaining walls, much of the proposed station and realigned track segments would be within the Greens Scenic Area easement and a portion of realigned track would be within the GWMP. As a result, the expanded footprint of the earthen berms would extend further east into the Greens Scenic Area easement and GWMP, affecting ground-level resources to a greater degree in those areas, including wetland vegetation and floodplain.

To demonstrate the relative difference between these two options and to encompass the maximum extent of impacts to visual and other environmental resources, the Final EIS presents two design options as follows:

- **Option 1 – Full Retaining and Station Walls:** the option maintains the design of Build Alternative B along the eastern side of the station building and realigned track. The station wall extends down to the existing grade level along the eastern side of the station and retaining walls support the full extent of the realigned tracks to the north and south of the station. Based on the design of Build Alternative B, the dimensions of the walls are approximately as follows:
    - Exposed portion of station wall below the level of the Metrorail tracks: approximately 15 feet in height from grade level and 650 feet in length.
    - South retaining wall: maximum height of 14 feet tapering to 0 feet over the 120 feet in length visible from areas east of Potomac Greens Park along the GWMP. The tapered

retaining wall continues south an additional 340 feet behind the lawn area of Potomac Greens Park and the townhomes but would not be visible from areas to the east of Potomac Greens along the GWMP.

  - North retaining wall: maximum height of 18 feet, tapering down to the north over the 780 feet in length.

- **Option 2 – Full or Partial Berm:** the option replaces the retaining walls with earthen fill and extends these berms along the station wall and under the maintenance access easement around the station. This option reduces the visual impact of the station wall on the GWMP by using a vegetated earthen berm to screen the portion of the station structure below the tracks and to support the maintenance access easement and realigned track beds. The earthen berm would be between 12 and 22 feet in height, about 1,800 feet in length, and extend out to the east side as much as 17 feet. This option would increase the footprint of the station and realigned track area within parkland and natural areas along their eastern side by up to 30 percent.

The final design of the Preferred Alternative may incorporate design elements of both options. As design refinements are ongoing, additional minor refinements proposed for mitigation of project impacts will be specified in the Record of Decision.

Construction Staging and Access Refinements from Build Alternative B

Refinements were made to the preliminary construction staging area and access routes presented in the Draft EIS for Build Alternative B (option with no construction access from the GWMP roadway). The refinements incorporate more detailed development of construction phasing plans since the Draft EIS and efforts to reduce impacts to resources identified in the Draft EIS.

The following refinements are made for the Preferred Alternative:

- *East of the Metrorail tracks* – To minimize impacts to the GWMP, the extent of the Build Alternative B construction staging area on the GWMP property is removed except where required for direct access to build the realigned track at the northern end of the project site. A short segment of the realigned track will cross NPS property, and construction of the retaining wall or earthen berm on the eastern side of the track immediately to the south would occur directly adjacent to NPS property. Thus, construction staging and access is needed along the eastern side as well as the western side of the realigned track for these construction activities. As a result, between 0.25 and 0.42 acres of GWMP property in this area would be temporarily required to accommodate construction staging, in addition to the 0.16 to 0.33 acres of GWMP property permanently required for the realigned track. A wider area of construction activity immediately north of the station is indicated to accommodate installation of a crossover switch on the realigned track. The construction staging areas avoid archaeological sites identified during the Phase I archaeological investigations. In addition, to allow for potential minor design modifications to the station pedestrian and bicycle access facilities in Potomac Greens Park, the extent of the construction staging area and access area is expanded by up to 0.88 acres to accommodate potential modifications.

- *In between the Metrorail tracks and CSXT right-of-way* – The construction staging area is expanded by 5.37 acres to the south across the full extent of the City of Alexandria Rail Park to accommodate construction contracting offices at this location rather than at the northern end of the Potomac Greens neighborhood, thereby reducing vehicular traffic along Potomac Greens Drive by construction employees.
- *Access Routes through the Old Town Greens and Potomac Greens neighborhoods* – To ensure safe conditions along the construction access route along the WMATA substation access road through the Old Town Greens common area, the project proposes temporarily relocating the playground to another site within Old Town Greens and temporarily closing the tennis courts for the duration of construction. Similarly, to ensure safe conditions along the construction access route from the northern end of Potomac Greens neighborhood into Potomac Greens Park, the project proposes temporarily relocating or closing the playground for the duration of construction. To allow construction vehicles to circulate in a single direction with less impact to neighborhood traffic flow, the access route through the Potomac Greens neighborhood also includes Carpenter Road.
- *West of the CSXT tracks* – To allow for potential minor design modifications to the station entrance pavilions and pedestrian and bicycle access facilities along Potomac Yard Park, the extent of the construction staging area and access area is expanded by 0.15 acres to accommodate potential modifications.

As design refinements are ongoing, additional minor refinements proposed for mitigation of construction impacts will be specified in the Record of Decision.

4 Justification for Use of the Floodplain and Wetlands

Construction of the proposed Metrorail station in the Potomac Yard area is not possible without use of floodplain and wetlands due to physical site and land use constraints, engineering constraints, and other environmental constraints. Other non-Metrorail transportation alternatives would not be able to meet the project Purpose and Need described in the EIS.

Physical Site and Land Use Constraints

In the Potomac Yard area of Alexandria, the existing Metrorail line right-of-way is bound by the following existing uses and infrastructure:

- West – CSXT railroad tracks;
- East –Greens Scenic Area easement, George Washington Memorial Parkway, and Potomac River;
- Southeast – Potomac Greens neighborhood;
- South – existing Metrorail tunnel portal;
- Southwest – City of Alexandria Rail Park and CSXT railroad tracks; and
- North – Four Mile Run stream, existing Metrorail bridge, and aerial Metrorail track segments.

For any location along the existing tracks, the station facilities would extend beyond the WMATA Metrorail right-of-way onto adjacent lands. To avoid or minimize impacts to a particular resource, the degree to which the station can be located to the north or south along the existing tracks or the tracks can be realigned to the east or west is constrained by the rail engineering criteria described below.

Engineering Constraints

Rail engineering and design criteria have been established by WMATA and CSXT to ensure safe operating environments for passenger and freight rail services and maintain the structural and mechanical integrity of infrastructure and facilities during their design lifetimes. The criteria address station and track design, and thus place constraints on the available locations that are technically feasible for the proposed station. As a result, potential locations either on the existing track or on new realigned track that can avoid wetland and floodplain areas are limited.

WMATA and CSXT engineering design criteria require the following for the new station and any realigned track:

- Metrorail stations require a minimum 750 feet of straight (tangent) track that is level. In addition, the Potomac Yard station requires 200 feet of straight track for a crossover switch adjacent to the station;
- Metrorail tracks require a maximum vertical grade of four percent and minimum curve radius of 755 feet;
- CSXT requires 50 feet minimum horizontal clearance from the centerline of Metrorail track to the centerline of CSXT track and 35 feet minimum vertical clearance over CSXT track, and 25 feet minimum vertical clearance under CSXT track; and
- WMATA requires that construction activities cannot interrupt existing Metrorail operations on the Blue and Yellow line for a period longer than a three-day holiday weekend (76 hours). Where proposed station locations require adjustments to mainline track alignments, tie-in to the existing mainline must be at-grade, and cannot occur along the aerial or tunnel track segments to the north and south of Potomac Yard.

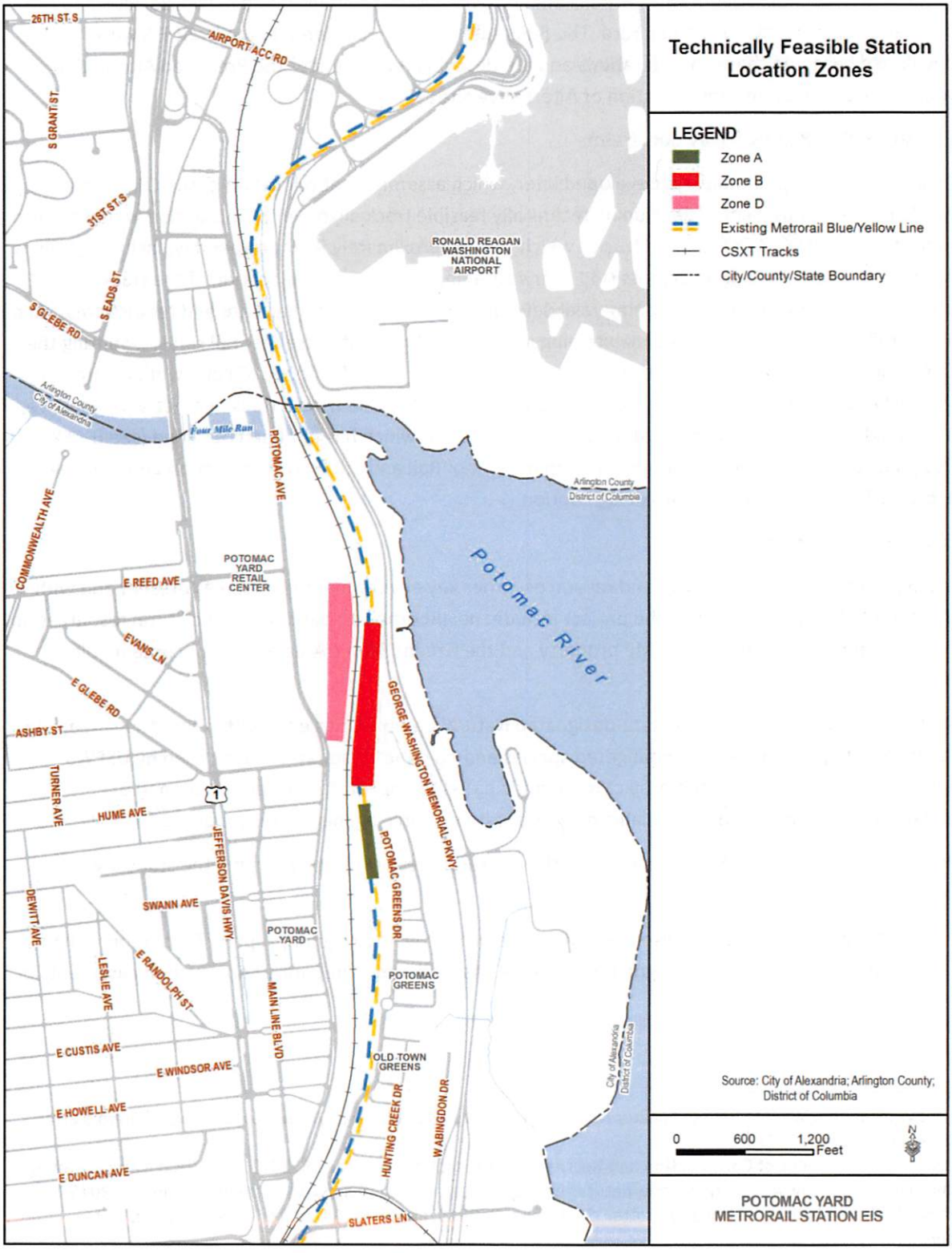
Based on these criteria, a narrow set of zones in which station locations would be technically feasible without affecting the CSXT tracks was identified (see **Figure 3**):

