

3 AFFECTED ENVIRONMENT

3.1 Soils

Physical properties of soils within the study area influence the evaluation of the alternatives with regard to soil/ground settlement, erosion, ease of excavation, and the potential for soil contamination. DC WASA obtained soils mapping from NRCS to identify the soil associations within the study area. NRCS publishes soil survey maps that show soil types and describe their uses and limitations. Soils in the District are formed in four general types, characterized by their parent material: (1) residual material derived from the weathering of Piedmont rocks; (2) unconsolidated Coastal Plain sediment consisting of sand, silt, clay, and rock fragments deposited over long periods of time; (3) recent alluvial sediment and associated river dredgings eroded from the Piedmont and Coastal Plain; and (4) rock fragments, saprolite, sand, silt, clay, and organic and inorganic objects that have been deposited over time from human activity.

The study area lies entirely within the Atlantic Coastal Plain physiographic province. Soils in the Coastal Plain consist of stratified sandy, silty, clayey, and loamy sediment that also contain lignitized or other carbonaceous materials in some places (Smith, 1976). Most of the soils formed in material weathered from these formations retain many of the particle-size and mineralogy characteristics typical of the sediment.

Soils located within the Alternative B surface disturbance areas (see **Table 3.1-1**) are of the Udorthents and Urban land associations. Udorthents soils are deep to moderately deep, nearly level to steep, well-drained soils that consist of cuts, fills, or otherwise disturbed land. Urban land soils consists of nearly level to moderately sloping areas, most of which are built up and occupied by structures. More than 80 percent of Urban land soils are covered by asphalt, concrete, buildings, or other impervious surfaces. Soils of the Udorthents and Urban land associations are not listed as Hydric, Prime Farmland, Unique Farmland, or Soils of Statewide Importance (USDA, NRCS, 2002; USDA, NRCS, 2002a; USDA, NRCS, 2009a).

Table 3.1-1: Soils Located Within Surface Disturbance Areas

Surface Disturbance Area	Soils within Study Area	
BPAWWTP Facilities	Ub	Urban Land
	UmB	Urban Land – Galestown complex
BAFB Overflow and Diversion Facilities	U1	Udorthents
Poplar Point Pumping Station	U6	Udorthents, smoothed
	Ub	Urban Land
Tingey Street Diversion Sewers and Main Pumping Station Diversion Facilities	Ub	Urban Land
CSO 005 & 007 Diversion Facilities	U3	Udorthents, sandy
	U6	Udorthents, smoothed
CSO 018 Diversion Facilities	U1	Udorthents
M Street Diversion Facilities	U1	Udorthents
	U5	Udorthents, clayey
	Ub	Urban Land
CSO 019 Overflow and Diversion Facilities	U1	Udorthents
	Ub	Urban Land

3.2 Water Quality

Water quality in the study area is impacted by CSO discharge, stormwater discharge, other sources of runoff, and upstream sources. DC WASA identified existing water quality in the Anacostia and Potomac rivers and considered how CSO discharges affect the rivers under existing conditions.

3.2.1 Surface Water Conditions

Section 510 of the CWA grants authority to the states, including the District, to develop their own water quality standards, provided they are at least as stringent as the federal standards. Section 13.4 of the USEPA Water Quality Standards (Standards), CFR Title 40, Part 131, assigns to states the responsibility for reviewing, developing, and revising water quality standards, subject to EPA approval and certification. Section 131.10 of the Standards mandates that each state specify appropriate water uses to be achieved and protected, and to classify each resource by use; and Section 131.4 of the Standards defines “states” to include the District of Columbia.

The water quality standards in the District were developed by the DDOE’s Water Quality Division, under the authority of the District Water Pollution Control Act of 1984. These are published in the Water Quality Standards for District Waters (21 DCMR, Chapter 11). **Table 3.2-1** defines the designated use categories for surface waters in the District, as well as the criteria for determining the limitations for each use category.

Table 3.2-1: Surface Water Quality Use Category Criteria

Use Category	Designated Uses	Use Criteria
A	Primary Contact Recreation (i.e. swimming and direct contact)	Free of discharges of untreated sewage, litter and unmarked submerged or partially submerged man-made structures that would constitute a hazard to direct-contact users
B	Secondary Contact Recreation & Aesthetic Enjoyment (i.e. boating and indirect contact)	Free of facilities not primarily and directly water oriented, unless the facility is for the general public benefit and service, and land based alternatives are not available
C	Protection and Propagation of Fish, Shellfish & Wildlife	Maintained to support aquatic life and not placed in pipes
D	Protection of Human Health Related to Consumption of Fish & Shellfish	Generally not exceeding bioconcentration factors and percent lipids in the commonly consumed fish that will result in a 10 ⁻⁶ human risk factor
E	Navigation	Free of unmarked submerged or partially submerged man-made objects that pose a hazard to users of these waters

The Anacostia and Potomac rivers, as well as Rock Creek, are designated for uses A, B, C, D, and E (as defined in **Table 3.2.1**); however, current conditions only support Uses B, C, D, and E. Section 303(d) of the CWA, requires states, including the District, to develop lists of impaired waters, which are defined by the CWA as waters that are too polluted or otherwise degraded to meet the designated water quality standards, and to submit these lists to the USEPA for approval. The District has developed such a list, and it has been approved by the USEPA. This List Fact Sheet for Watershed Middle Potomac-Anacostia (MDE, 2009) lists both Potomac and Anacostia Rivers, as well as Rock Creek, as impaired, due to failure to meet designated use A, or primary contact

recreational standards (i.e., safe for swimming). Pollutants of concern that have been listed for the Anacostia River in the District's Section 303(d) report include biological oxygen demand (BOD), bacteria, organics, metals, TSS, and oil/grease. These pollutants can adversely impact the waterbodies' ability to support aquatic life, accumulate in the tissues of fish and shellfish consumed by humans, cause human health ailments due to physical contact or the consumption of fish and shellfish, and degrade the waterbodies' physical appearance and odor.

The DOH has established water quality standards, as authorized by the CWA. These standards are published in Title 21 of the DMR, Chapter 11, Water Quality Regulations, as amended. These standards require that the surface waters of the District shall be free from substances in amounts or combinations that do any one of the following:

- (a) Settle to form objectionable deposits;
- (b) Float as debris, scum, oil, or other matter to create a nuisance;
- (c) Produce objectionable odor, color, taste, or turbidity;
- (d) Cause injury to, are toxic to, or produce adverse physiological or behavioral changes in humans, plants, or animals;
- (e) Produce undesirable or nuisance aquatic life or result in the dominance of nuisance species; or
- (f) Impair the biological community that naturally occurs in the waters or depends upon the waters for its survival and propagation.

To meet these standards, DOH has established a number of specific limits for concentrations of pollutants under various conditions which must be met to comply with the established requirements listed above. The Anacostia River is a relatively stagnant tidal water. As a result, CSO pollutants contained in CSO discharges are slow to flush from the river through natural processes and tend to remain there for a relatively long time. This contributes to the failure of the Anacostia River to comply with many of the District's water quality standards. Since the Anacostia River is a tributary to the Potomac, and both rivers are impacted by the same urban areas in the District and surrounding areas, they share many of the same water quality problems.

The CWA requires that TMDLs be developed for each individual water body that would not attain water quality standards after application of technology-based and other required controls. TMDLs are the amounts of a particular pollutant that a particular water body can 'handle' without violating state water quality standards. For the Anacostia River, TMDLs are in place for five different categories of water pollutants:

- **BOD**, which reduces dissolved oxygen concentrations in the river. Low dissolved oxygen reduces the river's capacity to support aquatic life;
- **TSS**, which includes sediments that reduce water clarity and may carry sorbed pollutants;
- **Fecal coliform bacteria**, which are indicative of contamination from sanitary waste and can be hazardous to human health by causing infections upon contact;
- **Oil and grease**, which are hazards commonly associated with urban runoff and are often visible as a sheen on the surface of the water and negatively impact the odor and aesthetics of the river, and can lead to physical ailments in humans, fish, and wildlife if ingested; and
- **Organics and metals**, which include a wide range of toxic substances such as arsenic, lead, polychlorinated biphenyls (PCBs), polyaromatic hydrocarbons (PAHs), and pesticides. These compounds tend to accumulate in the tissues of both fish and shellfish and can adversely impact the health of both types of aquatic species, as well as that of humans which regularly consume them.

A variety of waterbodies within the Potomac River watersheds, such as Rock Creek and the Anacostia River, flow through both the District and the State of Maryland, and empty into the Potomac River (see **Figure 3.2-1**). The Maryland Department of the Environment (MDE) has identified the waters of the Potomac River Lower Tidal watershed on the State's 303(d) List as impaired by nutrients, sediments, toxics (PCBs in fish tissue), bacteria, and impacts to biological communities (2004 and 2006) (MDE 2006). A TMDL for Fecal Coliform to address the 2004 bacteria listing was approved by the EPA in 2005. The MDE listed waters of the Potomac River Middle Tidal watershed as impaired by nutrients, sediments, toxics (PCBs in fish tissue), metals (Cadmium, Chromium, Copper, and Lead), and impacts to biological communities (Interstate Commission on the Potomac River Basin, 2007).

The DDOE has established TDMLS for the Potomac for fecal coliform bacteria and for organics and metals. In the District, the Potomac River is impaired primarily by bacteria. The Potomac River provides drinking water for approximately 5 million people in the District metropolitan region.

3.2.2 CSO Discharges

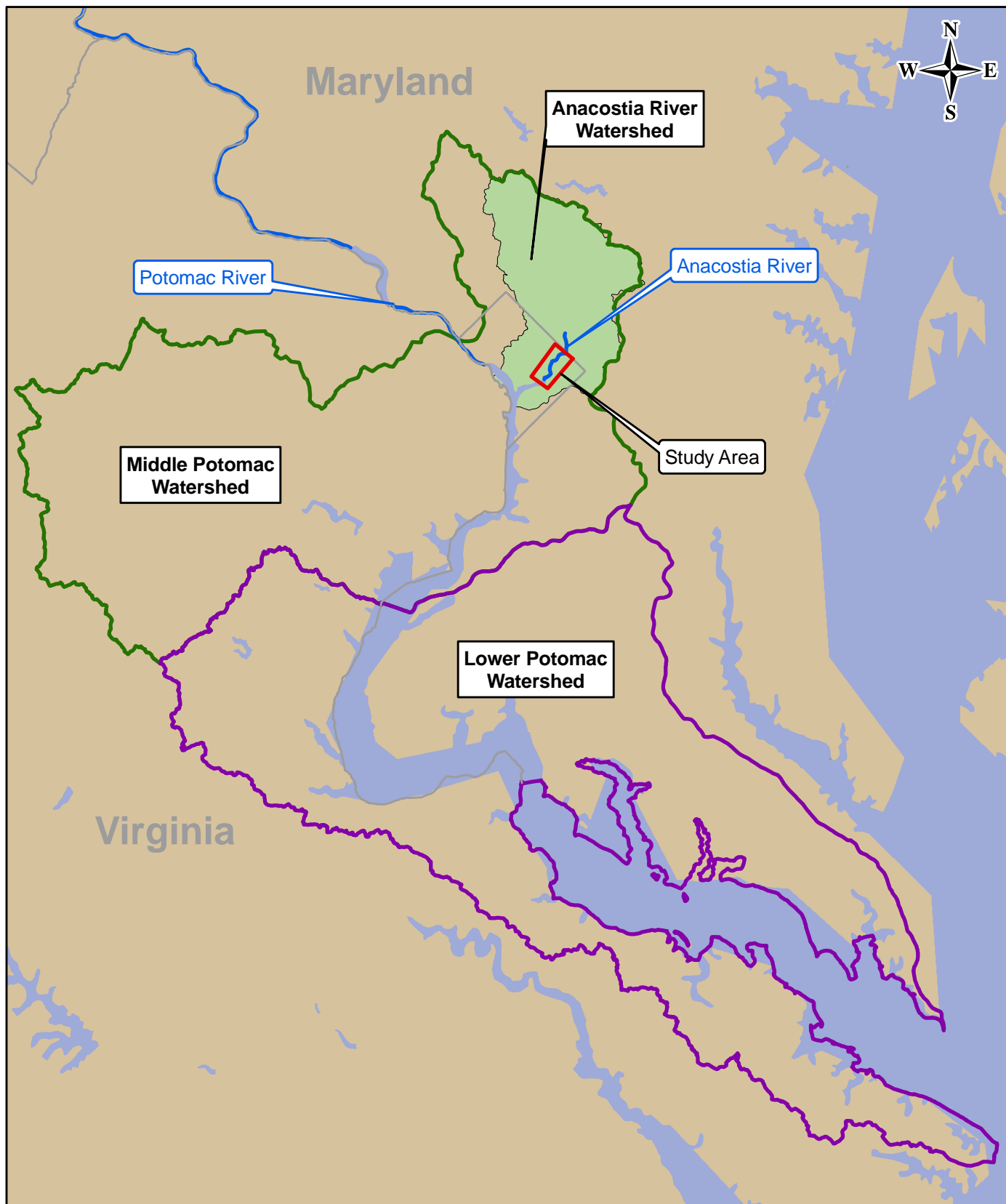
The District is a highly urbanized environment with a high percentage of impervious surfaces. During storms, the combined flow of runoff and sewage can exceed the capacity of the sewer system, and the excess flow is discharged to the Anacostia and Potomac rivers or their tributary waters. The CSO release is necessary to prevent flooding in homes, businesses, and streets. CSO discharges contain a variety of pollutants, which contribute to the degradation of the both the Anacostia River and the Potomac River, into which the Anacostia flows. These pollutants include coliform bacteria, suspended solids, oil and grease, organics, and metals. The discharge of these pollutants contributes to low dissolved oxygen levels, which adversely impact the health of aquatic organisms; poses human health hazards; and can reduce the aesthetic quality of the surface waters of the rivers.

During the development of LTCP in the early 2000s, DC WASA used water quality data compiled by MWCOG from October 1999 through June 2000 to determine the total pollutant loads entering the Anacostia River under typical, or base, flows and during storm events. These data showed greater than ten-fold increases in fecal coliform counts (colonies per 100 mL) and hundred-fold increases in Total Suspended Solids (TSS), compared to base flow, in the Anacostia River receiving waters during storm events (see **Table 3.2-2**), which indicates that stormwater discharges from CSOs were impacting the health of the river.

Table 3.2-2 Anacostia Receiving Water Boundary Conditions – Event Mean Concentration

Parameter	Units	Northwest Branch (1)		Northeast Branch (1)	
		Base Flow	Storm Flow	Base Flow	Storm Flow
CBOD ₅	mg/L	1	8.02	1.08	5.55
TSS	mg/L	3	311	7	475
Fecal Coliform	#/100 ml	500	8,000	500	8,000
E. Coli	#/100 ml	200	3,500	200	3,500
Notes:					
1. The river forms two branches just upstream of the District boundary					

Furthermore, DC WASA used the MWCOG data to calibrate computer models needed for the design of the proposed project. The LTCP concluded the following from the results of the sampling and modeling work:



**Figure 3.2-1:
Water Resources Map**

Anacostia River Projects
Long-term CSO Control Plan
Washington, D.C.



Legend:

- Anacostia River Watershed
- Lower Potomac Watershed
- Middle Potomac Watershed

Scale: 1 inch = 12 miles

Source: Chesapeake Bay Program. 2009. Chesapeake Bay Outline. Annapolis, MD.
MD DNR. 1998. Maryland's Third Order Watersheds. Annapolis, MD.

Penn State. 1996. Chesapeake Bay Major Watersheds. University Park, PA.

Low dissolved oxygen levels typically occur in the summer months of June to August following a large local or upstream wet weather event.

- The low dissolved oxygen concentrations are driven by the naturally low saturation level of oxygen in the water, due to the high water temperature (the higher the water temperature, the lower the concentration of oxygen the waters can support) and the influx of pollutant loads from wet weather events. Moreover, the sluggish nature of the Anacostia River does not allow effective re-aeration, which contributes to low dissolved oxygen levels.
- In addition to direct loads of oxygen-consuming pollutants from CSO discharges, stormwater runoff, and drainage areas upstream, the sediments in the Anacostia River are known to exert a substantial oxygen demand, which reduces the concentration of oxygen dissolved in the water. Dissolved oxygen levels below 2.0 mg/L can occur several times per summer month, with each episode lasting one to two days. Fish kills have been observed in the past under these conditions. Dissolved oxygen levels below 5 mg/l are generally considered to be the lower limit that would support large populations of various fishes; levels below three milligrams per liter (mg/l) are fatal to many fish species.
- CSO discharges, urban stormwater, and drainage areas upstream are considerable contributors of hazardous bacteria such as fecal coliform. Fecal coliform concentrations are relatively high and exceed the Class A monthly standard for the majority of the average year.

There are a total of 53 permitted CSO outfalls in the District's CSS. DC WASA's CSO Model for Average Year predicts that, in a normal rainfall year, there will be 452 episodes of CSO overflow into the Anacostia River and 244 overflow discharges. These are predicted to result in the release of 1,485 million gallons of overflow volume into the Anacostia River and 952 million gallons of overflow volume into the Potomac River. More details on the water quality sampling and modeling can be found in the LTCP in **Appendix B**.

3.3 Wetlands

Wetlands are of importance because they provide unique habitat conducive to species diversity; flood flow attenuation; contaminant filtering of surface waters; and recreational, economic, and other societal values.

3.3.1 Regulatory Background

Wetlands and waters of the U.S. are defined by USACE as "coastal and inland waters, lakes, rivers, and streams that are navigable waters of the United States, including their adjacent wetlands, and tributaries to navigable waters of the United States, including adjacent wetlands" (USACE, 1987). USACE and EPA define wetlands as "areas that are saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands typically include swamps, marshes, bogs, vernal pools, and similar areas (USACE, 1987)."

Wetlands and waters of the U.S. are protected under Section 404 of the CWA, and Section 10 of the Rivers and Harbors Act of 1899, which requires that a USACE permit be issued for activities that result in the discharge of dredge or fill material into wetlands and waterways. EO 11990, *Protection of Wetlands*, further defines impacts to wetlands to include indirect impacts, provides a long-term goal of "no net loss of wetlands," and requires federal agencies to adopt procedures that ensure compliance with EO 11990.

The framework for NPS to meet its responsibilities in protecting and preserving wetlands in a manner consistent with EO 11990 is detailed in DO 77-1, *Wetland Protection*. It also states NPS's

longer-term goal of achieving a net gain of wetlands on lands managed by NPS. DO 77-1 outlines NPS's policies and procedures for avoidance and minimization of impacts to wetlands, as well as preferred mitigation measures to compensate for unavoidable impacts to wetlands. It specifies that, for proposed new development or other new activities, plans, or programs that are either located in or otherwise have the potential for direct or indirect adverse impacts to wetlands, the NPS will employ a sequence of a) avoiding adverse wetland impacts to the extent practicable, b) minimizing impacts that could not be avoided, and c) compensating for remaining unavoidable adverse wetland impacts via restoration of degraded wetlands.

To achieve these objectives, Executive Order 11990 directs the NPS 1) to provide leadership and to take action to minimize the destruction, loss, or degradation of wetlands; 2) to preserve and enhance the natural and beneficial values of wetlands; and 3) to avoid direct or indirect support of new construction in wetlands, unless there are no practicable alternatives to such construction and the proposed action includes all practicable measures to minimize harm to wetlands.

The *NPS Statement of Findings* (SOF) (Straughan Environmental Services, 2010) (see **Appendix F**) states that the proposed activity would result in 32,860 square feet (0.75 acres) of long-term impacts to two tidal wetlands along the Anacostia and Potomac rivers. As Per D.O. #77-1, WASA would compensate for unavoidable impacts to wetlands through a mitigation project. NPS requires a 1:1 mitigation ratio for the replacement of lost wetland functions and values. NPS does not necessarily require mitigation to replace lost wetland surface area at a 1:1 ratio. A wetland mitigation project would be based on a functional assessment of existing resources.

Wetland mitigation projects could include the restoration or enhancement of wetlands, the removal of invasive species in an existing wetland or wetland buffer, the installation or retrofit of stormwater management facilities, or the restoration of a stream that flows to the Anacostia or Potomac river. The amount of mitigation required would depend on the type of mitigation project. All mitigation must be conducted within the NPS boundary.

