

ROUTE 7 WIDENING

— FAIRFAX COUNTY —
NATURAL RESOURCES
TECHNICAL REPORT

NOVEMBER 2017



Route 7 Corridor Improvements
Reston Avenue to Jarrett Valley Drive

Natural Resources Technical Report

Fairfax County, Virginia

Project Number: 0007-029-128, B610, C502, P102, R202; UPC: 52328

Federal Project Number: DEMO-5A01(439)

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List of Acronyms

AASHTO	American Association of State Highway Transportation Officials
BMP	Best Management Practice
C	Confirmed
CBPA	Chesapeake Bay Preservation Act
CCB	Center for Conservation Biology
CCT	Gerry Connolly Cross County Trail
CFR	Code of Federal Regulations
CLRP	Constrained Long Range Plan
CWA	Clean Water Act
EA	Environmental Assessment
EO	Executive Order
EPA	Environmental Protection Agency
ESA	Endangered Species Act
FE	Federal Endangered
FEMA	Federal Emergency Management Agency
FT	Federal Threatened
FHWA	Federal Highway Administration
GIS	Geographic Information Systems
HUC	Hydrologic Unit Code
HGM	Hydrogeomorphic
IPaC	Information of Planning and Consultation
IUCN	International Union for Conservation of Nature
LOD	Limits of Disturbance
MS4	Municipal Separate Storm Sewer System
MWCOG	Metropolitan Washington Council of Governments
NEPA	National Environmental Policy Act
NLCD	National Landcover Database
NLEB	Northern Long-Eared Bat
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NRCS	Natural Resources Conservation Service
NWF	National Wildlife Federation
NWI	National Wetlands Inventory
PCB	Polychlorinated biphenyl
PEM	Palustrine Emergent
PFO	Palustrine Forested
PJD	Preliminary Jurisdictional Determination
POW	Palustrine Open Water
PSS	Palustrine Scrub Shrub
R2	Lower Perennial
R3	Upper Perennial
R4	Intermittent

R6	Ephemeral
RMA	Resource Management Area
RPA	Resource Protection Area
SE	Stated Endangered
SPGP	State Programmatic General Permit
ST	State Threatened
SWPPP	Stormwater Pollution Prevention Plan
SYIP	Six-Year Improvement Program
TIP	Transportation Improvement Plan
TMDL	Total Maximum Daily Load
TPP	Transportation Project Priorities
UPC	Universal Project Code
USACE	United States Army Corps of Engineers
USC	United States Code
USDA	United States Department of Agriculture
USDOT	United States Department of Transportation
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
VAC	Virginia Administrative Code
VAFWIS	Virginia Fish and Wildlife Information Service
VDACS	Virginia Department of Agriculture and Consumer Services
VDCR-DNH	Virginia Department of Conservation and Recreation Division of Natural Heritage
VDEQ	Virginia Department of Environmental Quality
VDGIF	Virginia Department of Game and Inland Fisheries
VDOT	Virginia Department of Transportation
VMRC	Virginia Marine Resources Commission
VPDES	Virginia Pollutant Discharge Elimination System
VSMP	Virginia Stormwater Management Program
WERMS	Wildlife Environmental Review Map Service
WNS	White Nose Syndrome
WOUS	Waters of the United States

1.0 INTRODUCTION

1.1 Project Description

The Virginia Department of Transportation (VDOT), in coordination with the Federal Highway Administration (FHWA), is evaluating improvements along a seven mile section of Leesburg Pike (Route 7) between Reston Avenue and Jarrett Valley Drive in Fairfax County, Virginia (herein referenced as “the study area”). The purpose of these improvements under consideration is to increase capacity, as well as address safety and deficiencies in access management. Pursuant to the National Environmental Policy Act of 1969, as amended, (NEPA) and in accordance with FHWA regulations, an Environmental Assessment (EA) has been prepared to analyze and document the potential social, economic and environmental effects associated with the transportation improvements being considered. As part of the EA, VDOT is evaluating the environmental consequences of the No-Build Alternative and one Build Alternative.

To support the analysis in the EA, this Natural Resources Technical Report has been prepared to document the following:

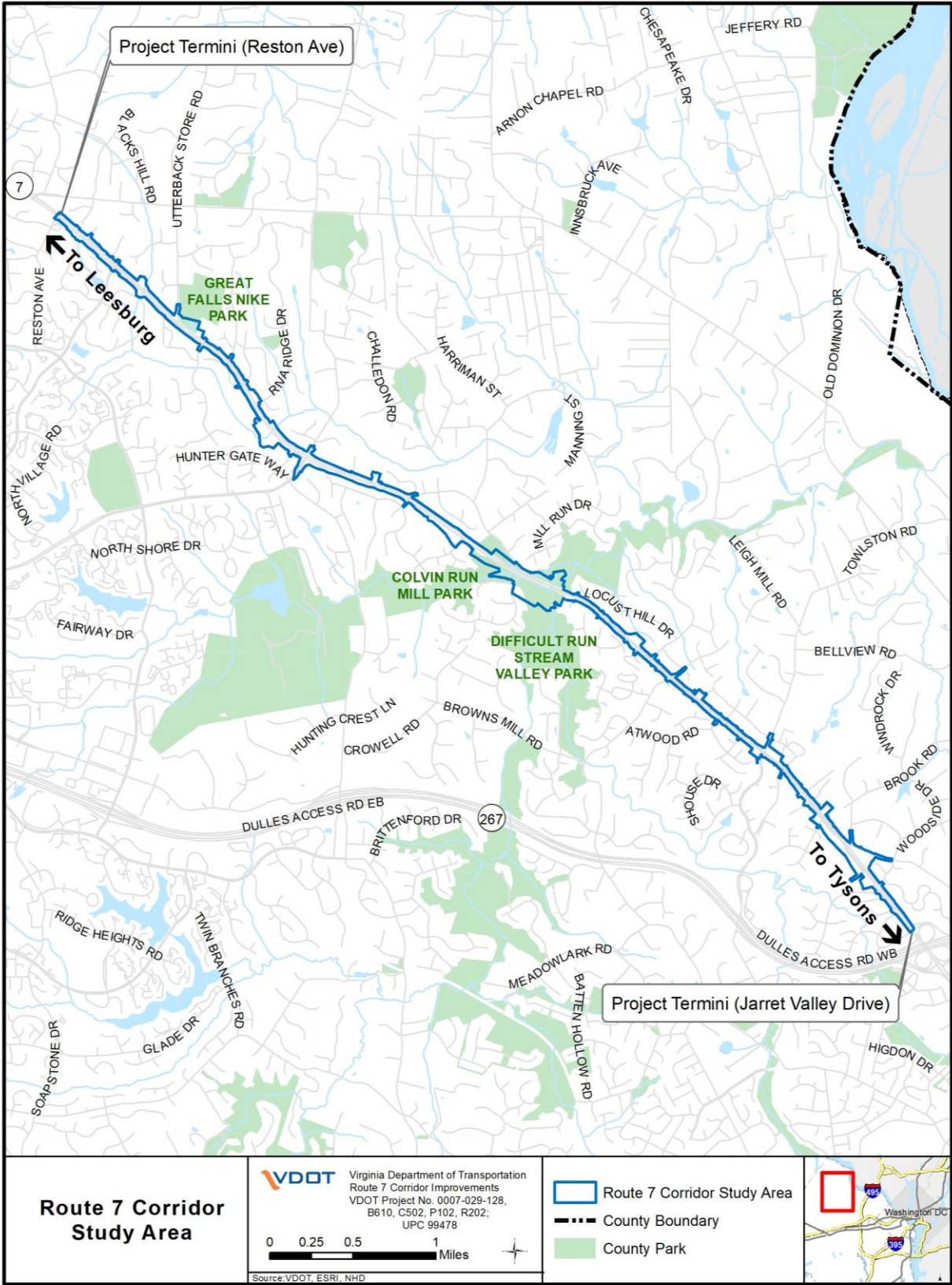
- **Section 1** provides an overview of the study, Purpose and Need of the project, and alternatives;
- **Section 2** describes Waters of the U.S. within the study area and evaluates the potential for impacts;
- **Section 3** describes the water quality within the study area and evaluates the potential for impacts;
- **Section 4** describes the floodplains within the study area and evaluates the potential for impacts;
- **Section 5** describes the threatened, endangered, and special status species and their habitats and evaluates the potential for impacts;
- **Section 6** describes wildlife within the study area, common plant and animal species found within the study area, and anticipated impacts to habitat;
- **Section 7** describes the aquatic biology within the study area and evaluates the potential for impacts;
- **Section 8** describes types of soils, focusing on prime farmland and farmland of statewide importance, and evaluates the potential for impacts;
- **Section 9** describes the permits that would be required; and
- **Section 10** includes a list of references that were used to complete this technical report.

The proposed roadway improvements would provide an additional lane in each direction and would widen to the inside median where possible. A raised median, multi-purpose trail and intersection improvements are also proposed. A bridge replacement is proposed for the Difficult Run stream crossing with the wider typical section. The study area is bounded by Reston Avenue to the west and Dulles Toll Road to the east (see **Figure 1-1**).

1.2 Project History

The widening of the Route 7 corridor from four to six lanes west of Tysons Corner to the Fairfax County line has been contemplated in Fairfax County’s Comprehensive Plan since 1975. The Fairfax County Parkway (Route 286) interchange at Route 7 was completed in 1999 and included the widening of Route 7 between the Loudoun and Fairfax County line to Rolling Holly Drive. In 2016, a one-mile section of Route 7 was widened between Rolling Holly Drive and Reston Avenue.

Figure 1-1: Study Area



Currently VDOT is widening Route 7 for a half of a mile between Jarrett Valley Drive and Tyco Road, which includes the replacement of the bridge deck over Dulles Airport Access Highway and Toll Road (Route 267) with construction expected to be completed in Spring 2018.

Currently, the widening of this section of Route 7 from four to six lanes is included in Fairfax County's Comprehensive Plan 2013 Edition (as amended) for Transportation (Fairfax County, 2017b). The County's interest in improving safety and capacity along Route 7 is also documented in the County's *Third Four Year Transportation Program (FY2013-FY2016)* and the *FY2015-FY2020 Transportation Project Priorities (TPP)* (Fairfax County 2014a and 2014b). This project has long been a part of the Metropolitan Washington Council of Governments (MWCOC) (the Region's Metropolitan Planning Organization) *Constrained Long Range Plan (CLRP)* and the *Transportation Improvement Plan (TIP)* (MWCOC, 2016a and 2016b). In addition to being included in this regional plan, the Northern Virginia Transportation Authority's regional transportation plan entitled *TransAction 2040* designates the Dulles/VA 7 corridor as their top corridor for improvements (NVTA, 2012). This project is also included in VDOT's *2025 State Highway Plan* (VDOT, 2005). This plan is included as part of the *2035 Virginia Surface Transportation Plan Update (VDRPT, 2013)*.

1.3 Purpose and Need

The purpose and need for the proposed improvements is to:

- Address capacity deficiencies resulting from existing and future traffic demand.
- Address access management deficiencies.

1.4 Alternatives

1.4.1 No Build Alternative

The No Build Alternative would retain the existing Route 7 roadway and associated intersections/interchanges in their present configuration, and allow for routine maintenance and safety upgrades. This alternative assumes no major improvements to the Route 7 corridor with the exception of previously committed projects, including projects currently programmed and funded in VDOT Fiscal Year (FY) 2018-2023 Six-Year Improvement Program (SYIP), the MWCOC for the National Capital Region CLRP 2016, and Fairfax County Department of Transportation Capital Projects. As these other projects are independent of the proposed action, they are not fully evaluated in this EA.

1.4.2 Build Alternative

The proposed project would provide an additional lane on each side of the existing roadway for a total of six 11-foot lanes with curb and gutter divided with a 16-foot raised median. Turn lane lengths would also be improved to meet the full American Association of State Highway Transportation Officials (AASHTO) requirements for deceleration and storage to eliminate backups into through lanes. Unsignalized median crossovers not meeting signal warrants would either be closed or converted to median left turn lanes.

In addition, the following improvements are proposed for the corridor:

- There are a number of substandard vertical curves that do not meet the required lengths for stopping sight distance and the roadway's design speed; substandard vertical curves would be corrected to meet the required design speeds;
- Intersection sight distance at the Trap Road/Route 7 intersection is substandard; the Build Alternative would configure the intersection to a right in/right out from the existing full access intersection to prohibit unsafe traffic movements;
- The Utterback Store Road intersection with Route 7 would be reconfigured to eliminate the existing severe skew;
- The project would replace the existing bridge over Difficult Run with a new structure to eliminate flooding issues experienced with the existing structure;
- 10-foot wide shared use paths would be provided along the westbound and eastbound lanes creating a continuous pedestrian route for the entire corridor; and,
- Protected signalized pedestrian movements would be provided at all signalized intersections.

2.0 WATERS OF THE U.S.

2.1 Methodology

In order to identify potential impacts to Waters of the U.S. (WOUS) that could be associated with the alternatives being evaluated, an in-office review of available resource information was conducted to evaluate the potential for regulated features to occur within the study area. Data reviewed included U.S. Geological Survey (USGS) topographic mapping, National Wetland Inventory (NWI) mapping, U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) soils mapping and data, and aerial imagery (USGS, 2017; USFWS, 2017b; and USDA, 2017).

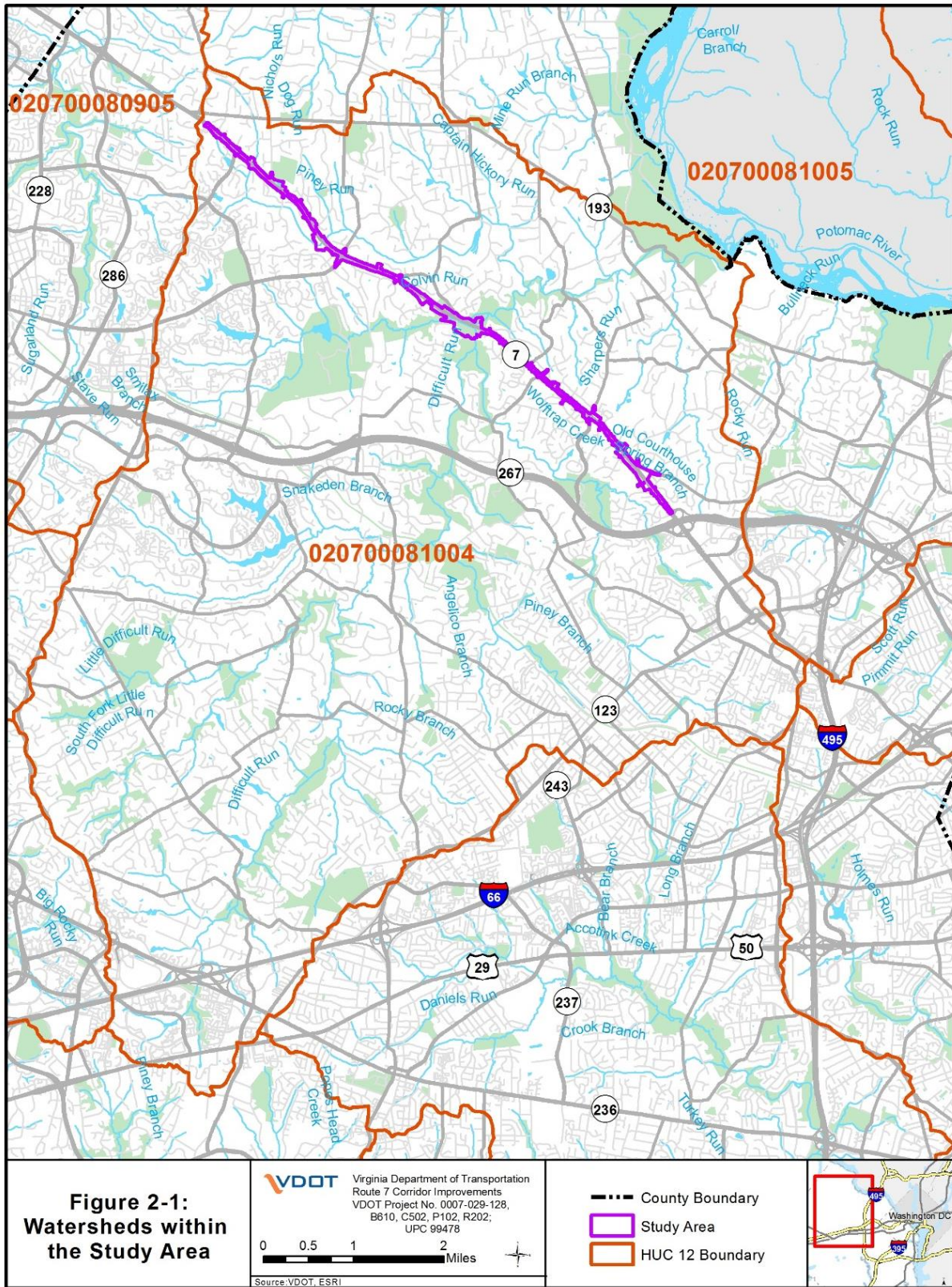
Following the in-office review, a field delineation was conducted in July 2015 to identify jurisdictional WOUS that occur within the study area. The delineation was performed in accordance with the 2012 *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont Region (Version 2.0)* and the United States Army Corps of Engineers (USACE) 1987 *Wetland Delineation Manual* and subsequent applicable regulatory guidance (USACE, 1987 and USACE, 2012).