- **Zone A (Build Alternative A)** – The station can be built on the existing track only if it is directly adjacent to the Potomac Greens residential community (Zone A), along which there is a segment of straight track that would meet the minimum design requirements. The environmental constraints and impacts of this location (Build Alternative A) are described below, and this alternative is described in Section 5.
- **Zone B (Build Alternative B and Preferred Alternative)** – The track can be realigned to create a segment of straight track further north of Potomac Greens (Zone B). Within this zone is the location identified for the Preferred Alternative, described below.
- **Zone D (Build Alternative D)** – Shifting the Metrorail line over the CSXT tracks to locate the station west of the tracks along elevated track is technically feasible (Zone D). The

environmental constraints and impacts of this location (Build Alternative D) are described below, and this alternative is described in Section 5.

Using underground or aerial realignments of the track to avoid wetland and floodplain areas is also not feasible. This is due to the engineering requirements for maximum vertical grade changes required to tie into the existing tracks north and south of Potomac Yard.

Figure 3: Technically Feasible Station Location Zones



The station locations within each zone were chosen to minimize impacts to the Greens Scenic Area easement to the north of Potomac Greens, minimize impacts to wetlands, and maximize access to the planned development in Potomac Yard. The Build Alternatives considered in the Draft EIS were developed based on these considerations and are described below under the Preferred Alternative subsection and Section 5 Investigation of Alternative Sites.

Transportation Right-of-Way Constraints

An additional design option was developed later, which assumed that relocation of the CSXT tracks would not be a constraint in developing technically feasible track alignments. This option would require relocating the active CSXT railroad tracks, which carry approximately 97 trains per day, including freight, Amtrak, and Virginia Railway Express (VRE) services along three tracks. Relocation of the tracks would occur within an area of existing commercial development in North Potomac Yard and require creation of a new railroad right-of-way while maintaining active freight rail and passenger rail service. Shifting the CSXT tracks to the west to locate the Metrorail station away from the floodplain and wetland area on the east of the existing Metrorail tracks may be technically feasible from a track geometry perspective, but would require an agreement with CSXT for the project, which has not been obtained (see B-CSX Design Option in Section 5). The Virginia Department of Rail and Public Transportation and VRE have expressed their opposition to this design option.

Environmental Constraints

In addition to floodplain and wetland resources, other key environmental resources present and with the potential to be impacted by the project include: neighborhoods, parkland, and cultural resources. In addition, portions of the NPS GWMP property and the Greens Scenic Area easement contain upland forest habitat.

No National Wildlife Refuge[1] or state-designated Natural Communities exist within the study area.[2] No federally-listed threatened or endangered species and no critical habitats are identified by USFWS within the study area,[3] and the project is not anticipated to impact state-listed threatened or endangered species based on available data and state resource agency correspondence.[4]

Potential impacts by project alternatives to the key resources noted above within the study area include:

- Land Acquisitions and Displacements – the project would require property for station facilities and right-of-way for realigned track, as well as additional temporary construction easements or access permits.

[1] USFWS National Wildlife Refuge Locator Map, http://www.fws.gov/refuges/refugeLocatorMaps/Virginia.html, accessed October 1, 2015.
[2] Virginia Department of Conservation and Recreation correspondence, June 18, 2012; and VDCR Natural Heritage Database, http://www.dcr.virginia.gov/natural-heritage/natural-area-preserves/, accessed October 1, 2015.
[3] USFWS Online Project Certification Letter, September 3, 2015, and USFWS Updated Official Species List, December 15, 2015.
[4] Virginia Department of Conservation and Recreation correspondence, June 18, 2012.

- Noise and Vibration – although the area currently experiences high level of ambient noise and vibration from existing transportation facilities, new track and station facilities have the potential to cause noise and vibration impacts to sensitive uses that are immediately adjacent.
- Visual Resources – the project would impact views from the George Washington Memorial Parkway, the Potomac Greens neighborhood, Potomac Greens Park, and Potomac Yard, due to the introduction of new visual elements and removal of vegetation for construction access and staging areas.
- Local Plans and Zoning – The City of Alexandria's *North Potomac Yard Small Area Plan* and the zoning for Coordinated Development District (CDD) 19 link the level of development in Potomac Yard with the presence of a Metrorail station that can accommodate the increased travel demand. The adopted Small Area Plan and CDD 19 zoning indicate the planned future land use within the study area. Both the Small Area Plan and the adopted zoning call for a station in the location of the Preferred Alternative (Build Alternative B) to maximize the high-density Potomac Yard development in close proximity to the station.
- Construction Impacts – Areas designated for construction staging would be cleared of all trees and other natural vegetation and filled or leveled as necessary to make construction activities possible. Potential protection of limited areas of high-quality vegetation within construction staging areas will be examined during detailed design phases as feasible. Temporary construction staging areas for the Preferred Alternative would comprise approximately 16 acres, which include both areas already developed and areas of natural vegetation. Construction activities would last approximately two and a half years. The proposed excavation, construction, and establishment of temporary construction staging areas and access driveways would result in soil disturbance, soil exposure and compaction that could cause potential adverse effects on shallow soil permeability, and soil erosion from water and wind. To minimize these effects, a sediment and erosion control plan would be developed as part of the construction documents for the site and would require measures needed to minimize impact to the site and surrounding water bodies. After construction, soils would be restored the areas would be replanted and landscaped/restored to return them to as close to pre-construction conditions as possible or better, in coordination with relevant agencies. Existing floodplain and wetlands within the proposed construction areas, including vegetation present and construction impacts, are described in Section 6.

Due to the site's constraints, avoiding or minimizing impacts to one resource may incur impacts to other environmental resources.

- A station location on the existing track immediately adjacent to townhomes in the Potomac Greens neighborhood (Build Alternative A, described in Section 5) would avoid most floodplain and wetland areas, but would result in noise and vibration impacts and visual impacts to this community.
- Re-routing the Metrorail line over the CSXT tracks into Potomac Yard (Build Alternative D, described in Section 5) would avoid the floodplain and wetlands within the Greens Scenic Area easement, but would impact 1.43 acres of GWMP property and 0.52 acres of Waters of the U.S. along Four Mile Run to tie back into the existing line. Build Alternative D also would result in

noise and vibration impacts and visual impacts to the Potomac Greens community due to the aerial tracks required over the existing Metrorail and CSXT tracks.

- Station locations on the existing track (Build Alternative A) or within the Potomac Yard development (Build Alternative D and B-CSX Design Option) would also be inconsistent with the City's *North Potomac Yard Small Area Plan* and adopted zoning, which seek to locate the station closest to the planned North Potomac Yard redevelopment without displacing portions of it.

Preferred Alternative

The Preferred Alternative (Build Alternative B) would avoid the noise and vibration impacts to the Potomac Greens community and reduce visual impacts to the neighborhood by relocating the station further north. However, this location would require a realignment of the existing Metrorail track to create a 750-foot segment of straight track. This realignment would need to be east of the existing line and pass through the edge of the floodplain and wetlands within the Greens Scenic Area easement. Within the technically feasible station zone that was identified for Build Alternative B, the Preferred Alternative is located as far west as possible to minimize permanent impacts to floodplain and wetlands. Temporary impacts to floodplain and wetlands would also occur. The construction access option chosen for the Preferred Alternative would avoid using the George Washington Memorial Parkway to access the site. Temporary construction staging areas for the Preferred Alternative would occupy a total of 16.0 acres, of which up to 0.42 acres would be within GWMP property and up to 3.09 acres would be within the Greens Scenic Area easement.

In addition to its technical feasibility and minimization of impacts to existing residential communities, the Preferred Alternative location would maximize the transportation, land use, and economic benefits of this transit project described in the Purpose and Need, by locating the station closest to the planned North Potomac Yard redevelopment (800 feet away walking distance). Although the B-CSX Design Option and Build Alternative D stations would be located closer to the center of the planned North Potomac Yard redevelopment, the stations and realigned track would occupy part of the redevelopment area, reducing its development potential.

5 Investigation of Alternative Sites

The Scoping process for the EIS identified a full range of potential alternatives and screened out those that did not broadly meet the Purpose and Need, local City of Alexandria plans for Potomac Yard, or technical feasibility criteria; this review is documented in the *Initial Screening of Alternatives Report* (2011). The Draft EIS documents the environmental impacts of the four build alternatives that were selected for detailed evaluation.

The Draft EIS evaluated four technically and financially feasible alternatives that meet the project's Purpose and Need, as well as the No Build (No Action) Alternative. The Draft EIS evaluated three Build Alternatives (A, B, and D), as well as a design option (B-CSX Design Option). As described in Section 2, Alternative B was selected as the Preferred Alternative.

No Build

The No Build Alternative would not improve the regional transit accessibility of Potomac Yard and would not meet the project Purpose and Need.

Build Alternative A

The location of Build Alternative A is directly behind townhouses in the Potomac Greens neighborhood. Construction of Alternative A would have resulted in greatest adverse impacts to the neighborhood in comparison to the other build alternatives. Impacts from Build Alternative A would have included noise impacts from operation of the station and vibration impacts from new track switches. Temporary construction impacts to Potomac Greens neighborhood would have resulted from construction vehicle traffic, noise, and vibration impacts.

Alternative A would have permanent impacts to 0.0 acres of 100-year floodplain, 0.41 acres of 500-year floodplain, and 0.02 acres of wetland. Additional temporary impacts during construction would occur on 0.01 acres of 500-year floodplain and 0.01 acres of wetland.