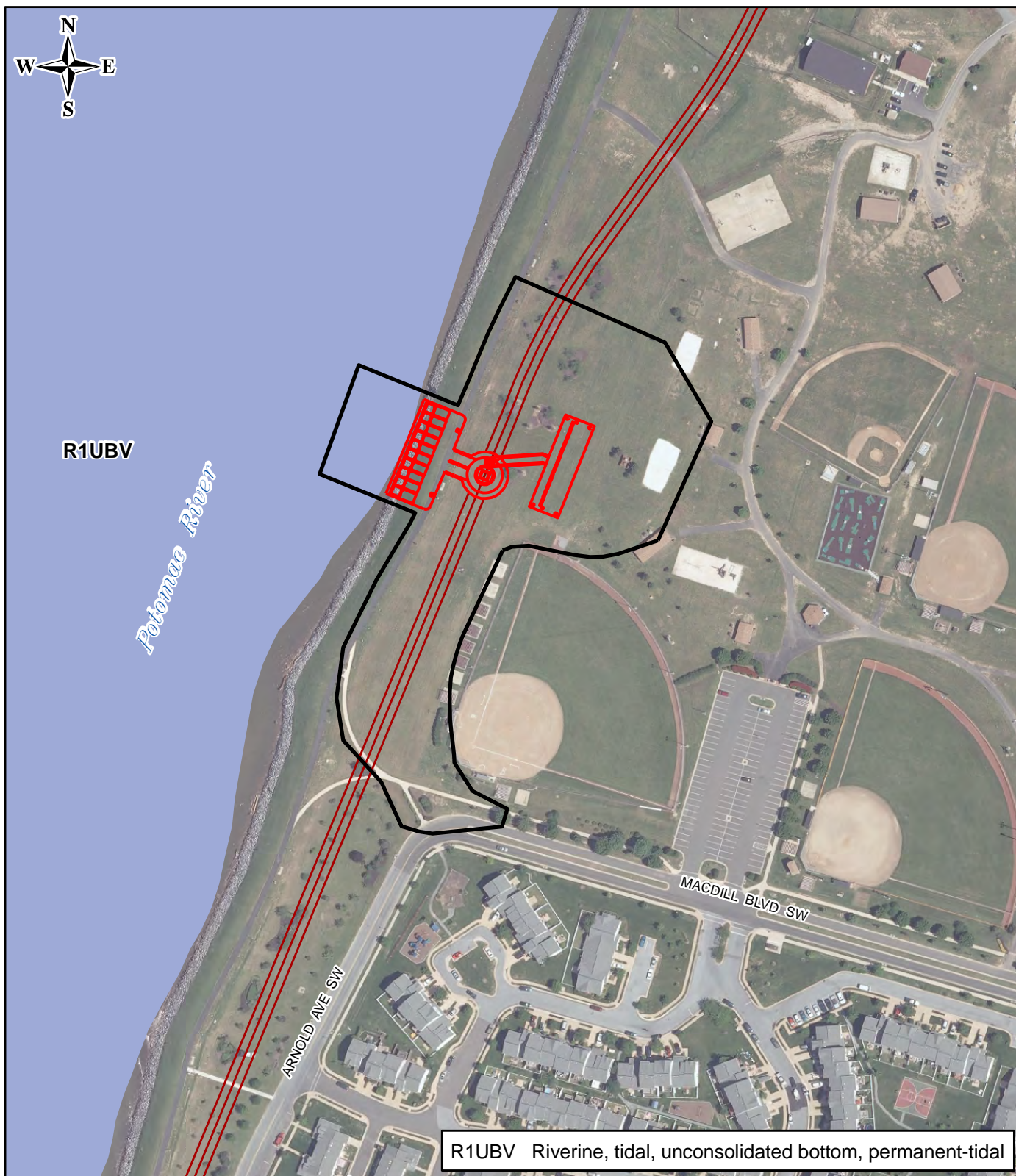
3.3.2 Published Information

USACE has determined that the boundaries of all potential jurisdictional wetlands and waters of the U.S. have been previously verified through the jurisdictional determination process within the past five years for other projects. This was confirmed during a meeting with a representative of the USACE, Ms. Maria Teresi, and representatives of DC WASA, on November 16, 2009, in which potential impacts to jurisdictional wetlands and waterways resulting from the DC WASA LTCP were discussed.

As part of its review, DC WASA examined published sources to identify the locations of potential wetlands and waterways in the study area vicinity. Sources included the *National Wetlands Inventory* (NWI) *Map for the District of Columbia* (USFWS, 2002), Known Wetlands within the District of Columbia (District of Columbia Wetland Conservation Plan, 1997) the *Soil Survey of District of Columbia* (USDA, 2002), and environmental documents for other major projects in the vicinity.

Wetlands identified in NWI mapping is based upon a definition of wetlands that is somewhat different than that used by the USACE. NWI mapped wetlands include deep water habitats, up to a depth of two meters, while the USACE normally regulates these areas as Waters of the U.S., and not as wetlands. The *NWI Map for District of Columbia* (USFWS, 2002) identifies two waterways within the impact areas (see **Figures 3.3-1 – 3.3-2**):

- One riverine, tidal, open water, permanent-tidal waterway (R10WV), the Anacostia River



**Figure 3.3-1:
National Wetlands
Inventory Map**

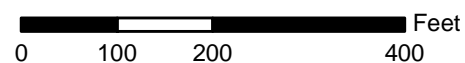
Bolling Air Force Base Overflow
and Diversion Facilities
Washington, D.C.



Legend:

- NWI Waterway
- Project Facility
- Surface Disturbance Area
- Preferred Tunnel Alignment

Scale: 1 inch = 200 feet



Source: Office of the Chief Technology Officer. 2008. Raster Digital Data, 2008 Orthophoto. Washington, DC.
US Fish and Wildlife Service. 2002. National Wetlands Inventory Vector Digital Data. Washington, DC.



**Figure 3.3-2:
National Wetlands
Inventory Map**

CSO 019 Overflow and
Diversion Facilities
Washington, D.C.

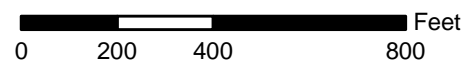


SERVING THE PUBLIC
PROTECTING THE ENVIRONMENT

Legend:

- NWI Waterway
- Project Facility
- Surface Disturbance Area
- Preferred Tunnel Alignment

Scale: 1 inch = 400 feet



Source: Office of the Chief Technology Officer. 2008. Raster Digital Data, 2008 Orthophoto. Washington, DC.
US Fish and Wildlife Service. 2002. National Wetlands Inventory Vector Digital Data. Washington, DC.

- One riverine, tidal, open water, unconsolidated bottom, permanent-tidal waterway (R1UBV), the Potomac River

The jurisdictional boundaries of the Anacostia and Potomac rivers were determined from National Oceanic and Atmospheric Administration (NOAA) tidal data. Two tidal stations were used to determine the mean high water (MHW) level at the CSO 019 Overflow and Diversion Facilities and the BAFB Overflow and Diversion Facilities. MHW at the BAFB CSO is 1.54 feet. MHW at CSO 019 is 1.69 feet. Both elevations are in the North American Vertical Datum (NGVD).

3.3.3 Field Investigation

DC WASA conducted wetland field investigations on November 3 and 23, 2009, to confirm the existence and extent of published potential wetlands and previously documented wetlands within the study area, and to identify and delineate the boundaries of any unpublished wetlands that could be impacted by the construction or operation of the proposed project. Fieldwork was conducted according to the Routine On-site Determination Method described in the *Corps of Engineers Wetlands Delineation Manual* (USACE, 1987). This methodology is recommended by the manual for use in the identification and boundary delineation of most wetlands, and is used by USACE, in most cases, as a basis for the issuance of its jurisdictional determinations (JDs).

The USACE manual outlines a three-parameter approach to delineating wetlands. Indications of all three wetland indicator parameters (hydrophytic vegetation, hydric soils, and wetland hydrology) must be present for an area to be classified as a wetland, unless the site has been disturbed or is considered characterized by atypical circumstances, such as atypical rainfall periods. If one or more wetland indicator parameters has been altered due to disturbance, or if atypical circumstances exist, additional investigations are performed to determine whether the missing parameter was present prior to the disturbance, and whether the disturbance was authorized by USACE. If it is determined that the missing parameter was present prior to the disturbance and that the disturbance was unauthorized, then that parameter is considered to be met, and the determination of whether the area meets the definition of a jurisdictional wetland is based upon the presence or absence of the undisturbed parameters. All surface disturbance areas were reviewed for the presence of wetlands and waterways.

The results of the wetland and waterways investigation are documented in the *Wetland Investigation Identification Report for the Anacostia River Projects* (Straughan Environmental Services, 2009) (see **Appendix E**). The investigation identified a total of two jurisdictional waterways regulated by the USACE within the disturbance area (see **Table 3.3-1**). No jurisdictional wetlands were identified within the surface disturbance areas; however, two jurisdictional waters of the U.S. governed by USACE regulations are considered to be wetlands under NPS guidelines.

Table 3.3-1: Wetlands and Waterways

Surface Disturbance Area	Resource Name	Jurisdictional Reference
CSO 019 Overflow and Diversion Facilities	Anacostia River	Traditional navigable waterway
Bolling Air Force Base Overflow and Diversion Facilities	Potomac River	Traditional navigable waterway

NPS defines tidal wetlands differently than EPA and USACE. NPS uses the USFWS classification system to define and categorize wetlands (Cowardin et al 1979). Using this system, NPS classifies all areas directly adjacent to tidal waterways as tidal wetlands, as stipulated in DO 77-1, *Wetland*

1 *Protection*. The area three feet landward of MHW and up to a depth of two meters of the river
2 bottom is considered tidal wetland. These areas along the Anacostia and Potomac rivers are
3 therefore classified separately for the NPS and EPA/USACE. The *NPS Statement of Findings* (SOF)
4 (Straughan Environmental Services, 2010), which documents the NPS wetland and waterway
5 investigation, is located in **Appendix F**.

6 The SOF identified two areas of the Anacostia and Potomac Rivers adjacent to the shore as riverine
7 wetlands, as defined by NPS. These wetlands are located near the CSO 019 and BAFB outfall
8 facilities. These areas lack hydrophytes, but contain inundated hydric soils. They primarily function
9 to provide freshwater fish, shellfish, and other wildlife habitat; however, these functions are
10 compromised by existing seawall and rip-rap modifications to the shorelines. As a result of these
11 shoreline stabilization structures, these wetlands do not support native emergent vegetation
12 communities which, were they present, would provide critical fish, shellfish, and wildlife habitat.
13 Other important functions associated with intact riverine and open water tidal wetlands, such as
14 flood attenuation and sediment retention, are not provided by the wetlands within the project area.

15 **3.4 Vegetation**

16 Vegetation provides a number of important environmental benefits, including improvements in air
17 quality, enhanced aesthetics, and reductions in stormwater runoff volumes. Vegetation can also
18 provide habitat for wildlife and reduce the impacts of urban noise. DC WASA reviewed existing
19 aerial photography of the study area (District GIS, 2008) and performed field verification to identify
20 the presence of forests or other vegetated areas that could potentially be impacted by the project.

21 **3.4.1 Regulatory Background**

22 The DDOT, Urban Forestry Administration, requires a permit for the removal or disturbance of a
23 street tree or special tree. A street tree is defined as any tree located within a public right of way,
24 usually between the street and sidewalk. A special tree is defined as any tree on private property
25 with a circumference of 55 inches or greater (17.51 inches in diameter at breast height, DBH).

26 **3.4.2 Field Investigations**

27 There are no designated state forests in the study area; however, field studies conducted on
28 November 3 and 23, and December 14, 2009, showed that small portions of the study area contain
29 small assemblages of upland and lowland forests. Most plant communities located within the study
30 area are typical of vegetation found in heavily urbanized environments, consisting primarily of
31 maintained turf and landscaped areas (including street trees), but also containing small patches of
32 riparian forested buffers adjacent to the Anacostia River. However, many surfaces are paved or are
33 otherwise impervious. A detailed description of vegetation within each surface disturbance area
34 follows.

- 35 • Tingley Street Diversion Sewer for CSOs 013 & 014: contains maintained turf and street
36 trees.
- 37 • Main Pumping Station Diversions: contains no vegetation.
- 38 • CSO 019 Overflow and Diversion Facilities: contains areas of riparian forest adjacent to the
39 Anacostia River. Tree species observed include American elm (*Ulmus americana*), American
40 sycamore (*Platanus occidentalis*), willow oak (*Quercus phellos*), pin oak (*Quercus palustris*),
41 northern red oak (*Quercus rubra*), green ash (*Fraxinus pennsylvanica*), eastern cottonwood
42 (*Populus deltoids*), white mulberry (*Morus alba*), silver maple (*Acer saccharinum*), and black

cherry (*Prunus serotina*). The understory consists of the invasive species bush honeysuckle (*Diervilla lonicera*).

- BAFB overflow and Potomac Outfall Diversion Sewer: contains maintained turf and landscaping trees.
- M Street Diversion Facilities: contains street trees and areas of riparian forest adjacent to the Anacostia River. Tree species observed include American elm, northern red oak, silver maple, and black locust (*Robinia pseudoacacia*). The understory consists of invasive species including, English ivy (*Hedera helix*), eastern poison ivy (*Toxicodendron radicans*), fox grape (*Vitis labrusca*), and multiflora rose (*Rosa multiflora*).
- CSO 018 Diversion Sewer: contains maintained turf.
- CSO 005 & 007 Diversion Sewer: contains landscaping trees and maintained turf. Tree species observed include Virginia pine (*Pinus virginiana*), little leaf linden (*Tilia cordata*), and black cherry (*Prunus serotina*).
- Blue Plains Tunnel Dewatering Pumping Station & Enhanced Clarification Facility: contains maintained turf.
- Poplar Point Pumping Station: contains landscaping trees and a small forested area adjacent to South Capitol Street. Silver maple, red maple (*Acer rubrum*), and eastern white pine (*Pinus strobes*) were observed.

A total of 24 special trees were identified within the study area during the field investigation. These species and their locations are detailed in **Table 3.4-1** and **Figures 3.4-1 to 3.4-3**.

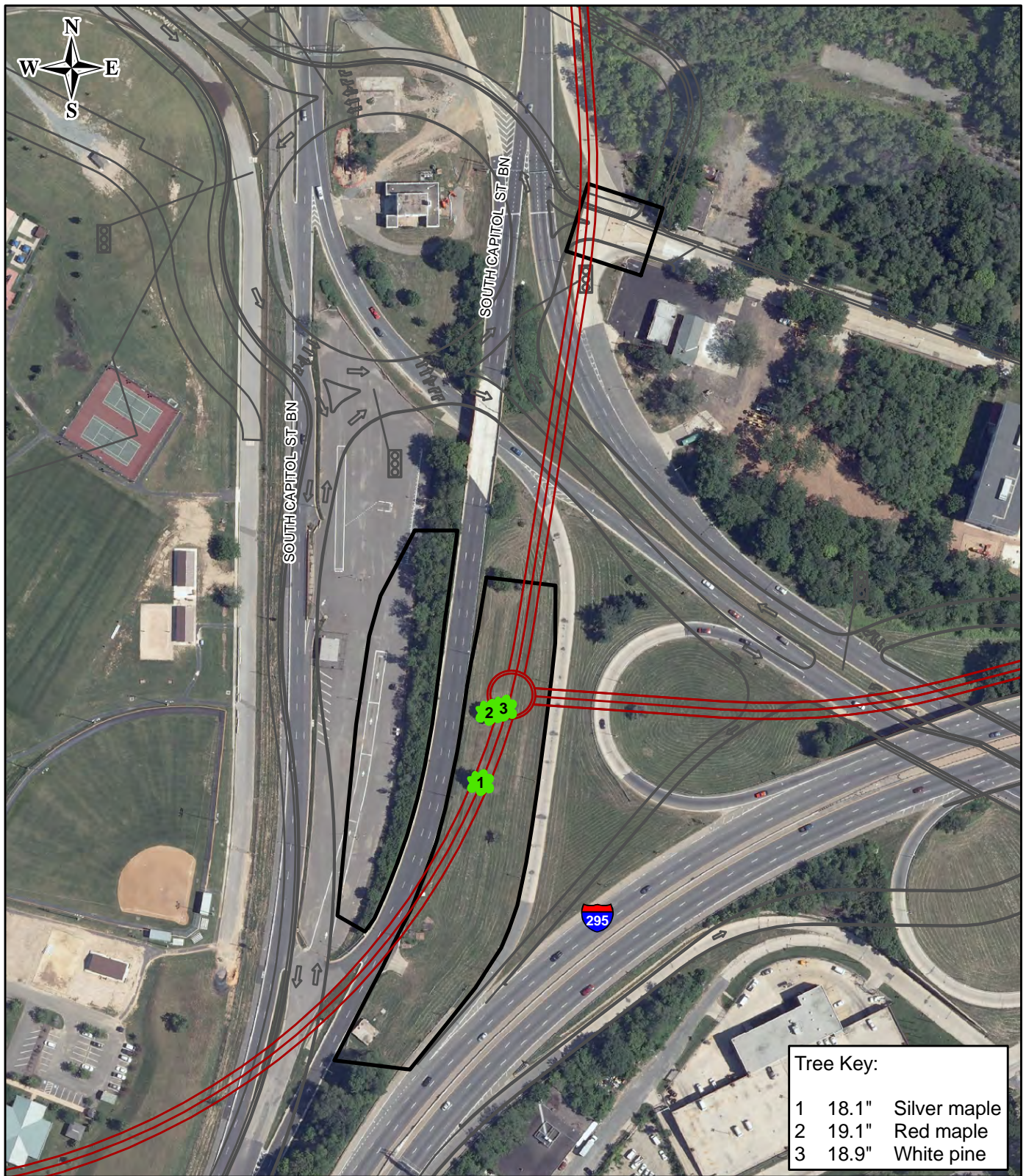
Table 3.4-1: Special Trees

Surface Disturbance Area	Common Name	Botanical Name	Diameter (inches)
CSO 019 Overflow and Diversion Facilities	American elm	<i>Ulmus americana</i>	18.6
	American elm	<i>Ulmus americana</i>	26.5
	American elm	<i>Ulmus americana</i>	22.3
	American elm	<i>Ulmus americana</i>	30.8
	American elm	<i>Ulmus americana</i>	20.3
	Silver maple	<i>Acer saccharinum</i>	31.6
	Silver maple	<i>Acer saccharinum</i>	17.6
	American sycamore	<i>Platanus occidentalis</i>	29.5
	American elm	<i>Ulmus americana</i>	17.9
	Eastern cottonwood	<i>Populus deltoides</i>	27.5
	American sycamore	<i>Platanus occidentalis</i>	18.4
	American elm	<i>Ulmus americana</i>	25.1
	Pin oak	<i>Quercus palustris</i>	21.7
	Willow oak	<i>Quercus phellos</i>	25.3
	Pin oak	<i>Quercus palustris</i>	24.2
	American elm	<i>Ulmus americana</i>	18.0
	Green Ash	<i>Fraxinus pennsylvanica</i>	17.8
	American Elm	<i>Ulmus Americana</i>	25.9
	American Elm	<i>Ulmus americana</i>	27.2
CSO 005 & 007 Diversion Facilities	Black Cherry	<i>Prunus serotina</i>	17.2
	American Elm	<i>Ulmus americana</i>	25.0

Table 3.4-1: Special Trees			
Surface Disturbance Area	Common Name	Botanical Name	Diameter (inches)
Poplar Point Pumping Station	Silver maple	<i>Acer saccharinum</i>	18.1
	Red maple	<i>Acer rubrum</i>	19.1
	Eastern white pine	<i>Pinus strobus</i>	18.9

1

2



**Figure 3.4-1:
Vegetation Map**

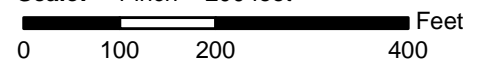
Poplar Point Pumping Station
Washington, D.C.



Legend:

- Specimen Tree
- Surface Disturbance Area
- Preferred Tunnel Alignment
- New Road Alignment

Scale: 1 inch = 200 feet



Source: Office of the Chief Technology Officer. 2008. Raster Digital Data, 2008 Orthophoto. Washington, DC.







**Figure 3.4-2:
Vegetation Map**

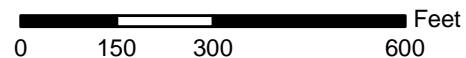
CSO 005 & 007
Diversion Facilities
Washington, D.C.