On December 22, 2015, a USACE field visit was conducted to verify the limits of jurisdictional WOUS within the study area. An in-office review of delineation material occurred on March 23, 2017, and a preliminary jurisdictional determination (PJD) was issued by the USACE on the same day.

2.2 Existing Conditions

The study area is located within the Middle Potomac-Catoctin sub-basin (Hydrologic Unit Code [HUC] 02070008) and Difficult Run sub-watershed (020700081004), as shown on **Figure 2-1**. These are a part of the larger Potomac River Basin. Several named perennial streams pass through or in close proximity to the study area, including Dog Run, Piney Run, Colvin Run, Difficult Run, and Bridge Branch. These streams are depicted on **Figure 2-1**. The streams within the study area are confined by Route 7 and have very little riparian buffer. All of the streams within the study area ultimately flow to the Potomac River.

Figure 2-1: Watersheds within the Study Area



**Figure 2-1:
Watersheds within
the Study Area**

VDOT Virginia Department of Transportation
Route 7 Corridor Improvements
VDOT Project No. 0007-029-128,
B610, C502, P102, R202,
UPC 99478

0 0.5 1 2 Miles

Source: VDOT, ESRI

--- County Boundary
 [Purple Box] Study Area
 [Orange Box] HUC 12 Boundary



2.2.1 Wetlands

Approximately 22.23 acres of wetlands were delineated within the study area, including 13.73 acres of palustrine forested (PFO) wetlands, 3.21 acres of palustrine scrub-shrub (PSS) wetlands, 2.74 acres of palustrine emergent (PEM) wetlands, and 2.55 acres of palustrine open water (POW) wetlands. Delineated wetlands are depicted on **Figure 2-2 (Appendix A)**.

Palustrine Forested Wetlands

Temporarily or seasonally flooded broad-leaved, deciduous palustrine forested wetlands, including diked/impounded palustrine forested wetlands (PFO1A/Ch) occur throughout the study area (see **Figure 2-2 [Appendix A]**). These features occur mostly as riparian systems. Dominant tree species encountered for these wetland areas include pin oak (*Quercus palustris*), willow oak (*Quercus phellos*), red maple (*Acer rubrum*), common persimmon (*Diospyros virginiana*), sycamore (*Platanus occidentalis*), American elm (*Ulmus americana*), green ash (*Fraxinus pennsylvanica*), and river birch (*Betula nigra*). The understory consists primarily of green ash, box elder (*Acer negundo*), sycamore, hazel alder (*Alnus serrulata*), black willow (*Salix nigra*), spicebush (*Lindera benzoin*), American holly (*Ilex opaca*), common persimmon, arrowwood (*Viburnum dentatum*), whitegrass (*Leersia virginica*), roundleaf greenbrier (*Smilax rotundifolia*), jewelweed (*Impatiens capensis*), three-way sedge (*Dulichium arundinaceum*), common rush (*Juncus effusus*), Japanese stiltgrass (*Microstegium vimineum*), deertongue (*Dichanthelium clandestinum*), netted chain fern (*Woodwardia aereolata*), marsh knotweed (*Persicaria hydropiper*), wingstem (*Verbesina alternifolia*), small-spike false nettle (*Boehmeria cylindrica*), sweet wood-reed (*Cinna arundinacea*), and skunk cabbage (*Symplocarpus foetidus*).

Palustrine Scrub Shrub Wetlands

Seasonally flooded/saturated and semipermanently flooded broad leaved deciduous palustrine scrub shrub (PSS1E/F) wetlands occur in the study area along stream systems (see **Figure 2-2 [Appendix A]**). Stream and backwater flooding from Route 7 prevent succession of these wetlands to forested communities. Common vegetation identified within the study area for these wetland areas includes black willow, hazel alder, box elder, green ash, multiflora rose (*Rosa multiflora*), arrowleaf tearthumb (*Polygonum sagittatum*), Japanese stiltgrass, broadleaf arrowhead (*Sagittaria latifolia*), broadleaf cattail (*Typha latifolia*), shallow sedge (*Carex lurida*), fox sedge (*Carex vulpinoidea*), Frank's sedge (*Carex frankii*), common rush, and deertongue.

Palustrine Emergent Wetlands

Temporarily flooded, seasonally flooded, seasonally flooded/saturated, and semipermanently flooded broad leaved deciduous palustrine emergent wetlands, including diked/impounded palustrine emergent wetlands (PEM1A/C/E/Fh) occur throughout the study area (see **Figure 2-2 [Appendix A]**). These systems occur mostly as riparian systems. Some are naturally occurring PEM wetlands, which result from prolonged inundation that prevents succession by woody species. Water impoundment by Route 7 contributes to this inundation. Other PEM wetlands are artificially maintained in an emergent state along maintained utility easements and roadway rights-of-way. Typical species for these wetland areas include rice cutgrass (*Leersia oryzoides*), whitegrass, Japanese stiltgrass, arrowleaf tearthumb (*Persicaria sagittata*),

marshpepper knotweed (*Polygonum hydropiper*), shallow sedge, fox sedge, Frank's sedge, red fescue (*Festuca rubra*), cattail, deertongue, and small carp grass.

Palustrine Open Water (POW) Wetlands

The study area contains six palustrine open water (POW) ponds with no vegetative cover (see **Figure 2-2 [Appendix A]**). These manmade ponds are comprised of a combination of impounded stream channels, stormwater management facilities, and ponds associated with the historic operation of the waterwheel at Colvin Mill. The water quality in study area ponds can be quite variable depending on the source of runoff supplying the pond's hydrology, which can include runoff and groundwater. For further information on water quality in the study area, please see **Section 3.0**.

Wetland Functions

Wetland functions are the processes that take place within a wetland that benefit the wetland and the wetland's watershed. Wetland functions are self-sustaining properties of a wetland ecosystem that exist in the absence of society without regard to subjective human values (USACE, 1999). Wetlands within the study area serve a variety of functions that benefit the wetland and the wetland's watershed. These include, but are not limited to, habitat for fish, wildlife, and plants; improving water quality and hydrology; flood protection; protecting shorelines and stream banks from erosion; economic benefit; and recreation, education, and research (EPA, 2016).

The hydrogeomorphic (HGM) approach to assessing wetland functions groups wetlands into subclasses based on geomorphic setting, dominant water sources (i.e., hydrology), and dominant hydrodynamics. Applying the HGM methodology, the majority of the wetlands within the study area fall into two subclasses: bottomland hardwood forests and mineral soil flat wetlands. Bottomland hardwood forests within the study area can generally be described as hardwood dominated riverine wetlands located in floodplains, river terraces, and along stream systems with hydrology being derived from groundwater and overbank flow. Further classification describes these systems in a geomorphic context as low-gradient alluvial wetlands (Brinson, 1993). Hydrodynamics are dominated by unidirectional and horizontal flow where flow velocities correspond with low-gradient landforms. Singular or multiple inflow points can be present while outlets are generally unobstructed, and typically convey surface hydrology to downstream resources. Lateral migration is present in periods when groundwater discharge or precipitation events exceed soil permeability. Reduced soil matrices generally display strong redoximorphic features providing evidence that there is a fluctuating water table. Mineral soil flat wetlands occur on relatively flat land with a shallow, relatively impermeable soil layer that retains precipitation resulting in a perched water table (USACE, 2012). Hydrology is derived primarily from precipitation and hydrodynamics are dominated by vertical flow.

2.2.2 Jurisdictional Streams and Ditches

Approximately 10,800 linear feet of regulated stream channels were identified within the study area, including 7,666 linear feet of perennial channel (R2/R3), 774 linear feet of intermittent channel (R4), 152 linear feet of ephemeral channel (R6), and 2,208 linear feet of piped streams. Delineated streams are depicted on **Figure 2-2 (Appendix A)**. The streams within the study area are confined by Route 7 and have very little riparian buffer. No jurisdictional ditches were identified.

2.3 Environmental Consequences

The Build Alternative would result in impacts to approximately 2.14 acres of wetlands (including 1.61 acres of PFO wetland, 0.11 acres of PSS wetland, 0.39 acres of PEM wetland, and 0.03 acres of PUB wetland (*i.e.*, ponds) and approximately 3,185 linear feet of stream (including 2,769 linear feet of perennial stream (R2/R3) and 416 linear feet of intermittent stream (R4)) (see **Tables 2-1** and **2-2**).

Table 2-1: Wetland Impacts from the Build Alternative

Station Range	PFO acres	PSS acres	PEM acres	PUB acres
175-177	0.000005	0.00	0.06	0.00
200-204	0.14	0.00	0.08	0.00
224-226	0.00	0.00	0.01	0.00
261-266	0.13	0.00	0.01	0.00
301-302	0.002	0.00	0.00	0.00
344-371	1.33	0.11	0.23	0.03
505-509	0.01	0.00	0.003	0.00
Subtotals	1.61	0.11	0.39	0.03
TOTAL: 2.14				

Table 2-2: Stream Impacts from the Build Alternative

Station Range	Perennial lf	Intermittent lf	Ephemeral lf
201-203	179	0	0
225-226	42	0	0
264-265	164	0	0
322-332	53	42	0
350-368	2,161	0	0
396-400	137	336	0
482-508	33	38	0
Subtotals	2,769	416	0
TOTAL: 3,185			

Primary impacts to streams and wetlands resulting from roadway construction would likely include discharges of fill material for culverted stream crossings, bridge approaches and abutments, stream relocations, stormwater management basin outfalls, and roadway cut/fill slopes. Secondary effects would likely include stormwater discharge from the widened roadway and right-of-way and shading at bridge crossings.

Should the project advance, impacts to wetlands and streams would be avoided and minimized to the maximum extent practicable as part of the Section 404/401 permitting process. Compensatory mitigation for permanent impacts to streams and wetlands would be developed, as required, during the Section 404/401 permitting process in coordination with the appropriate state and federal agencies.

Throughout project development, VDOT has refined the project design to avoid and minimize impacts to wetlands and streams. VDOT coordinated with USACE, Environmental Protection Agency (EPA), and Virginia Department of Environmental Quality (VDEQ) to solicit comments on the project design. In a

letter dated April 17, 2017, the USACE requested additional evaluations and design refinements including: relocating Colvin Run to the north of Route 7; reducing the width and/or combining shared use paths with the Gerry Connolly Cross County Trail (CCT); reducing the median width; placing the CCT on top of the box culvert shown in Colvin Run Option 5 (discussed below); placing the relocated Colvin Run in a straight riprap or equivalent-lined channel; and assessing a combination of open channel, riprap or equivalent-lined channel, and box culvert. In addition, on June 22, 2017, VDOT met with USACE, VDEQ, and EPA in the field to discuss project design options and to make recommendations for further avoidance and minimization. The majority of the impact reductions resulted from refinements to three key design elements: roadway design, stormwater management basins, and the relocation of Colvin Run. Following is a summary of the avoidance and minimization efforts.

Total Project Avoidance and Minimization

Prior to the design used for the EA, alternative design elements were considered informally and discarded or refined in order to reduce impacts. One such example is the consideration of Pond 6, which would have been located in forested wetlands in the vicinity of the relocated Colvin Run. Pond 6 was ultimately abandoned because it would have increased wetland impacts by 0.66 acres. Additionally, permitting agencies typically will not allow stormwater ponds to be placed in wetlands unless there is no practicable alternative. Because stormwater treatment could be achieved for the project without Pond 6, it was eliminated from further consideration. Impact reductions from design refinements are summarized in **Table 2-3**.

Table 2-3: Impact Reduction Summary

Design Element	Design Iterations ¹			Impact Reduction (Baseline to Refined LOD)
	EA LOD (PH Design)	EA LOD (corrected)	Revised EA LOD	
Roadway (including Colvin Run relocation)	---	3294	3185	109
SWM Ponds	---	130	0	130
Total Project Stream (lf)	2894	3425	3185	239
Roadway (including Colvin Run relocation)	---	4.83	2.13	2.70
SWM Ponds	---	1.73	0.01	1.71
Total Project Wetland (ac)	5.41	6.56	2.14	4.42

¹Impacts for the EA LOD (corrected) and Revised EA LOD were calculated using a 20-foot buffer from the limits of construction to account for installation of erosion and sediment control measures. The difference between the EA LOD (PH Design) and the EA LOD (corrected) is due to the addition of the 20-foot buffer and the inclusion of stormwater ponds that had not been included in the EA LOD (PH Design).

Roadway

Avoidance and minimization efforts for roadway design typically result from refinements to three key design elements: horizontal alignment, vertical alignment, and typical section (*e.g.*, reduced median width, reduced lane width, steep side slopes, retaining walls, etc.). Because the project is improving an existing road, the opportunity to reduce impacts through refinement of the horizontal alignment was minimal. One example of a horizontal shift is in the vicinity of the Difficult Run crossing where the road tangent was shifted to the east which moved the road 20' to the north reducing impacts to wetlands. Examples of typical section reduction include: use of retaining walls at the Difficult Run crossing; median width reduction from 48 feet to 16 feet from Difficult Run to the western terminus of the project; lane width reduction from 12 feet to 11 feet for the entire project; reduction of the shared use path width from 10 feet to 8 feet wide at the Difficult Run crossing; and reduction of the shared use path buffer from the back of curb from 8 feet to 5 feet for the entire project. One example of a vertical shift was the lowering of the Difficult Run crossing by one foot (design waiver pending). Lowering the bridge resulted in minor impact reductions.

Overall, roadway design refinements resulted in impact reductions to 2.7 acres of wetlands and 109 linear feet of stream. The majority of the impact reductions (2.6 acres) were the result of design refinements in the vicinity of the Difficult Run bridge crossing (discussed in detail below in the Colvin Run Stream Relocation section). The remaining impact reduction (0.10 acre) resulted from refinement of three design elements:

- The median width was reduced from 48 feet to 16 feet between Reston Avenue and Difficult Run, approximately 3.1 miles. The remaining median width continues to be 16 feet between Difficult Run and Jarrett Valley Drive;
- Lane widths were reduced from 12 feet to 11 feet for the entire project and a design waiver was requested and approved by VDOT for this variation in the design standards.
- The shared use path buffer from the back of curb was reduced from 8 feet to 5 feet for the entire project.

Stormwater Management Basins

The stormwater management design for the project was conducted in four iterations: Base Design, Iteration 1, Iteration 2, and Iteration 3 (see **Figure 2-3 [Appendix A]** and **Table 2-3**). The Base Design was designed in compliance with the Virginia Stormwater Management Program (VSMP) Part IIB technical criteria (“new regulations”) and consisted of 14 stormwater basins resulting in 1.73 acres of wetland impacts. The Base Design was refined through a combination of basin relocation and elimination resulting in Iteration 1, which reduced wetland impacts from 1.73 acres to 0.49 acres. VDEQ determined that the project would be grandfathered pursuant to Title 9 of the Virginia Administrative Code (VAC) (9VAC25-870-48); therefore, Iteration 2 was developed in compliance with the VSMP Part IIC technical criteria (“old regulations”) which eliminated two additional basins leaving a total of 9 basins and further reducing the wetland impacts from 0.49 to 0.42 acres. The final iteration, Iteration 3, was further optimized to reduce wetland impacts from 0.42 acres to 0.01 acres.