Build Alternative A would locate the station furthest from the dense redevelopment and planned office uses in North Potomac Yard (1,650 feet away walking distance). Because Alternative A would be furthest from the development at North Potomac Yard, the planned redevelopment would have less density and fewer office uses than in the approved North Potomac Yard plan. This would result in decreased economic benefit to the City and fewer benefits to surrounding neighborhoods when compared to the Preferred Alternative.

Temporary construction staging areas for Build Alternative A would occupy 7.0 acres, of which 2.40 acres would be within GWMP property and 0.13 acre would be within the Greens Scenic Area easement.

B-CSX Design Option

This B-CSX Design Option was developed in 2013 at the request of NPS in an effort to avoid and minimize adverse impacts to the GWMP. This alternative would have located the Metrorail station in the northern portion of Potomac Yard adjacent and west of the existing Metrorail tracks. This alternative would require that the CSXT railroad tracks be realigned, pending agreement with CSXT to relocate its freight railroad tracks, which has not been obtained.

B-CSX Design Option would have no permanent or temporary construction impacts to floodplain or wetland.

This option is opposed by the Virginia Department of Rail and Public Transportation and providers of passenger rail services along the CSXT line, the Virginia Railway Express and Amtrak. In addition, CSXT stated that it strongly preferred that B-CSX Design Option not be chosen for the project. Even with agreement among the various parties, the City of Alexandria anticipates that selection of this alternative would cause a three-year delay to construct the project.

B-CSX Design Option would locate the station within the North Potomac Yard redevelopment area. However, the realigned CSXT track and right-of-way and portions of the station would occupy parts of

the area planned for parkland and dense office and mixed-use development, reducing the amount of parkland and overall development potential of North Potomac Yard.

Temporary construction staging areas for B-CSX Design Option would occupy 13.3 acres, of which 0.0 acres would be within GWMP property or the Greens Scenic Area easement.

Build Alternative D

Alternative D would have constructed the Metrorail station in the northern portion of Potomac Yard on an elevated structure. Alternative D requires the greatest amount of public park land of any of the build alternatives, 1.43 acres of GWMP and 5.38 acres from City of Alexandria parks. Alternative D requires the construction of a new bridge over Four Mile Run, a tributary to the Potomac River and Navigable Water of the United States. Alternative D would also result in the greatest increase in new impervious surface (9.24 acres), when compared to the other build alternatives.

Alternative D would have permanent impacts to 0.90 acres of 100-year floodplain, 0.41 acres of 500-year floodplain, and 0.50 acres of wetland. Additional temporary impacts during construction would occur on 1.22 acres of 100-year floodplain, 0.32 acres of additional 500-year floodplain, and 0.48 acres of wetland.

In addition to park land and natural resource impacts, Alternative D would negatively affect views from the GWMP due to the elevated track structures required to build the station. Alternative D would also cause noise, vibration, and visual impacts to residents of Potomac Greens.

Build Alternative D would locate the station 500 feet walking distance from the dense redevelopment and planned office uses in North Potomac Yard. However, the realigned Metrorail track and portions of the station would occupy parts of the area planned for parkland and dense office and mixed-use development, reducing the amount of parkland and overall development potential of North Potomac Yard.

Construction staging areas for Build Alternative D would occupy 18.0 acres, of which 2.40 acres would be within GWMP property and 0.02 acre would be within the Greens Scenic Area easement.

6 Site Description

6.1 Floodplain

Location

The project area lies at a low elevation and the floodplain terrace of the Potomac River. The project area is relatively flat, bounded by slopes up that lead up to the existing Metrorail tracks. The regulated 100-year floodplain extends from the project area east to the Potomac River and encompasses the GWMP parkland and portions of the Greens Scenic Area easement.

Flooding on the Potomac River is caused both by flooding in the Potomac River Basin (from the west) and coastal storm surges on the Atlantic Ocean (from the east). Major floods on the Potomac River (and

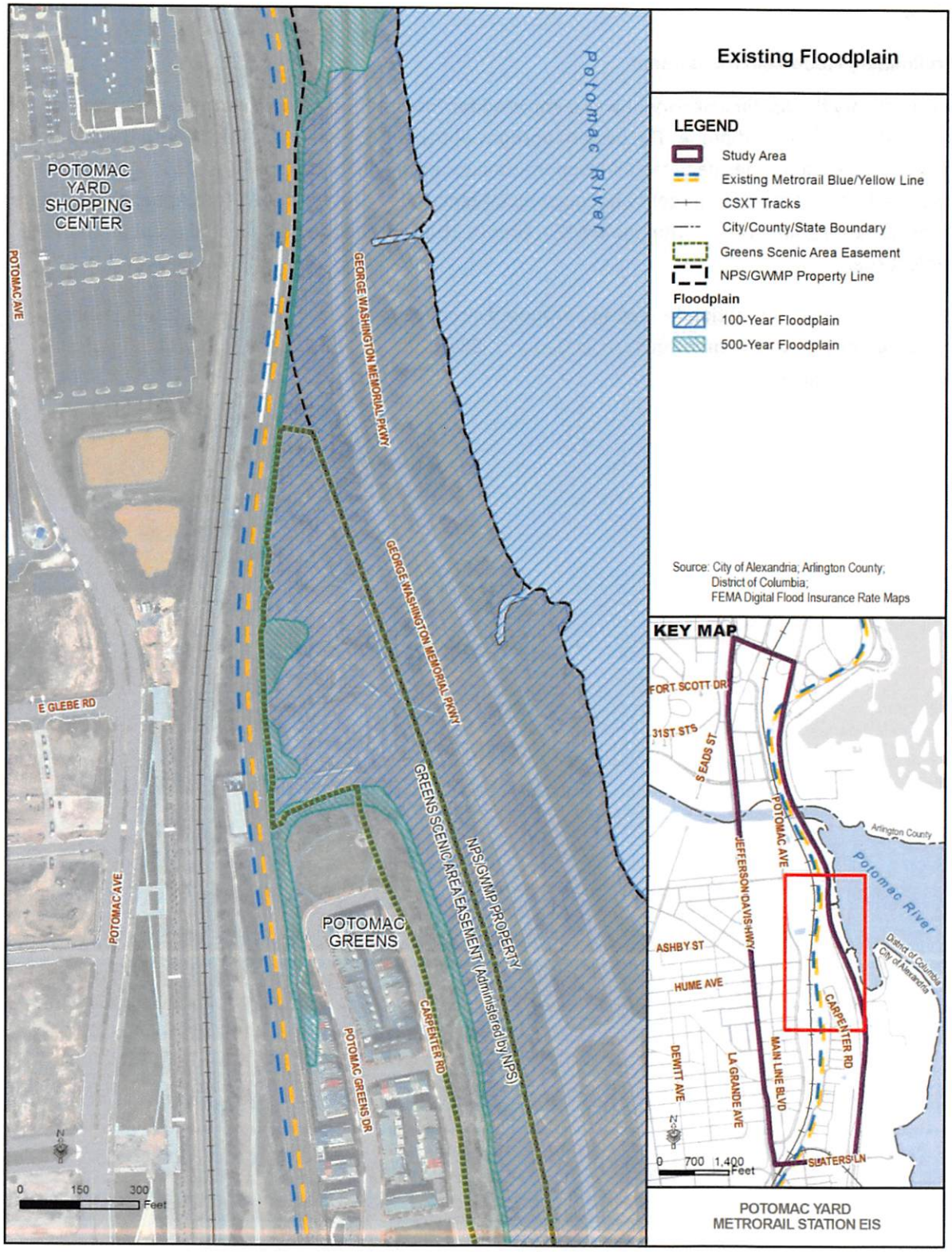
within the City of Alexandria) in recent history were recorded in 1936, 1942, 1972, 1985, 1996, and 2003.

Preliminary Floodplain Assessment

A preliminary floodplain assessment was completed for the Draft EIS, which determined that portions of the study area are flood prone. The eastern portions of the study area are located in both the 100-year and 500-year flood zones depicted on Flood Insurance Rate Map (FIRM (Panel ID# 5155190033E) approved by the Federal Emergency Management Agency (FEMA) in June 2011 (see Appendix B). **Figure 4** shows existing floodplain within the GWMP, Greens Scenic Area easement, and adjacent areas of the project site.

Referenced elevations of flood zones and proposed structures are in relation to current sea level as measured by the North American Vertical Datum 1988 (NAVD88), which is the standard reference elevation for sea level.

Figure 4: Existing Floodplain



Delineation of the Regulatory Floodplain

The delineation of the regulatory floodplain in the tidal portions of the Potomac River (including the study area) was completed in 2008 by the U.S. Army Corps of Engineers, Engineer Research and Development Center (ERDC), Coastal and Hydraulics Laboratory (CHL) using the ADvanced CIRCulation (ADCIRC) numerical model. ADCIRC was developed by ERDC to analyze coastal storm surges. ADCIRC simulates a storm surge by replicating historical storm events (e.g., Hurricane Isabel), and peak storm surge elevations measured at USGS monitoring sites located along the Lower Potomac River. This floodplain delineation was incorporated into the FIRM in June 2011.

100-Year Floodplain

The 100-year floodplain extends from the Potomac River to the eastern edge of the Potomac Greens neighborhood and to the eastern side of the Metrorail tracks north of the Potomac Greens neighborhood. 39.88 acres of the project area are located within the 100-year floodplain. The delineation by USACE determined that the Base Flood Elevation is 10 feet (NAVD88) within the project area.

500-Year Floodplain

The 500-year floodplain covers an additional 6.29 acres of the study area (excluding the area also within the 100-year floodplain), mostly along the edges of the Potomac Greens neighborhood and along the existing Metrorail tracks near the northern edge of the Potomac Greens neighborhood. The elevation of the 500-year floodplain is estimated to be 12 feet (NAVD88) based on two-foot resolution topographic data provided by the City of Alexandria.

Flood Conditions and Hazards

Following Hurricane Isabel in 2003, and due to recurrent flooding in Old Town Alexandria, the City of Alexandria prepared an analysis of flood conditions and hazards along its shore with the Potomac River. The report, *Potomac River Waterfront Flood Mitigation Study, Evaluation and Recommendation of Mitigation Measures* (July 2010), summarized flooding problems in Alexandria, identified their causes, and identified potential flood mitigation solutions. The report characterizes four discrete types of flood events which occur in the City:

- Nuisance Flood;
- "Six Foot" Flood;
- Intermediate Flood; and
- Extreme Flood (referred to as the "100-year flood").