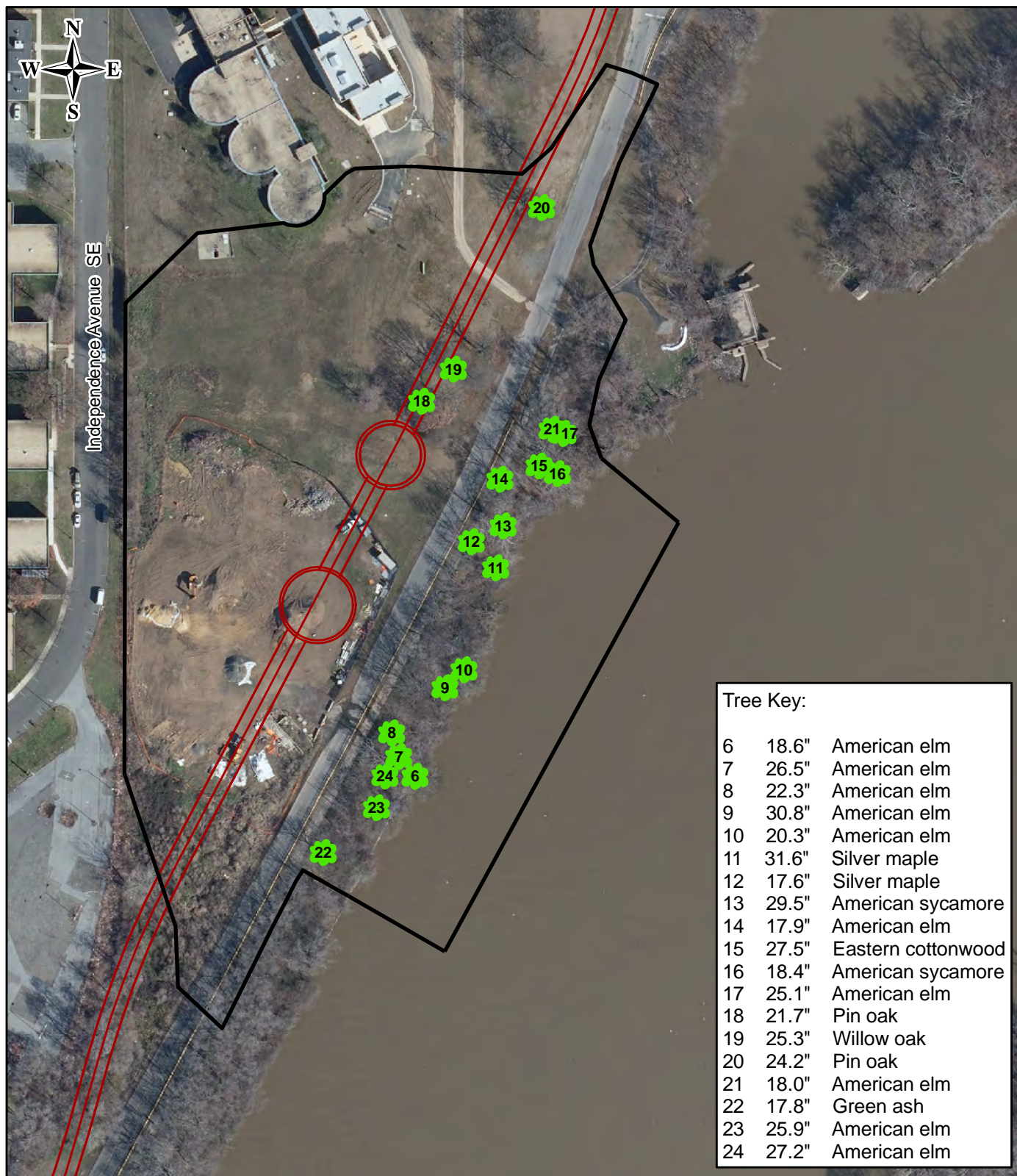
Legend:

-  Specimen Tree
-  Surface Disturbance Area
-  Preferred Tunnel Alignment
-  New Road Alignment

Scale: 1 inch = 300 feet



Source: Office of the Chief Technology Officer. 2008. Raster Digital Data, 2008 Orthophoto. Washington, DC.



**Figure 3.4-3:
Vegetation Map**

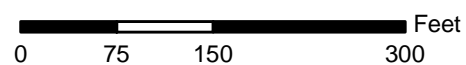
CSO 019 Overflow and
Diversion Facilities
Washington, D.C.



Legend:

- Specimen Tree
- Surface Disturbance Area
- Preferred Tunnel Alignment

Scale: 1 inch = 150 feet



Source: Office of the Chief Technology Officer. 2008. Raster Digital Data, 2008 Orthophoto. Washington, DC.

3.5 Wildlife and Wildlife Habitat

Wildlife and wildlife habitat provide important human recreational and economic benefits. They also serve as intricate components in ecological processes and the natural landscape. Wildlife may be impacted by changes to their existing habitat, which may include both short-term and long-term changes. Wildlife populations located within the study area are strongly influenced by land use type and land cover, which in the study area consists predominately of urban land.

Scientific literature was consulted regarding the habitat requirements of small mammals (Burt, 1957; Burt and Grossenheider, 1976; Martin, et al., 1951; Whitaker, 1980), reptiles and amphibians (Behler and King, 1979), birds (Bent, 1937; Craighead and Craighead, 1956; Ehrlich et al., 1988; Farrand, 1988; Harrison, 1975; Hunter et al., 2001; Kaufman, 1990; Martin et al, 1951; Peterson, 1980; Robbins et. al, 1966), and fishes (Page and Burr, 1991) that inhabit fields, open waters, and disturbed sites, including birds of prey and insectivorous birds.

DC WASA conducted field investigations on November 3, November 23, and December 14, 2009, to determine whether habitat for wildlife is present in the study area, as well as to collect data for the wetland assessment (see **Section 3.3**) and vegetation assessment (see **Section 3.4**). These data were then used, along with other information contained in the wetland and vegetation assessments, to classify any habitats present by cover type and to identify potential impacts to wildlife or their habitat.

As discussed in **Section 3.4.2**, most of the surface disturbance areas contain maintained turf and landscape trees. This habitat provides a variety of niches for suburban-dwelling species of small and mid-size mammals and songbirds. These species may probe lawns for invertebrates dwelling in the vegetation and soil, or forage for insects by flying above the surface of lawns. Landscape trees provide suitable resting, feeding, and nesting habitat for a variety of other common urban bird species, and also provide habitat for eastern gray squirrels (*Sciurus carolinensis*).

Both the CSO 019 Overflow and Diversion Facilities and portions of the M Street Diversion Facilities contain areas of riparian forest adjacent to the Anacostia River. The Poplar Point Pumping Station site contains a small forested area adjacent to South Capitol Street.

These wooded areas may provide suitable habitat for a wide variety of small mammals, such as chipmunk (*Tamias striates*), eastern gray squirrel, Norway rat (*Rattus norvegicus*), striped skunk (*Mephitis mephitis*), raccoon (*Procyon lotor*), woodchuck (*Marmota monax*), and opossum (*Didelphis marsupialis*) (Burt, 1957; Burt and Grossenheider, 1976; Martin, et al., 1951; Whitaker, 1980). The wooded areas may also provide habitat for those woodland bird species that do not require large, unbroken tracks of forest and that are adapted to forest edge habitat, both as residents or during migration. These species include songbirds and larger birds of prey (Bent, 1937; Craighead and Craighead, 1956; Ehrlich et al., 1988; Farrand, 1988; Harrison, 1975; Hunter et al., 2001; Kaufman, 1990; Martin et al, 1951; Peterson, 1980; Robbins et. al, 1966). These wooded areas may also provide habitat for a variety of reptiles and amphibians (Behler and King, 1979).

The Anacostia and Potomac rivers provide habitat for fish and shellfish populations. Due to their unique location within the Chesapeake Bay watershed, both rivers support resident inhabitants of the freshwater tributaries and main channel. These include both anadromous fish, such as shad (*Alosa sapidissima*) or striped bass (*Morone saxatilis*), which live in marine or estuarine waters but return to freshwater to spawn; as well as catadromous fish, such as the American eel (*Anguilla rostrata*), which live in freshwater but migrate to the sea to spawn.

3.6 Cultural Resources

The study area is also located within the historic urban environment of the nation's capital and within the vicinity of several historic districts. This area contains both archaeological and historical resources. The terraces above the Anacostia and Potomac rivers contain archaeological sites, many preserved under deep layers of fill as a result of episodes of dredge disposal and land filling operations.

Information on recorded archaeological sites, as well as historic sites, districts, and landscapes that are listed on or eligible for listing on the National Register of Historic Places (NRHP) was obtained from the District Historic Preservation Office's GIS data. Additionally, information on the potential for surface disturbance areas to contain important archaeological resources was obtained from archaeological survey reports, historic maps, utility maps, and soil boring data. The APEs and locational information for previously identified cultural resources are shown in **Figures 3.6-1** and **Figure 3.6-5**. Archaeological site locations are confidential and are not shown in these figures.

3.6.1 Archaeology

Archaeological resources have been previously identified adjacent to several surface disturbance areas. The presence of deep fill over reclaimed areas of land made it difficult to assess archaeological potential in five surface disturbance areas. Geoarchaeological soil borings were conducted in March and April 2010 to address archaeological potential within these areas. Existing archaeological resources and the potential for each surface disturbance area to contain archaeological resources are described below.

- **BPAWWTP** No archaeological resources have previously been identified in this area. This surface disturbance area is located on deep fill that appears to overlay an earlier land surface. The presence of the BPAWWTP Digestion Facility precludes any geoarchaeological investigation to address archaeological potential until the facility is removed.
- **BAFB Overflow and Diversion Facilities:** One archaeological site (51SW3) is currently mapped as being adjacent to the surface disturbance area and one of the ball fields, although the BAFBs *Cultural Resources Management Plan* acknowledges that the exact site location is unknown. This site is a prehistoric Native American camp site that has not been evaluated for National Register eligibility. Other sites, including additional prehistoric campsites and two ossuaries are located on the base, but not in the vicinity of the surface disturbance area.

The Cultural Resources Management Plan indicates that the surface disturbance area is located in a larger area of high archaeological potential. This area contains the original Giesboro Point land surface, located under 5-10 feet of fill. There is also potential for the surface disturbance area to encounter a wharf or outbuildings associated with 17th century Giesboro Plantation. Geoarchaeological soil borings identified archaeological potential at this surface disturbance area.

Poplar Point Pumping Station: No archaeological resources have been previously identified in this area. This surface disturbance area is located in an area of extensive fill on Poplar Point, but has high potential to contain cultural resources because fill overlays the original Poplar Point land surface. Stickfoot Branch flowed into the Anacostia River in this area, and the terraces above the waterways in this area have high potential to contain resources. Geoarchaeological soil borings identified archaeological potential at this surface disturbance area.

- **Main Pumping Station Diversion Facilities:** No archaeological resources have been previously identified in this area. A terminus of the Washington Canal was located in this vicinity in the 19th century. Initially, this area was considered to have no potential to contain



**Figure 3.6-1:
Historic Structures
and Districts**

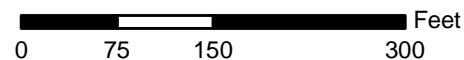
BPAWWTP Facility
Washington, D.C.



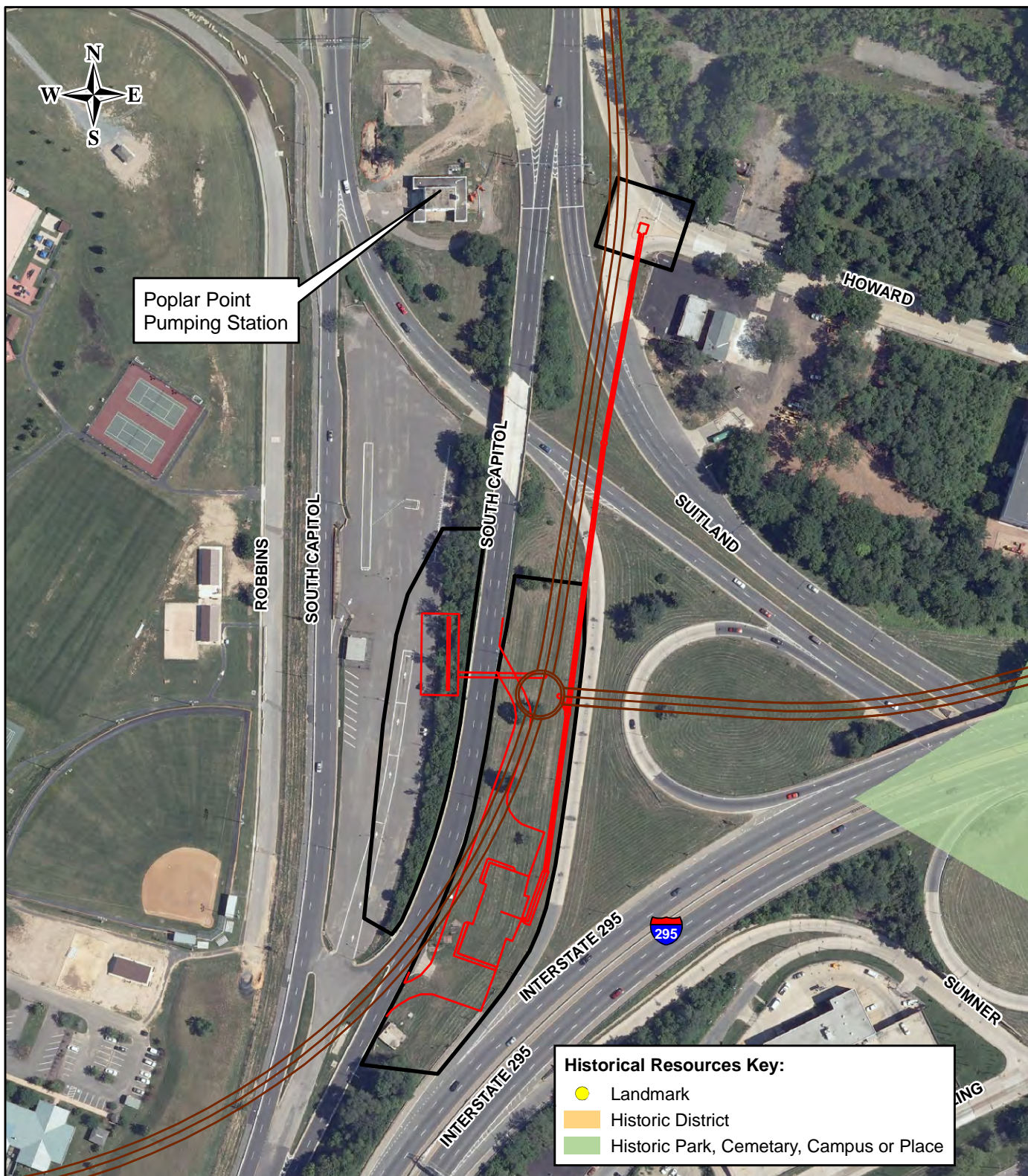
Legend:

- Project Facility
- Surface Disturbance Area
- Proposed Tunnel Alignment

Scale: 1 inch = 150 feet



Source: DC District Department of Transportation. 2005. Street Centerlines. Washington, D.C.; National Capital Planning Commission, National Park Service. DC GIS. 2002. LandmrkPly, Digital Vector Data. Washington, D.C.; District of Columbia Inventory of Historic Sites. DC GIS. 2002. LandmrkPt, Digital Vector Data. Washington, D.C.; D.C. Office of Planning. DC GIS. 2002. HistDisPly, Digital Vector Data. Washington, D.C.



**Figure 3.6-2:
Historic Structures
and Districts**

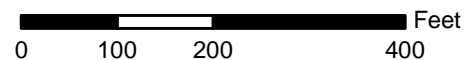
Poplar Point Pumping Station
Washington, D.C.



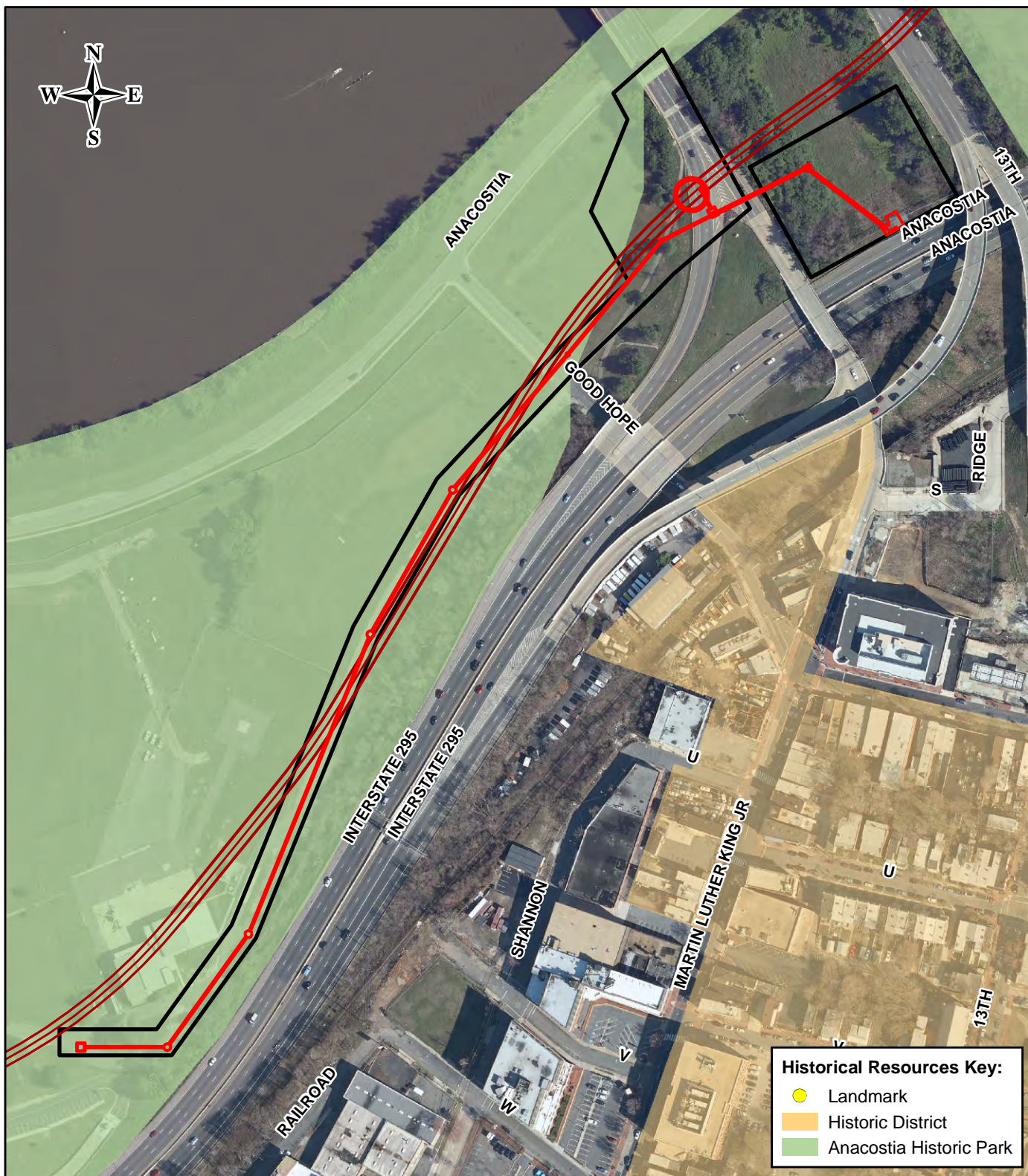
Legend:

- Project Facility
- Surface Disturbance Area
- Proposed Tunnel Alignment

Scale: 1 inch = 200 feet



Source: DC District Department of Transportation. 2005. Street Centerlines. Washington, D.C.; National Capital Planning Commission, National Park Service. DC GIS. 2002. LandmrkPly, Digital Vector Data. Washington, D.C.; District of Columbia Inventory of Historic Sites. DC GIS. 2002. LandmrkPt, Digital Vector Data. Washington, D.C.; D.C. Office of Planning. DC GIS. 2002. HistDisPly, Digital Vector Data. Washington, D.C.



**Figure 3.6-3:
Historic Structures
and Districts**

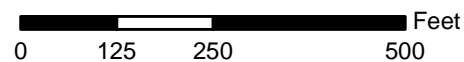
CSO 005 & 007 Diversion Facilities
Washington, D.C.



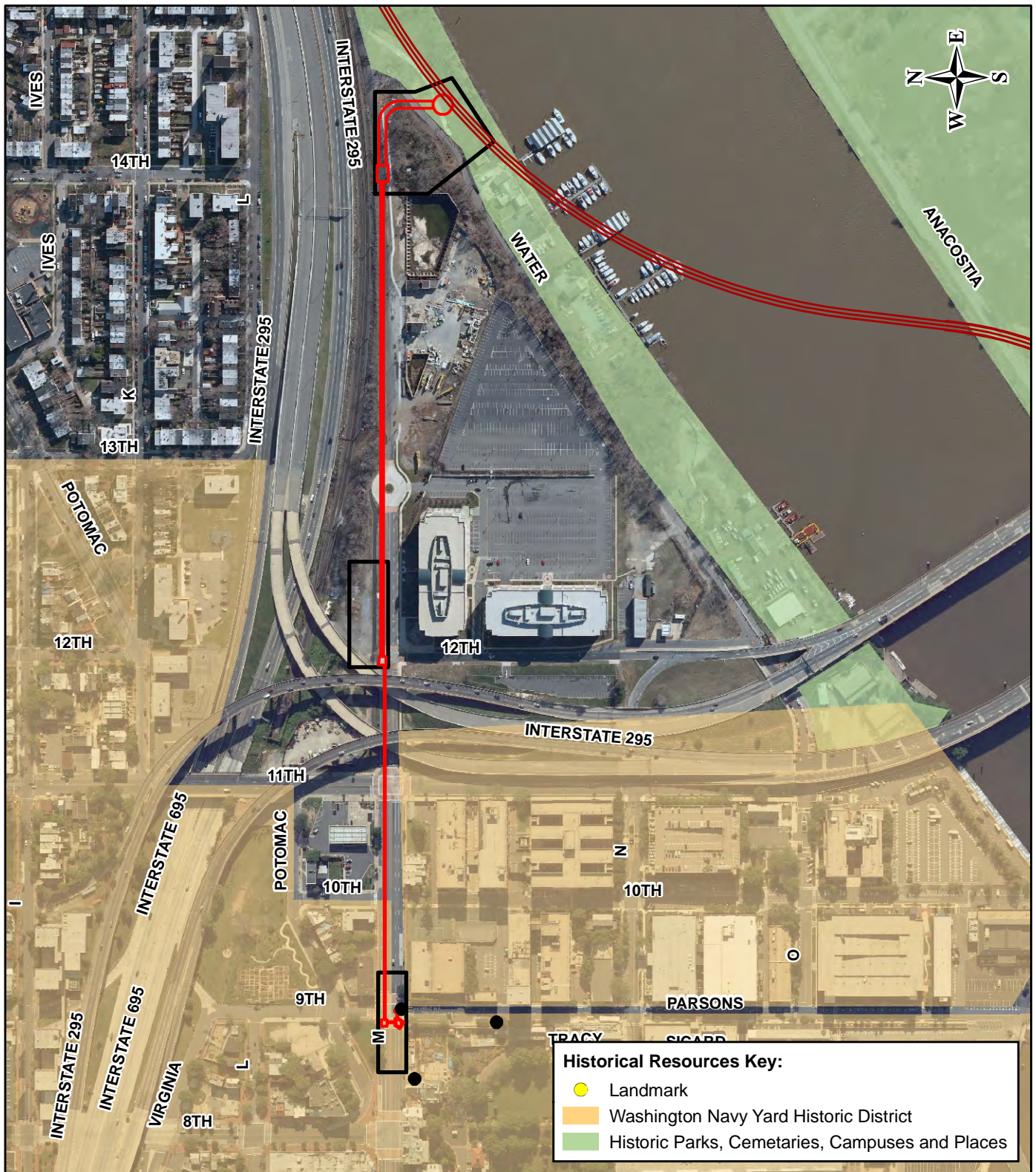
Legend:

- Project Facility
- Surface Disturbance Area
- Preferred Tunnel Alignment

Scale: 1 inch = 250 feet



Source: DC District Department of Transportation. 2005. Street Centerlines. Washington, D.C.; National Capital Planning Commission, National Park Service. DC GIS. 2002. LandmrkPly, Digital Vector Data. Washington, D.C.; District of Columbia Inventory of Historic Sites. DC GIS. 2002. LandmrkPt, Digital Vector Data. Washington, D.C.; D.C. Office of Planning. DC GIS. 2002. HistDisPly, Digital Vector Data. Washington, D.C.