Table 2-4: Stormwater Management Pond Avoidance and Minimization

Outfall/ Storm- water Pond	Impervious Drainage Area (acres)	Base Design****						Iteration #1*						Iteration #2**						Iteration #3***									
		Utilizing IIB Criteria						Utilizing IIB Criteria						Utilizing IIC Criteria						Utilizing IIC Criteria - Final Refinements									
		BMP Type	Pond Total Wetland Impacts			Outfall Total Wetland Impacts			BMP Type	Pond Total Wetland Impacts			Outfall Total Wetland Impacts			BMP Type	Pond Total Wetland Impacts			Outfall Total Wetland Impacts			BMP Type	Pond Total Wetland Impacts			Outfall Total Wetland Impacts		
			PEM	PFO	PSS	PEM	PFO	PSS		PEM	PFO	PSS	PEM	PFO	PSS		PEM	PFO	PSS	PEM	PFO	PSS		PEM	PFO	PSS			
Square Feet			Square Feet			Square Feet			Square Feet			Square Feet			Square Feet			Square Feet			Square Feet								
1	3.28	Wet Pond		7,106			66		Wet Pond		2,733				Eliminated						Eliminated								
2	2.65	Wet Pond							Wet Pond						Wet Pond						Wet Pond								
3A	6.67	Wet Pond							Wet Pond		8,084				Wet Pond		8,084				Wet Pond								
3B	5.8	Wet Pond	32,888	5,795		2,572			Wet Pond	7,697	256		110		Wet Pond	7,697	256		110		Wet Pond								
4	N/A	Dry Pond							Dry Pond						Dry Pond						Wet Pond								
5	7.61	Wet Pond		3,011					Eliminated						Eliminated						Eliminated								
6	9.59	---							Eliminated						Eliminated						Eliminated								
7	4.24	Wet Pond		16,228					Eliminated						Eliminated						Eliminated								
8	6.81	Wet Pond							Wet Pond						Wet Pond						Wet Pond								
9	4.04	Wet Pond							Wet Pond						Wet Pond						Wet Pond								
10	3.51	Wet Pond							Wet Pond						Wet Pond						Wet Pond								
11	5.69	Wet Pond							Wet Pond						Wet Pond						Wet Pond								
12	2.03	Wet Pond							Wet Pond						Eliminated						Eliminated								
13	3.83	Wet Pond		6,198			1,309		Wet Pond		2,359				Wet Pond		2,359				Wet Pond		102			454			
Totals			32,888	38,339	0	2,572	1,375	0		7,697	13,432	0	110	0		7,697	10,699	0	110	0		0	102	0	0	454	0		
Total Acres			0.76	0.88	0.00	0.06	0.03	0.00		0.18	0.31	0.00	0.00	0.00		0.18	0.25	0.00	0.00	0.00		0.00	0.00	0.00	0.01	0.00			
Total Acres			1.73						0.49						0.42						0.01								

Notes:

PEM - Emergent; PFO - Forested; PSS - Scrub- Shrub; NC - Nutrient Credit Purchase

*Ponds 5 and 7 were eliminated in Iteration 1 by applying Nutrient Credit purchase and the 1% Rule

**Ponds 1 and 12 were subsequently eliminated in Iteration 2 when the Technical Criteria was switched from Part IIB to Part IIC (grandfathered).

***Final refinements to SWM Pond designs were made to minimize and virtually eliminate wetland impacts.

****Pond 6 was eliminated prior to the Base Design due to design conflict with the Colvin Run relocation. Removal of Pond 6 eliminated 0.64 acres of PFO and 0.02 acres of PSS impacts.

Colvin Run Stream Relocation

In order to accommodate an additional east-bound travel lane in the vicinity of the Difficult Run bridge crossing, approximately 1,600 feet of Colvin Run located adjacent to the south side of Route 7 from approximately 500 feet west of Carpers Farm Way east to Difficult Run, would have to be relocated. As part of the avoidance and minimization process, VDOT evaluated a range of options with consideration of various design elements to achieve the most practicable solution with the least amount of impacts. Following is a summary of the design elements that were considered in order to avoid and minimize impacts.

1. Use of retaining walls;
2. Location of pump station access road;
3. Location of equestrian bridle trail;
4. Location and width of Gerry Connolly Cross County Trail;
5. Median width;
6. Lane width;
7. Width of multi-use paths and safety buffer from back of curb on Route 7;
8. Typical section of stream channel (e.g., box culvert, riprap or equivalent-lined, concrete-lined, natural channel with wide meander and floodplain, natural channel with narrow meander and no floodplain, etc.);
9. Shift horizontal alignment of Route 7 further to the north;
10. Relocation of Colvin Run to the north of Route 7 versus to the south.

A total of 10 options (including three variations of Option 7, two variations of Option 9, and three variations of Option 10) were evaluated on the basis of construction cost, environmental impacts, and practicability (e.g., constructability, maintenance, etc.). All of the options were determined to be equally constructable; therefore, the selected option was chosen primarily based on cost and environmental impacts. Option 1 was the least expensive (\$859,100) but would have resulted in 3.45 acres of wetland impacts and was deemed not permissible by the USACE and VDEQ. Option 10C, while not the least expensive (\$3,757,061), was the least impactful (0.85 acres of wetlands) and was ultimately selected as the preferred design option. Option 10C, is depicted in **Figure 2-4**. A number of design elements were incorporated into the relocation of Colvin Run that reduced the total width of the project footprint as well as shifted the alignment away from wetlands to reduce wetland and stream impacts. Design options analyzed but not retained are depicted in **Figure 2-5 (Appendix A)**. The design elements considered as well as the decisions for each option are included in **Table 2-4**. By refining the design of the relocated Colvin Run, impacts to wetlands were reduced from 3.45 acres to 0.85 acres, a reduction of 2.6 acres. The impact acreages for the Colvin Run options also include some impacts attributed to roadway design as reported in **Table 2-5** below because the roadway design and Colvin Run relocation design are each affected by the other and could not be reasonably separated.

Figure 2-4: Colvin Run Options – Stream Relocation Option 10C

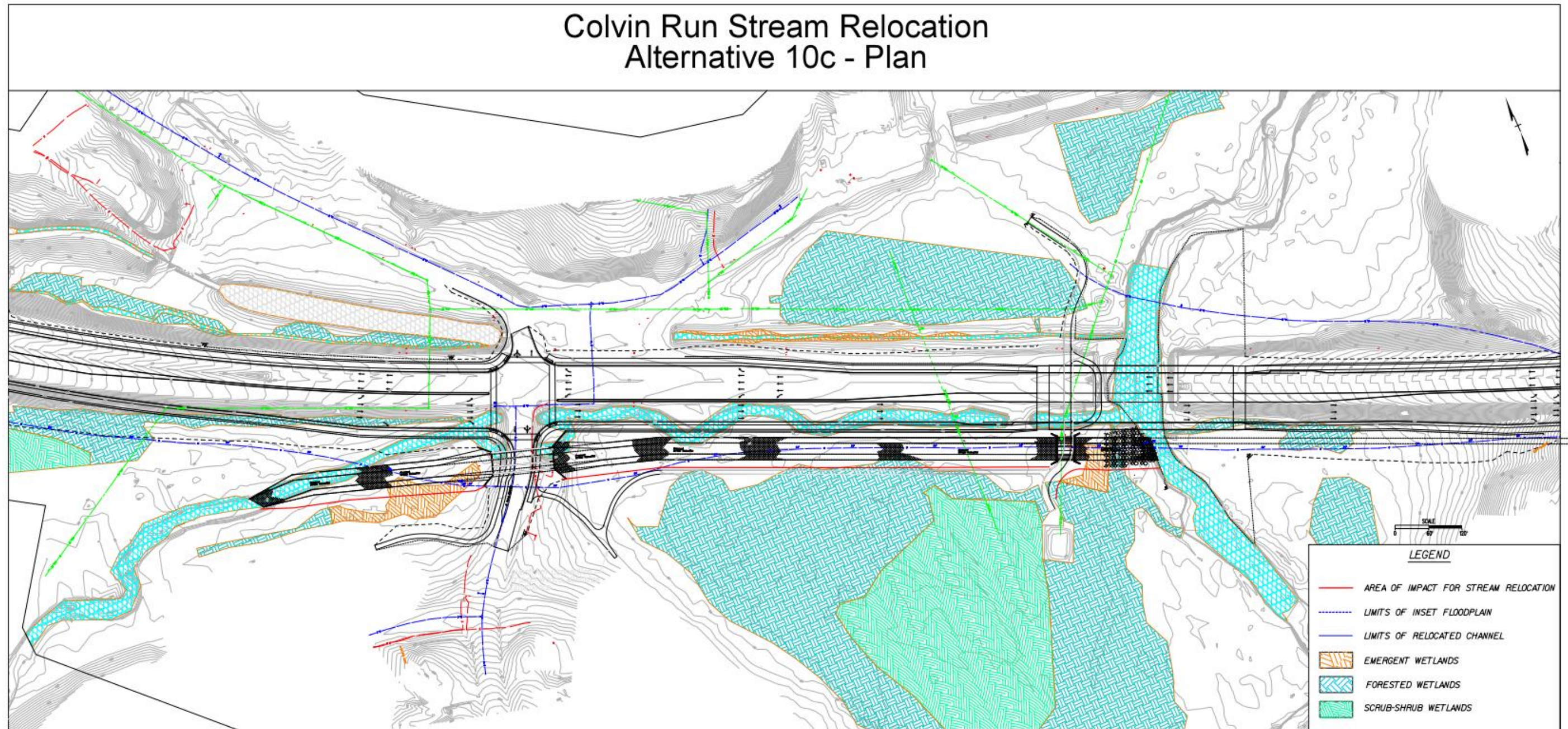


Table 2-5: Colvin Run Options

	Option 1 - "Wide Floodplain"			Option 2 - "Reduced Floodplain"			Option 3 - "No Floodplain"		
Design Elements	Natural channel design, wide meander, wide constructed floodplain, CCT/bridle trail between Route 7 and Colvin Run			Natural channel design with narrow meander, step pools, rock vanes, narrow floodplain, CCT/bridle trail between Route 7 and Colvin Run			Natural channel design with narrow meander, step pools, rock vanes, no floodplain, CCT/bridle trail between Route 7 and Colvin Run		
Estimated Construction Cost	\$859,100			\$1,441,000			\$2,305,800		
Wetland Impacts (AC)	PEM	PSS	PFO	PEM	PSS	PFO	PEM	PSS	PFO
	0.34	0.47	2.15	0.34	0.23	1.41	0.33	0.2	1.24
Total Wetland Impacts (AC)	3.45			1.98			1.77		
Stream Impacts (LF)	1,660			1,660			1,660		
Decision	Not chosen. High wetland impacts. Not permissible.			Not chosen. High wetland impacts. Not permissible.			Not chosen. High wetland impacts. Not permissible.		
	Option 4- Concrete Channel			Option 5 - Culvert Enclosure			Option 6 - Splitting Flow to Colvin Mill and Reduced Floodplain		
Design Elements	Colvin Run conveyed through a concrete-lined channel, CCT between Route 7 and Colvin Run			Colvin Run conveyed through triple 12' X 12' box culverts, CCT/bridle trail located south of relocated Colvin Run through wetlands.			Option 1 stream design plus impound Colvin Run and reconstruct head race to Colvin Mill to return flowing water to the Colvin Mill water wheel		
Estimated Construction Cost	\$3,272,300			\$7,145,800			\$7,500,000		
Wetland Impacts (AC)	PEM	PSS	PFO	PEM	PSS	PFO	PEM	PSS	PFO
	0.34	0.11	1.15	0.16	0.01	0.59	0.34	0.47	2.15
Total Wetland Impacts (AC)	1.6			0.76			2.96 (+26.62 AC for dam)		
Stream Impacts (LF)	1,660			1,660			7,921		
Decision	Not selected. High wetland impacts. High cost. Not permissible.			Not chosen. Cost prohibitive.			Not chosen. Cost prohibitive. High wetland and stream impacts. Not permissible.		
	Option 7 - Box Culvert under Route 7 to Discharge to Mill Tail Race			Option 7a - Box Culvert under Route 7 Discharge to Improved Mill Race Channel			Option 7b - Box Culvert under Route 7 Discharge to Improved Mill Race Channel with Retaining Wall to Reduce impacts		
Design Elements	Convey Colvin Run north through box culvert under Route 7 and tie into Mill Tail Race which will be conveyed through a box culvert to discharge into Difficult Run			Convey Colvin Run north through box culvert under Route 7 and tie into Mill Tail Race which will be conveyed through an improved "Option 3" type channel with a narrow meander, step pools, rock vanes and no floodplain			Option 7a but with retaining wall on north side of Route 7		
Estimated Construction Cost	\$6,261,700			\$5,682,866			\$6,217,166		
Wetland Impacts (AC)	PEM	PSS	PFO	PEM	PSS	PFO	PEM	PSS	PFO
	0.12	0	0.56	0.12	0	0.68	0.12	0	0.32
Total Wetland Impacts (AC)	0.68			0.8			0.44		
Stream Impacts (LF)	2,386			2,386			2,386		
Decision	Not chosen. Cost too high. High stream impacts.			Not chosen. High cost. High stream impacts.			Not chosen. High cost. High stream impacts.		

	Option 8 - Raise Stream Bed of Relocated Colvin Stream/Step-Pool Transition at Difficult Run			Option 9a - Wide Floodplain with Retaining Wall for Reduced Impacts			Option 9b - No Floodplain with Retaining Wall for Reduced Impacts		
Design Elements	Option 1 stream design, but with raised stream bed of relocated Colvin Run and step pool transition and rock vanes at discharge into Difficult Run			Option 1 stream design with a retaining wall on south side of Route 7.			Option 3 stream design with retaining wall on south side of Route 7.		
Estimated Construction Cost	\$1,253,159			\$1,896,423			\$2,497,353		
Wetland Impacts (AC)	PEM	PSS	PFO	PEM	PSS	PFO	PEM	PSS	PFO
	0.34	0.47	2.15	0.33	0.22	1.76	0.27	0.09	1.06
Total Wetland Impacts (AC)	2.96			2.31			1.42		
Stream Impacts (LF)	1,660			1,660			1,660		
Decision	Not chosen. High wetland impacts. Not permissible.			Not chosen. High wetland impacts. Not permissible.			Not chosen. High wetland impacts. Not permissible.		
	Option 10a -			Option 10b -			Option 10c -		
Design Elements	Colvin Run conveyed through straight riprap or equivalent-lined channel, no meander, no floodplain; retaining wall on south side of Route 7; box culvert under Carpers Farm Way skewed to direct Colvin Run closer to Route 7; Route 7 shifted 20 feet to north; bridle trail between Route 7 and Colvin Run; pump station access road coming from north under Difficult Run bridge			Same as Option 10a, except bridle trail traversing wetlands to south of Colvin Run			Same as Option 10a, except bridle trail between Colvin Run and wetlands		
Estimated Construction Cost	\$3,765,861			\$3,757,941			\$3,757,061		
Wetland Impacts (AC)	PEM	PSS	PFO	PEM	PSS	PFO	PEM	PSS	PFO
	0.14	0	0.15	0.17	0	0.12	0.17	0	0.06
Total Wetland Impacts (AC)	0.90			1.1			0.85		
Stream Impacts (LF)	1,660			1,660			1,660		
Decision	Not chosen. Not least impactful option.			Not chosen. Not least impactful option.			Selected option. Least impactful option.		

*Impact acreages for Options 1 and 10C include a 20-foot buffer from construction limits to allow for installation of erosion and sediment control measures. Impact acreages for Options 2 through 10B do not include a 20-foot buffer from the limits of construction.