Each type of flood event has a recurrence interval, which is the estimated period of time between occurrences of equally sized flood events. For example, the extreme flood has a recurrence interval of 100 years. The recurrence interval for the flood events recorded in the City of Alexandria is listed in **Table 1**. Note that the flood stage for the Potomac River in Alexandria is 3.1 feet (NAVD88). The National Weather Service defines the "flood stage" for a river as "an established gauge height for a given location above which a rise in water surface level begins to create a hazard to lives, property, or

commerce." The nearest gauge where water levels are recorded is located on the Potomac River at the end of Cameron Street in Old Town Alexandria.

Table 1: Return Period for Alexandria Flood Events

Flood Event	Elevation (Feet)[1]	Recurrence Interval (Years)
Nuisance	4.0	1.5
Six-Foot Flood	6.0	10
Intermediate	8.0	30
Extreme	10.2	100

[1]Referenced elevations use the North American Vertical Datum of 1988 (NAVD88).

Source: City of Alexandria, Virginia, *Potomac River Waterfront Flood Mitigation Study, Evaluation and Recommendation of Mitigation Measures,* July 2010.

Soils and Geology

The study area is located within the Atlantic Coastal Plain physiographic province, which extends along the east coast of the United Sates from Florida to New England. Coastal Plain sediments consist of clays, silts, sands, and gravels deposited in river and marine environments that were probably derived from erosion in the Piedmont physiographic province.

The local topography of the study area slopes down from the railroad tracks to the east and then rises again as it approaches the GWMP, forming a depression of wetlands with a mosaic of more upland-like areas. Drainage within this low area is discharged to the Potomac River and Dangerfield Island area through a series of culverts beneath the GWMP. The natural topography in the area has been modified by humans, likely several times over since the time of the first European settlement in the 18th Century through the development of the GWMP in the 1930s.

Floodplain soils are defined as those soils with the characteristic of flooding, or the temporary inundation of an area caused by overflowing streams, by runoff from adjacent slopes, or by tides. During flood events erosion occurs when soil is carried away with the flood water. Gullies and gaps in the field will form as a result of the loss of soil and often the gullies are filled with sediment and then topsoil from another area upstream.

The "K factor" is a soil erodibility value used by the Natural Resources Conservation Service (NRCS) to represent a soil's susceptibility to erosion and the rate of runoff. Soils high in clay have low K values, about 0.05 to 0.15, because they are resistant to detachment. Coarse textured soils, such as sandy soils, have low K values, about 0.05 to 0.25, because of low runoff even though these soils are easily detached. Medium textured soils, such as the silt loam soils, have moderate K values, about 0.25 to 0.40, because they are moderately susceptible to detachment and they produce moderate runoff. Soils having high silt content are the most erodible type of soil. Silty soils are easily detached and tend to produce high rates of erosional runoff. Values of K for these soils tend to be greater than 0.40.

The extent of soil erosion and the potential for soil migration are dependent upon the K factor of the soils, the duration and type of flood event, and the extent of vegetation root stabilization. The supply of

soil particles material available for transport during flood events depends on topography, soils, vegetation, and land use.

Vegetation is the top factor stabilizing soil particles and keeping soils in place. Within the Limits of Disturbance (LOD, the areas of temporary ground disturbance during construction) and Limits of Construction (LOC, the areas of permanent project facilities and cut/fill) for the Preferred Alternative, the significant amount of vegetation, is likely to prevent large amounts of soil to become suspended in floodwaters and wash away. Proposed clearing of vegetation for construction and staging activities would have a negative effect on soil stability. Small parts of the eroded soil (silt and clay) can be transported long distances, while large parts, such as sand, gravel and rocks, are typically distributed short distances during flood events.

Study area soils are a mixture of fill and natural soil materials. Due to the proximity to the Potomac River, the soils native to this area were likely formed through alluvial deposits, manmade dredge spoils, or deposits of unknown types of materials. NRCS identifies Grist Mill Sandy Loam, Urban Land, and Udorthents-urban land soil types within the study area. Grist Mill Sandy Loam predominates the LOD and LOC for the Preferred Alternative.

Grist Mill Sandy Loam

Grist Mill Sandy Loam soil consists of sandy, silty, and clayey sediments of the Coastal Plain that have been mixed, graded, and compacted during development and construction. These soils have a K factor of 0.24, which is in the range between low and medium susceptibility of soil detachment.

Urban Land

Urban land is classified by NRCS as developed areas consisting mostly of sites for buildings, paved roads, and parking lots. These soils require onsite investigation and evaluation for most land use decisions, as their chemical and physical properties are unknown. Due to the unknown physical properties of these soils, their susceptibility to erosion is unknown.

Udorthents -urban land

This complex consists of moderately well-drained to excessively-drained soils that have been disturbed by cuffing or filling, and areas that are covered by buildings and pavement. These soils require onsite investigation and evaluation for most land use decisions, as their chemical and physical properties are unknown. Due to the unknown physical properties of these soils, their susceptibility to erosion is unknown.

Floodplain Impact

Project impact to floodplains was analyzed using a Digital Flood Insurance Rate Map (DFIRM) approved by FEMA on June 16, 2011, and provided by the City of Alexandria (local administrator of the National Flood Insurance Program). The DFIRM depicts 100-year and 500-year flood zones within the project area and is based on FIRM Panel ID# 5155190033E. The impact analysis was completed in GIS by overlaying the DFIRM with the proposed LOC and permanent LOD for the Preferred Alternative.

Figure 5 illustrates the regulatory (100-year) floodplain, 500-year floodplain, and impact areas for the Preferred Alternative.

Permanent and temporary construction impacts due for the Preferred Alternative are summarized in **Table 2.**

Table 2: Floodplain Impact Summary for the Preferred Alternative (Acres)

Design Option	Area	100-Year Floodplain		500-Year Floodplain*	
		Permanent	Temporary	Permanent	Temporary
Design Option 1 – Full Retaining and Station Walls	NPS Land/Greens Scenic Area	1.31	3.37	0.49	0.13
	Non-Federal Parkland	0.17	0.07	0.46	0.33
	TOTAL	**1.48**	**3.44**	**0.95**	**0.46**
Design Option 2 – Full or Partial Berm	NPS Land/Greens Scenic Area	1.67	3.01	0.52	0.10
	Non-Federal Parkland	0.22	0.02	0.46	0.33
	TOTAL	**1.89**	**3.03**	**0.98**	**0.43**

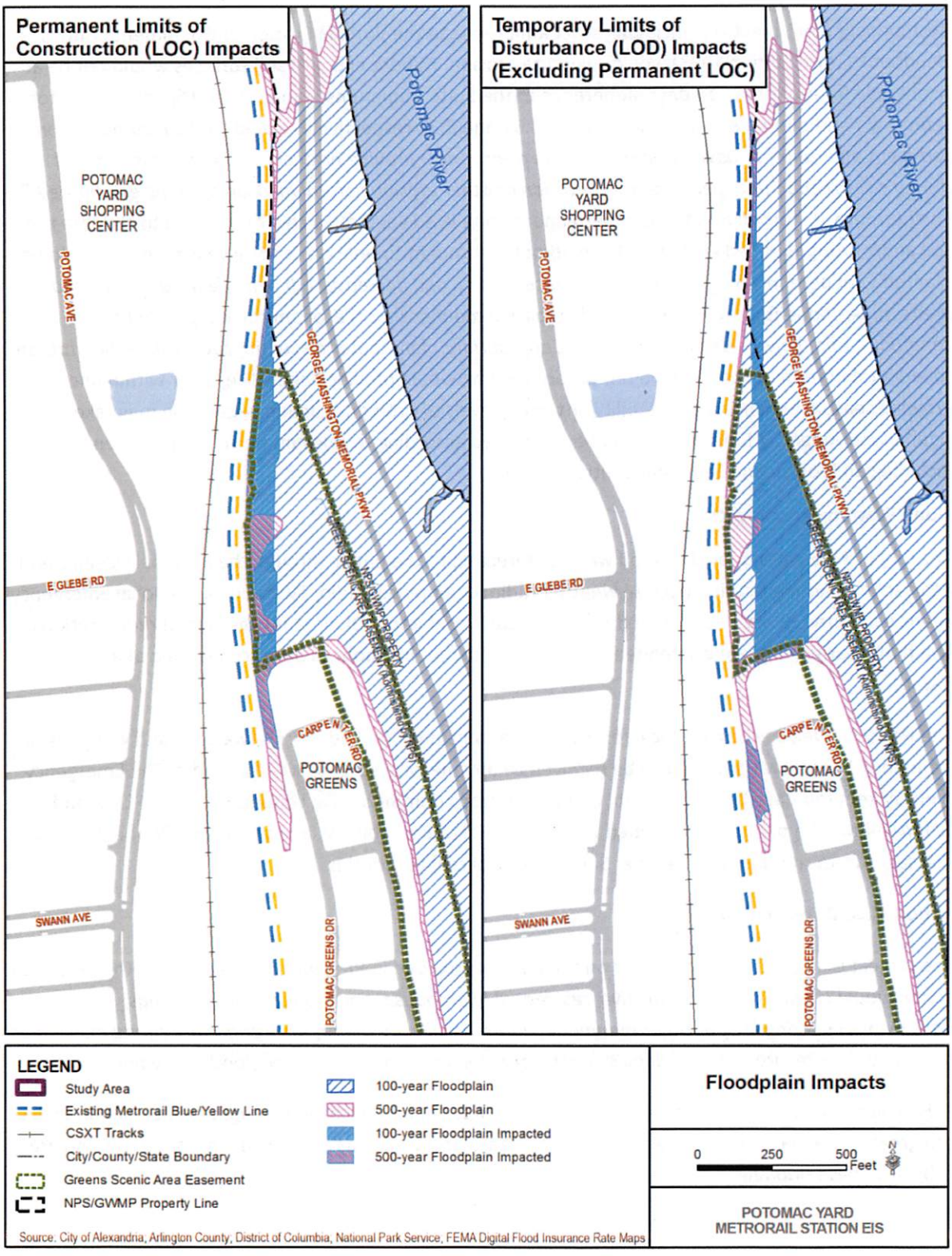
* 500-year floodplain area excludes area also within the 100-year floodplain.

Under Design Option 2, the 100-year floodplain could be impacted up to approximately 30 percent more than under Design Option 1. These impacts would be due to the wider footprint of the earthen berm (up to 17 feet additional width) along the eastern side of the station and realigned track as described in Section 3.