**Figure 3.6-4:
Historic Structures
and Districts**

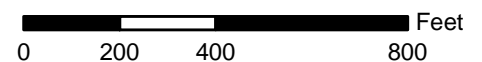
M Street Diversion Facilities
Washington, D.C.



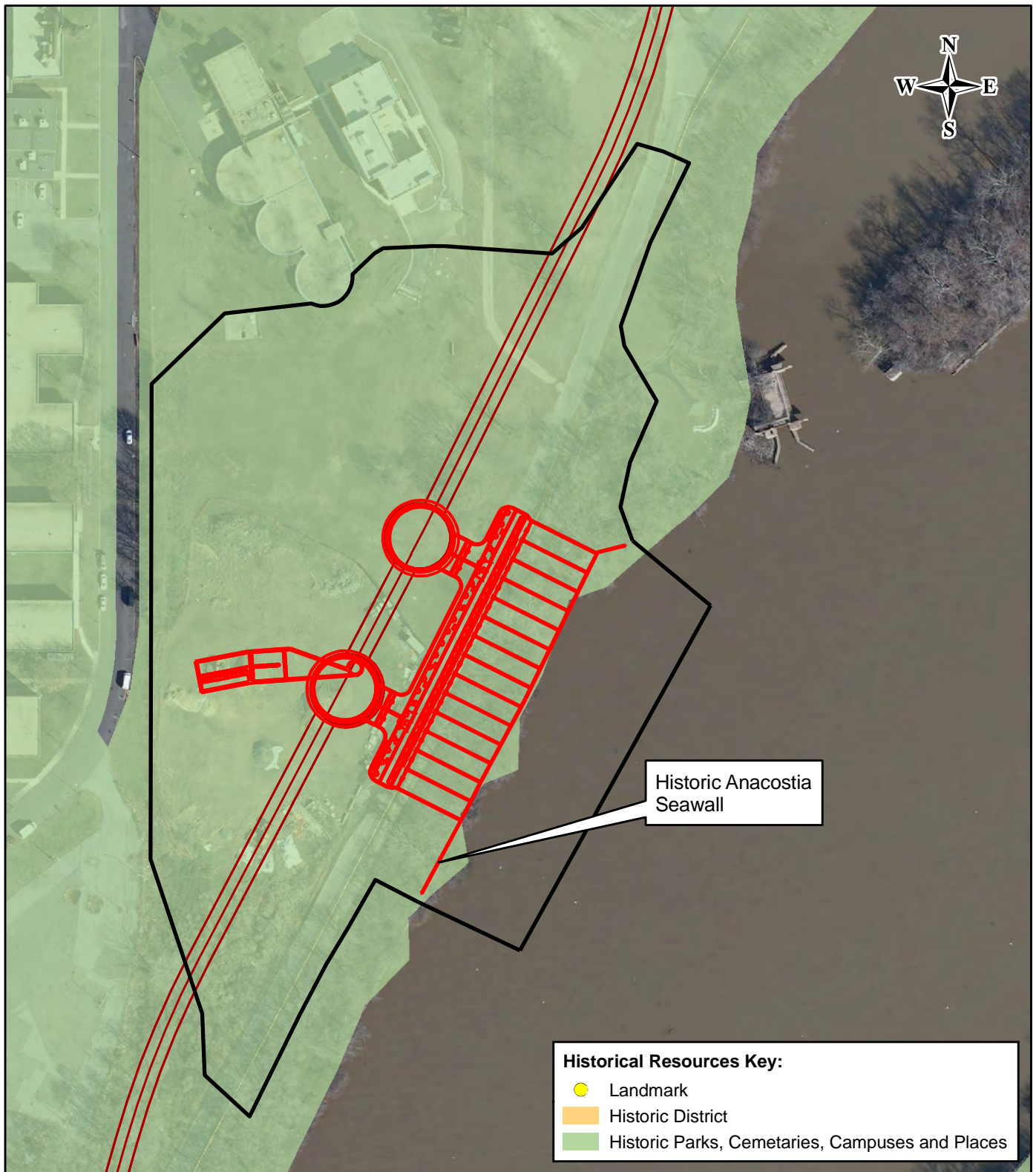
Legend:

- Project Facility
- Surface Disturbance Area
- Preferred Tunnel Alignment

Scale: 1 inch = 400 feet



Source: DC District Department of Transportation. 2005. Street Centerlines. Washington, D.C.; National Capital Planning Commission, National Park Service. DC GIS. 2002. LandmrkPly, Digital Vector Data. Washington, D.C.; District of Columbia Inventory of Historic Sites. DC GIS. 2002. LandmrkPt, Digital Vector Data. Washington, D.C.; D.C. Office of Planning. DC GIS. 2002. HistDisPly, Digital Vector Data. Washington, D.C.



**Figure 3.6-5:
Historic Structures
and Districts**

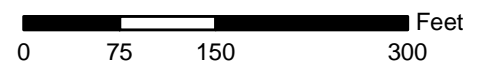
CSO 019 Overflow
and Diversion Facilities
Washington, D.C.



Legend:

- Project Facility
- Surface Disturbance Area
- Preferred Tunnel Alignment

Scale: 1 inch = 150 feet



Source: DC District Department of Transportation. 2005. Street Centerlines. Washington, D.C.; National Capital Planning Commission, National Park Service. DC GIS. 2002. LandmrkPly, Digital Vector Data. Washington, D.C.; District of Columbia Inventory of Historic Sites. DC GIS. 2002. LandmrkPt, Digital Vector Data. Washington, D.C.; D.C. Office of Planning. DC GIS. 2002. HistDisPly, Digital Vector Data. Washington, D.C.

archaeological resources because it is made land, but additional research and consultation with the Historic Preservation Office indicates that there is potential for canal remnants to be located within the artificial land surface.

- **CSO 005 and 007 Diversion Facilities:** No archaeological resources have been previously identified in this area. Most of this area is made land with no potential to contain archaeological resources. The southernmost portion of this surface disturbance area, in the vicinity of the NPS Park Police Headquarters, is located on the original land surface below fill. It has high potential to contain archaeological resources. However, the geoarcheological soil borings indicated that the entire surface disturbance area is located on made land with no archeological potential.
- **M Street Diversion Facilities:** No archaeological resources have been previously identified in the vicinity of the CSO 15 and 16 diversion chamber surface disturbance areas, and these areas contain no potential for archaeological resources because of existing sewer, roadway, and other utility disturbance. No archaeological resources have been identified in the vicinity of the CSO 17 diversion sewer or shaft. This area contains deep fill, much of it over made land, and utility disturbance. It has low potential to contain archaeological resources. Geoarcheological soil borings verified that this area is made land with extensive fill and has no potential to contain archaeological resources.
- **CSO 018 Diversion Facilities:** No archaeological resources have been previously identified in the vicinity of CSO 18 diversion facilities. Grading for road construction has likely destroyed any archaeological resources which may have existed in this area.
- **CSO 019 Overflow and Diversion Facilities:** The CSO 19 surface disturbance area contains one archaeological site (51SE30). Phase II archaeological investigations undertaken by Engineering Science, Inc. for DDOT's Barney Circle Freeway project in 1990 indicated that the site was a prehistoric lithic scatter. However, the recovery of only two fragments of non-diagnostic flaked stone indicated that it had a low level of significance. The report conclusions stated that no further work was recommended at this site, and it is therefore interpreted as ineligible for the NRHP. The majority of the surface disturbance area was previously within a side channel of the Anacostia River, and therefore has no potential to contain archaeological resources. However, the sub-area in the vicinity of the diversion structure is considered to have high potential to contain archaeological resources. Georcheological soil borings indicated that this sub-area is made land and has no potential to contain archaeological resources.

Because many of the project facilities would be located deep underground, underneath existing layers of fill, geoarchaeology can be used to identify in-tact land surfaces beneath the fill.

3.6.2 Historic Structures and Districts

National Register-eligible or listed historic structures and districts are located in close proximity to six surface disturbance areas.

- **Blue Plains Advanced Waste Water Treatment Plant Facilities:** The digesters, located within the surface disturbance area, are an element of the Wastewater Treatment Plant. The Waste Water Treatment Plant has been determined to be eligible for the NRHP.
- **Bolling Air Force Base Overflow and Diversion Facilities:** The surface disturbance area is located adjacent and to the north of the BAFB National Register Historic District.
- **Poplar Point Pumping Station:** The existing Poplar Point Pumping Station is adjacent and northwest of this surface disturbance area. It has been determined to be eligible for the NRHP.

- **Main Pumping Station Diversion Facilities:** The DC WASA Main Pumping Station is adjacent and to the north of this surface disturbance area and has been determined to be eligible for the NRHP.
 - **CSO 005 and 007 Diversion Facilities:** The surface disturbance area is located within Anacostia Park, which has been determined eligible for the NRHP.
 - **M Street Diversion Facilities:** The CSO 015 diversion chamber surface disturbance area is located adjacent and to the north of the National Register-listed Washington Navy Yard Historic District.
 - **CSO 018 Diversion Facilities:** No historic structures or districts are located in the vicinity of this surface disturbance area.
 - **CSO 019 Overflow and Diversion Facilities:** The Anacostia Seawall, a National Register-eligible resource, is located within this surface disturbance area.
- The Cultural Resources Coordination Summary is located in **Appendix H**.

3.7 Aesthetic Resources

Aesthetic resources include natural landscapes, attractive architecture, scenic vistas, and other desirable aspects of both natural and man-made views that could be impacted by the proposed project. DC WASA assessed aesthetic resources by identifying parks and other recreational resources in the study area based on mapping and existing studies prepared by the National Capital Planning Commission (NCPC). DC WASA also conducted field visits to assess the condition of proposed construction sites to identify any scenic features that might be impacted by the proposed project.

Aesthetics vary at each proposed surface disturbance area and depend upon the existing land use and natural features. A portion of the study area would be located in Anacostia Park. Anacostia Park is a unit of the National Park System and consists of 1,200 acres along five miles of the Anacostia River shoreline, from the Frederick Douglas Memorial Bridge north to the District/Maryland line. This urban park is a multi-use recreational park with extensive shoreline access. It includes trails, boat launches, picnic areas, a swimming pool, a multi-use pavilion, and other amenities.

The *Comprehensive Plan for the National Capital: Federal Elements* (District Office of Planning, 2006) identifies a number of scenic resources in the study area. Under the *Comprehensive Plan*, scenic resources to be preserved include the Anacostia Waterfront and the Anacostia Hills, which are forested bluffs along the Anacostia River. The visual characteristics of each surface disturbance area are described below.

- **BPAWWTP Facilities:** This area is located on DC WASA's BPAWWTP and is surrounded by buildings, trailers, and facilities designed to support the wastewater treatment operations. From the BPAWWTP, the east bank of the Potomac River is visible. The east bank area includes scenic resources such as Old Town Alexandria, Daingerfield Island and the Mount Vernon Trail. Daingerfield Island and the Mount Vernon Trail are recreational resources associated with the George Washington Memorial Parkway, administered by the National Park Service.
- **BAFB Overflow and Diversion Facilities:** This area is located on BAFB, in a well maintained open area between the Potomac River and some ball fields. This area includes a pedestrian path with occasional benches, on which people can stop to observe the river.
- **Poplar Point Pumping Station:** This area is located on three unpopulated traffic islands in between various roadways.

- **Tingey Street Diversion Facilities and Main Pumping Station Diversion Facilities:** This area is located along Tingey Street SE and on the existing Main Pumping Station site. There is currently an existing public courtyard near the Tingey Street SE and New Jersey Avenue SE intersection, and development along the street is ongoing. The proposed development will consist of mixed-use facilities that are being designed to attract future residents, businesses, and patrons.
- **CSO 005 & 007 Diversion Facilities:** This area is located within Anacostia Park along a private roadway between the NPS Park Police building and a grassy area to the west, and a vegetative buffer to the east. A nearby heliport and ball field are located just outside of the surface disturbance area.
- **CSO 018 Diversion Facilities:** This area is located within grassy areas adjacent to the I-295 and Pennsylvania Avenue SE interchange. The diversion facilities would be constructed on the underpass adjacent to a major roadway. A portion of the overpass is also included in the study area, which is adjacent to a residential community, and along a major roadway and a fast food facility.
- **M Street Diversion Facilities:** This area is located along M Street SE near Parson's Avenue SE, 12th Street SE, and Water Street. M Street SE near Parson's Avenue SE is a well maintained, developed corridor. M Street SE near 12th Street SE is currently under construction in the vicinity of an overpass. The setting along M Street SE near Water Street generally consists of a pedestrian path, trees, and other vegetation; while cars and construction vehicles park within breaks in the vegetative cover and along the roadway.
- **CSO 019 Overflow and Diversion Facilities:** This area is located within a vegetated portion of Anacostia Park, between the Anacostia River and the Anacostia Riverwalk. Various parking lots and other poorly maintained paved areas containing construction equipment are located immediately east of the path.

3.8 Land Use

Within municipalities, comprehensive plans are generally used to guide land use within a defined area. Construction projects have the potential to alter existing land use, or to induce future land use, preferably in accordance with established comprehensive plans. DC WASA used the District's Geographic Information System (GIS) spatial data, including 2004 land use delineations developed for the *Comprehensive Plan* (District Office of Planning, 2006), to identify existing land uses. Within the study area, existing land uses include: federal, public, parklands, residential, commercial, open space, institutional, mixed, and water uses. Surface disturbance would take place mostly on public, federal, and parkland. Various land uses exist above the alignment for the BPT and ART (see **Figure 3.8.1** through **3.8-16**). **Table 3.8-1** shows the existing land use categories associated with each of the surface disturbance areas. The area adjacent to the Tingey Street Diversion Sewers has recently undergone redevelopment and is currently undergoing additional redevelopment; therefore, the existing land use identified below has changed during the development of this EA. The District Office of Planning uses the following land use categories:

- **Low Density Residential:** Defines the District's single family neighborhoods. Single family detached and semi-detached housing units with front, back, and side yards are the predominant uses.
- **Moderate Density Residential:** Defines the District's row house neighborhoods as well as its low-rise garden apartment complexes. This category also applies to areas characterized by a mix of single family homes, 2-4 unit buildings, row houses, and low-rise apartment buildings. In

1 some older inner city neighborhoods with this designation, there may also be existing multi-
2 story apartments.

- 3 • **Medium Density Residential:** Defines neighborhoods or areas where mid-rise (4-7 stories)
4 apartment buildings are the predominant use. Pockets of low and moderate density housing
5 may exist within these areas. This designation may also apply to taller residential buildings
6 surrounded by larger areas of permanent open space.
- 7 • **High Density Residential:** Defines neighborhoods and corridors where high-rise (8 stories or
8 more) apartment buildings are the predominant use. Pockets of less dense housing may exist
9 within these areas.
- 10 • **Commercial:** Defines shopping and service areas that are predominantly retail, office, and
11 service business uses.
- 12 • **Federal:** Includes land and facilities owned, occupied and used by the federal government,
13 excluding parks and open space. Uses include military bases, federal government buildings, the
14 International Chancery Center, federal hospitals, and similar federal government activities. The
15 “Federal” category generally denotes ownership rather than use. Land with this designation is
16 generally not subject to zoning.
- 17 • **Public:** Includes land and facilities occupied and used by the District government or other local
18 government agencies (such as WMATA), excluding parks and open space. Uses include public
19 schools including charter schools, public hospitals, government office complexes, and similar
20 local government activities.
- 21 • **Institutional:** Includes land and facilities occupied and used by colleges and universities, large
22 private schools, hospitals, religious organizations, and similar institutions.
- 23 • **Parks, Recreation, and Open Space:** Includes the federal and District park systems, including
24 the Nationals Parks; the circles and squares of the L’Enfant city and District neighborhoods; the
25 National Mall; settings for significant commemorative works; certain federal buildings such as
26 the White House and the U.S. Capitol grounds and museums, and District-operated parks and
27 associated recreation centers. It also includes permanent open space uses such as cemeteries,
28 open space associated with utilities such as the Dalecarlia and McMillan Reservoirs, and open
29 space along highways such as Suitland Parkway. This category includes a mix of passive open
30 space (for resource conservation and habitat protection) and active open space (for recreation).
- 31 • **Mixed:** Areas where the mixing of two or more land uses is encouraged. These are shown in the
32 figures within this EA as striped patterns. The colors of the stripes correspond to the specific
33 land uses. The general density and intensity of development within a Mixed Use area is
34 determined by the specific mix of uses. If the desired outcome is to emphasize one use over the
35 other (for example, ground floor retail with three stories of housing above), the figure may
36 indicate the dominant use by showing it at a slightly higher density (in this case, “Moderate
37 Density Residential/Low Density Commercial”). The Comprehensive Plan Area Elements may
38 also provide additional detail on the specific mix of uses envisioned.

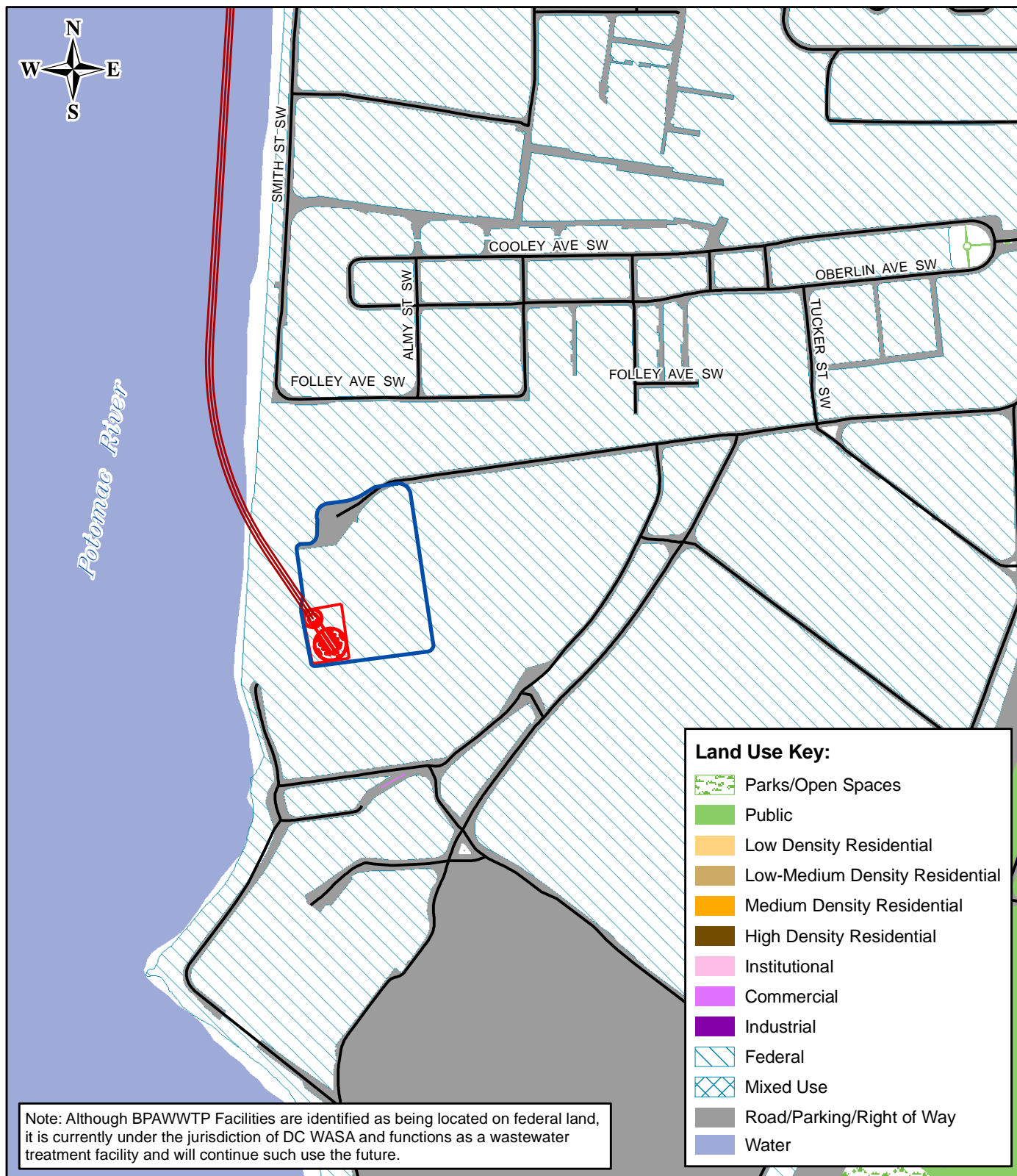
39 DC WASA used GIS spatial data from the District’s *Comprehensive Plan* (District Office of Planning,
40 2006), which shows the areas of the city that are planned for various uses. These uses include public
41 land, residential and commercial (at various densities), institutional, federal, and industrial uses. Future
42 land use planned within each surface disturbance area is identified in **Table 3.8-1**. Although
43 **Figure 3.8-1** and **Figure 3.8-9** identify the BPAWWTP Facilities as being located on federal and public
44 land, it is currently under the jurisdiction of DC WASA and functions as a wastewater treatment facility
45 and will continue into the future.