The key design refinements incorporated into Option 10C are provided below:

- Colvin Run would be conveyed through a straight, riprap or equivalent-lined channel with no meander and no constructed floodplain. This design would greatly reduce the lateral footprint and would minimize encroachment into the adjacent wetland. The channel would be designed to allow adequate energy dissipation to minimize effects to downstream hydrodynamics.
- The relocated 54-inch water main would be collocated under the equestrian bridle trail to minimize land disturbance and impacts. The design currently allows for a 28-foot-wide permanent utility easement for the collocated trail and water main, of which the CCT would occupy 12 feet. Fairfax Water typically prefers a 40-foot wide permanent easement; however, during a meeting with VDOT on August 16, 2017, Fairfax Water tentatively agreed to a narrower easement in this location to avoid impacts to wetlands. The width of the permanent easement may increase pending final decision from Fairfax Water.
- The pump station access road would cross under the Difficult Run bridge from the north side of Route 7 eliminating the need to place the road between Route 7 and Colvin Run further reducing encroachment into the wetlands to the south.
- The road tangent was shifted to the east shifting the horizontal road alignment 20 feet to the north.
- A retaining wall would be constructed on the south side of Route 7 to further reduce the road typical section.
- The CCT would cross at the signalized intersection between Route 7 and Carpers Farm Way rather than travel between Route 7 and Colvin Run east to cross under the Difficult Run bridge.
- The box culvert under Carpers Farm Way was skewed to direct Colvin Run closer to Route 7.
- The equestrian bridle trail width was reduced from 10 feet to 7 feet.
- The width of the shared use path on Route 7 was reduced from 10 feet to 8 feet at Difficult Run crossing.

Compensation for Lost Wetland Functions

Banks within the same HUC are restoring and preserving similar systems with similar geomorphic setting, hydrology, and hydrodynamics; therefore, it is reasonable to assume that these banks would provide suitable, “in-kind” compensation that would replace the lost functions of the wetlands being impacted by the Project.

3.0 WATER QUALITY

As directed by Section 305(b) of the Clean Water Act (CWA), VDEQ monitors quality in the state's waters, identifying impairments and sources of impairments, and developing and implementing Total Maximum Daily Load (TMDL) reports for impaired waters (VDEQ, 2014). TMDLs are the allowable loadings or loading strategies for waterbodies classified as water quality limited. A TMDL Report is a study to determine the amount of a pollutant that the impaired water can assimilate and still meet water quality standards.

When surface waters fail to meet water quality standards sufficient to support designated use categories, the waters are classified as “impaired waters” under Section 303(d) of the CWA. Freshwater rivers and surface waters in Virginia are evaluated biennially on the water’s ability to support the following six designated use categories: Recreation, Aquatic Life, Fish Consumption, Shellfish Harvest, Public Water Supply, and Wildlife.

3.1 Methodology

To determine water quality within the study area, best available data sources were reviewed. These include DEQ’s Final 2014 305(b)/303(d) Water Quality Assessment Integrated Report, which was reviewed to determine if any impaired waters are located within the study area (VDEQ, 2014). Additionally, Fairfax County’s website was reviewed to determine the proximity of the proposed project to public drinking water supplies (Fairfax County Water Authority, 2017). The findings are summarized below.

3.2 Existing Conditions

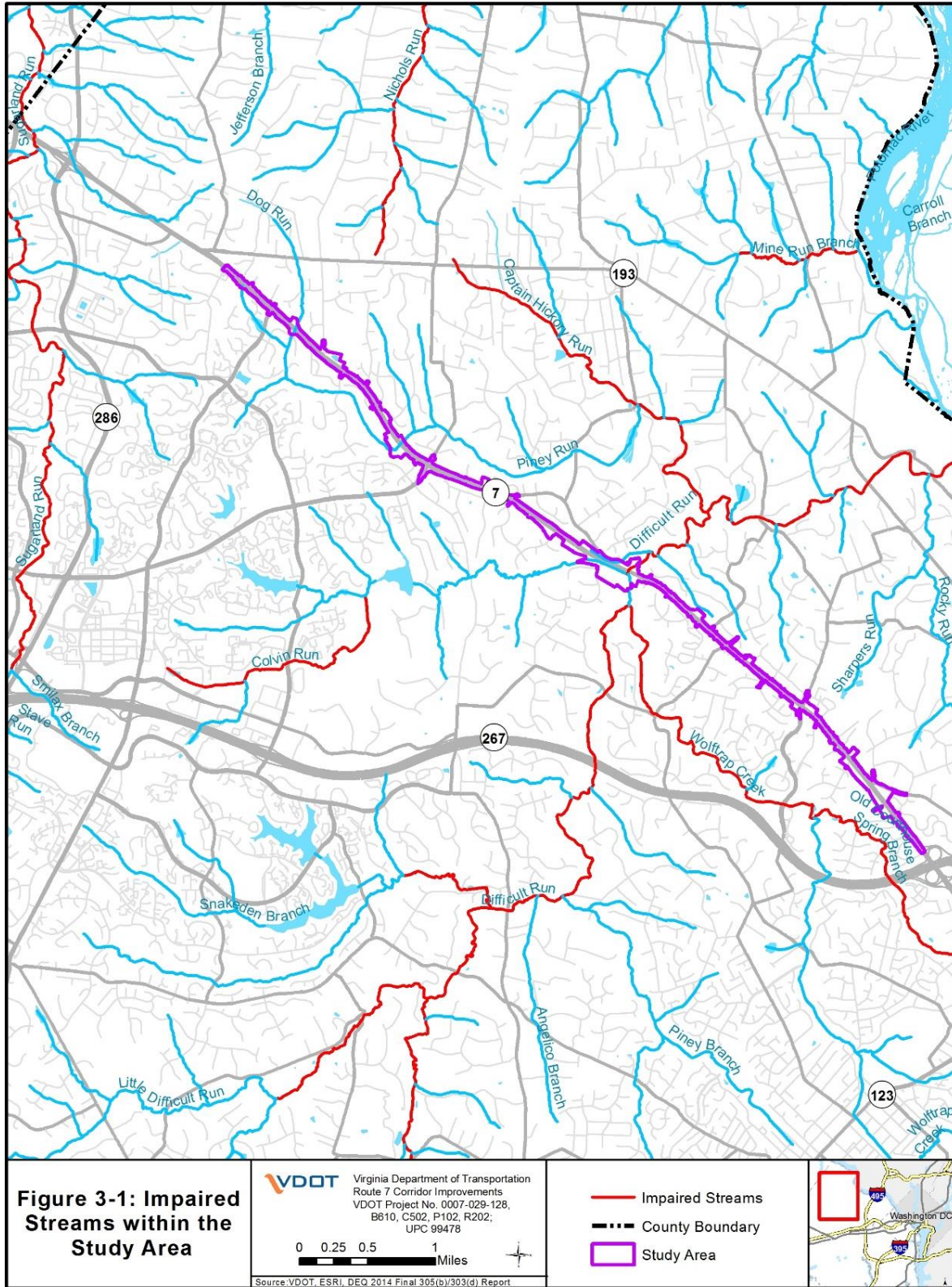
One stream segment, a portion of Difficult Run from the Route 7 Bridge downstream to the northern study area boundary, is classified as impaired due to polychlorinated biphenyl (PCB) in fish tissue (source unknown). This segment within the study area totals 533 linear feet. **Figure 3-1** displays this impaired water within the study area. No TMDLs are located within the study area.

3.3 Environmental Consequences

The Build Alternative would result in temporary impacts to water quality during roadway construction through increased sedimentation from land disturbing activities and occurrences of fuel spills or hydraulic spills from construction equipment. During construction, the contractor would be required to adhere to strict erosion and sediment control and stormwater measures and the associated required monitoring protocols. Both temporary and permanent stormwater best management practices (BMP) would be designed as the project progresses and implemented to minimize the negative impacts of various pollutants that can be carried by runoff into the groundwater and receiving waters in accordance with VDOT’s Drainage Manual to minimize impacts and comply with VSMP (VDOT, 2017).

Generally, VDOT’s practice is to maintain both water quality and quantity post-development equal to or better than pre-development, as described in the current guidance, Minimum Requirements for the Engineering, Plan Preparation and Implementation of Post Development Stormwater Management Plans (Instructional and Informational Report Number: IIM-LD-195.8, VDOT – Location and Design Division).

Figure 3-1: Impaired Streams within the Study Area



Title 9 of the VAC (9VAC25-870-48) allows projects to be grandfathered for stormwater subject to certain conditions. Locality, state, and federal projects shall be considered grandfathered by the VSMP authority and shall be subject to the Part II C technical criteria of 9VAC25-870-93 provided:

1. There has been an obligation of locality, state, or federal funding, in whole or in part, prior to July 1, 2012, or the department has approved a stormwater management plan prior to July 1, 2012;
2. A state permit has not been issued prior to July 1, 2014; and
3. Land disturbance did not commence prior to July 1, 2014.

This project was approved by VDEQ for grandfathering under the Part II C technical criteria because funds, in part, were obligated prior to July 1, 2012, no state permit was issued prior to July 1, 2014, and land disturbance did not commence prior to July 1, 2014. Additionally, VDOT verified the Universal Project Code (UPC) 70849 existed prior to July 1, 2012. Although this project is grandfathered for stormwater, the project would be compliant with the Chesapeake Bay Preservation Act (CBPA) because the project would be designed and constructed in accordance with VDOT's annual erosion and sediment control and stormwater management standards and specifications. VDOT's annual standards and specifications are approved by VDEQ.

Stormwater

Construction of new permanent stormwater management facilities associated with the Build Alternative would offset any impacts to water quality and quantity over existing conditions, as this portion of Route 7 currently lacks modern stormwater facilities. These improvements would also serve to protect public water supplies.

Equestrian Trail

Nutrient input from horse manure could affect water quality. Horses typically defecate within ½ mile of the beginning of a trail ride (USDOT, 2007). The closest likely parking area for horses is in Lake Fairfax Park, which is approximately 1.5 trail miles to the west of Colvin Run; therefore, it is likely that horse defecation on the bridle trail in the vicinity of Difficult Run and Colvin Run within the study area would be minimal.

As such, in order to further minimize potential effects of horse manure runoff, the project design would include technical requirements to ensure that manure runoff is adequately addressed.

4.0 FLOODPLAINS

Floodplains provide a natural means of detaining floodwaters and thus protect downstream properties from flood damage. Development in floodplains reduces flood storage capacity and places development in the floodplain and downstream properties at risk. Federal policies, Executive Order (EO) 11988, as amended, EO 13690, and FHWA policy as set forth in 23 Code of Federal Regulations (CFR) §650, require avoidance of effects associated with the modification of and development in floodplains if a practicable alternative (such as shifting alignments to reduce or avoid the floodplains) exists for the proposed action. Federal Emergency Management Agency (FEMA) standards also limit increases in base flood levels to less than 1.0 foot above pre-development levels, provided that hazardous velocities are not produced.

The 100-year flood, or base flood, is the area covered by a flood that has a one percent chance of occurring in any given year; this is commonly referred to as the 100-year floodplain. The 100-year floodplain includes the floodway, which is the area that experiences the deepest water and the highest velocities. The floodplain also includes the flood fringe, which is located just outside the floodway. The 500-year floodplain is the area covered by a flood that has a 0.2 percent chance of occurring in any given year.

4.1 Methodology

Locations of designated floodplains and floodways were determined using Flood Boundary and Floodway Maps published by FEMA (US Department of Homeland Security, 2017).

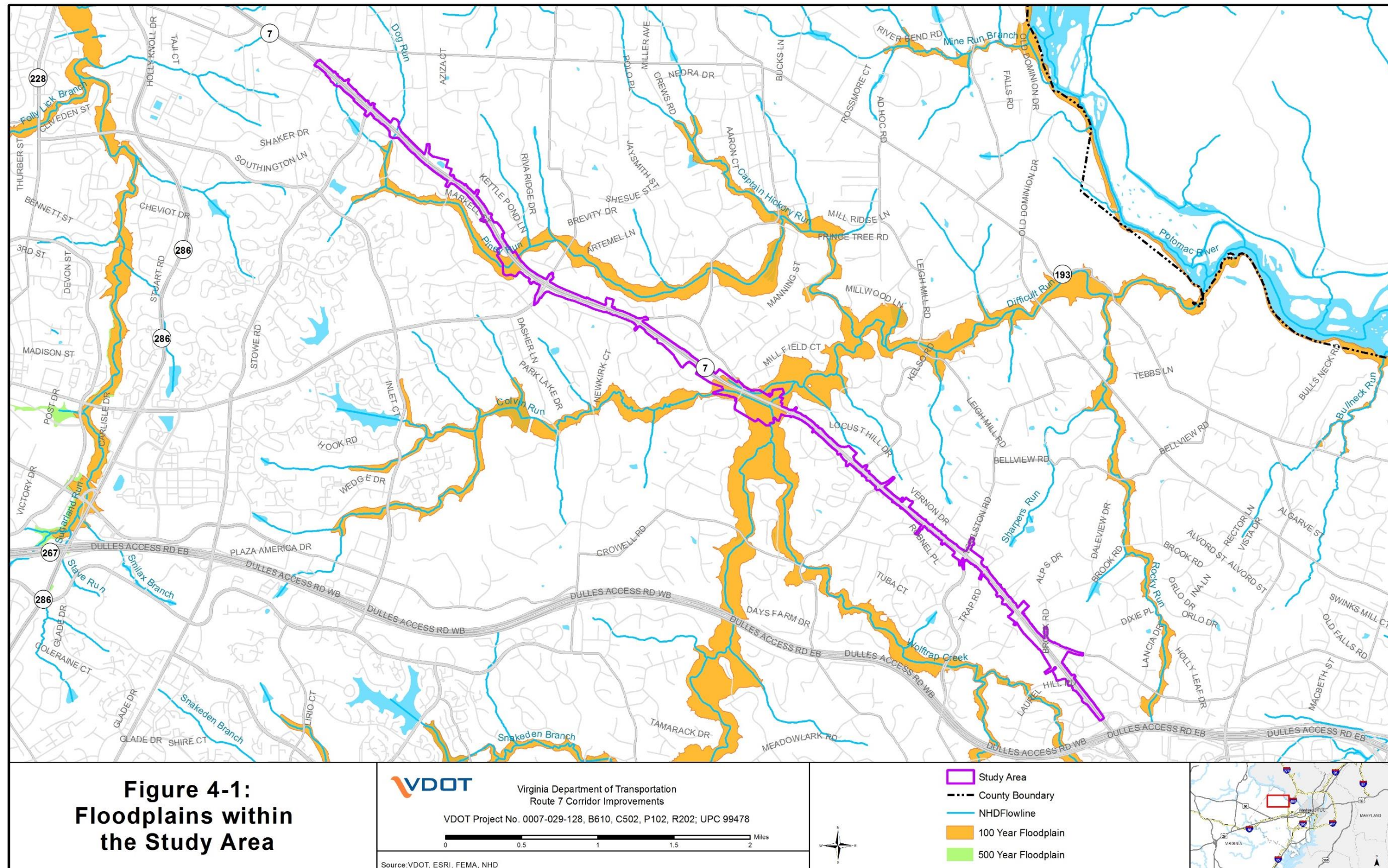
4.2 Existing Conditions

The study area contains approximately 50 acres of 100-year floodplain, 0 acres of floodway, and 0 acres of 500-year floodplain (see **Figure 4-1**). These 100-year floodplains are associated with Difficult Run, Colvin Run, and Piney Run. The remaining 245 acres within the study area are designated as Zone X (areas outside of the 500-year floodplain) (United States Department of Homeland Security, 2017).

4.3 Environmental Consequences

The Build Alternative would impact approximately 17.5 acres of 100-year floodplain, 0 acres of floodway, and 0 acres of 500-year floodplain. Floodplain impacts would occur directly adjacent to Route 7, and are the result of fill required for the addition of a third lane. Consequently, the proposed floodplain impacts are in an area in which floodplains are already impacted by Route 7. During final design, a hydrologic and hydraulic analysis would be required by VDOT to provide adequate design of the hydraulic openings of culverts and proper conveyance of floodwaters to minimize potential impacts to the floodplain and floodplain hazards. In the case of the Difficult Run crossing, the hydraulic opening would be expanded and therefore, the proposed floodplain conditions would be better than existing conditions.

Figure 4-1: Floodplains within the Study Area



5.0 THREATENED, ENDANGERED, AND SPECIAL STATUS SPECIES

The United States Fish and Wildlife Service (USFWS) and National Oceanic and Atmospheric Administration (NOAA) - National Marine Fisheries Service (NMFS) regulate and protect federally listed threatened, endangered, and special status species under the Endangered Species Act (ESA) of 1973 with the primary goal of conserving and recovering listed species. The ESA, with few exceptions, prohibits activities affecting threatened, endangered, and special status species unless authorized by a permit. The legal federal status of a species is determined by USFWS and NMFS.