Although the Metrorail station and associated track structures would be built above the Base Flood Elevation of 10 feet (NAVD88), the foundation for the station would be constructed within the regulated floodplain. The lowest finished floor elevation of the Metrorail Station structure would be 24.8 feet (NAVD88, same level as the existing Metrorail tracks). Utility compartments for the escalator pits would extend down to approximately 18 feet elevation (NAVD88), which would only be accessed periodically by WMATA employees for maintenance activities and would not be accessible to the general public. These elevations are also above the 500-year flood elevation of 12 feet (NAVD88).

Construction of the Metrorail station would slightly reduce floodplain function by decreasing the flood storage capacity of the floodplain and reducing the ability of the floodplain to recharge and infiltrate stormwater. This decrease is not expected to change the Base Flood Elevation (BFE) within the study area, however, due to the large width of the Potomac River and its associated floodplains in the vicinity of the project area.

Figure 5: Floodplain Impacts



Stabilization of Impacted Floodplain Soils

Best management practices, including strict adherence to the Virginia Erosion and Sediment Control Handbook (Third Edition 1993) would minimize erosion. Where exposed soil surfaces would not be at final grade for more than 14 days, adherence to the State Minimums Standards and Specifications for temporary and permanent seeding (Sections 3.31 and 3.32 respectively) would *"reduce damage from sediment and runoff to downstream or off site area...and... provide protection to bare soils exposed during construction until permanent vegetation or other erosion control measures can be established."* Furthermore, disturbed areas where permanent, long-lived vegetative cover is needed to stabilize the soil and/or rough-graded areas which would not be brought to final grade for a year or more would be planted with perennial vegetation *"...To reduce erosion and decrease sediment yield from disturbed areas; to permanently stabilize disturbed areas in a manner that is economical, adaptable to site conditions, and allows selection of the most appropriate plant materials; to improve wildlife habitat; and to enhance natural beauty."* While temporary seeding would provide vegetative cover within one growing season, enhancing soil stability, attaining levels of pre-construction vegetation may take significantly longer. Monitoring would be performed according to relevant permit requirements, including an Erosion and Sediment control permit.

Flood Warning Procedures

The City of Alexandria provides flood warning forecasts to the public through the National Oceanic and Atmospheric Administration (NOAA) weather radio, commercial radio, TV stations, and local emergency agencies. Warnings are disseminated through local Washington, DC area television and radio stations. The flood warning system is intended to provide up to one half hour of advance warning of a flood hazard.

The National Weather Service local forecast office transmits flood advisories, watches and warnings on frequency 162.550 MHz which can be received by anyone with a NOAA weather radio. The Emergency Alert System (operated by the Federal Communications Commission in cooperation with FEMA and NOAA) allows the public to be notified via commercial radio, cable TV, and broadcast TV of emergency messages from the National Weather Service or local civil authorities.

Action Class Determination

The project is a "Class I Action" based on the criteria provided in Procedural Manual 77-2. The proposed action would construct *"administrative, residential, warehouse, and maintenance buildings; nonexcepted parking lots; or other manmade features which by their nature entice or require individuals to occupy the site, are prone to flood damage, or result in impacts to natural floodplain values."*

This project was determined to be neither a Class II Action, for which even a slight chance of flooding is too great, nor a Class III Action, actions in high hazard areas, such as coastal high hazard areas and areas subject to flash flooding.

6.2 Wetlands

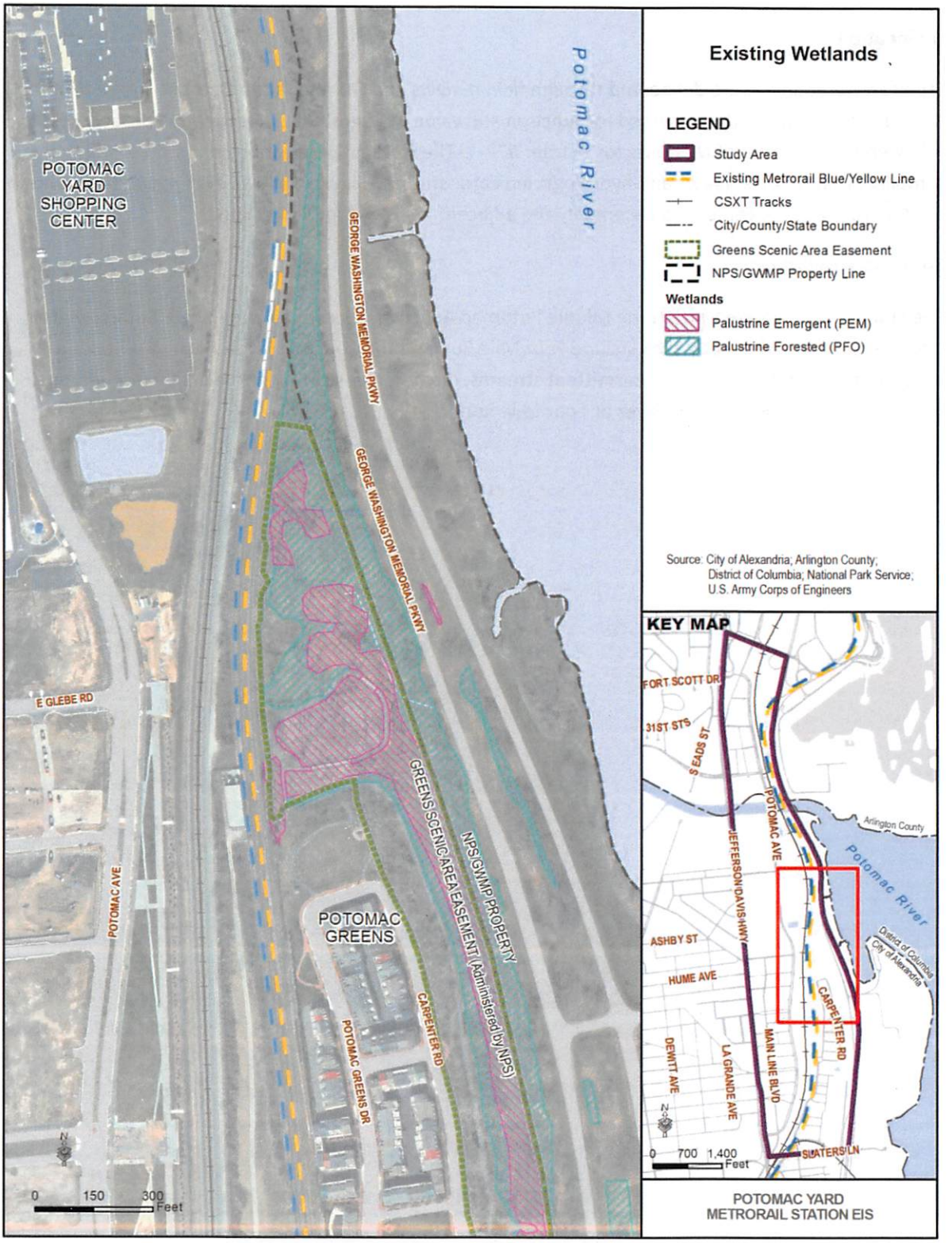
Delineation

Study area wetlands were delineated through field reviews and GIS analysis in October and December 2011 and then additionally assessed for function and value in August 2015. Delineation procedures followed the protocols of NPS Director's Order #77-1. The wetland delineation consisted of soil sampling, vegetation surveys, and hydrologic indicator studies. **Figure 6** shows existing wetlands within the GWMP, Greens Scenic Area easement, and adjacent areas of the project site.

Study Area Hydrology

The study area is situated within the Middle Potomac-Anacostia-Occoquan watershed. Surface water bodies adjacent to the study area include Four Mile Run and the Potomac River. Four Mile Run is a tributary to the Potomac River. Intermittent streams, ditches, and stormwater management features connect to either the Potomac River or Four Mile Run.

Figure 6: Existing Wetlands



Description

Field delineation of the study area determined that two Cowardin wetland classes were present at the site (Classification of Wetlands and Deepwater Habitats of the United States, L. M., V. Carter, F. C. Golet, E. T. LaRoe. Cowardin, 1979):

- Palustrine Emergent Wetlands (PEM), which the Cowardin system classifies as freshwater herbaceous marsh, fen, swale and wet meadow; and
- Palustrine Forested/Shrub Wetlands (PFO), which the Cowardin system classifies as freshwater forested swamp or wetland shrub bog or wetland.

The Palustrine System was developed to group the vegetated wetlands traditionally called by such names as marsh, swamp, bog, fen, and prairie, which are found throughout the United States. It also includes the small, shallow, permanent or intermittent water bodies often called ponds. Palustrine wetlands may be situated shoreward of lakes, river channels, or estuaries; on river floodplains; in isolated catchments; or on slopes. Palustrine wetlands may also occur as islands in lakes or rivers. The erosive forces of wind and water are of minor importance except during severe floods.

The Emergent Wetland Class is characterized by erect, rooted, herbaceous hydrophytes, excluding mosses and lichens. This vegetation is present for most of the growing season in most years. These wetlands are usually dominated by perennial plants. All water regimes are included except subtidal and irregularly exposed.

The Class Forested Wetland is characterized by woody vegetation that is 6 m tall or taller. All water regimes are included except subtidal.

The Class Scrub-Shrub Wetland includes areas dominated by woody vegetation less than 6 m (20 feet) tall. The species include true shrubs, young trees, and trees or shrubs that are small or stunted because of environmental conditions. All water regimes except subtidal are included.

Species common to the PEM wetland areas or freshwater herbaceous marsh, fen, swale and wet meadow areas are Asiatic tearthumb (*Persicaria perfoliata*), eastern broadleaf cattail (*Typha latifolia*), swamp rose mallow (*Hibiscus moscheutos*), boneset (*Eupatorium perfoliatum),* and the common reed (*Phragmites australis*).

Species common to the PFO wetland areas, freshwater forested swamp, or wetland shrub bog or wetland areas are dominated by broadleaf deciduous trees, including Red Maple (*Acer rubrum*), eastern cottonwood (*Populus deltoids*), and sweetgum (*Liquidambar styraciflua*). Also present are the evergreen trees species American holly (*Ilex opaca*) and eastern redcedar (*Juniperus virginiana*).