BAFB Overflow and Diversion Facilities, and Tingey Street Diversion Sewers and Main Pumping Station Diversion Facilities areas are located on existing federal land. Public land use currently exists at the Tingey Street Diversion Sewers and Main Pumping Station Diversion Facilities surface disturbance areas. Parkland exists in the following surface disturbance areas: CSO 005 & 007 Diversion Facilities, M Street Diversion Facilities, and CSO 019 Overflow and Diversion Facilities. Water uses currently exist at both the BAFB Overflow and Diversion Facilities and the CSO 019 Overflow and Diversion Facilities surface disturbance areas. Existing commercial land use occurs at the Tingey Street Diversion Sewers, Main Pumping Station Diversion Facilities, and M Street Diversion Facilities surface disturbance areas.

Table 3.8-1: Land Use

Surface Disturbance Area	Figures	Existing Land Use	Future Land Use
BPAWWTP Facilities	3.8-1 3.8-9	Federal*	Public*
		Roads/Parking/ROW*	Parks/Open Space*
BAFB Overflow and Diversion Facilities	3.8-2 3.8-10	Water	Federal
		Federal	Water
			Parks/Recreation/Open Space
Poplar Point Pumping Station	3.8-3 3.8-11	Roads/Parking/ROW	Parks/Recreation/Open Space
Tingey Street Diversion Sewers and Main Pumping Station Diversion Facilities	3.8-4 3.8-12	Public	Mixed
		Federal	Federal
		Commercial	Parks/Recreation/Open Space
		Roads/Parking/ROW	
CSO 005 & 007 Diversion Facilities	3.8-5 3.8-13	Parks/Open Space	Parks/Recreation/Open Space
		Roads/Parking/ROW	
CSO 018 Diversion Facilities	3.8-6 3.8-14	Roads/Parking/ROW	Medium Density Residential
		Low Density Residential	Parks/Recreation/Open Space
M Street Diversion Facilities	3.8-7 3.8-15	Parks/Open Space	Parks/Recreation/Open Space
		Roads/Parking/ROW	Mixed
		Commercial	Production/Distribution/Repair
			Federal
CSO 019 Overflow and Diversion Facilities	3.8-8 3.8-16	Parks/Open Space	Parks/Recreation/Open Space
		Water	Water
* BPAWWTP is currently under the jurisdiction of DC WASA and functions as a wastewater treatment facility and will continue into the future.			

Although planned uses and current uses may be similar, future land use is a generalized product and cannot be used to identify specific uses for individual locations in the District. Future land use within and surrounding the study area will be influenced by the comprehensive planning documents that are listed in **Table 3.8-2**.



**Figure 3.8-1:
Existing Land Use Map**

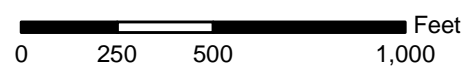
BPAWWTP Facilities
Washington, D.C.

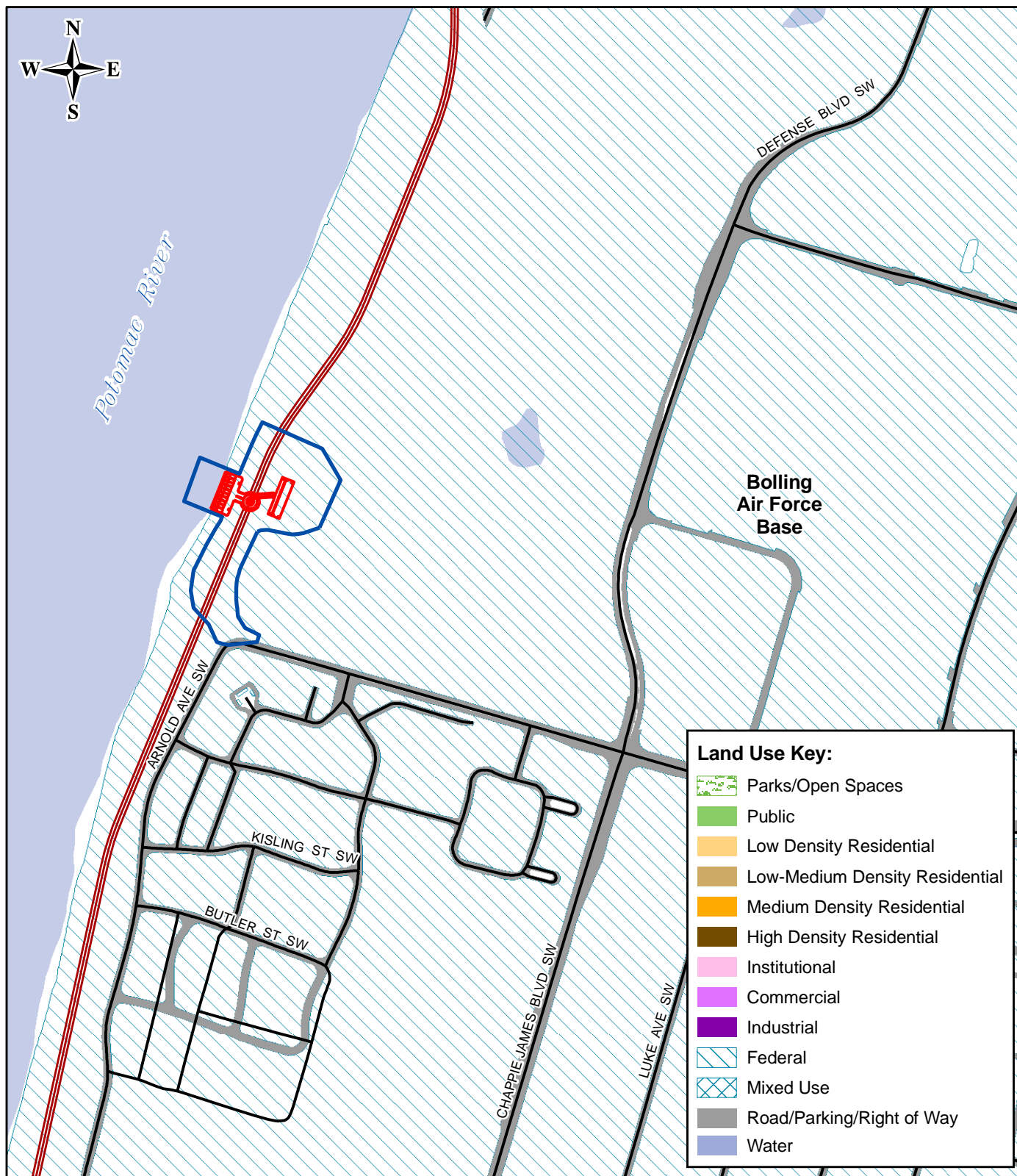


Legend:

- Project Facility
- Surface Disturbance Area
- Preferred Tunnel Alignment
- Existing Road

Scale: 1 inch = 500 feet





**Figure 3.8-2:
Existing Land Use Map**

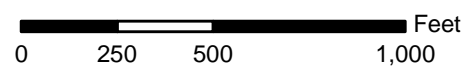
Bolling Air Force Base Overflow
and Diversion Facilities
Washington, D.C.

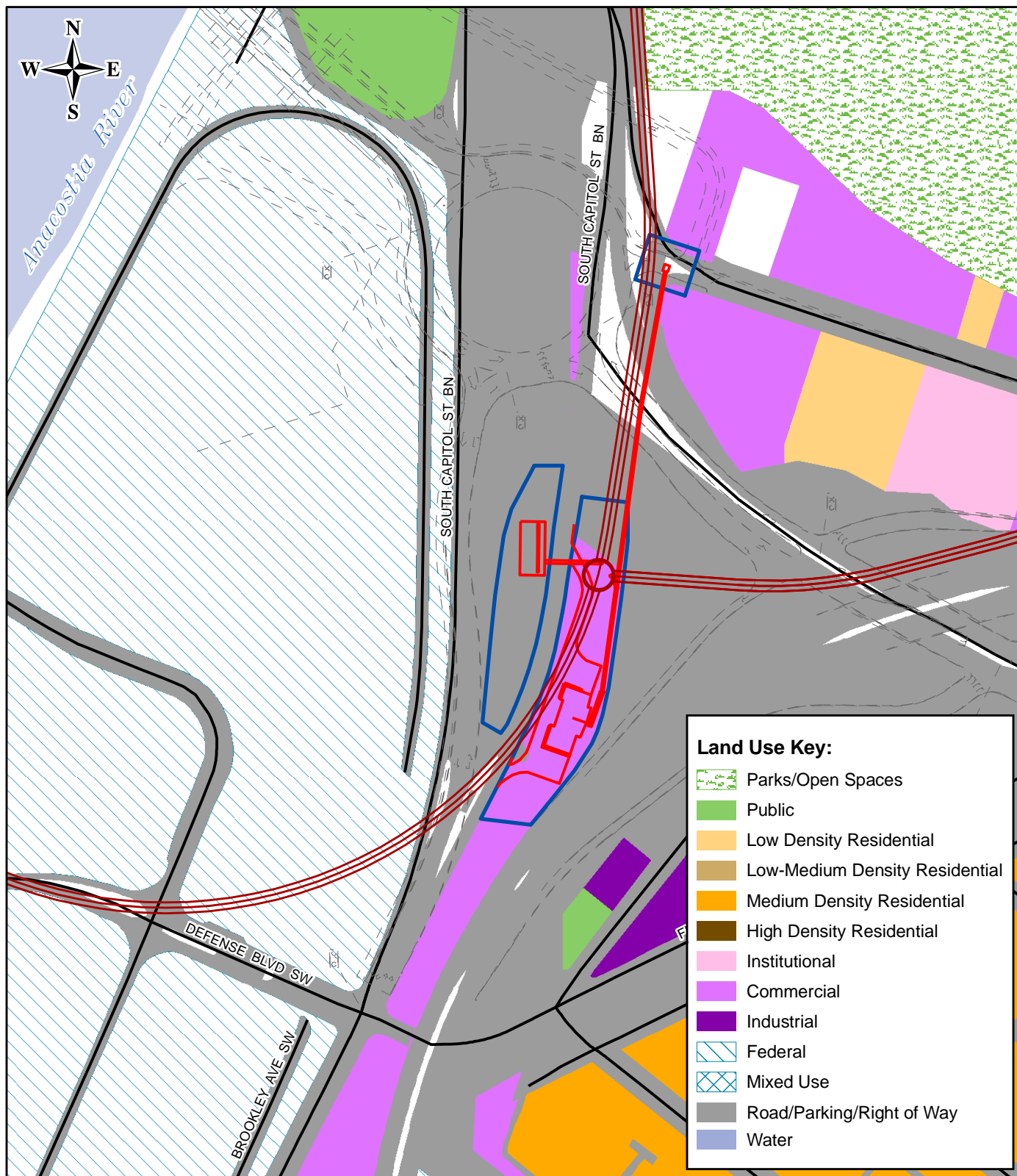


Legend:

- Project Facility
- Surface Disturbance Area
- Preferred Tunnel Alignment
- Existing Road

Scale: 1 inch = 500 feet





**Figure 3.8-3:
Existing Land Use Map**

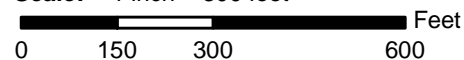
Poplar Point Pumping Station
Washington, D.C.



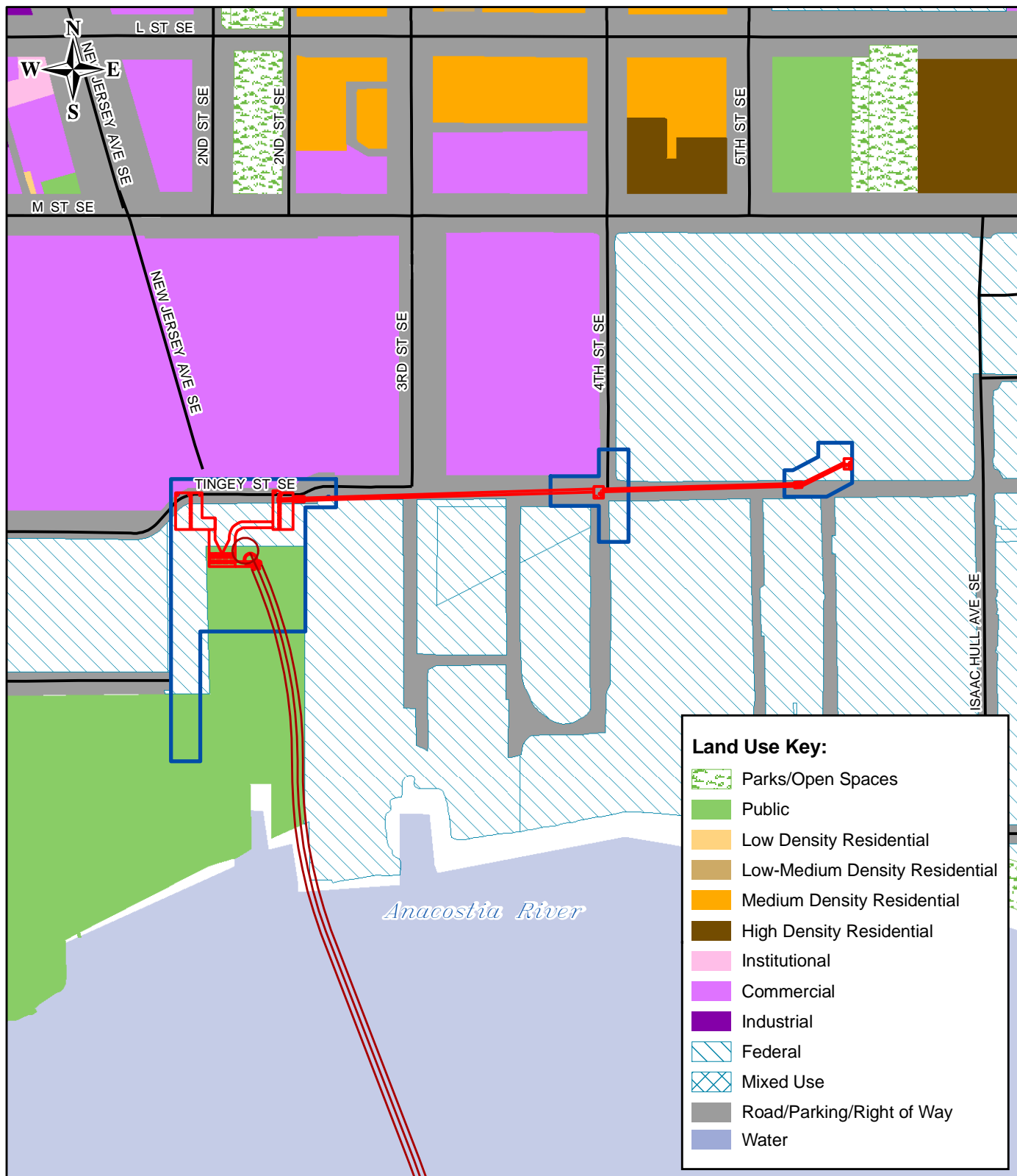
Legend:

- Project Facility
- Surface Disturbance Area
- Preferred Tunnel Alignment
- New Road Alignment
- Existing Road

Scale: 1 inch = 300 feet



Source: DC Office of Planning. 2005. Existing Landuse. Washington, DC.



**Figure 3.8-4:
Existing Land Use Map**

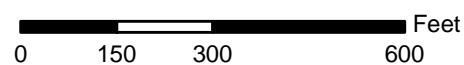
Tingey Street Diversion Sewers
and Main Pumping Station
Diversion Facilities
Washington, D.C.

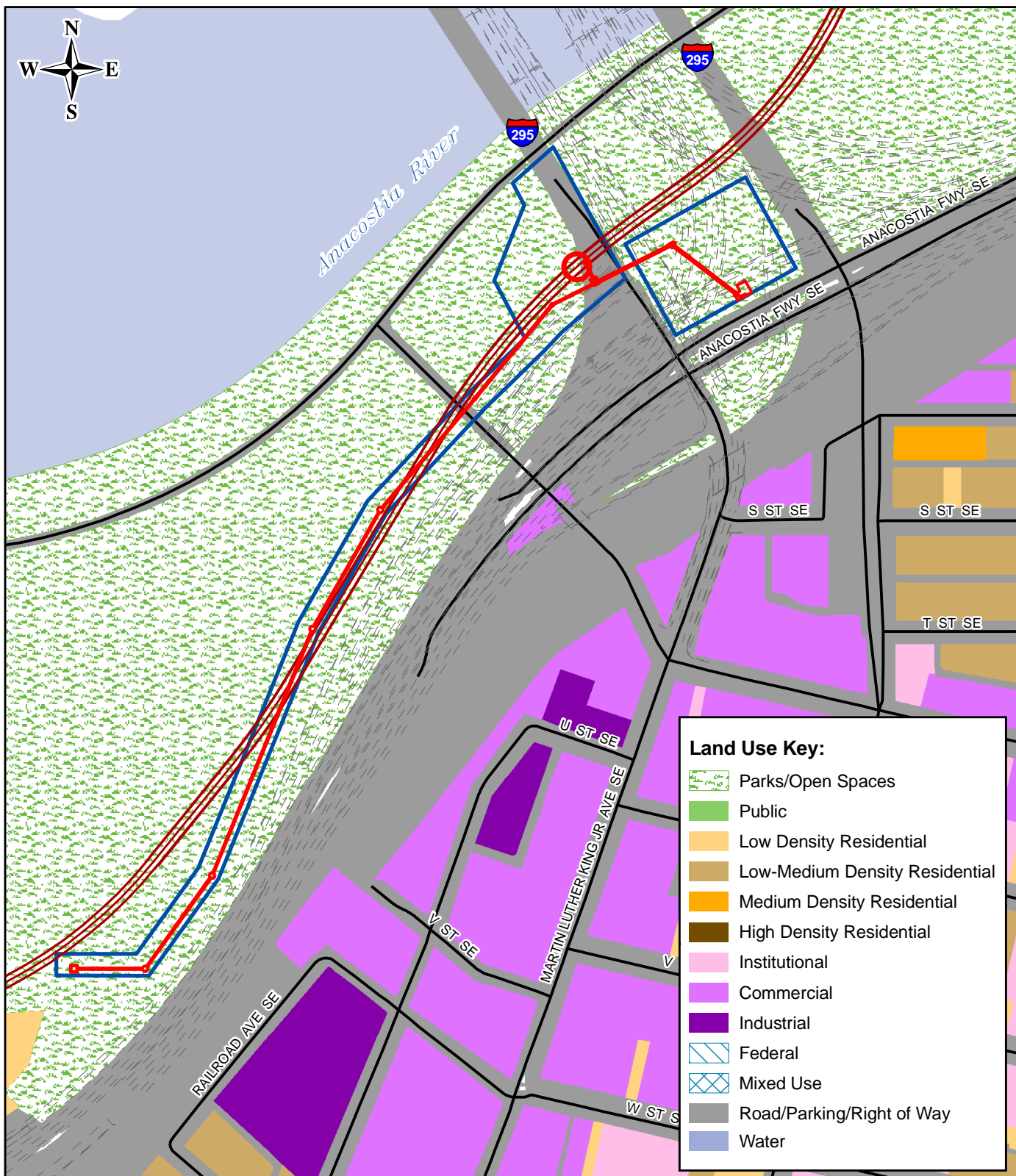


Legend:

- Project Facility
- Surface Disturbance Area
- Preferred Tunnel Alignment
- Existing Road

Scale: 1 inch = 300 feet





**Figure 3.8-5:
Existing Land Use Map**

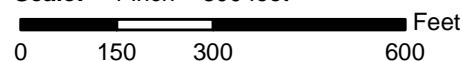
CSO 005 & 007 Diversion Facilities
Washington, D.C.