In addition to federal oversight, threatened, endangered, and special status species are also regulated at the state level by a number of different agencies and organizations. The state agencies have adopted the federal list as well as a state list of threatened, endangered, and special status species, with the primary focus of managing Virginia's wildlife to maintain optimum populations of all species and conserve biodiversity. The Virginia Department of Game and Inland Fisheries (VDGIF) is responsible for game, fish and wildlife resources and habitats, and state-listed threatened, endangered, and special status animal species (exclusive of insects). The Virginia Department of Agriculture and Consumer Services (VDACS) is responsible for threatened, endangered, and special status species of plants and insects. The Virginia Department of Conservation and Recreation's Division of Natural Heritage (VDCR-DNH) maintains a statewide database for conservation planning and project review.

The bald eagle (*Haliaeetus leucocephalus*) was removed from the federal list of threatened and endangered species in 2007 and removed from the Virginia list of threatened and endangered species in 2013. However, the bald eagle still receives protection under the federal Bald and Golden Eagle Protection Act and federal Migratory Bird Treaty Act.

5.1 Methodology

On June 29, 2017, the VDGIF Virginia Fish and Wildlife Information Service (VAFWIS) database, the VDGIF Wildlife Environmental Review Map Service (WERMS), the USFWS Information for Planning and Consultation (IPaC) database, the VDCR-DNH online searchable database, the Center for Conservation Biology (CCB) Mapping Portal, and the USFWS Virginia Field Office's Bald Eagle Map Tool were queried to identify threatened, endangered, and special status species that may potentially be affected by the project.

5.2 Existing Conditions

5.2.1 Database Findings

All species identified in the database queries are depicted in **Table 5-1**. Database searches did not identify the rusty patched bumblebee (*Bombus affinis*); however, Fairfax County is considered to be in the historical range of this species and was therefore carried forward for further evaluation.

Table 5-1: Threatened and Endangered Species Carried Forward for Analysis

Common Name	Scientific Name	Legal Status	IPaC	VDCR-DNH (12 Digit HUC)	VAFWIS (2 Mile Buffer)	WERMS
Rusty Patched Bumblebee	<i>Bombus affinis</i>	FE, SE				
Northern Long-eared Bat	<i>Myotis septentrionalis</i>	FT, ST	X			
Yellow Lance	<i>Elliptio lanceolata</i>	Proposed FT	X			
Wood Turtle	<i>Glyptemys insculpta</i>	ST		X	C	X

FE=federal endangered, FT=federal threatened, SE=state endangered, ST=state threatened, C=confirmed

Within the study area, VAFWIS and WERMS identified 948 linear feet of Difficult Run as threatened and endangered waters for the wood turtle. VAFWIS and WERMS did not identify Anadromous Fish Use areas mapped within the study area; the closest Anadromous Fish Use areas are over 2.3 miles away. VAFWIS and WERMS indicate the closest historic trout streams are over 3.4 miles away from the study area. The USFWS IPaC system indicates that no critical habitat occurs within the study area. Additionally, VAFWIS, WERMS, the CCB Mapping Portal, and the USFWS Virginia Field Office's Bald Eagle Map Tool indicate no bald eagle nests are present within the study area; the closest nest is over 5 miles away.

Rusty Patched Bumblebee (*Bombus affinis*)

The rusty patched bumblebee was listed by the USFWS as endangered on March 21, 2017. The rusty patched bumblebee is a wide-ranging species found throughout the northeastern United States and adjacent Canada. They typically live close to or within woodlands, but have been documented in grasslands, marshes, agricultural landscapes, and residential parks and gardens. Colonies are annual and only mated queens overwinter, typically in soft disturbed soil. Nests are located underground in abandoned rodent nests, in tufts of grass, old birds' nests, rock piles, and in cavities of dead trees. Major threats to this species include pathogen spill-over from commercial to wild bees, habitat loss due to agriculture and development, pesticide use, and climate change.

From 2007 to 2016, surveys were conducted to identify known locations of the rusty patched bumblebee. Using a habitat connectivity model, the USFWS determined the probability of the bumblebee occurring in the areas surrounding known locations. The predictive model used typical bumblebee foraging distances, surrounding suitable habitat (derived from National Landcover Database maps), and typical dispersal distances. USFWS has identified areas immediately surrounding a current record as high potential zones where the bumblebee is likely to be present and where coordination should be conducted with USFWS to evaluate potential effects to the species. The area immediately surrounding a high potential zone is called a primary dispersal zone and represents an area of lower probability no greater than 6.2 miles from a known location where the bee may occur based on less frequent dispersal events. Areas not located within high potential zones or primary dispersal zones are defined as the historical range where the bumblebee could have occurred in the past but is not likely to be present currently.

USFWS's rusty patched bumblebee map indicates that the study area is located within the historical range, but is approximately 28 miles east of the nearest high potential zone and approximately 20 miles east of the nearest primary dispersal zone for the rusty patched bumblebee (USFWS, 2017c).

Northern Long-eared Bat (*Myotis septentrionalis*)

The Northern Long-eared Bat (NLEB) was listed by the USFWS as threatened on April 2015. Home range for the northern long-eared bat is widely but patchily distributed in the eastern and north-central United States and adjacent southern Canada, and southward to southern Texas, Louisiana, Alabama, Georgia, and Florida, and westward in the United States generally to the eastern margin of the Great Plains region (NatureServe, 2017). In the winter, they hibernate in caves, mines, and tunnels with relatively constant and cool temperatures, high humidity, and no air currents. In the summer, they roost in old-growth forests with uneven forest structure, single and multiple tree-fall gaps, standing snags, and woody debris. Major threats to the species existence include the fungal disease white-nose syndrome (WNS), wind energy development, and habitat modification. This species has not been recorded within the study area, but IPaC has predicted potential occurrences. VDGIF's northern long-eared bat winter habitat and roost trees mapper indicates the closest known hibernacula or roost tree is over 80 miles away from the study area (VDGIF, 2017a).

Yellow Lance (*Elliptio lanceolata*)

On April 5, 2017, the USFWS published a proposed rule to list the yellow lance as threatened under the ESA. A 60-day public comment period began on April 5, 2017 and closed on June 5, 2017. Comments will be used to inform the final decision. Within one year of the proposed rule, the USFWS will either:

1. publish a final listing rule as originally proposed or later revised because the best available biological data support it;
2. withdraw the proposal because the biological information does not support the listing; or
3. extend the proposal if there is substantial disagreement within the scientific community concerning the biological appropriateness of the listing. After a six-month extension, the USFWS is required to make a decision on the basis of the best scientific information available.

A final listing rule generally becomes effective 30 days after publication in the Federal Register.

The yellow lance is a bright yellow, short-term brooding mussel that grows to about 8.6 centimeters long. It inhabits river basins in Maryland, Virginia, and North Carolina. Suitable habitat consists of clean, fast-flowing rivers with rubble, gravel, and sand substrates. Typically, yellow lance lives in main stream channels at least a meter across. Major threats include water pollution, dams, development, and fragmented habitat (Encyclopedia of Life, 2017). This species has not been recorded in the study area, but IPaC has predicted potential occurrences.

Wood Turtle (*Glyptemys insculpta*)

The wood turtle is a small turtle that is found throughout much of the east coast and midwest from northern Virginia to Nova Scotia and eastern Minnesota to the northern Appalachians. Suitable habitat consists of forested floodplains, fields, wet meadows, and farmland as long as these places have a large creek or stream nearby. They wander on land in the summer and hibernate in deep pools during the winter. They prefer slow moving waters and often hibernate under submerged logs, in beaver dams, or in muskrat burrows.

Threats include destruction of habitat, vehicular encounters, and pet trade (Harding, 2017). Wood turtle has been documented within the study area; however, the last known observation (VAFWIS and WERMS) was along Difficult Run in the vicinity of Route 7 in 2002 (VDGIF, 2017c).

5.3 Environmental Consequences

The majority of the area associated with the Build Alternative has been disturbed by previous roadway improvements, as well as residential and commercial development. Given the habitat requirements, historic observations, and distance to known observations, it is unlikely that the proposed project would result in impacts to threatened and endangered species.

Should the Build Alternative be selected for construction, further coordination and final Section 7 effect determinations would be conducted with resource agencies during the 404/401 permitting process. The study area is not located within an area where the USFWS has predicted the rusty patched bumblebee is likely to occur (i.e., within a high potential zone or primary dispersal zone). Because the study area is located only within the historical range where the bee is not likely present, it is not anticipated that the project will affect rusty patched bumblebee. Conservation and protection measures for the northern long-eared bat would be in accordance with the final 4(d) rule and the Programmatic Biological Assessment for Transportation Projects in the Range of the Indiana Bat and Northern Long-eared Bat. Coordination with resource agencies may result in presence/absence surveys in suitable habitat for yellow lance and wood turtle or under bridges for northern long-eared bat. Additional conservation measures that may be implemented depending upon the outcome of agency coordination and presence/absence surveys would be potential time-of-year restrictions for instream work (yellow lance and wood turtle), riparian wetlands and wooded habitat (wood turtle), or bridge work (northern long-eared bat).

6.0 TERRESTRIAL WILDLIFE AND HABITAT

6.1 Methodology

National Land Cover Database (NLCD) was reviewed to determine the types of land cover within the study area. Wildlife corridors were identified using aerial imagery; streams with contiguous forest cover generally greater than 0.25 mile in width were selected as wildlife corridors. The Fairfax County list of common wildlife was consulted to identify which species may be present within the study area. Additionally, wildlife observations were recorded while conducting the wetland delineation.

6.2 Existing Conditions

The study area has experienced noticeable alterations over the past several hundred years, primarily due to human activity. Land development of the 1900s, including housing, retail, and Route 7, has encroached and fragmented the various terrestrial wildlife habitats found within the study area. As illustrated in **Table 6-1** and **Figure 6-1**, developed lands are the predominant land cover type.

Figure 6-1: Land Cover within the Study Area

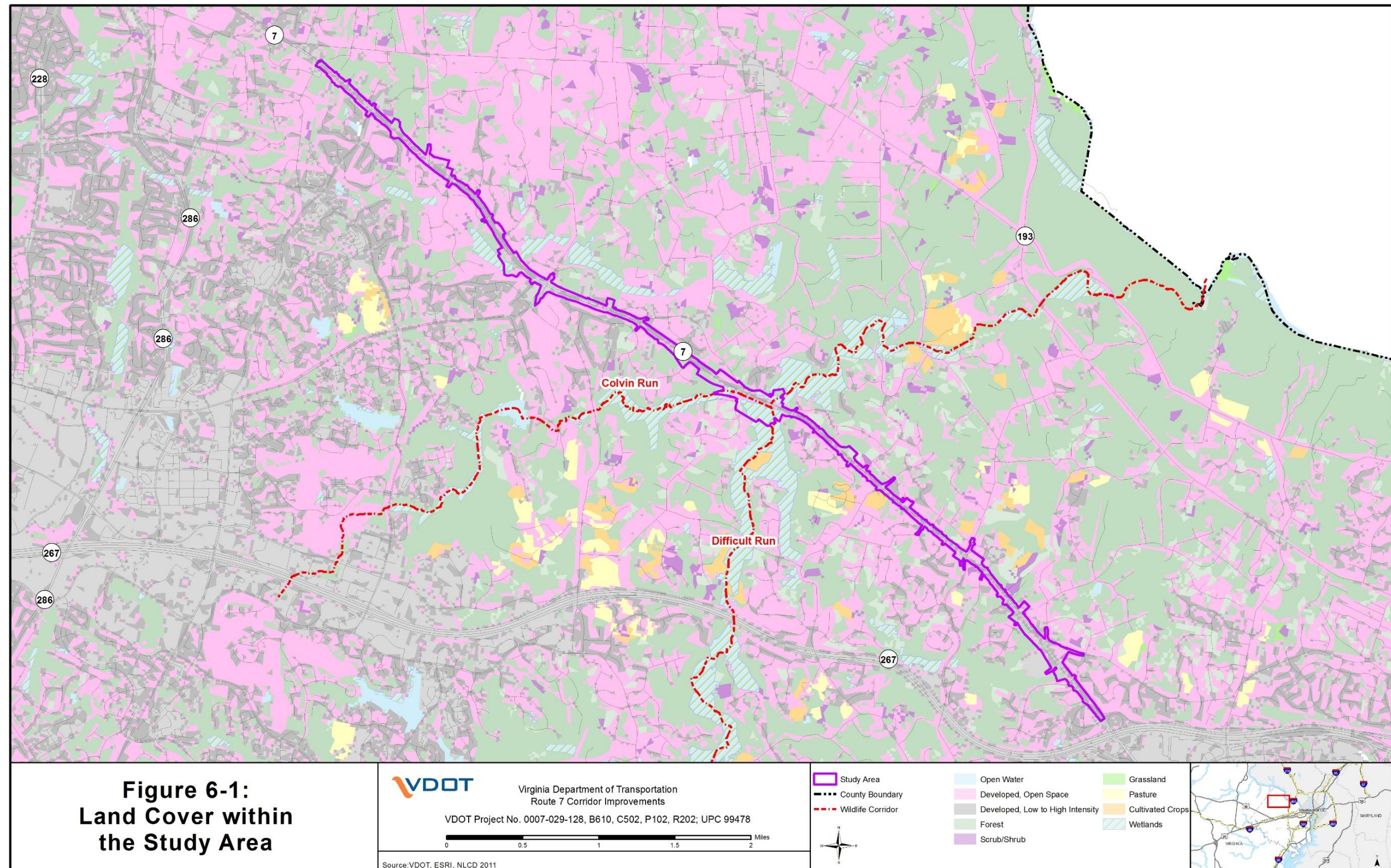


Table 6-1: Land Cover within the Study Area

Land Cover Type	Percentage
Developed; Low, Medium, and High Intensity	48%
Developed; Open Space	30%
Forest; Deciduous, Evergreen, and Mixed	12%
Woody Wetlands	9%
Shrub/Scrub	<1%
Cultivated Crops	<1%
TOTAL	100

Source: NLCD2011

The wildlife in the study area primarily consists of species that are adapted to urban environments; however, some of the riparian corridors contain forested habitat that supports fauna more typically found in less disturbed floodplain forests, including neotropical migrant birds. These riparian corridors with native vegetation can serve as wildlife corridors, linking wildlife habitats that might otherwise be separated by human development (NWF, 2017).

The study area includes two urban wildlife corridors associated with the riparian habitat along Difficult Run and Colvin Run in Colvin Run Mill Park, Difficult Run Stream Valley Park, and Wolf Trap Stream Valley Park (see **Figure 6-1**). These corridors are intersected by roads, which fragment the corridor, but do not prevent the continued use of corridors.