Understory species that are common across the study area include American holly, greenbriar (*Smilax rotundifolia*), porcelainberry (*Ampelopsis brevipedunculata*), and Japanese Stiltgrass (*Microstegium vimineum*).

A significant issue across the project area is the presence of invasive species (some of which are listed above) that have displaced native plant species and reduced overall plant diversity.

Wetland Function and Values

A function and values assessment used the methodologies described in the *Highway Methodology Workbook (1993)* and *Wetland Function and Values Supplement* (2015) developed by the USACE-New England District. The wetland classification boundaries were also updated to match field conditions using the USFWS *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin *et al.* 1979). The assessment found that the function and values of study area wetlands include:

- Flood protection;
- Sediment and toxicant retention;
- Nutrient removal;
- Wildlife habitat;
- Recreational value;
- Scientific and educational value; and
- Uniqueness/heritage.

Flood protection

The wetlands appear to provide flood protection from surface water detention, and the wetlands abate a small degree of storm surge. The watershed contains a high percentage of impervious surfaces and the effective flood storage is small or non-existent upslope of or above the wetland. The developed nature of the surrounding landscape provides few opportunities for natural flood protection.

Sediment and toxicant retention

The wetlands may also provide sediment/toxicant retention as the wetland outflow is into the Potomac River, which is used for drinking water. Phase I and Phase II Environmental Site Assessments have been conducted for the project. Subsurface soil and fill material consisting primarily of fly ash and some ballast with elevated metals content (arsenic), and residual petroleum-impacted soils near the former freight rail yard's oil/water separator ponds, have been identified within the project site. No soils exhibiting hazardous waste characteristics were identified. Shallow groundwater in the vicinity of the project site is likely contaminated with residual levels of petroleum hydrocarbons and metals.

Wildlife habitat

While the wetlands contain numerous invasive species, decreasing habitat stratification and food source variety, the relative value of the wetland as a habitat island surrounded by development is beneficial. Deer tracks, beaver marks, frogs, birds, and insects were observed on-site.

Recreation

A multi-use trail is located within the wetland complex. Visitors were observed using these trails for walking. A positive indicator of this value is that the wetland is within a short drive or safe walk from highly populated public and private areas. This wetland provides value through highly accessible recreational opportunities.

Educational/Scientific Value

This feature has a paved trail for handicap access and informative plaques placed along the trail.

Uniqueness/Heritage

The wetland complex is surrounded by developed residential transportation, and commercial uses which are further increasing in density. These factors mean that the opportunity for visitors to experience a typical wetland class is limited for this geographic location, and the wetland complex provides value through the special experience not afforded elsewhere.

Impact

The impact analysis was completed using GIS mapping by overlaying the delineated wetland areas with the proposed temporary limits of construction (LOC) and permanent limits of disturbance (LOD) for the Preferred Alternative including the two design options described in Section 3. Wetland impacts within NPS park land, Greens Scenic Area easement, and non-federal park land are summarized in **Table 3** and shown in **Figure 7**. Appendix C, Large Wetland Impact Figure, also shows the construction access and (temporary) impact area within the wetland area, and the preferred alternative permanent impact limits within the wetland area. Appendix D includes a summary of total permanent and temporary wetland impacts for each of the alternatives previously considered described in Section 5 and the Preferred Alternative.

Table 3: Wetland Impact Summary for the Preferred Alternative (Acres)

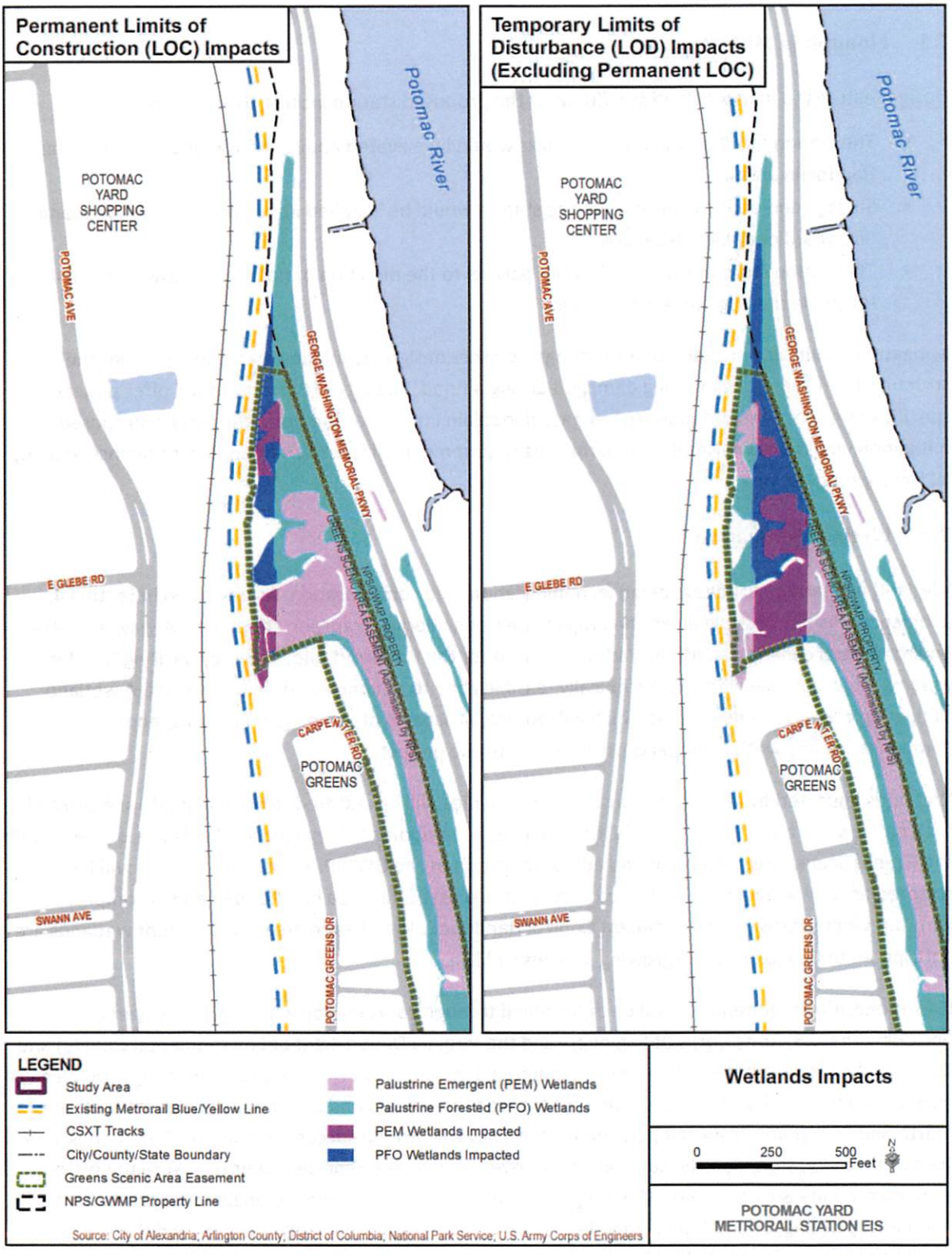
Design Option	Area	Palustrine Emergent (PEM)		Palustrine Forested/Shrub (PFO)	
		Permanent	Temporary	Permanent	Temporary
Design Option 1 – Full Retaining and Station Walls	NPS Land/Greens Scenic Area Easement	0.50	1.66	0.62	1.59
	Non-Federal Parkland	0.07	0.00	0.08	0.10
	TOTAL	**0.57**	**1.66**	**0.70**	**1.69**
Design Option 2 – Full or Partial Berm	NPS Land/Greens Scenic Area Easement	0.57	1.59	0.88	1.33
	Non-Federal Parkland	0.07	0.00	0.13	0.05
	TOTAL	**0.64**	**1.59**	**1.01**	**1.38**

Under Design Option 2, the total permanent impact to wetlands could be up to 30 percent more than Design Option 1, with higher impacts to Palustrine Emergent wetlands and Palustrine Forested wetlands. These impacts would be due to the wider footprint of the earthen berm (up to 17 feet additional width) along the eastern side of the station and realigned track as described in Section 3.

Project construction activities have the potential to encounter contaminated materials described above in "Wetland Function and Values, Sediment and toxicant retention". Soil disturbance could be lessened by use of driven piles, shafts, or sheeting, rather than drilled shafts to accommodate any excavations. In

areas of the site where pile foundations may need to be installed by alternative methods due to geotechnical and/or vibration concerns, impacts from the generation of potentially contaminated fill, soil, and groundwater would be mitigated in accordance with a Site Management Work Plan developed for the project construction process. Management of contaminated soils and groundwater on the site and disposal off-site would be conducted in accordance with applicable Virginia solid waste management regulations. Measures during construction, including construction worker health and safety practices, management of excavated contaminated soil, and construction dewatering management and permitting, would be implemented to prevent exposure and release of potential contaminants.

Figure 7: Wetlands Impacts



7 Mitigative Action

7.1 Floodplain Mitigation

Design features to manage flood conditions at the proposed station include the following:

- The station facilities and railroad tracks would be elevated above the 100-year and 500-year floodplain areas.
- Storage and utilities which serve the station would be installed above both the 100-year and 500-year floodplain elevations.
- The station structure will be oriented parallel to the direction of floodwater flow, generally following the edge of the floodplain.

Mitigation would also include flood-proofing and other design techniques that would prevent the structure from collapsing or being damaged during a flood. The City of Alexandria will offer project specific design recommendations to mitigate floodplain impacts at the permitting stage. Proposed mitigation would be consistent with permitting requirements of the City's floodplain ordinance and any NPS recommendations.

7.2 Wetland Mitigation

Wetland mitigation includes avoidance, minimization, and compensation. As described in Section 4, avoidance was not possible given the project site's engineering, transportation right-of-way, and other environmental constraints. Minimization was used for the Preferred Alternative by locating the station as far west as possible within its technically feasible zone to minimize and reduce impact. A wetland mitigation plan will be developed which will outline all aspects of avoiding, minimizing, and compensating any wetland impacts associated with the project.

Wetlands impacted by temporary construction activities will be restored to original grade and planted with native vegetation. A total of 2.92 to 3.25 acres of temporarily impacted wetlands are located within the Greens Scenic Area easement and adjacent portion of the GWMP. Temporary impacts will be restored as soon as practicable after construction in a particular area has stopped and in compliance with the Virginia Erosion and Sediment Control Handbook. The planted areas of emergent wetlands are anticipated to take one to two growing seasons to fill in.