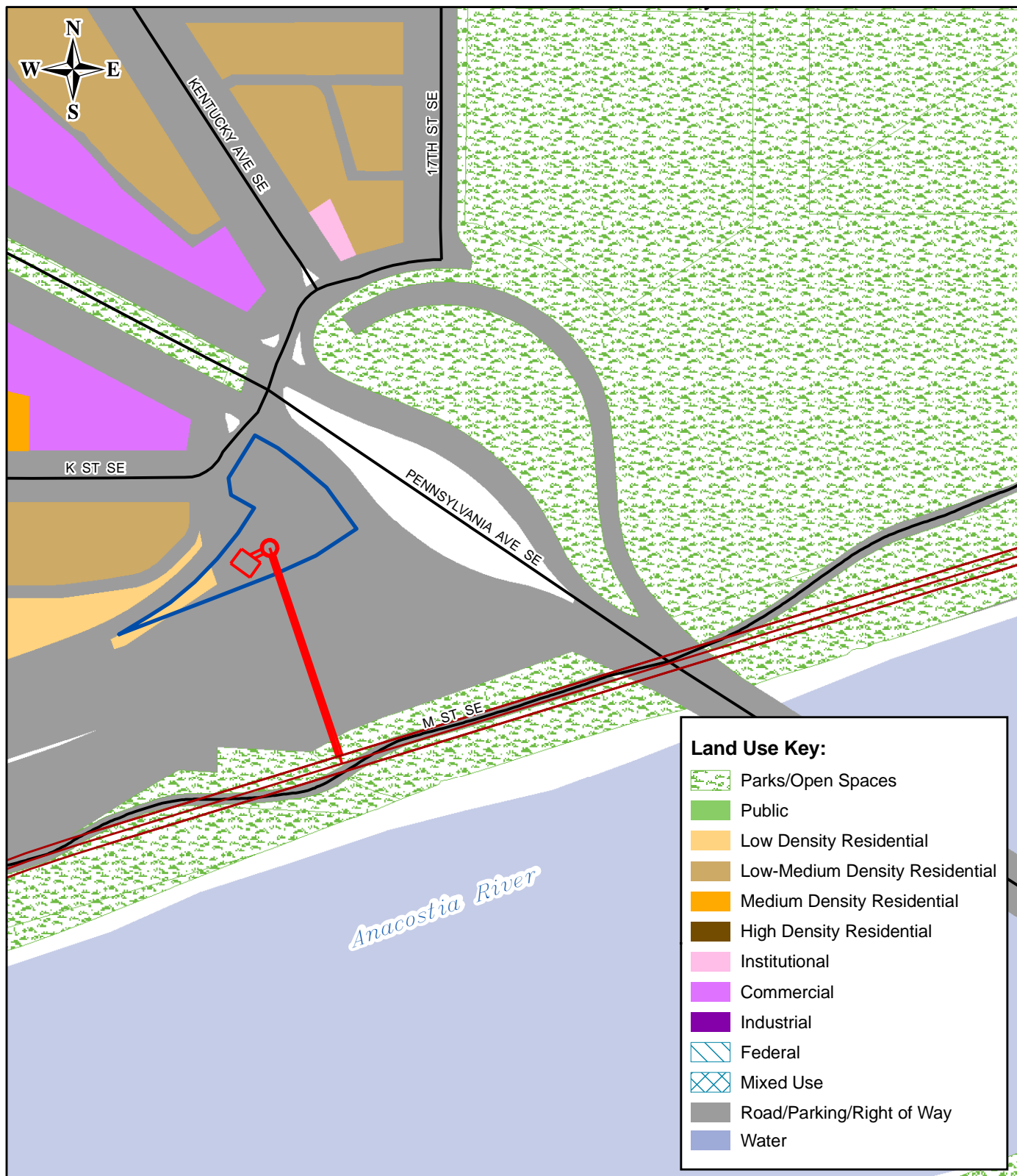


Legend:

- Project Facility
- Surface Disturbance Area
- Preferred Tunnel Alignment
- New Road Alignment
- Existing Road

Scale: 1 inch = 300 feet

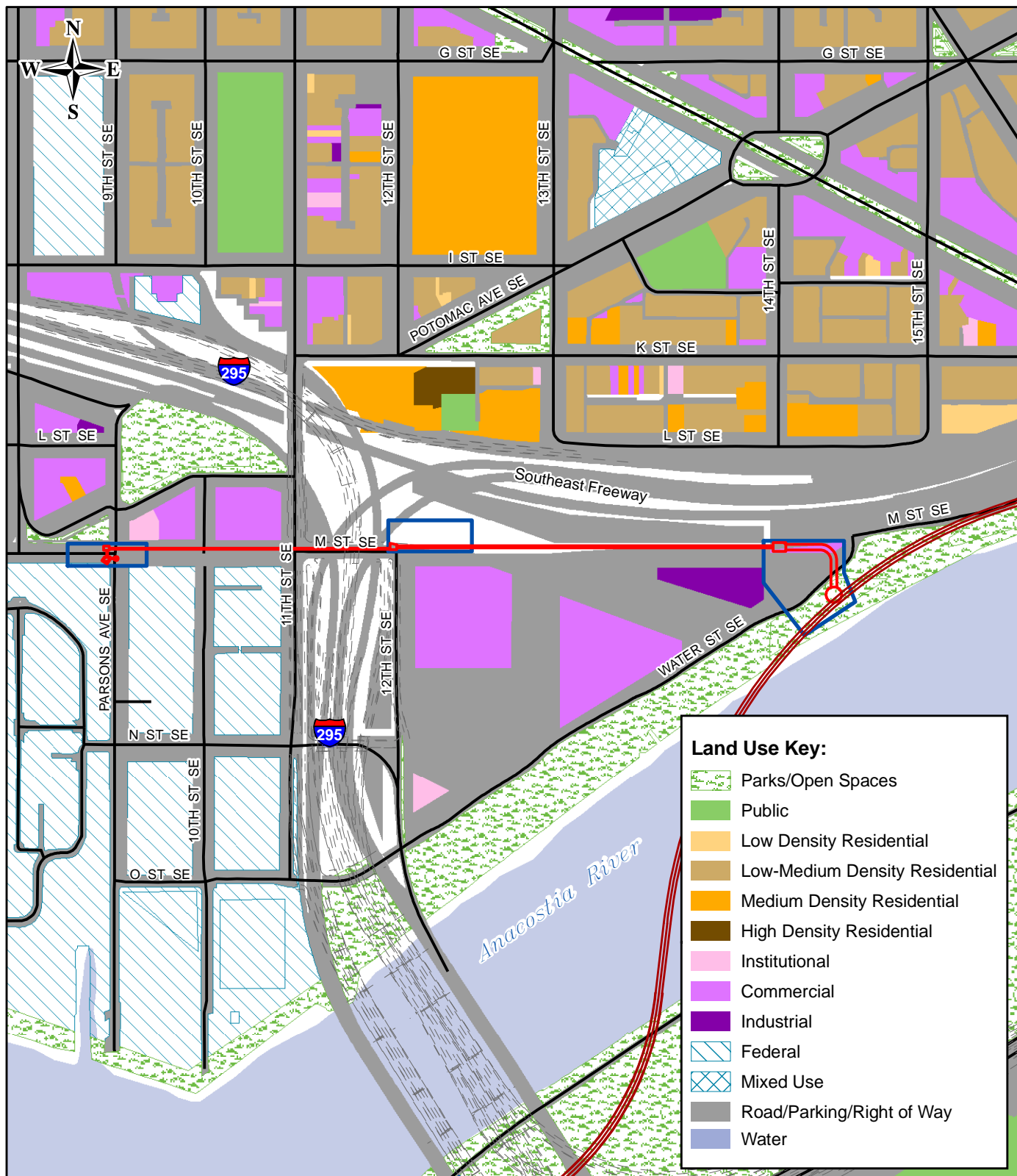




**Figure 3.8-6:
Existing Land Use Map**

CSO 018 Diversion Facilities
Washington, D.C.





**Figure 3.8-7:
Existing Land Use Map**

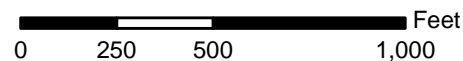
M Street Diversion Facilities
Washington, D.C.

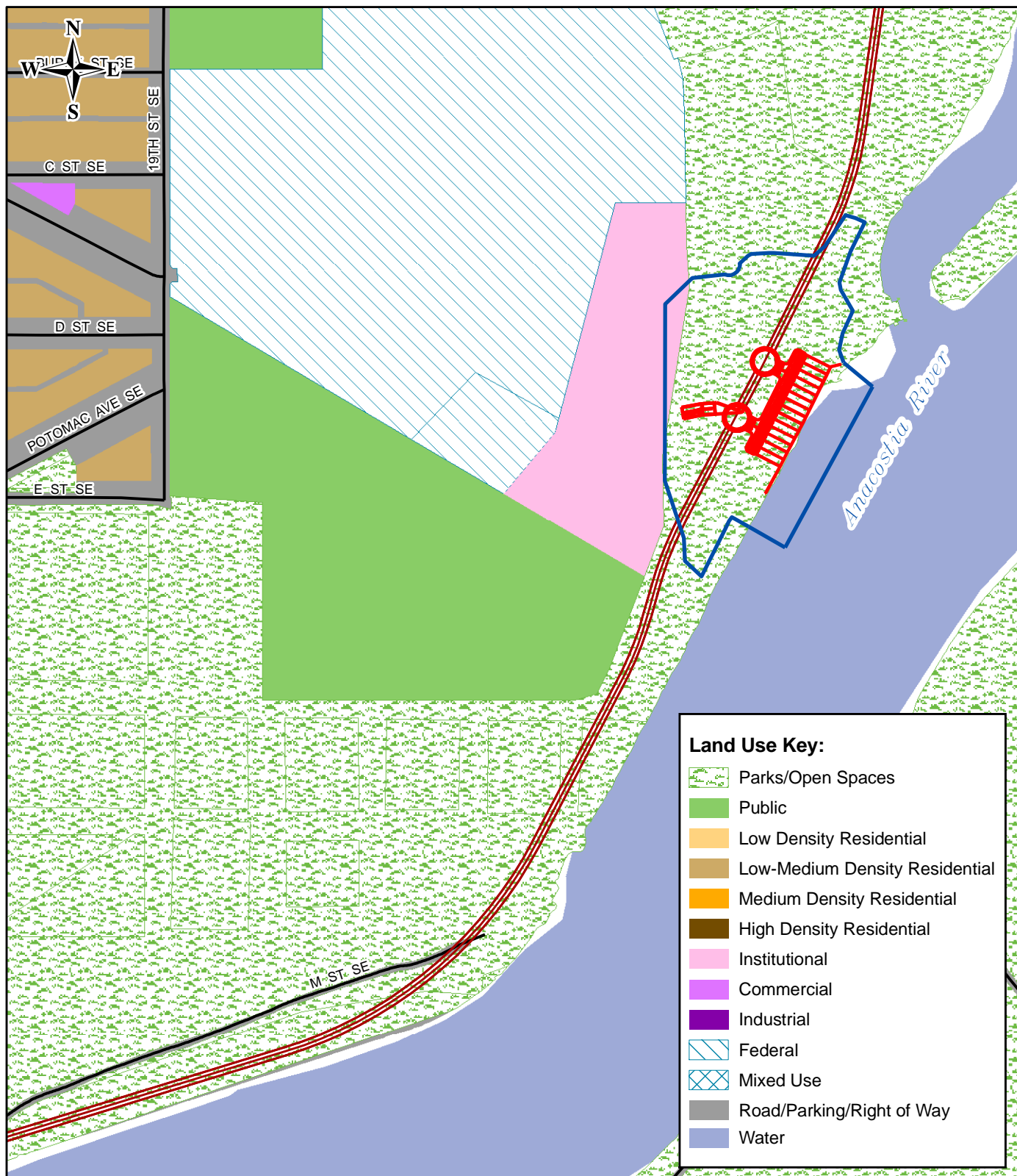


Legend:

- Project Facility
- Surface Disturbance Area
- Preferred Tunnel Alignment
- New Road Alignment
- Existing Road

Scale: 1 inch = 500 feet





**Figure 3.8-8:
Existing Land Use Map**

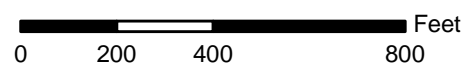
CSO 019 Overflow and
Diversion Facilities
Washington, D.C.

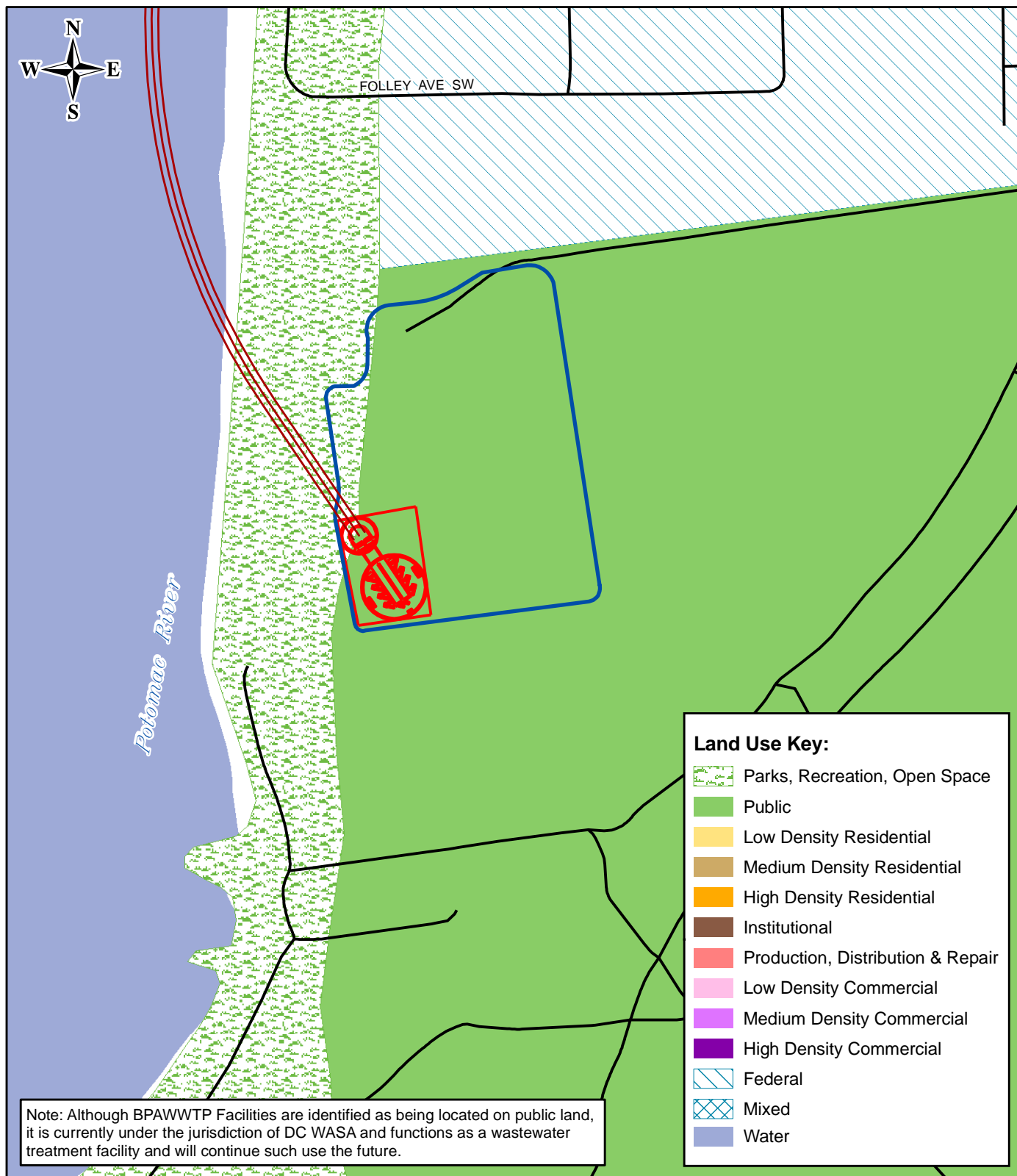


Legend:

- Project Facility
- Surface Disturbance Area
- Preferred Tunnel Alignment
- Existing Road

Scale: 1 inch = 400 feet





**Figure 3.8-9:
Future Land Use Map**

BPAWWTP Facilities
Washington, D.C.

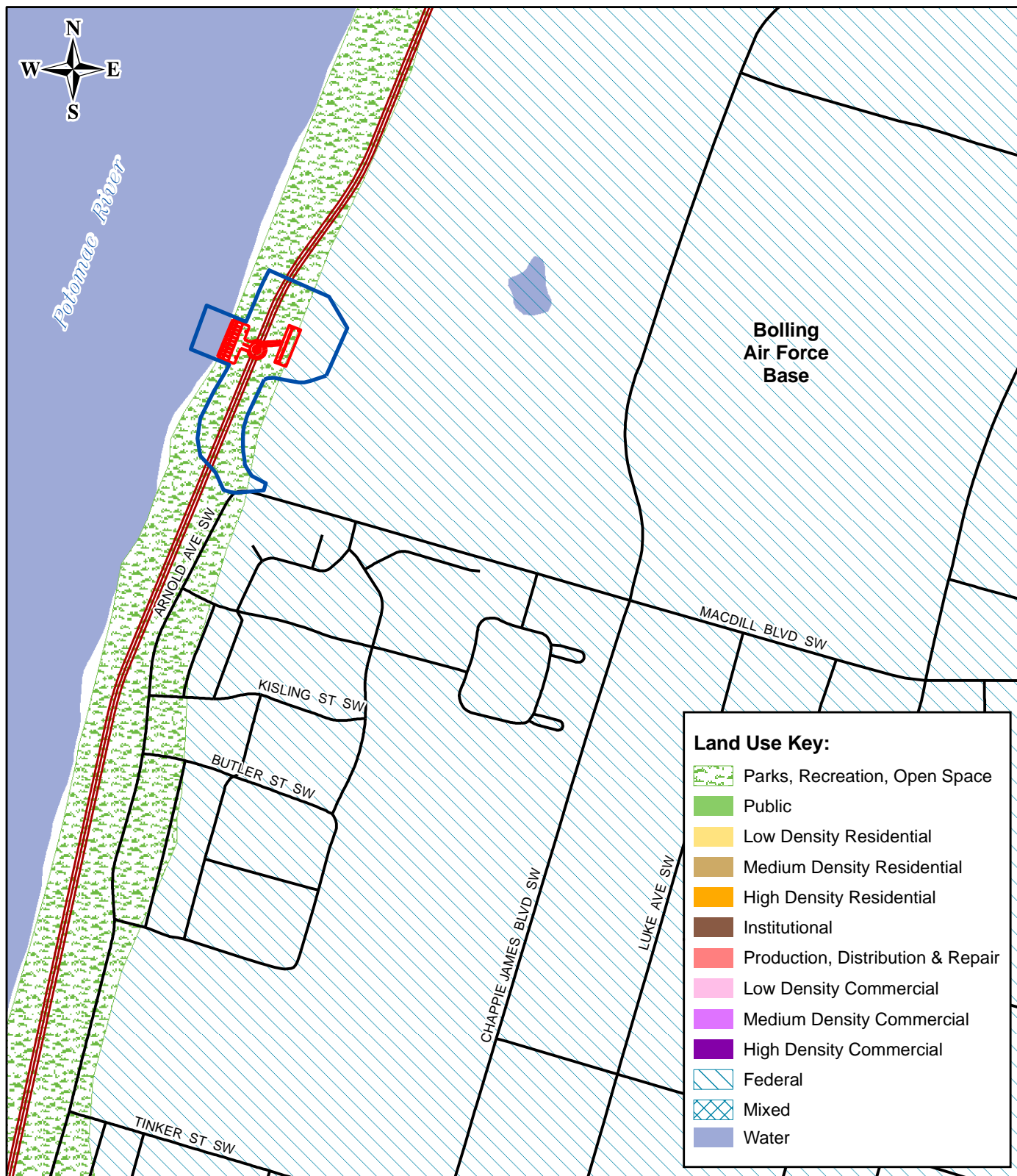


Legend:

- Project Facility
- Surface Disturbance Area
- Preferred Tunnel Alignment
- Existing Road

Scale: 1 inch = 250 feet
0 125 250 500 Feet

Source: DC Office of Planning. 2006. Planned Landuse from the 2006 DC Comprehensive Plan. Washington, DC.



**Figure 3.8-10:
Future Land Use Map**

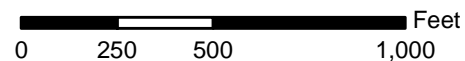
Bolling Air Force Base Overflow
and Diversion Facilities
Washington, D.C.