Species that may be present within the study area, including the wildlife corridors, include the following (Fairfax County, 2017a):

Common mammal species include:

- Coyote (*Canis latrans*)
- Beaver (*Castor canadensis*)
- Opossum (*Didelphis virginiana*)
- Big brown bat (*Eptesicus fuscus*)
- Southern flying squirrel (*Glaucomys volans*)
- Silver-haired bat (*Lasionycteris noctivagans*)
- Eastern red bat (*Lasiurus borealis*)
- Hoary bat (*Lasiurus cinereus*)
- Bobcat (*Lynx rufus rufus*)
- Groundhog (*Marmota monax*)
- Striped skunk (*Mephitis mephitis*)
- White-tailed deer (*Odocoileus virginianus*)
- Eastern pipistrelle (*Perimyotis subflavus*)
- Raccoon (*Procyon lotor*)
- Gray squirrel (*Sciurus carolinensis pennsylvanicus*)
- Fox squirrel (*Sciurus niger vulpinus*)
- Fisher’s eastern chipmunk (*Tamias striatus fisheri*)
- Gray fox (*Urocyon cinereoargenteus*)
- Black bear (*Ursus americanus*)
- Red fox (*Vulpes vulpes*)

Common amphibian and reptile species include:

- Eastern cricket frog (*Acris crepitans*)
- Northern copperhead (*Agkistrodon contortix mokasen*)
- Spotted salamander (*Ambystoma maculatum*)
- Marbled salamander (*Ambystoma opacum*)
- American toad (*Anaxyrus americanus*)
- Fowler’s toad (*Anaxyrus fowleri*)
- Eastern wormsnake (*Carphophis amoenus amoenus*)
- Northern scarletsnake (*Cemophora coccinea copei*)
- Northern black racer (*Coluber constrictor constrictor*)
- Timber rattlesnake (*Crotalus horridus*)
- Northern dusky salamander (*Desmognathus fuscus*)
- Northern ringneck snake (*Diadophis punctatus edwardsii*)
- Northern two-lined salamander (*Eurycea bislineata*)
- Three-lined salamander (*Eurycea guttolineata*)
- Four-toed salamander (*Hemidactylium scutatum*)
- Eastern hognose snake (*Heterodon platirhinos*)
- Cope’s gray treefrog (*Hyla chrysoscelis*)
- American green tree frog (*Hyla cinerea*)
- Mole kingsnake (*Lampropeltis calligaster*)
- Eastern kingsnake (*Lampropeltis getula*)
- Eastern milksnake (*Lampropeltis triangulum*)
- American bullfrog (*Lithobates catesbeianus*)
- Northern green frog (*Lithobates clamitans*)
- Pickerel frog (*Lithobates palustris*)
- Southern leopard frog (*Lithobates sphenoccephalus*)
- Wood frog (*Lithobates sylvaticus*)
- Northern watersnake (*Nerodia sipedon*)
- Red-spotted newt (*Notophthalmus viridescens*)
- Northern rough greensnake (*Opheodrys aestivus*)
- Eastern ratsnake (*Pantherophis alleghaniensis*)
- Red cornsnake (*Pantherophis guttatus*)
- Five-lined skink (*Plestiodon inexpectatus*)
- Northern red-backed salamander (*Plethodon cinereus*)
- White-spotted slimy salamander (*Plethodon cylindraceus*)
- Northern spring peeper (*Pseudacris crucifer*)
- Eastern mud salamander (*Pseudotriton montanus montanus*)
- Northern red salamander (*Pseudotriton ruber ruber*)
- Upland chorus frog (*Pseudacris feriarum*)
- Queen snake (*Regina septemvittata*)
- Eastern spadefoot (*Scaphiopus holbrookii*)
- Northern brownsnake (*Storeria dekayi dekayi*)

- Northern red-bellied snake (*Storeria occipitomaculata*)
- Common ribbon snake (*Thamnophis sauritus*)
- Eastern garter snake (*Thamnophis sirtalis*)
- Eastern smooth earthsnake (*Virginia valeriae*)

Common bird species include:

- Cooper's hawk (*Accipiter cooperii*)
- Mallard duck (*Anas platyrhynchos*)
- Blue heron (*Ardea herodias*)
- Tufted titmouse (*Baeolophus bicolor*)
- Canada goose (*Branta canadensis*)
- Red-tailed hawk (*Buteo jamaicensis*)
- Red-shouldered hawk (*Buteo lineatus*)
- Green heron (*Butorides virescens*)
- Northern cardinal (*Cardinalis cardinalis*)
- American goldfinch (*Carduelis tristis*)
- House finch (*Carpodacus mexicanus*)
- Turkey vulture (*Cathartes aura*)
- Northern flicker (*Colaptes auratus*)
- Rock pigeon (*Columba livia*)
- Black vulture (*Coragyps atratus*)
- American crow (*Corvus brachyrhynchos*)
- Fish crow (*Corvus ossifragus*)
- Bluejay (*Cyanocitta cristata*)
- Gray catbird (*Dumetella carolinensis*)
- Bald eagle (*Haliaeetus leucocephalus*)
- Pileated woodpecker (*Hylatomus pileatus*)
- Wood thrush (*Hylocichla mustelina*)
- Red-bellied woodpecker (*Melanerpes carolinus*)
- Song sparrow (*Melospiza melodia*)
- Northern mockingbird (*Mimus polyglottos*)
- Carolina chickadee (*Parus carolinensis*)
- House sparrow (*Passer domesticus*)
- Eastern towhee (*Pipilo erythrophthalmus*)
- Eastern bluebird (*Sialia sialis*)
- Chipping sparrow (*Spizella passerina*)
- Field sparrow (*Spizella pusilla*)
- Barred owl (*Strix varia*)
- European starling (*Sturnus vulgaris*)
- Carolina wren (*Thryothorus ludivicianus*)
- House wren (*Troglodytes troglodytes*)
- American robin (*Turdus migratorius*)
- Mourning dove (*Zenaida macroura*)

6.3 Environmental Consequences

A majority of the proposed improvements associated with the Build Alternative would occur along Route 7. Construction associated with this alternative would occur primarily within areas already heavily disturbed by development and previous transportation projects. The Build Alternative would not add impediments to their utilization by wildlife. Noise barriers may be placed adjacent to the road, but would not impede wildlife movement any more so than the existing road and culverts.

7.0 AQUATIC BIOLOGY

7.1 Methodology

To determine aquatic biology within the study area, best available data sources were reviewed. This included Fairfax County’s Stream Protection Baseline Study, which determined benthic macroinvertebrate community integrity, aquatic habitat, fish taxa richness, and fish species that may be present within the study area (Fairfax County, Virginia 2003).

7.2 Existing Conditions

According to the Fairfax County Stream Protection Baseline Study, three monitoring stations are within or close to the study area: one on Colvin Run, one on Piney Run, and one on Difficult Run. Benthic macroinvertebrate community integrity for the portion of Colvin Run near the study area scored “poor” whereas the portion of Difficult Run near the study area and Piney Run received a “good” rating. All three segments scored “poor” for aquatic habitat (Fairfax County Virginia, 2003).

Fish taxa richness scored a “high” rating for the portion of Colvin Run near the study area, a “low” rating for Piney Run, and a “moderate” rating for Difficult Run. The following fish species are present within the Difficult Run Watershed, and may be present within the study area streams (Fairfax County Virginia, 2003):

- Yellow Bullhead (*Ameiurus natalis*)
- Brown Bullhead (*Ameiurus nebulosus*)
- American Eel (*Anguilla rostrata*)
- Central Stoneroller (*Campostoma anomalum*)
- White Sucker (*Catostomus commersonii*)
- Rosyside Dace (*Clinostomus funduloides*)
- Satinfish Shiner (*Cyprinella analostana*)
- Fantail Darter (*Etheostoma flabellare*)
- Tessellated Darter (*Etheostoma olmstedii*)
- Cutlips Minnow (*Exoglossum maxillingua*)
- Northern Hogsucker (*Hypentelium nigricans*)
- Redbreast Sunfish (*Lepomis auritus*)
- Green Sunfish (*Lepomis cyanellus*)
- Pumpkinseed (*Lepomis gibbosus*)
- Warmouth (*Lepomis gulosus*)
- Bluegill (*Lepomis macrochirus*)
- Longear Sunfish (*Lepomis megalotis*)
- Common Shiner (*Luxilus cornutus*)
- Largemouth Bass (*Micropterus salmoides*)
- Golden Shiner (*Notemigonus crysoleucas*)
- Spottail Shiner (*Notropis hudsonius*)
- Margined Madtom (*Noturus insignis*)
- Swallowtail Shiner (*Notropis procne*)
- Fathead Minnow (*Pimephales promelas*)
- Blacknose Dace (*Rhinichthys atratulus*)
- Longnose Dace (*Rhinichthys cataractae*)
- Creek Chub (*Semotilus atromaculatus*)
- Fallfish (*Semotilus corporalis*)
- Eastern Mudminnow (*Umbra pygmaea*)

7.3 Environmental Consequences

Aquatic organisms and their associated habitats would incur some impacts as a result of roadway construction, stream relocation, maintenance, and vehicular passage. These impacts may result from the movement and compaction of soils, thus causing alterations to hydrology, water quality, and habitat. It is expected that construction activities would temporarily increase turbidity levels and sedimentation. Community diversity may be temporarily affected by clearing activities that would cause changes in acidity or alkalinity and temperature. Without best management practices being implemented during construction, such effects would be more intense and potentially damaging. Habitat within the footprint of any fill in aquatic systems, totaling approximately 3,185 linear feet of stream and 0.03 acres of POW, would be permanently lost. However, the seasonal fluctuations and the itinerant nature of aquatic biology would likely allow for any impacts to be more temporary than permanent, and provide for re-population of affected stream reaches post-construction. Additionally, the relocation of Colvin Run could largely offset the negative effects to aquatic biology associated with the Build Alternative because Colvin Run is currently unstable and eroding and the relocated stream channel would be stabilized thus potentially improving downstream water quality and aquatic habitat in this location.

8.0 FARMLANDS

The Farmland Protection Policy Act of 1981 [7 (USC) 4201] is administered by the USDA NRCS. Section 2 of the Act states that “the purpose of this act is to minimize the extent to which Federal programs contribute to the unnecessary and irreversible conversion of farmland to nonagricultural uses, and to assure State, unit of local government, and private programs and policies to protect farmland.”

8.1 Methodology

The Farmland Protection Policy Act Manual was reviewed to determine if lands covered by the Act are present within the study area. Additional resources, such as the 2010 census urbanized area maps and agricultural and forestal districts, were also reviewed.

8.2 Existing Conditions

The entire study area is located within the Census urbanized area; therefore, the study area is not subject to the Farmland Protection Policy Act.

Portions of one agricultural and forestal district are present within the study area.

8.3 Environmental Consequences

The Build Alternative would impact approximately 0.31 acres of one agricultural and forestal district (Fairfax County Zoning Evaluation Division, Department of Planning and Zoning, 2017). The proposed impacts would reduce the farm size to 26.88 acres. This is above the minimum agricultural and forestal district size of 20 acres. According to § 15.2-4313 of the Code of Virginia, since the impacts are below one acre, no further coordination is required for impacts to agricultural and forestal districts.

9.0 ANTICIPATED PERMITS

Following is a discussion of permits that could be required for each alternative. Given that this is a planning level analysis, the required permits may change as the design of the project progresses.

9.1 Section 404/401

The proposed project would require Section 404/401 permits from USACE and VDEQ and a subaqueous bottomland permit from VMRC. A USACE Section 404 Individual Permit is anticipated because one separate and complete crossing (Difficult Run/Colvin Run) is expected to exceed the 0.5 acre of wetland and 1,000 linear feet of stream threshold for the State Programmatic General Permit (SPGP). A VDEQ Virginia Water Protection Individual Permit is anticipated because impacts at the Difficult Run/Colvin Run crossing are expected to exceed the Water Protection Permit Number 3 threshold of 2 acres of wetlands and 1,500 linear feet of stream. If the project is advanced to construction, the permit applicant, in coordination with the VDEQ and USACE, may adopt a phased permitting approach and pursue separate permits for each single and complete crossing with independent utility.

A VMRC subaqueous bottomland permit would be required for impacts to Colvin Run and Difficult Run, as these two systems have drainage areas greater than five square miles. A project specific SWPPP would be developed for this project, as required under the VDEQ General Permit for Discharges of Stormwater from Construction Activities. Mitigation for wetland and stream impacts would be required for the Build Alternative and would be developed as described below.

The federal and state permit programs rely on the use of compensatory mitigation to offset unavoidable aquatic impacts by replacing lost functions with replicated functions elsewhere. Appropriate mitigation is coordinated by the agencies. Compensatory mitigation would be required for permanent impacts to streams and wetlands resulting from the project. Compensatory mitigation is typically required in the same or adjacent HUC within the same watershed and physiographic province as the impact.

Regulations providing guidance for compensatory mitigation were jointly issued by the USACE and the EPA and became effective in 2008 (EPA, 2017). These regulations, referred to as the Mitigation Rule, established a national framework and hierarchy of preferences regarding how compensatory mitigation is addressed for project impacts to jurisdictional surface waters. The Mitigation Rule provides the following preference for compensatory mitigation options:

- Purchase of compensatory mitigation bank credits.
- Purchase of approved in-lieu fee fund credits.
- Watershed approach based mitigation by the permittee.
- On-site mitigation/in-kind mitigation by the permittee.
- Off-site mitigation/out-of-kind mitigation by the permittee.

The current typical compensatory mitigation impact ratios in Virginia for non-tidal forested, scrub-shrub, and emergent wetlands are 2:1, 1.5:1, and 1:1, respectively.

In accordance with the existing regulations and standard permit conditions, all areas with temporary impacts would be required to be restored to the areas' original contours and re-vegetated with the same or similar

species. If the Build Alternative advances to the permitting stage, the specific limits of jurisdictional resources, applicable permits, and required mitigation would be confirmed in coordination with the appropriate regulatory agencies during such time.

9.2 Chesapeake Bay Preservation Act

The CPBA, administered by VDEQ, regulates development in the Chesapeake Bay watershed. The CPBA provides protections for riparian habitats that buffer wetlands and streams through the designation of Resource Protection Areas (RPA) and Resource Management Areas (RMA). In Virginia, administration and enforcement of the CBPA is carried out by the individual localities subject to the CPBA. In the study area, the CPBA is enforced by Fairfax County; RPA in Fairfax County includes any land characterized by one or more of the following features (Fairfax County Virginia Code of Ordinances, 2017):

- A tidal wetland;
- A tidal shore;
- A water body with perennial flow;
- A nontidal wetland connected by surface flow and contiguous to a tidal wetland or water body with perennial flow; and
- A buffer area as follows:
 - Any land within a major floodplain;
 - Any land within 100 feet of a feature listed in the bullets above.

RMAs include any area not designated by an RPA. Generally, development within the RPA is limited to water dependent activities or redevelopment of existing developed areas. Development within the RMA is generally less restrictive; however, coordination with the County is still required before development.

By managing land uses within these areas, local governments help reduce the water quality impacts of nonpoint source pollution and improve the health of the Chesapeake Bay. The regulation of activities within RMAs and RPAs has been incorporated into the enforceable policies of Virginia's Coastal Zone Management Program. Approximately 69 acres of RPA are located within the study area (see **Figure 9-1**).

Title 9 of the VAC (9VAC10-20-150B) allows public roads to be located within RPAs subject to certain conditions. Construction, installation, operation, and maintenance of public roads and the roads' appurtenant structures are exempt if:

- The roadway is constructed in accordance with an erosion and sediment control plan consistent with regulations promulgated pursuant to the Erosion and Sediment Control Law (§10.1-560 et seq. of the Code of Virginia).
- The roadway is constructed in compliance with the Stormwater Management Act (§10.1-603.1 et seq. of the Code of Virginia) and a stormwater management plan is approved by VDEQ.
- The road is designed and constructed to prevent or minimize otherwise minimal encroachment in the RPA and minimize water quality impacts.

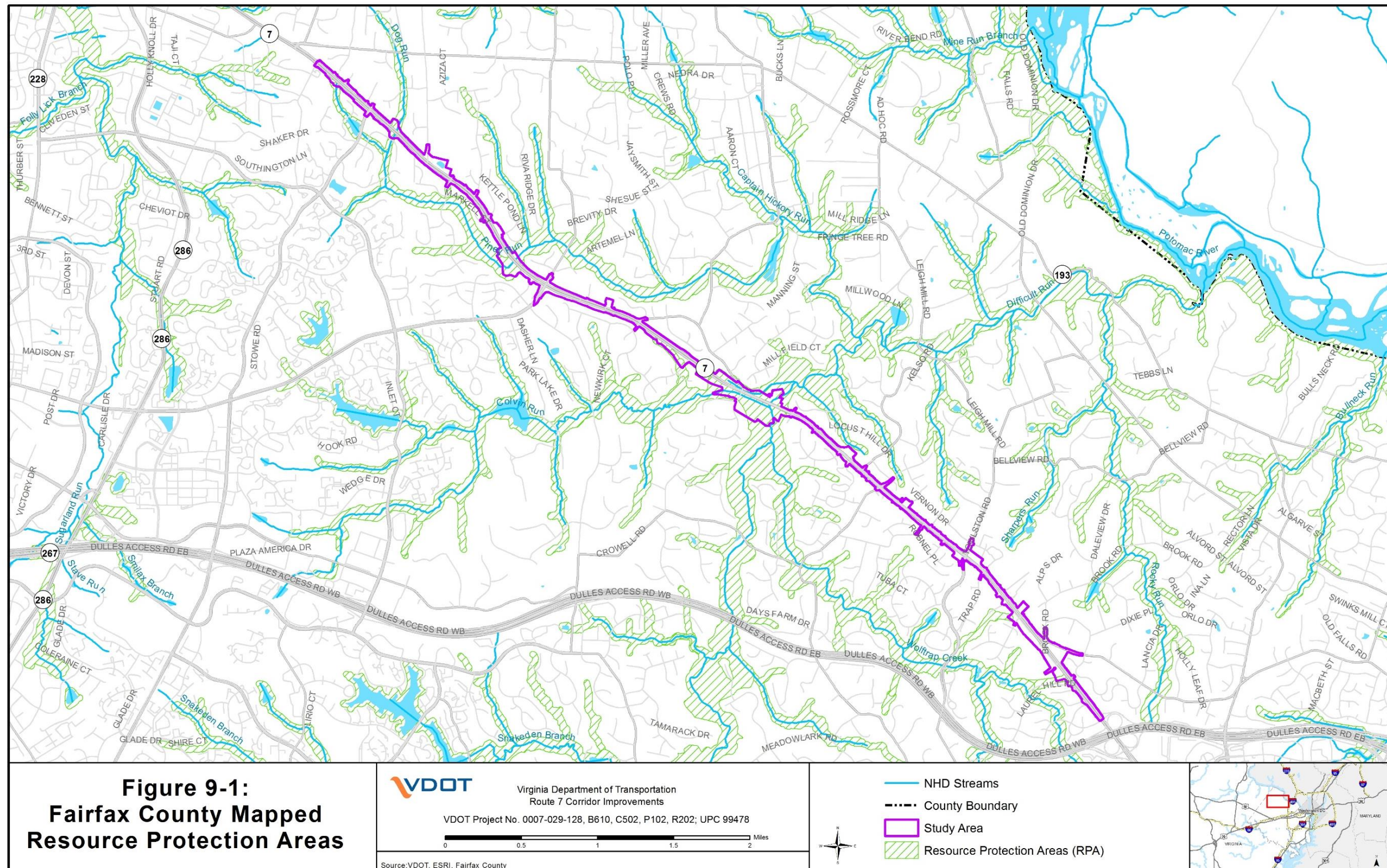
9.3 Erosion and Sediment Control

Construction activities that may result in erosion and sediment discharge are regulated by the Virginia Erosion and Sediment Control Act. This Act is primarily administered by localities, which issue land disturbance permits for construction activities. VDEQ regulates water resources and water pollution through various programs including the Virginia Pollutant Discharge Elimination System Permits (VPDES) and the VSMP.