Final monitoring requirements will be determined through coordination with regulatory agencies (including the U.S. Army Corps of Engineers and the Virginia Department of Environmental Quality) and details will be included in a mitigation plan approved by NPS. Details of the proposed mitigation plan will include two monitoring events each year for the first three years and one monitoring event for the fourth and fifth years. Proposed performance metrics will include success criteria which may consist of species diversity, stem density, survival, aerial cover, and invasive species cover to ensure the restored plant community is established. The mitigation plan will include adaptive management provisions for regrading, planting, or additional work depending on unanticipated changes in site conditions (e.g., supplementation of topsoil, deer fencing, browse control, and goose control). Performance metrics for

wetland restoration would be evaluated at the end of each growing season during the monitoring period, and adjustments would be made to mitigation areas using adaptive management techniques as necessary. If a monitoring event determines that major earth work or structures may be needed to meet restoration performance metrics, then the regulatory agencies would need to review and approve proposed adaptive management strategies in coordination with NPS.

Wetland impacts will be compensated through off-site wetland restoration at the Dyke Marsh Wildlife Preserve (Dyke Marsh) restoration project, which is summarized on the following pages. The 4.37 acres of total temporary and permanent impact will be compensated at an approximate 1:1 ratio at Dyke Marsh. **Figure 8** shows the location of Dyke Marsh in relation to the project site, and **Figure 9** depicts the proposed Dyke Marsh compensation site from the NPS restoration and management plan. As described in the *Dyke Marsh Wetland Restoration and Long-term Management Plan / Final Environmental Impact Statement* (NPS, 2014), the Dyke Marsh project's proposed restoration and creation is for tidal marsh restoration and creation and for bottomland hardwood forest restoration to a lesser extent. According to the Dyke Marsh EIS, the wetland restoration and creation will change the sediment transport, enhance wildlife habitat, and reduce threats via erosion to threatened and endangered species.

The project sponsor for the Potomac Yard Metrorail Station, the City of Alexandria, would provide funds for the compensation for Dyke Marsh up to $1 million per impacted acre (up to $4.37 million). Exact costs estimates on this restoration are not available at this time, and may be adjusted at the time the NPS issues the City of Alexandria its Special Use Permit. These funds would be held in the NPS Impact Fund Account, which was established by the July 10, 2015, Memorandum of Agreement between the National Park Service and The Conservation Fund. The funds will be paid into this account and administered pursuant to the terms of that Memorandum of Agreement. These funds will go solely towards the restoration work at Dyke Marsh through the construction of containment cells that will be filled with appropriate hydraulic slurry approved by the USACE for level of contaminants, particle or grain size, and consolidation rates. The size and configuration of the containment cells may be adjusted to address design and construction constraints. After the cells are completed, they would either be planted using appropriate native species for allow for natural recruitment of vegetation to occur. **Table 4** summarizes the NPS wetland mitigation.

Table 4: Wetland Mitigation Summary for the Preferred Alternative (Acres)

Design Option	Impact Area	Off-site Dyke Marsh Compensatory Mitigation		On-Site Wetland Restoration	
		For Permanent Impacts	For Temporary Impacts	For Permanent Impacts	For Temporary Impacts
Design Option 1 –Full Retaining and Station Walls	NPS Land/ Greens Scenic Area Easement	1.12	3.25	0	3.25
Total Design Option 1			**4.37**		**3.25**
Design Option 2 –Full or Partial Berm	NPS Land/ Greens	1.45	2.92	0	2.92

	Scenic Area Easement				
Total Design Option 2		**4.37**		**2.92**	

In addition to NPS wetland mitigation requirements, permitting will be conducted through the United States Army Corps of Engineers (USACE) Norfolk District to determine its mitigation requirements for wetlands regulated by USACE through the Joint Permit Application process in compliance with Section 404 of the Clean Water Act.

Dyke Marsh Restoration Project Summary

Dyke Marsh is a large wetland area on the Potomac River in Fairfax County south of Alexandria, Virginia, that is part of the GWMP. The marsh is one of the few remaining tidal freshwater marshes on the Potomac River. Such marshes provide habitat for many species of plants and animals, including rare species and species of state concern. Before the marsh came under the ownership of NPS, and continuing during NPS administration, the wetland was dredged extensively for the gravel deposits that underlay the marsh, and the result has been loss of acreage and acceleration of erosion in the marsh.

As described in the *Dyke Marsh Wetland Restoration and Long-term Management Plan / Final Environmental Impact Statement* (NPS, 2014), goals for the wetland restoration project are:

- Restore, protect, and maintain tidal freshwater wetlands and associated ecosystems to provide habitat for fish, wildlife, and other biota;
- Ensure that management actions promote native species while minimizing the intrusion of nonnative invasive plants;
- Reduce erosion of the existing marsh and provide for erosion control measures in areas of restored marsh;
- To the extent practicable, restore and maintain hydrologic processes needed to sustain Dyke Marsh;
- Protect populations of species of concern, such as swamp sparrow (*Melospiza georgiana*) and river bulrush (*Bolboschoenus fluviatilis*); and
- Increase the resilience of Dyke Marsh and provide a natural buffer to storms and flood control in populated residential areas.

Congress has enacted several pieces of legislation that designate the marsh as a valuable resource to the region that should be preserved and restored. This legislation includes Public Law (P.L.) 93-251 in 1974, and most recently in the Water Resources Development Act of 2007. The purpose of these laws is to restore Dyke Marsh wetland resources, plant and animal communities, and natural ecosystem functions that have been damaged by previous human uses and continued erosion and are subject to continuing threats. These threats include alterations to the hydrology in the Potomac River and in nearby tributaries, and other effects from urbanization in the Washington, DC region.

Figure 8: Project Study Area and Dyke Marsh Locations

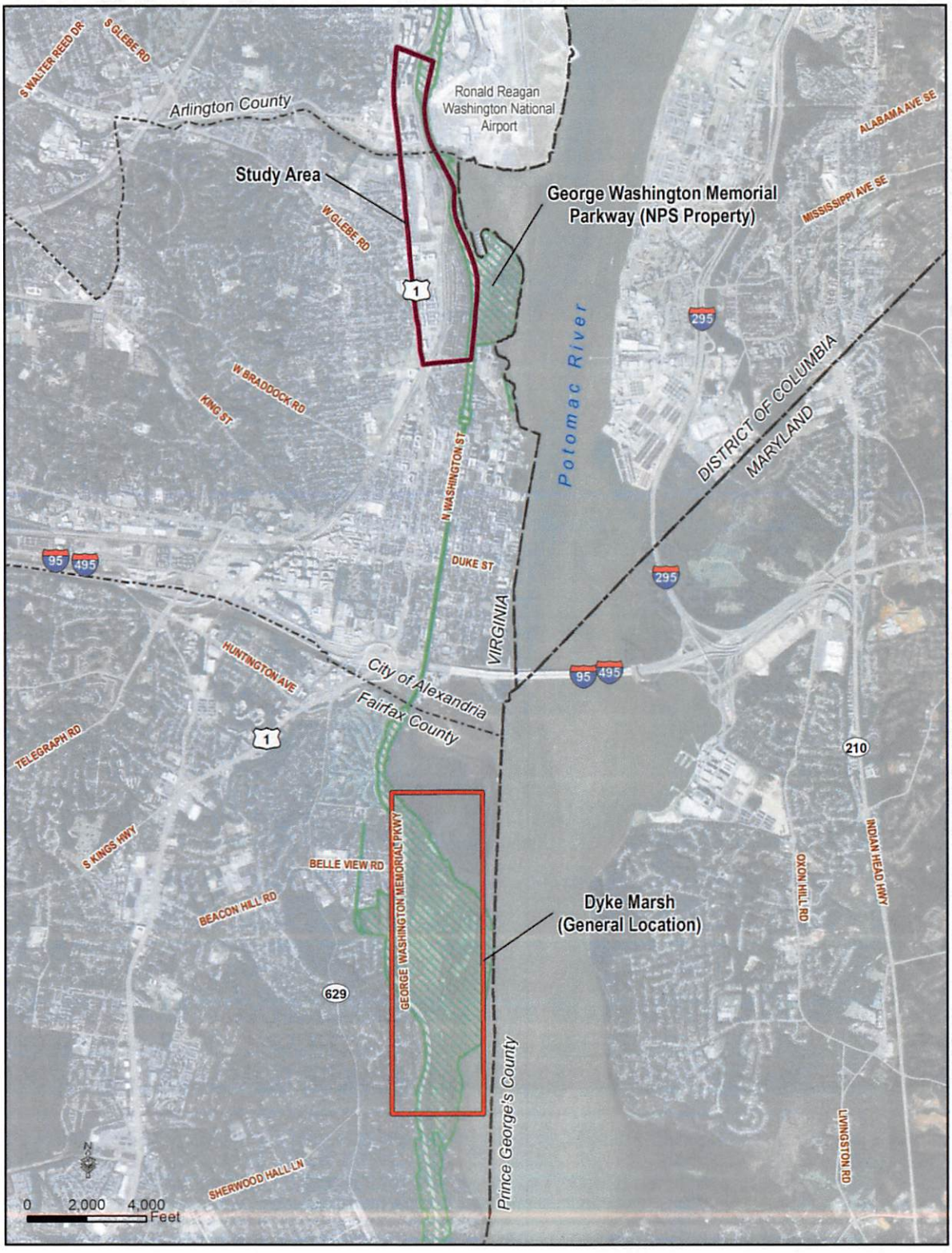


Figure 9: Dyke Marsh Wetland Mitigation Site

8 Compliance

In addition to Executive Orders 11988 and 11990, applicable laws and regulations pertaining to wetland and floodplain impacts are as follows:

- Coastal Zone Management Act of 1972
- Clean Water Act Section 401 and 404
- Executive Order 13690 Establishing a Federal Flood Risk Management Standard and a Process for Further Soliciting and Considering Stakeholder Input
- National Environmental Policy Act of 1969
- National Flood Insurance Program (administered by the City of Alexandria)
- Subaqueous Lands Act (Section 62.1-3 Code of Virginia)
- City of Alexandria Floodplain Ordinance (Sec. 6-300 et. al.)