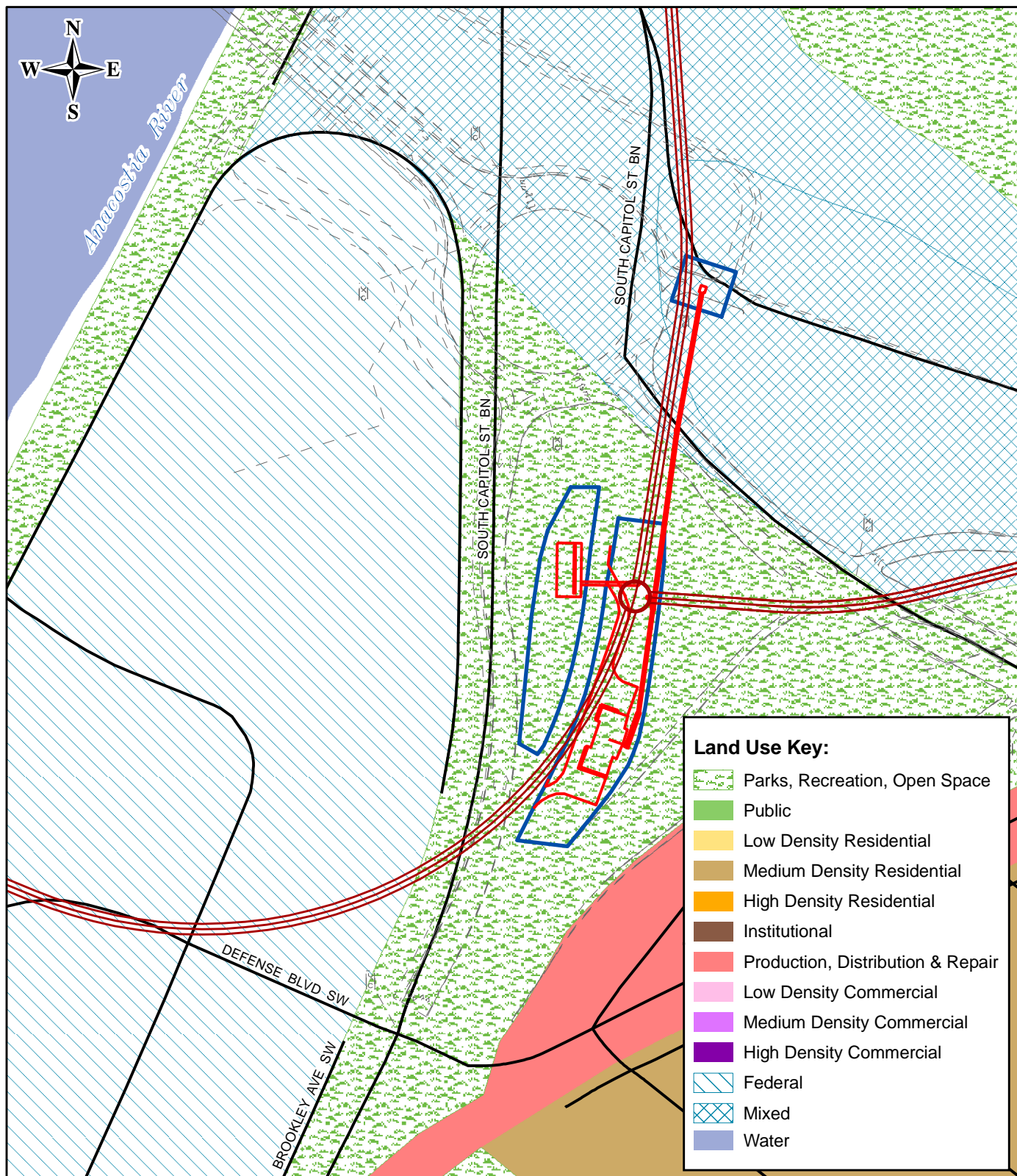
Legend:

- Project Facility
- Surface Disturbance Area
- Preferred Tunnel Alignment
- Existing Road

Scale: 1 inch = 500 feet



Source: DC Office of Planning, 2006. Planned Landuse from the 2006 DC Comprehensive Plan. Washington, DC.



**Figure 3.8-11:
Future Land Use Map**

Poplar Point Pumping Station
Washington, D.C.

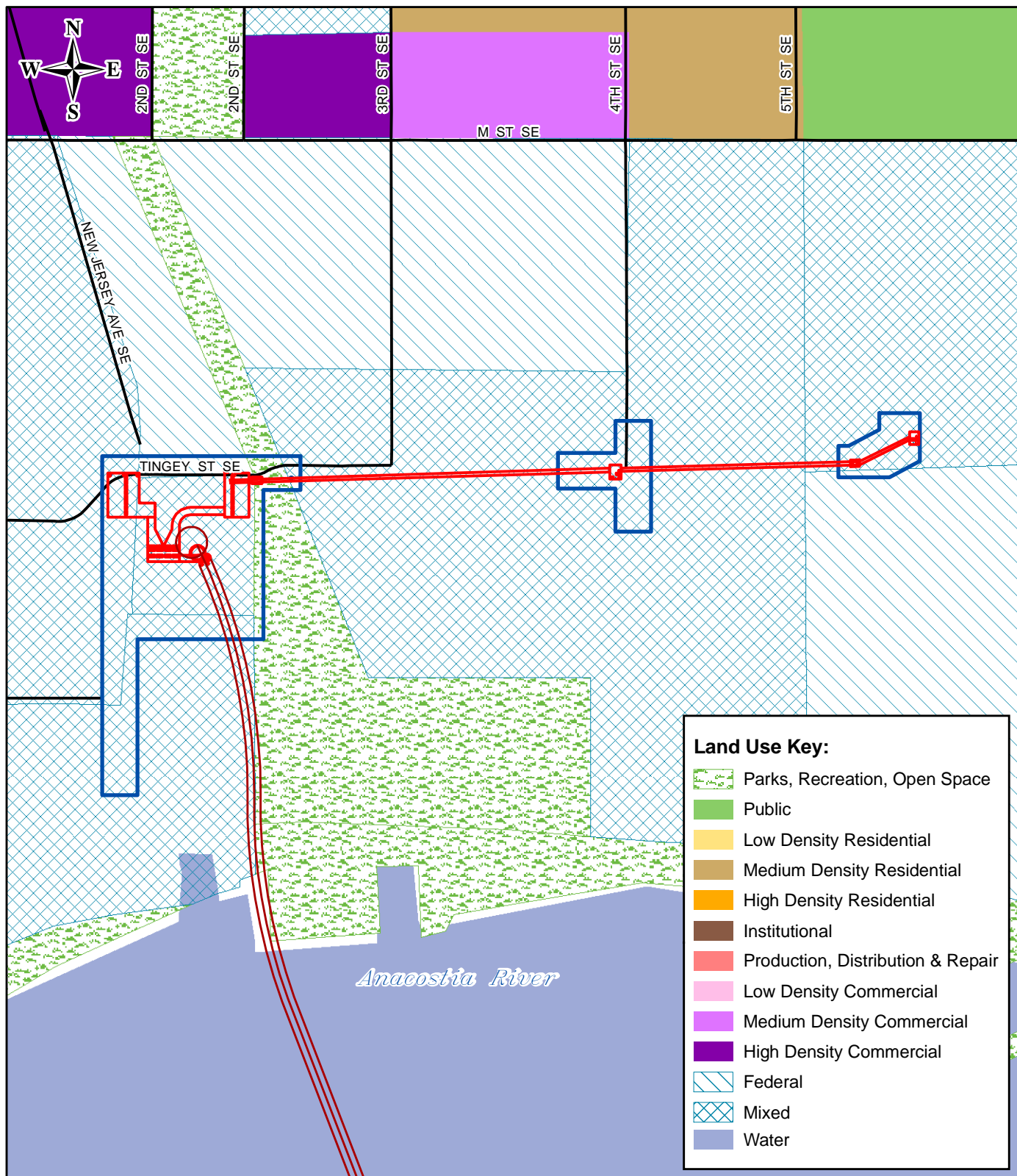


Legend:

- Project Facility
- Surface Disturbance Area
- Preferred Tunnel Alignment
- New Road Alignment
- Existing Road

Scale: 1 inch = 300 feet
0 150 300 600 Feet

Source: DC Office of Planning. 2006. Planned Landuse from the 2006 DC Comprehensive Plan. Washington, DC.



**Figure 3.8-12:
Future Land Use Map**

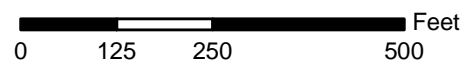
Tingey Street Diversion Sewers
and Main Pumping Station
Diversion Facilities
Washington, D.C.



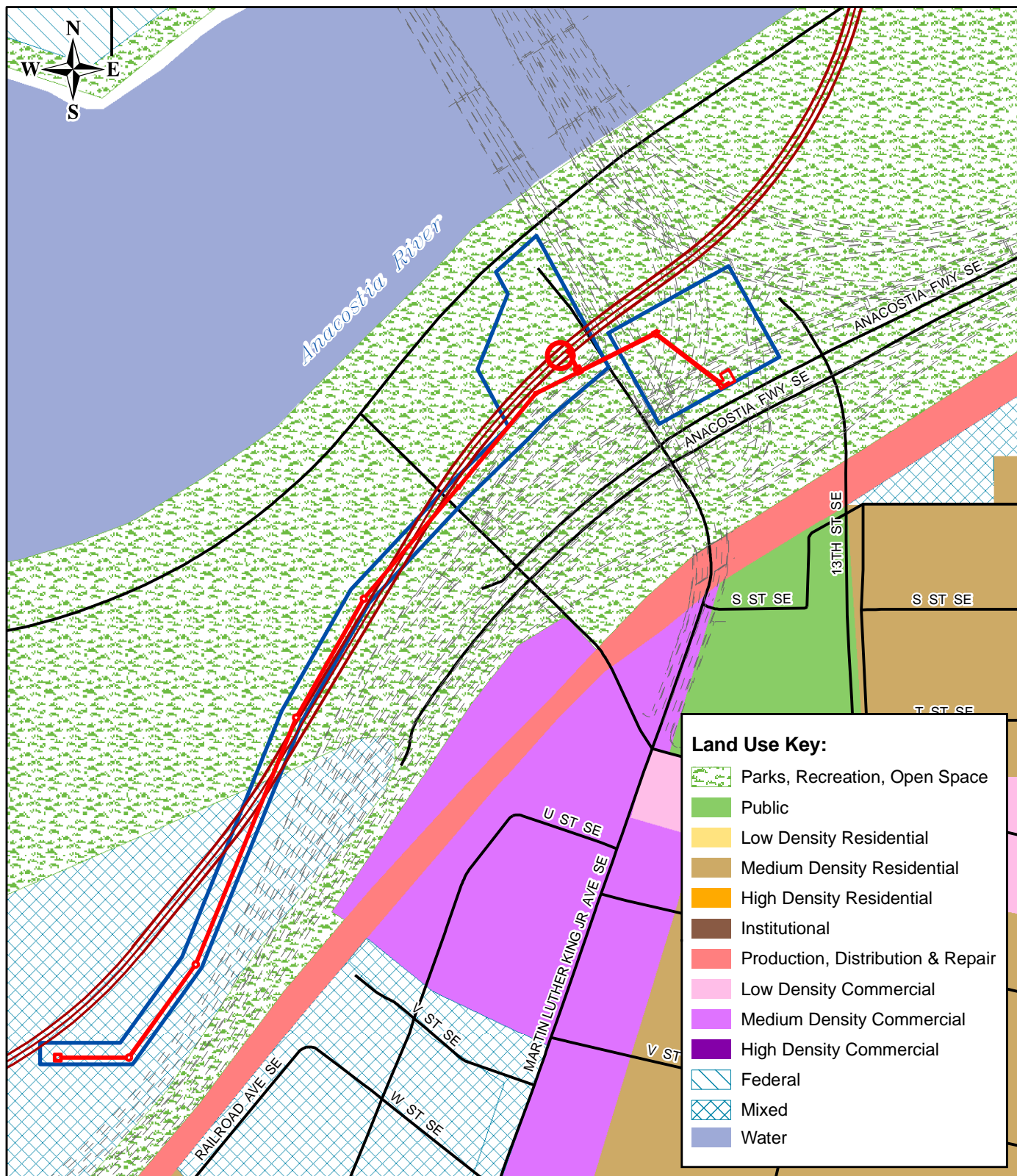
Legend:

- Project Facility
- Surface Disturbance Area
- Preferred Tunnel Alignment
- Existing Road

Scale: 1 inch = 250 feet



Source: DC Office of Planning, 2006. Planned Landuse from the 2006 DC Comprehensive Plan. Washington, DC.



**Figure 3.8-13:
Future Land Use Map**

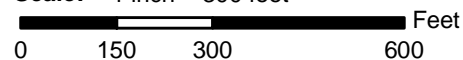
CSO 005 & 007 Diversion Facilities
Washington, D.C.



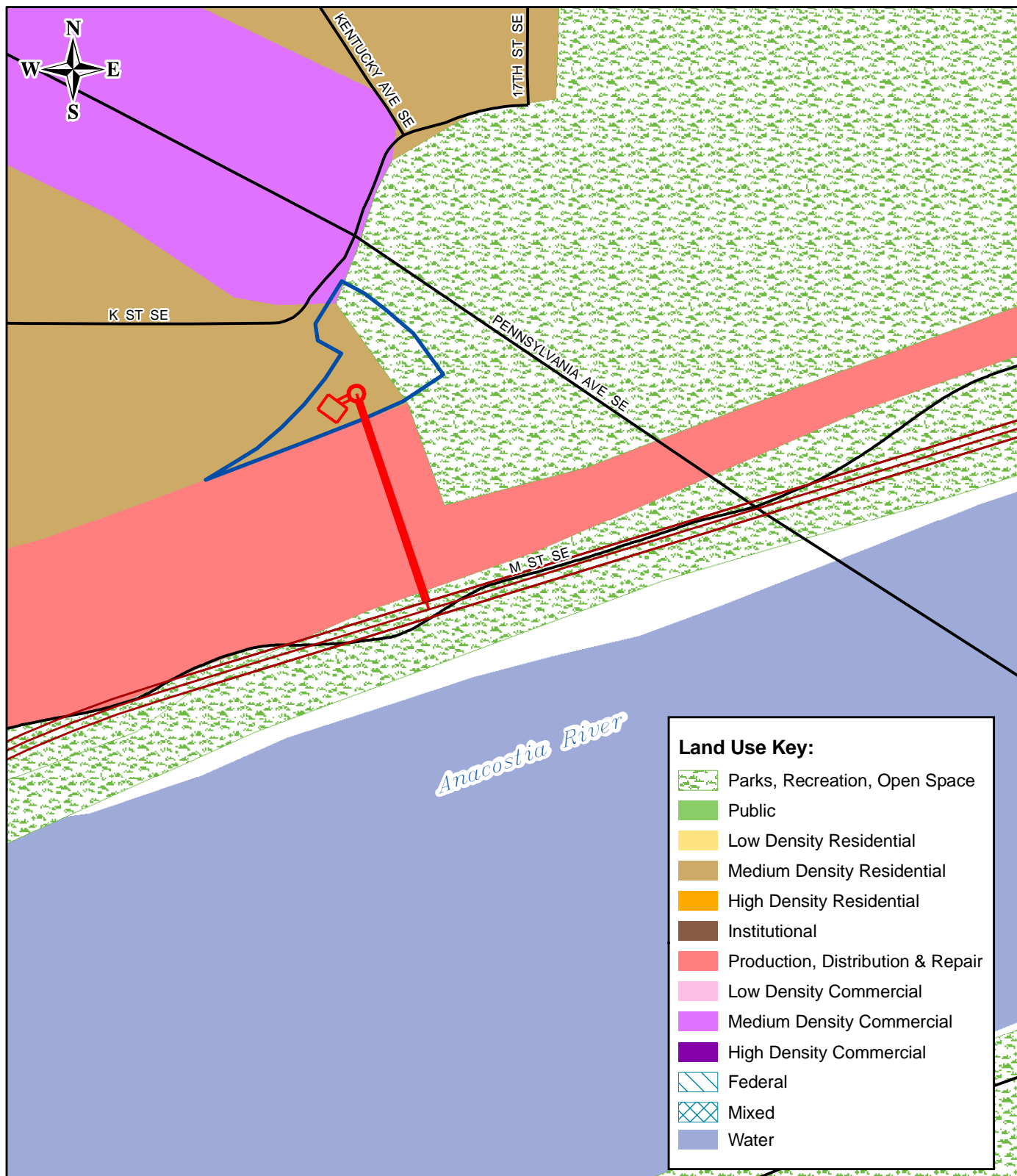
Legend:

- Project Facility
- Surface Disturbance Area
- Preferred Tunnel Alignment
- New Road Alignment
- Existing Road

Scale: 1 inch = 300 feet



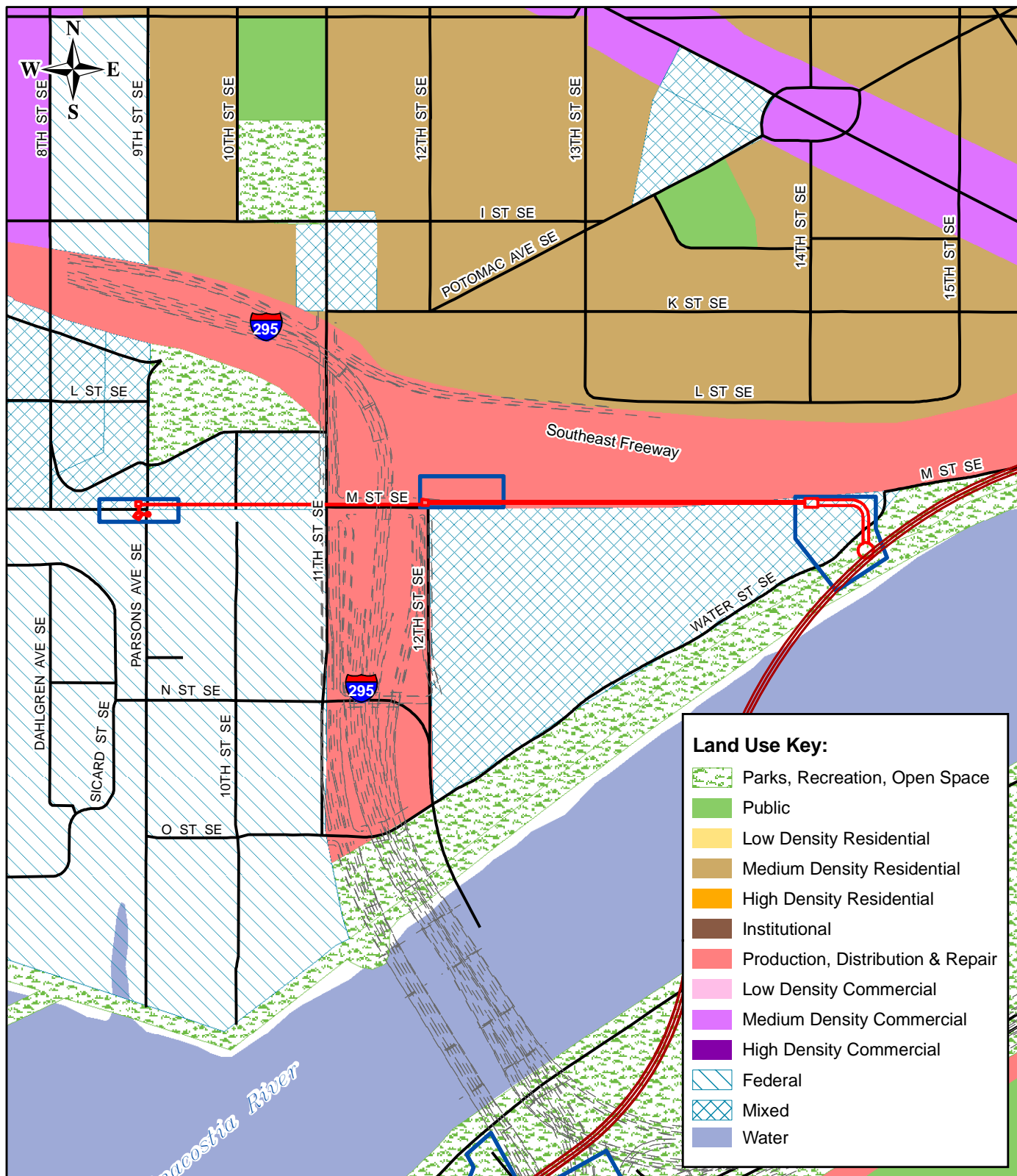
Source: DC Office of Planning. 2006. Planned Landuse from the 2006 DC Comprehensive Plan. Washington, DC.



**Figure 3.8-14:
Future Land Use Map**

CSO 018 Diversion Facilities
Washington, D.C.





**Figure 3.8-15:
Future Land Use Map**

M Street Diversion Facilities
Washington, D.C.