All regulated land-disturbing activities associated with the alternatives evaluated, including on and off site access roads, staging areas, borrow areas, stockpiles, and soil intentionally transported from the project, would be covered by a project specific erosion and sediment control plan, developed in accordance with erosion and sediment control and stormwater regulations, as well as VDOT standards and specifications. For any land-disturbing activities equal to one acre or more, registration with VDEQ for coverage under the VPDES General Permit for Discharges of Storm Water from Construction Activities would be required.

VDEQ is responsible for regulating stormwater discharges from municipal separate storm sewer systems (MS4s) and construction activities. A Construction General Permit would be required for land-disturbing activities equal to or greater than one acre. This permit requires a Site-Specific Stormwater Pollution Prevention Plan (SWPPP). VDOT's MS4 permit program encompasses both operation and construction of the state's roadways. This program would monitor and control regulated pollutant discharges during construction.

Figure 9-1: Fairfax County Mapped Resource Protection Areas



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Appendix A:
Figures 2-2; 2-3; and 2-5

Figure 2-2:
Delineated Streams and
Wetlands within the Study
Area

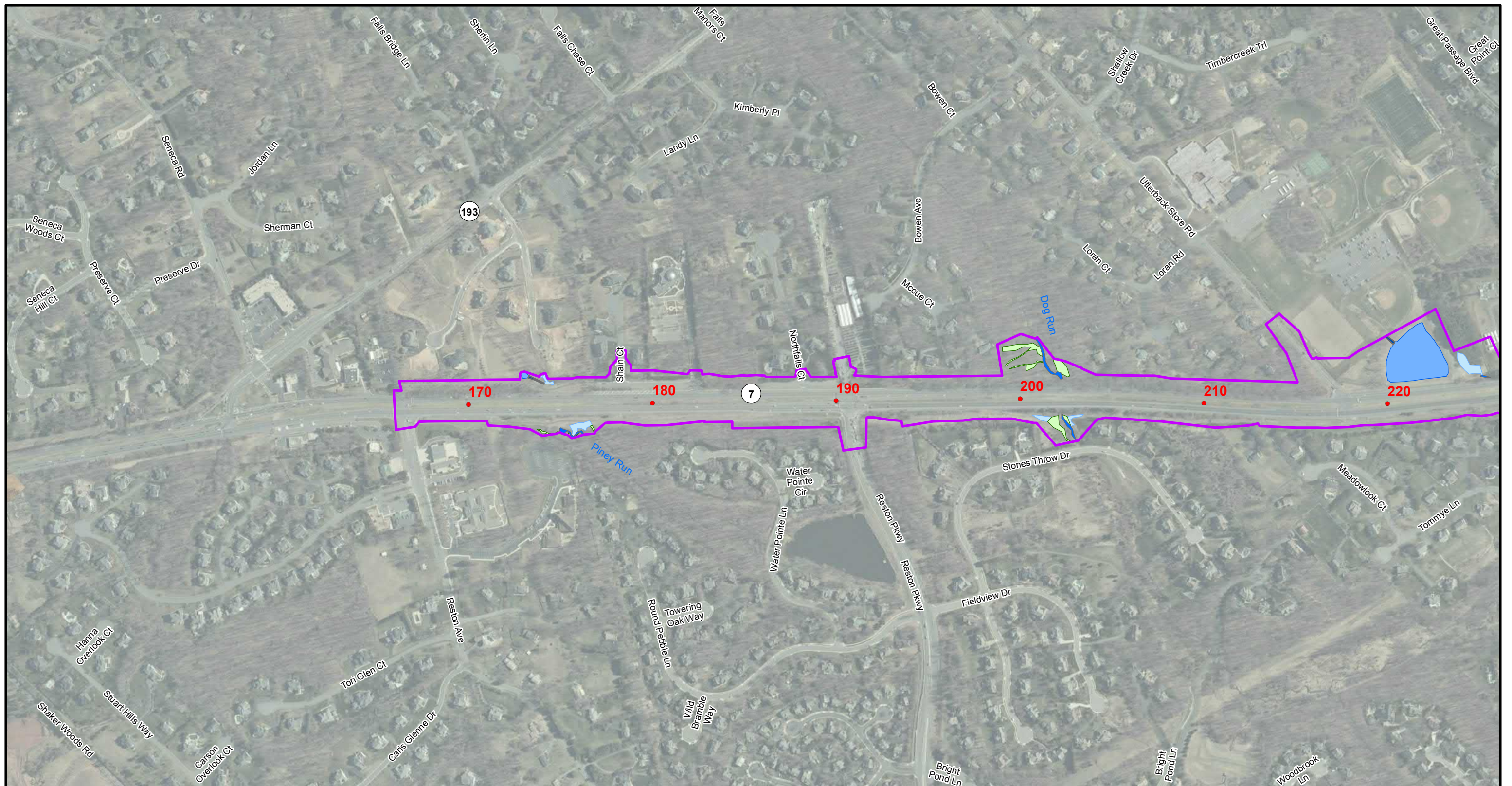
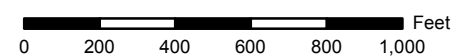


Figure 2-2: Delineated Streams and Wetlands within the Study Area



Virginia Department of Transportation
Route 7 Corridor Improvements
VDOT Project No. 0007-029-128; UPC 99478



Source: VDOT, ESRI



• Stationing Points

□ Study Area

Delineated Streams

■ Perennial/Intermittent Stream

■ Ephemeral Stream

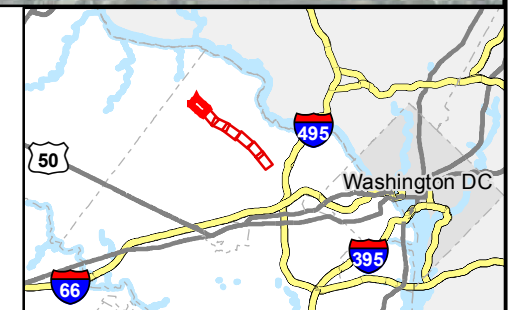
Delineated Wetlands

■ PSS

■ POW

■ PFO

■ PEM



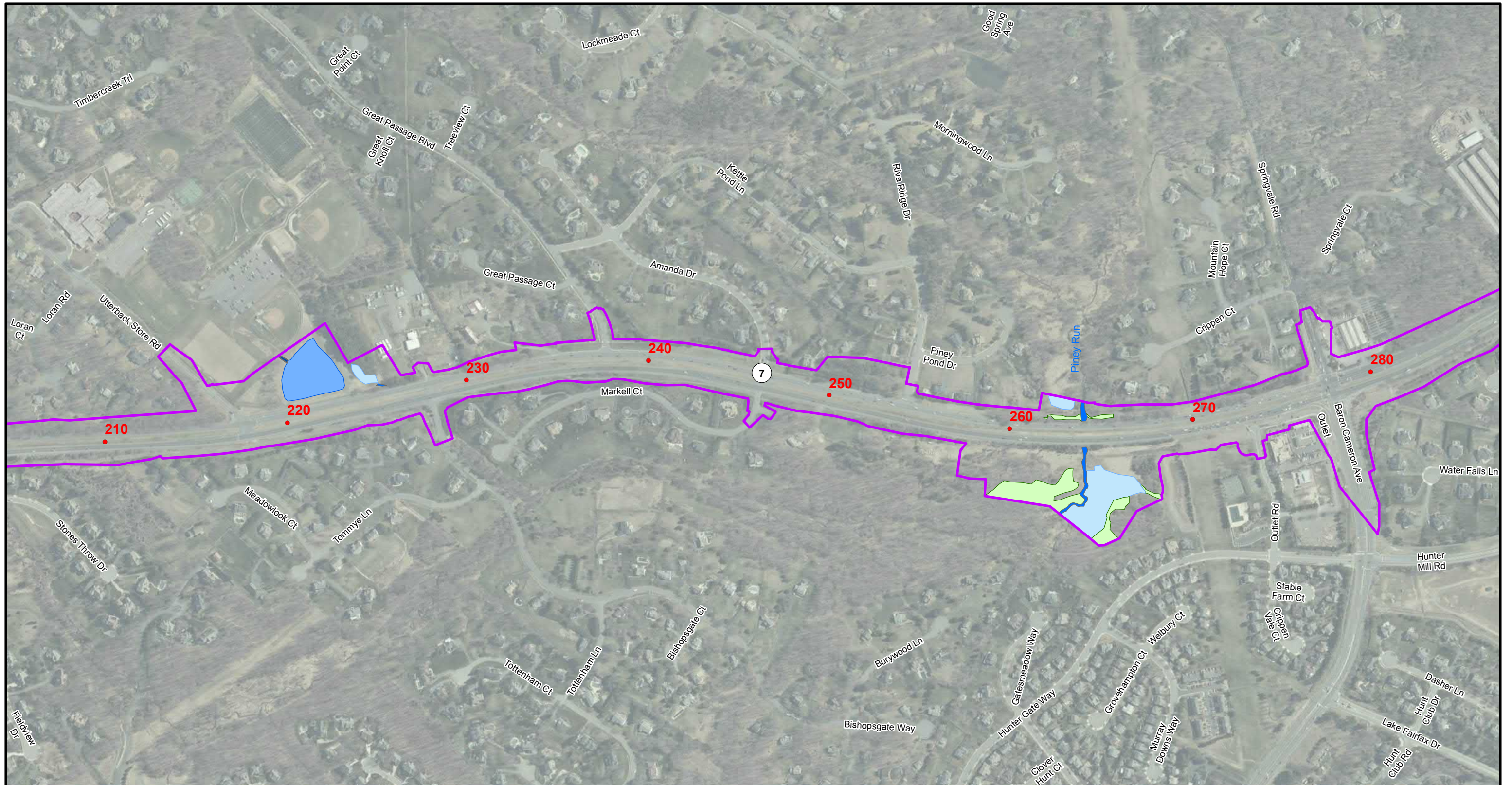
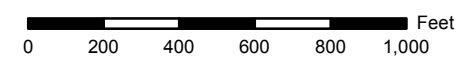


Figure 2-2: Delineated Streams and Wetlands within the Study Area



Virginia Department of Transportation
Route 7 Corridor Improvements
VDOT Project No. 0007-029-128; UPC 99478



Source: VDOT, ESRI

• Stationing Points

□ Study Area

Delineated Streams

■ Perennial/Intermittent Stream

■ Ephemeral Stream

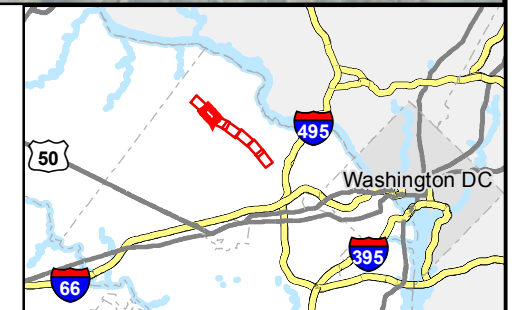
Delineated Wetlands

■ PSS

■ POW

■ PFO

■ PEM



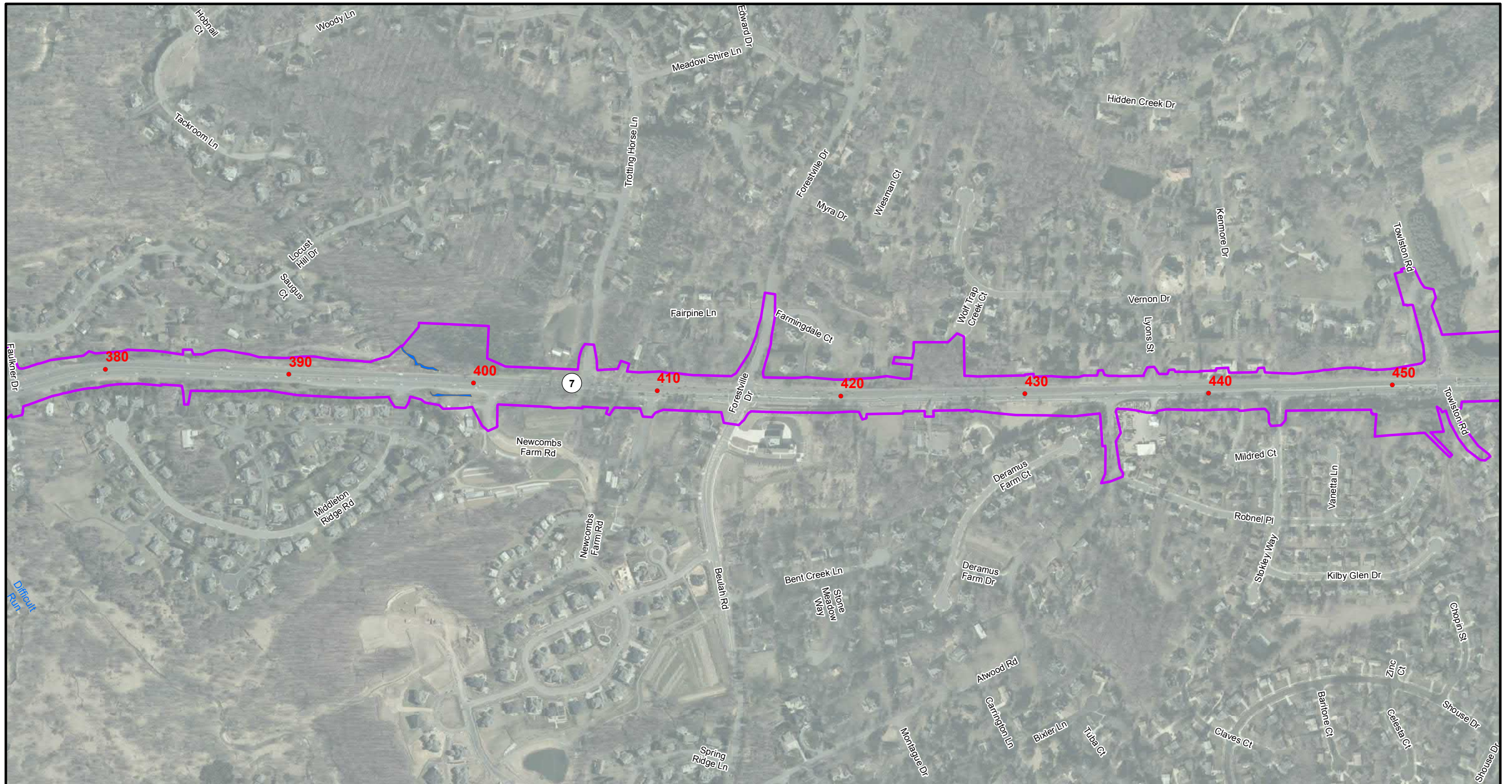
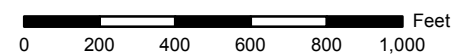