Coastal Zone Management Act of 1972
The Virginia Department of Environmental Quality (VDEQ) administers the Coastal Zone Management Program (CZMP) in the Commonwealth of Virginia. The project has demonstrated consistency with the Coastal Zone Management Act (CZMA). The Project Management Team submitted a Federal Coastal Zone Consistency Determination for the project to VDEQ in December 2012. VDEQ determined that the project was consistent with Virginia's CZMP in January 2013.

Clean Water Act Sections 401 and 404
A Joint Permit Application (JPA) will be developed for both permanent and temporary project-related wetland impacts in compliance with Section 401 and 404 of the Clean Water Act. The City of Alexandria will initiate the permitting with USACE and VDEQ, which administers the permitting program in the Commonwealth of Virginia. If wetlands are deemed tidal wetlands, the permitting process would also be initiated with the Virginia Marine Resources Commission (VMRC).

All NPS actions with the potential to have adverse impacts on wetlands must also comply with Director's Order 77-1. In the case where both NPS and USACE procedures apply, coordination with the appropriate USACE office will be initiated early in the process to reduce potential duplication of effort, and the JPA would be initiated at the design phase of the project. The USACE will review the permit application for the preferred alternative.

During the JPA process, USACE may conduct an Alternatives Analysis to determine the Least Environmentally Damaging Practicable Alternative (LEDPA) prior to completion of the Final EIS.

VDEQ is responsible for review of projects that result in a significant discharge into state waters, which include wetlands. Before USACE can grant a 404 permit, VDEQ must certify that the activity does not violate state water quality standards (the 401 certification).

Executive Order 13690 Establishing a Federal Flood Risk Management Standard and a Process for Further Soliciting and Considering Stakeholder Input

EO 13690, issued on January 30, 2015, modifies the existing Executive Order for floodplain management (EO 11988). EO 13690 expands the definition of the regulated floodplain boundary to include areas 2 to 3 feet above the BFE. A new definition for the floodplain elevation and flood hazard area is recommended in the EO using one of the following approaches:

- Elevation and flood hazard area that result from using the freeboard value, reached by adding an additional 2 feet to the base flood elevation for non-critical actions and by adding an additional 3 feet to the base flood elevation for critical actions;
- Area subject to flooding by the 0.2 percent annual chance flood; or
- Elevation and flood hazard area that result from using any other method identified in an update to the Federal Flood Risk Management Standard.

National Environmental Policy Act

The Environmental Impact Statement, this Statement of Findings for Executive Orders 11990 and 11988, and Record of Decision would complete the requirements for the National Environmental Policy Act for this project.

Subaqueous Lands Act (Section 62.1-3 Code of Virginia)

The Subaqueous Lands Act is administered by the Virginia Marine Resources Commission and applies to activities that encroach upon or over the beds of the bays and ocean, rivers, streams, and creeks in the Commonwealth of Virginia.

City of Alexandria Floodplain Ordinance

Construction within the regulated floodplain is subject to City of Alexandria approvals as the local administrator of the National Flood Insurance Program. Approvals would be obtained in accordance with the City of Alexandria Floodplain Ordinance (Sec. 6-300, et. al.).

9 Conclusion

Construction of a new Metrorail station is the key to transforming the Potomac Yard area of Alexandria into a transit-oriented, walkable community with a mix of office and residential uses, high-quality retail, entertainment and parks. The location of the Preferred Alternative is adjacent to the George Washington Memorial Parkway and low-lying areas of the Potomac River. The foundation for the Metrorail Station would be constructed within the 100-year floodplain of the Potomac River as well as delineated wetlands; therefore, work in the regulated floodplain and delineated wetland area(s) is required. The Preferred Alternative is not anticipated to increase the Base Flood Elevation within the study area.

The Preferred Alternative is designed to minimize impacts to wetlands and other WOUS and to compensate for impacts to the delineated wetlands in accordance with the Clean Water Act, Virginia law and NPS policies. The Preferred Alternative includes the restoration of off-site wetlands in the Dyke

Marsh Wildlife Preserve (Dyke Marsh) for permanent impacts and on-site restoration for temporary construction impacts. Temporal mitigation for temporary wetland impacts includes restoration of additional off-site wetlands in Dyke Marsh.

The proposed mitigation measures would have long-term beneficial impacts to the Dyke Marsh wetlands via improvements to flood protection, sediment and toxicant retention, nutrient removal, wildlife habitat, recreational value, scientific and educational value, and uniqueness/heritage which are consistent with the existing functions. Temporary impacts to wetland due to construction would be mitigated through on-site restoration of the existing functions and values (flood protection, sediment and toxicant retention, nutrient removal, and wildlife habitat).

A total area of 4.37 acres of wetland impact will be compensated at a 1:1 ratio with 4.37 acres of restored emergent wetland in Dyke Marsh. A total area of 2.92 to 3.35 acres of temporary on-site wetland impact will be compensated at a 1:1 ratio with 2.92 to 3.35 acres of restored or reconstructed wetland to return to as close to pre-construction conditions as possible or better. Compensation for and restoration of wetland areas impacted by the project will be funded by the City of Alexandria (project sponsor).

NPS finds that this proposed action is consistent with the policies and procedures of NPS Director's Order #77-1 and #77-2: Wetland Protection, including the "no-net-loss of wetlands" policy.

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Appendix A: Project Purpose and Need Statement (Draft EIS)

Project Purpose

The purpose of the project is to improve local and regional transit accessibility to and from the Potomac Yard area adjacent to the U.S. Route 1 corridor for current and future residents, employees, and businesses.

Project Need

Currently, the project area is not served by direct access to regional transit services, such as Metrorail. The initial segment of the Crystal City/Potomac Yard (CCPY) Transitway (also known as Metroway) opened in August 2014. Metroway is a premium bus service that serves riders along the U.S. Route 1 corridor between the Braddock Road and Crystal City Metrorail Stations and operates in bus-only lanes for the most congested portions of the route. The second phase of the project, which will provide dedicated bus-only lanes along segments within Arlington County and extend the route to the Pentagon City Metrorail Station, is currently under construction. The existing transitway and its future extension will improve reliability and travel times of local bus transit services along the corridor. However, direct access to the regional Metrorail system is still needed to enhance accessibility and mobility to and from the area via longer transit trips, both for existing travel demand and to support the City of Alexandria's planned redevelopment of Potomac Yard, which will include a major transit-oriented, mixed-use activity center.

According to the Metropolitan Washington Council of Governments (MWCOG) Round 8.1 Cooperative Forecast, the population of Alexandria is expected to grow by 35 percent over the next 30 years, while the population of the Northern Virginia area as a whole is expected to grow by 41 percent. Within the same time period, employment in Alexandria is expected to grow by 46 percent, while Northern Virginia as a whole will experience a 53 percent increase in employment. This growth would result in increased vehicle miles traveled (VMT) and congestion; the transportation study conducted as part of the North Potomac Yard Small Area Plan (NPYSAP) indicates that traffic congestion will increase on U.S. Route 1 even without the proposed development in Potomac Yard. Increasing the share of transit trips would help to manage congestion, reduce auto trips and emissions along transit corridors, and make efficient use of existing infrastructure.

The study area includes and is located adjacent to existing residential neighborhoods and includes an approximately 600,000 square-foot retail center. In 2010, the Alexandria City Council approved the NPYSAP, which guides redevelopment of the existing retail center into a dense walkable urban environment with a mix of uses supported by new local and regional transit services. The NPYSAP plans for 7.525 million square feet of mixed-use development, including office, retail, residential, and hotel uses supported by a proposed Metrorail station located east of North Potomac Yard and the CSXT tracks, just north of the Potomac Greens neighborhood (approximate location of Build Alternative B considered in the Draft EIS and the Preferred Alternative). If a Metrorail station is not constructed or is constructed in a different location, then the allowable development volume in North Potomac Yard

would be reduced by as much as 3.8 million square feet to a total of 3.7 million square feet. Properties in the South Potomac Yard redevelopment area are approved for a total of approximately 5.1 million square feet of development, much of which has already been constructed.

Thus, the planned redevelopment of Potomac Yard will impact the existing roadway network with increased travel demand resulting in additional vehicle and transit trips. The NPYSAP states that "New transit infrastructure including a new Metrorail station, dedicated high-capacity transitway and expanded local bus service are required by the Plan to support the proposed density." (City of Alexandria, NPYSAP, p. 57) The Potomac Yard Multimodal Transportation Study (City of Alexandria, 2010) found that these transit services would support a high transit mode share, and that the transitway and expanded bus service by themselves would not be able to accommodate the expected increase in travel demand from the fully-built urban activity center envisioned in the NPYSAP.

Further expansion of the roadway network in the project area to accommodate local and regional trips is limited by the heavy rail tracks to the east, a pedestrian-friendly urban street grid within Potomac Yard, and existing residential neighborhoods along the west side of U.S. Route 1. Due to the constrained capacity of the roadway network, additional transportation options are needed to support the City of Alexandria's redevelopment plans by accommodating travel demand through transit and other non-auto modes. Direct regional transit access would provide more transportation choices for residents and workers and would enhance connections to regional employment and activity centers.

Appendix B: Flood Insurance Rate Map

Appendix C: Large Wetland Impact Figure

Appendix D: Wetland Summary for Alternatives Previously Considered and Preferred Alternative

Design Option	Area	Permanent	Temporary
Alternative A (Option 2 construction access, no GWMP access)	NPS Land/Greens Scenic Area Easement	-	-
	Non-Federal land	0.02	0.01
	TOTAL	**0.02**	**0.01**
Preferred Alternative Design Option 1 – Full Retaining and Station Walls (Build Alternative B, Option 2 construction access, no GWMP access)	NPS Land/Greens Scenic Area Easement	1.13	3.24
	Non-Federal land	0.15	0.10
	TOTAL	**1.28**	**3.35**
Preferred Alternative Design Option 2 – Full or Partial Berm (Build Alternative B, Option 2 construction access, no GWMP access)	NPS Land/Greens Scenic Area Easement	1.45	2.92
	Non-Federal land	0.20	0.05
	TOTAL	**1.65**	**2.97**
B-CSX Design Option	NPS Land/Greens Scenic Area Easement	-	-
	Non-Federal land	-	-
	TOTAL	-	-
Alternative D	NPS Land/Greens Scenic Area Easement	0.50	0.48
	Non-Federal land	-	-
	TOTAL	**0.50**	**0.48**