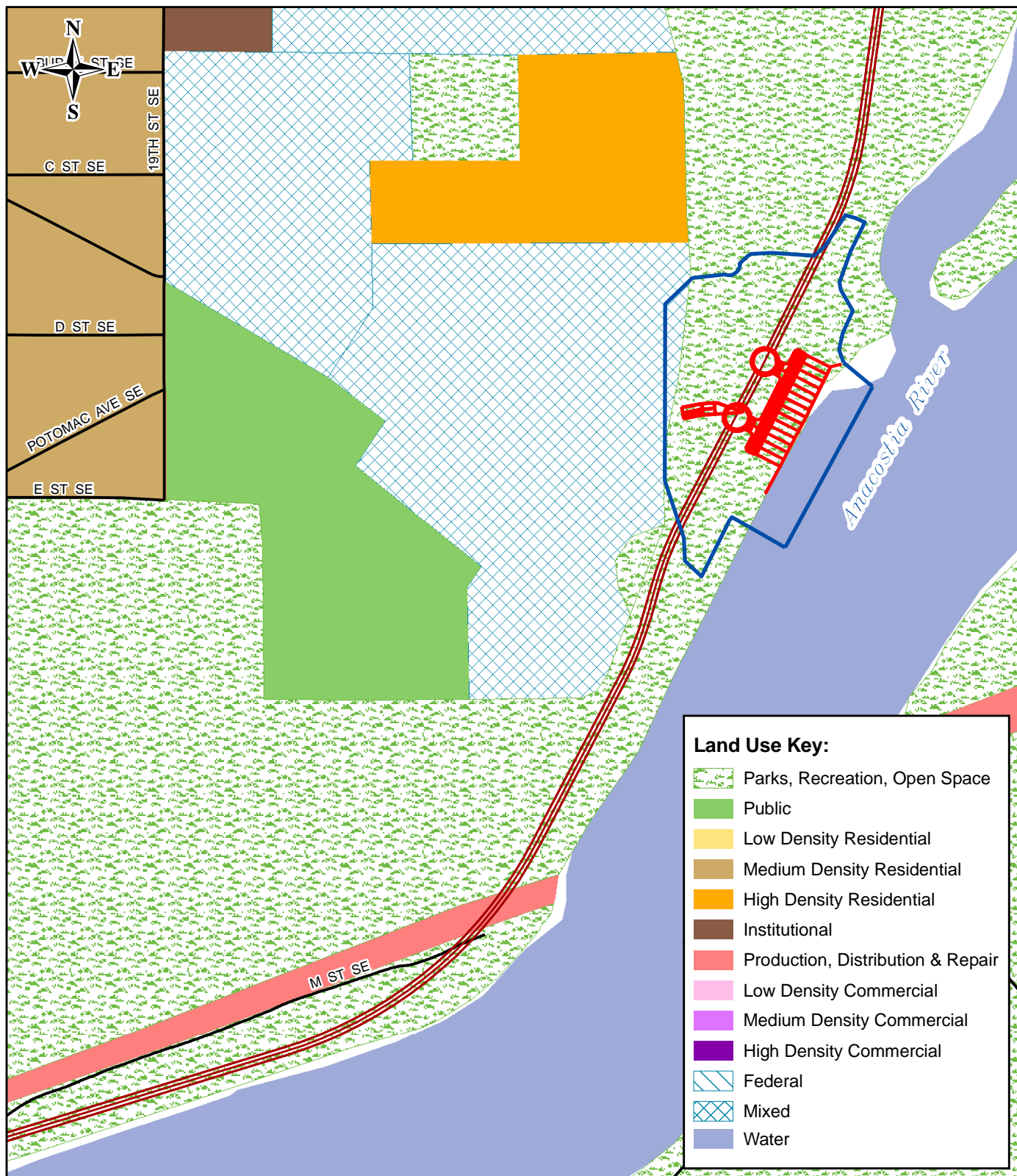
Legend:

- Project Facility
- Area of Surface Disturbance
- Preferred Tunnel Alignment
- New Road Alignment
- Existing Road

Scale: 1 inch = 500 feet

0 250 500 1,000 Feet

Source: DC Office of Planning. 2006. Planned Landuse from the 2006 DC Comprehensive Plan. Washington, DC.



**Figure 3.8-16:
Future Land Use Map**

CSO 019 Overflow and
Diversion Facilities
Washington, D.C.



Table 3.8-2: Future Land Use Plans			
Agency	Plan	Status / Date	Future Land Use Summary
DC Office of Planning	Urban Design Framework for the Near Southeast	Draft April 2003	General framework plan that proposes land uses for the Near Southeast neighborhood.
DC Office of Planning	2006 Comprehensive Plan for the National Capital: District Elements	March 2007	Proposes long-term planning strategies and goals for the District as a whole.
DC Office of Planning	AWI Poplar Point Target Area Master Plan	Draft March 2003	Calls for cultural and community-related uses adjacent to the WMATA parking garage and mixed-use development along Howard Road.
DC Office of Planning / Anacostia Waterfront Initiative (AWI)	Ballpark District Development Plan	Draft September 2005	Specifies amount of development that could occur within the Ballpark district, between M Street and the Anacostia River. Does not lay out specific land uses.
National Capital Planning Commission (NCPC)	South Capitol Street Urban Design Study	January 2003	Presents both commercial- and residential- oriented land use scenarios. States that principal commercial node should be at South Capitol Street and M Street.
NCPC	New Vision for South Capitol Street	Complete 2005	Recommends South Capitol Commons, a large open space and/or memorial site, within a traffic oval. Supports federal facilities along South Capitol Street north of M Street.
Urban Land Institute Advisory Panel	An Advisory Services Panel Report – South Capitol Street Corridor	Complete 2003	Recommends land uses based on a market analysis.
Architect of the Capitol	Master Plan	1981	Recommends land use for repair, rehabilitation, construction, renovation or alteration of all state buildings in the Capitol Complex, including tunnels, power and heating plants, and surrounding grounds.
NPS	Anacostia Park General Management Plan	2003	Would cover the Poplar Point area. Transfer of this land from the NPS to the District government may affect the relevance of this plan. Draft concepts for Poplar Point include ecosystem restoration, grand waterfront park, potential land acquisition, and sports facilities.
NCPC	Comprehensive Plan for the National Capital: Federal Elements	2004	States goals, objectives, and planning policies to manage growth and development in the District during the next 20 years.

Table 3.8-2: Future Land Use Plans			
Agency	Plan	Status / Date	Future Land Use Summary
U.S. Navy	Anacostia Support Facility Anacostia Site Development Plan	December 2004	Unknown
U.S. Air Force	BAFB Plan	2004	Unknown
General Services Administration	St. Elizabeth's West Campus Master Plan	Expected Spring 2007	Land is being redeveloped as the headquarters for the Department of Homeland Security, and the U.S. Coast Guard.
District of Columbia Office of the Deputy Mayor for Planning and Economic Development / Office of Planning	Boathouse Row Planning Study	Final Draft March 2009	Designated in future land use maps in the 2006 <i>Comprehensive Plan</i> as Parks, Recreation, and Open Space.
DC Office of Planning	AWI Framework Plan	November 2003	Organized according to five themes; identifies vibrant new places for people to live, work, enjoy nature, and celebrate the District's local and national heritage along the Anacostia River.
DC Office of Planning	Anacostia Transit Area Strategic Investment and Development Plan	April 2004	Land use would include housing, retail, and office space.
DC Office of Planning	Public Reservation 13: Hill East Waterfront	Approved Master Plan October 2002	Land use would include residential, health care, clinics, offices, retail, and open space.
DC Office of Planning	NoMA Vision Plan and Development Strategy	October 2006	Land use would include commercial and residential development.
DC Office of Planning	Barry Farm/Park Chester/Wade Road Redevelopment Plan	Draft November 2006	Land use is intended to create a vibrant mixed-income community of mid-rise apartments and low-rise family housing.

3.9 Human Health and Safety

Human health and safety issues are relevant for any project involving construction, particularly when hazardous materials may be encountered. DC WASA considered known contaminated sites and the quality of the Anacostia River in its assessment of health and safety. DC WASA also considered the possibility that unexploded ordnance (UXO) may be encountered during exploratory geotechnical drilling and/or construction.

As noted in **Section 3.2**, the water quality impairments on the Anacostia and Potomac rivers may threaten the health of those who use the rivers for primary contact recreation. In addition, the contaminated sites could threaten human health if any contaminated materials (e.g. PCBs, BTEX) were touched, exposed to rain and wind, or otherwise mobilized in proximity to humans.

Soil and groundwater in urban areas frequently contain petroleum products and other contaminants that could pose a danger to human or environmental health. Construction in these areas could uncover and mobilize hazardous materials, thereby increasing health and environmental risks. Common sources of soil and groundwater contamination include:

- Accidental spills from vehicles or commercial/industrial users;
- Leaking underground storage tanks (LUSTs);
- Past use of contaminated soil for urban fill; and
- Unauthorized dumping of chemicals and refuse.

DC WASA developed a preliminary list of regulatory sites and associated contaminants of concern with the potential to adversely impact the construction areas for the proposed project. The sites were included based on their distance and topography in relation to the proposed construction areas, the location of surface water bodies, and information in the Phase I Environmental Site Assessment (ESA) conducted for the ARPs Facility Plan (DC WASA, 2009). The ESA consulted numerous public databases compiled by federal, state, and local governmental agencies for records of environmental concerns at sites on or near the proposed project. DC WASA identified potential sites of concern using the following environmental databases:

- **NPL Sites:** This list includes uncontrolled or abandoned hazardous waste sites (known as Superfund sites, named after the federal Superfund for cleaning up abandoned hazardous waste). NPL sites are those sites listed by EPA as being the most contaminated according to an EPA Hazard Ranking System (HRS).
- **Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) Sites:** This database identifies hazardous waste sites that require investigation and possible remedial action to mitigate potential adverse impacts on human health or the environment. Sites can be placed in this database if there is a history of hazardous waste on the site, a potential for hazardous waste to be present at the site, or if there was a spill of hazardous materials on the site.
- **RCRA Sites:** RCRA regulates facilities treating, storing, or disposing of regulated hazardous wastes.
- **Emergency Response Notification System (ERNS):** This database contains records of oil and hazardous substances spills and other accidents that are reported to the National Response Center.
- **District of Columbia Leaking Underground Storage Tank (DC LUST):** This list contains information for reported LUSTs in the District. Sites within 1/8 mile of any of the proposed construction areas are considered to be of possible environmental concern.
- **District of Columbia Underground Storage Tank/Aboveground Storage Tanks (UST/AST):** This list contains an inventory of USTs and ASTs registered in the District. Tanks within 1/8 mile of proposed construction areas were considered for evaluation.

Tables 3.9-1 and 3.9-2 list specific sites of concern surrounding the proposed BPT components and ART components, respectively. For ease of identification and analysis, contaminated sites of interest were grouped based on their proximity to proposed surface disturbance areas. The tunnels themselves could intersect these hazardous waste sites as well, since subsurface tunneling would occur between the areas of surface disturbance. **Figures 3.9-1 and 3.9-2** show the hazardous waste releases identified in the vicinity of the proposed project.

Table 3.9-1: Hazardous Waste Sites of Concern for Blue Plains Tunnel Components			
Surface Disturbance Area	Regulatory Site	Database Listing	Possible Contaminants of Concern at Construction Site
BPAWWTP Facilities	DC WASA BPAWWTP	-Five open LUST cases -Five USTs -RCRA SQG	TPH-DRO TPH-GRO BTEX
	Naval Research Lab	-CERCLIS-NFRAP -RCRA CA & TSD Site -Four closed LUST cases	TPH-DRO TPH-GRO BTEX
Poplar Point Pumping Station	C & P Telephone	-Closed LUST	TPH-DRO TPH-GRO BTEX
Tingey Street Diversion Sewers and Main Pumping Station Diversion Facilities	DC DPW Fleet Management	-Two open LUSTs -CERCLIS-NFRAP	TPH-DRO TPH-GRO BTEX
	Southeast Federal Center	Former NPL Site	TPH TCE 3,3-dichlorobenzidine PCBs Lead Nickel Benzo(a)pyrene Phenanthrene Legacy contamination
	Shell Oil Company	-Open LUST -UST	TPH-DRO TPH-GRO BTEX
BAFB Overflow and Diversion Facilities	Anacostia Naval Station (ANS)	-RCRA-LQG -17 closed LUSTs -Three ERNS spills -USTs: 10 in use, 58 out of use	Heavy metals TPH-DRO TPH-GRO BTEX Aviation fuel additives Legacy contamination
	BAFB	-RCRA-LQG -Two open LUSTs -11 closed LUSTs -USTs: 11 in use, 59 out of use -12 ERNS spills	Heavy metals TPH-DRO TPH-GRO BTEX Aviation fuel additives Persistent pesticides (DDT, DDE, Aldrin, Chlordane, heptachlor epoxide)

BTEX: Benzene, Toluene, Ethylbenzene, and Xylene
 CA: Corrective Action program
 DDT: dichlorodiphenyltrichloroethane (pesticide)
 DDE: dichlorodiphenyldichloroethylene (breakdown product of DDT)
 DRO: Diesel Range Organics
 ERNS: Emergency Response Notification System
 GRO: Gasoline Range Organics
 LQG: Large Quantity Generator
 LUST: Leaking Underground Storage Tank

NFRAP: No Further Remedial Action Planned
 NPL: National Priorities List
 PCBs: Polychlorinated Biphenyls
 RCRA: Resource Conservation and Recovery Act
 SQG: Small Quantity Generator
 TCE: Trichloroethylene
 TPH: Total Petroleum Hydrocarbons
 TSD: Treatment, Storage, Disposal
 UST: Underground Storage Tank

Table 3.9-2: Hazardous Waste Sites of Concern for Anacostia River Tunnel Components			
CSO Structure / Construction Area	Regulatory Site	Database Listing	Possible Contaminants of Concern at Construction Site
Tingey Street Diversion Sewers and Main Pumping Station Diversion Facilities	Washington Gas & Light / Washington Gas Station East	-CERCLIS – Voluntary cleanup (2000) - Engineering controls in place (2000) -RCRA LQG	TPH-DRO TPH-GRO BTEX Legacy contamination
	Exxon (1022 M Street SE)	-Closed LUST	TPH-DRO TPH-GRO BTEX
	Amtrak (12 th and M Streets SE)	-One subsurface ERNS spill	Electrical insulating oil Legacy contamination
	Steuart Petroleum / Support Terminal Services Inc. (1333 M Street)	-Closed LUST -UST -RCRA LQG	TPH-DRO TPH-GRO BTEX Legacy contamination
Poplar Point Pumping Station	C & P Telephone	-Closed LUST	TPH-DRO TPH-GRO BTEX
CSO 019 Overflow and Diversion Facilities	DC General Hospital (19 th and C Streets SE)	-UST	TPH-DRO TPH-GRO BTEX
CSO 005 & 007 Diversion Facilities	National Park Police Anacostia Operations (1910 Anacostia Drive SE)	-Closed LUST -UST	TPH-DRO TPH-GRO BTEX

BTEX: Benzene, Toluene, Ethylbenzene, and Xylene
DRO: Diesel Range Organics
ERNS: Emergency Response Notification System
GRO: Gasoline Range Organics
LQG: Large Quantity Generator

LUST: Leaking Underground Storage Tank
RCRA: Resource Conservation and Recovery Act
TPH: Total Petroleum Hydrocarbons
UST: Underground Storage Tank



**Figure 3.9-1:
Hazardous Waste Site Map**

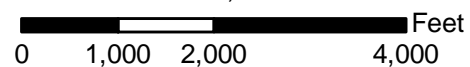
Anacostia River Projects
Long-term CSO Control Plan
Washington, D.C.



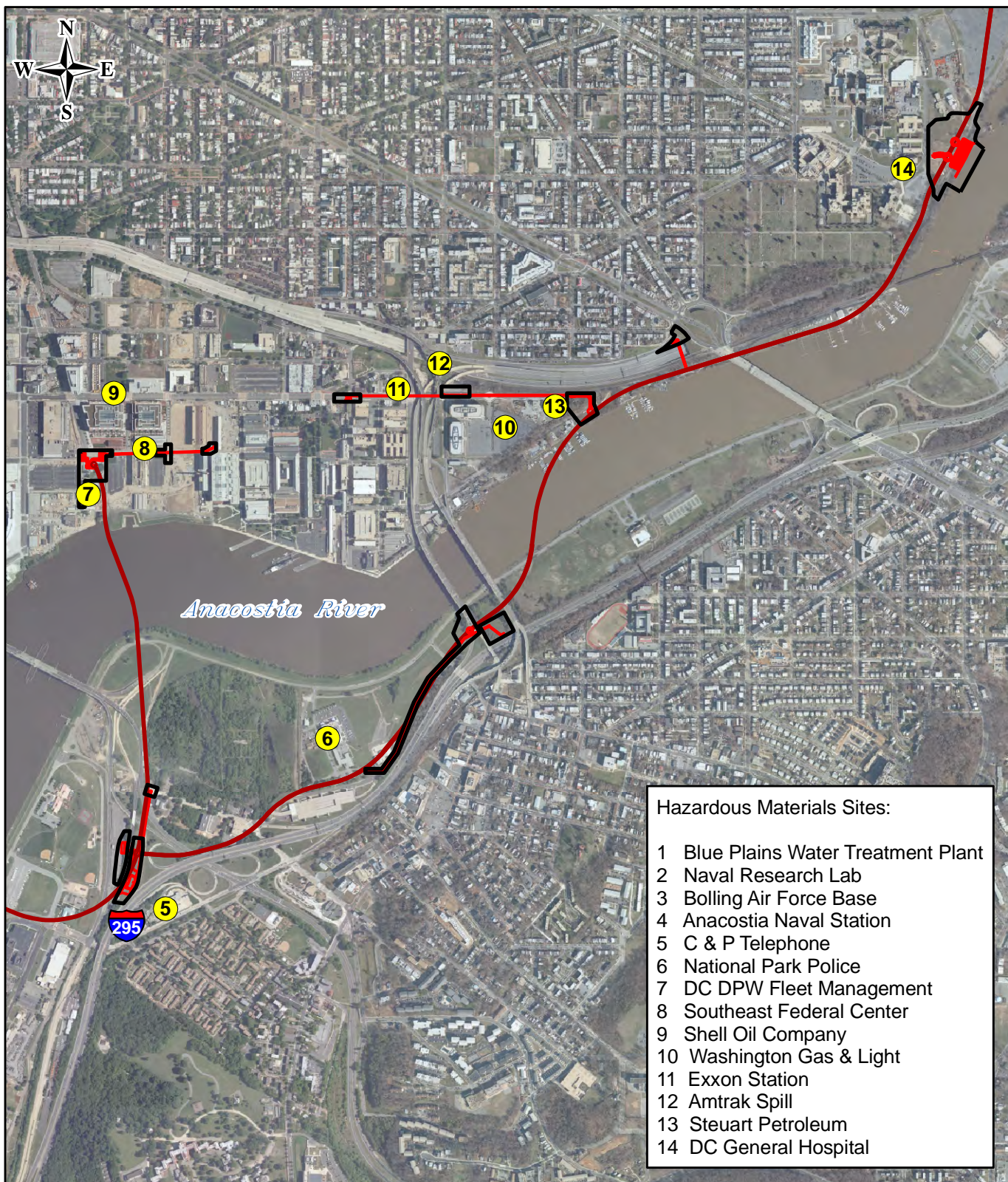
Legend:

- Hazardous Material Site
- Surface Disturbance Area
- Project Facility
- Preferred Tunnel Alignment

Scale: 1 inch = 2,000 feet



Source: Environmental Protection Agency. 2002. Hazardous Waste Locations. Washington, DC.



**Figure 3.9-2:
Hazardous Waste Site Map**

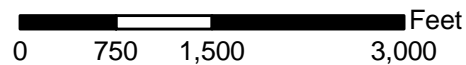
Anacostia River Projects
Long-term CSO Control Plan
Washington, D.C.



Legend:

- Hazardous Material Site
- Surface Disturbance Area
- Project Facility
- Preferred Tunnel Alignment

Scale: 1 inch = 1,500 feet



Source: Environmental Protection Agency. 2002. Hazardous Waste Locations. Washington, DC.

1

2 **3.10 Visitor/Resident Use and Experience**

3 Visitor experience varies throughout Anacostia Park, as do the types of visitors, which includes both
4 tourists and residents. Over one million recreational visits occur at the park every year. The Park
5 offers its visitors a variety of recreational options including hiking/biking, fishing, boating, picnic
6 areas, bird watching, and recreational fields. The Park is open year round excluding Thanksgiving,
7 Christmas, and New Years Day, from dawn to dusk. Educational opportunities include ranger
8 guided tours, guest speakers, and the Anacostia Park Education Programs, which includes both
9 on-site and off-site educational experiences. Portions of the M Street Diversion Facilities, CSO 005 &
10 007 Diversion Facilities, and CSO 019 Overflow and Diversion Facilities surface disturbance areas
11 are in close proximity to many park facilities including the Park headquarters, the Anacostia
12 Riverwalk hiker/biker trail, a recreational field, Anacostia River access locations, roadways that
13 access park facilities, and parking spaces.

14 The other surface disturbance areas are located outside of the Park. Residents and visitors of those
15 areas generally experience conditions that are typically associated with an urban environment,
16 which includes urban noise, traffic, high population density, and commercial activities.

17