Figure 2-2: Delineated Streams and Wetlands within the Study Area



Virginia Department of Transportation
Route 7 Corridor Improvements
VDOT Project No. 0007-029-128; UPC 99478



Source: VDOT, ESRI

• Stationing Points

□ Study Area

Delineated Streams

■ Perennial/Intermittent Stream

■ Ephemeral Stream

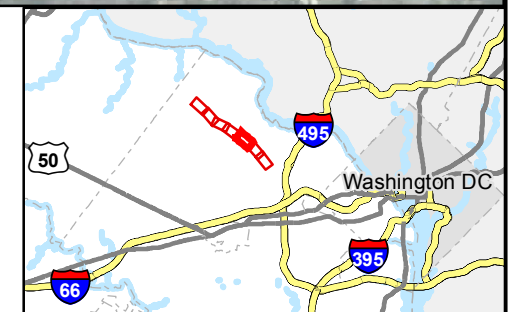
Delineated Wetlands

■ PSS

■ POW

■ PFO

■ PEM



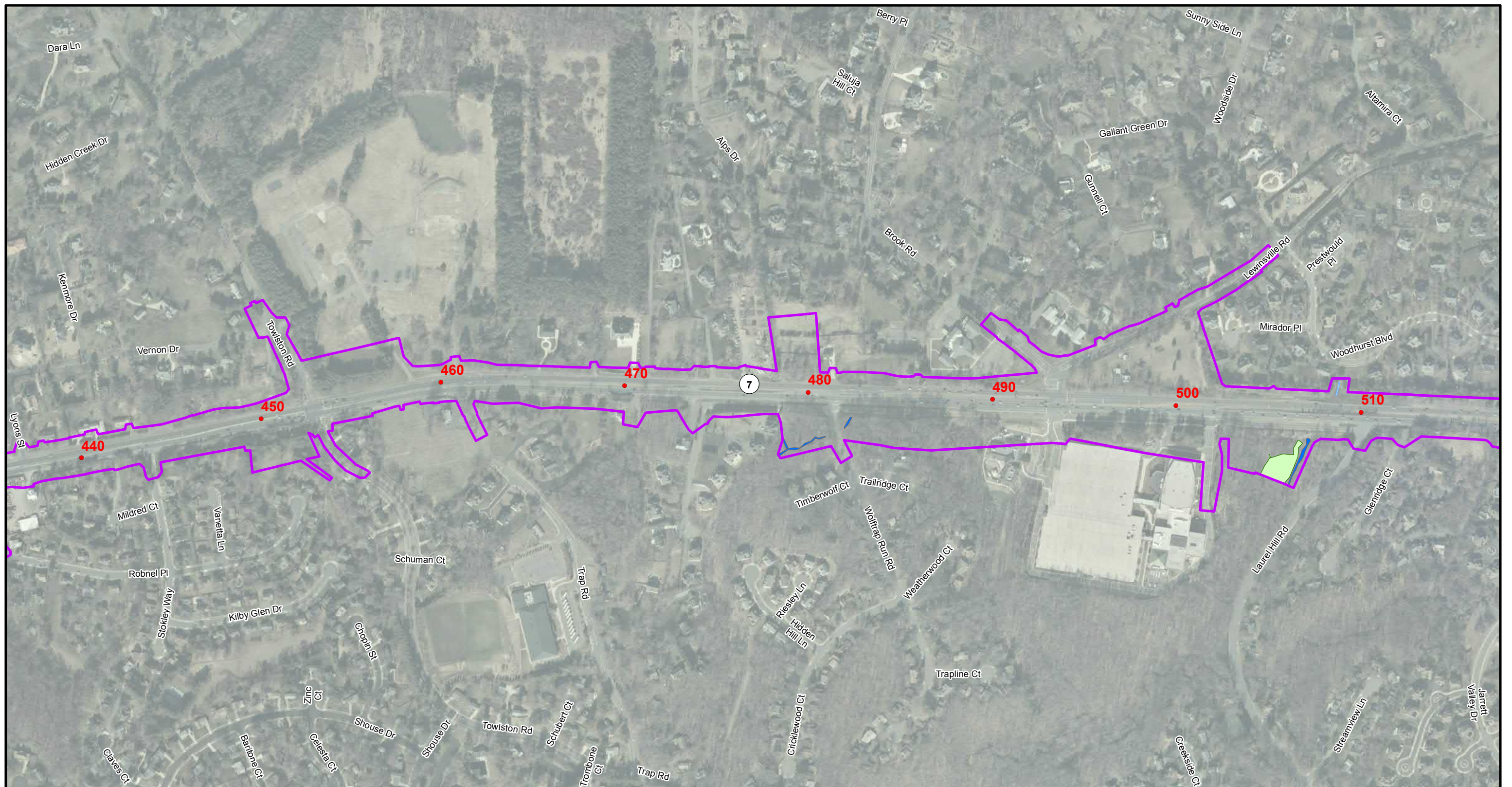
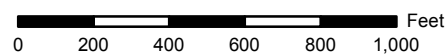


Figure 2-2: Delineated Streams and Wetlands within the Study Area



Virginia Department of Transportation
Route 7 Corridor Improvements
VDOT Project No. 0007-029-128; UPC 99478



Source: VDOT, ESRI



• Stationing Points

□ Study Area

Delineated Streams

■ Perennial/Intermittent Stream

■ Ephemeral Stream

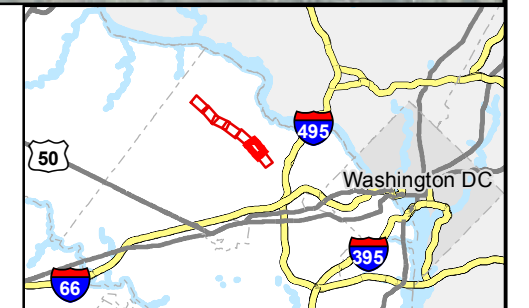
Delineated Wetlands

■ PSS

■ POW

■ PFO

■ PEM



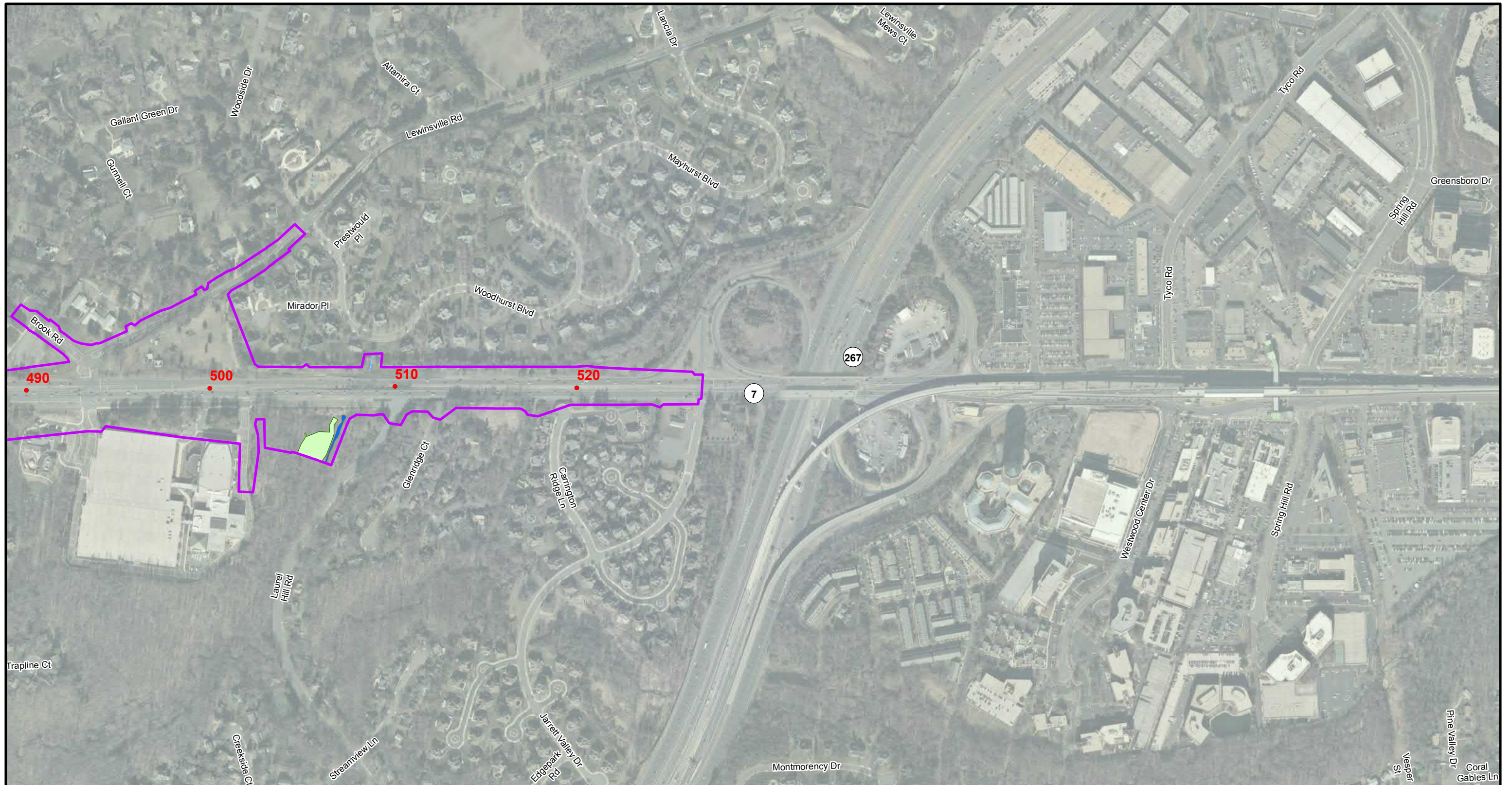
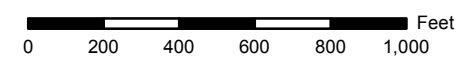


Figure 2-2: Delineated Streams and Wetlands within the Study Area



Virginia Department of Transportation
Route 7 Corridor Improvements
VDOT Project No. 0007-029-128; UPC 99478



Source: VDOT, ESRI



• Stationing Points

□ Study Area

Delineated Streams

■ Perennial/Intermittent Stream

■ Ephemeral Stream

Delineated Wetlands

■ PSS

■ POW

■ PFO

■ PEM

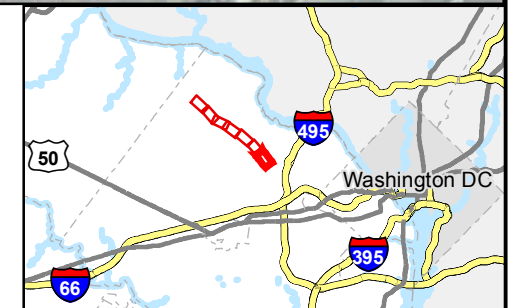


Figure 2-3:
Stormwater Management
Pond Avoidance and
Minimization

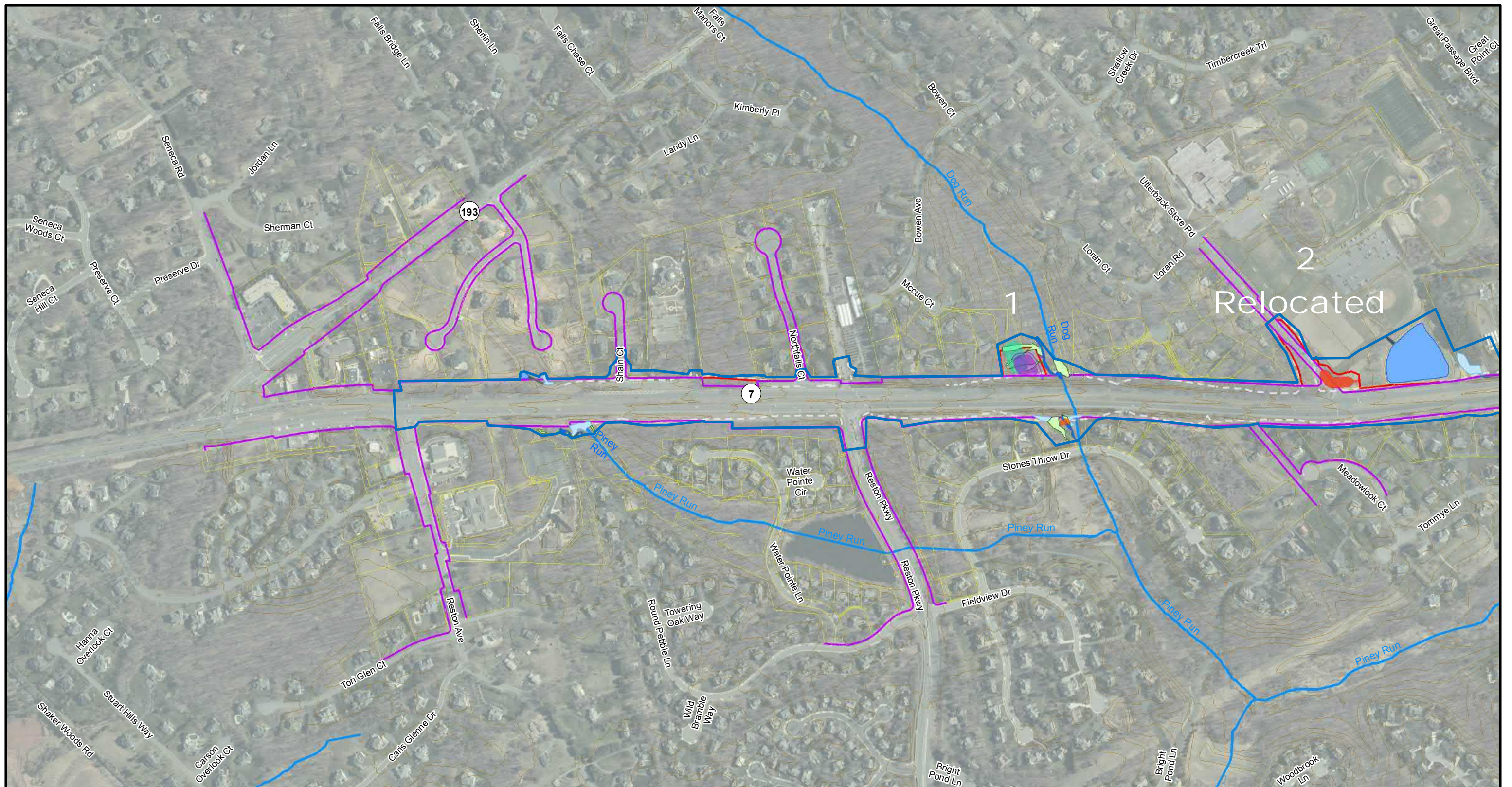
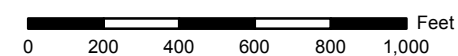


Figure 2-3: Stormwater Management Pond Avoidance and Minimization

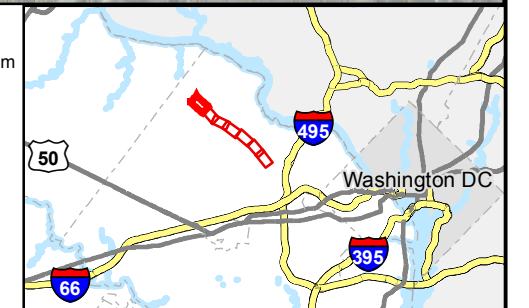


Virginia Department of Transportation
Route 7 Corridor Improvements
VDOT Project No. 0007-029-128; UPC 99478



Source: VDOT, ESRI

- | | | |
|-----------------------------|-----------------------|-------------------------------|
| Study Area | SWM Ponds Base Design | Perennial/Intermittent Stream |
| Parcels | SWM Ponds Iteration 1 | Ephemeral Stream |
| Existing ROW | SWM Ponds Iteration 2 | PSS |
| Proposed ROW | SWM Ponds Iteration 3 | POW |
| Construction Limits In Fill | | PFO |
| Construction Limits In Cut | | PEM |



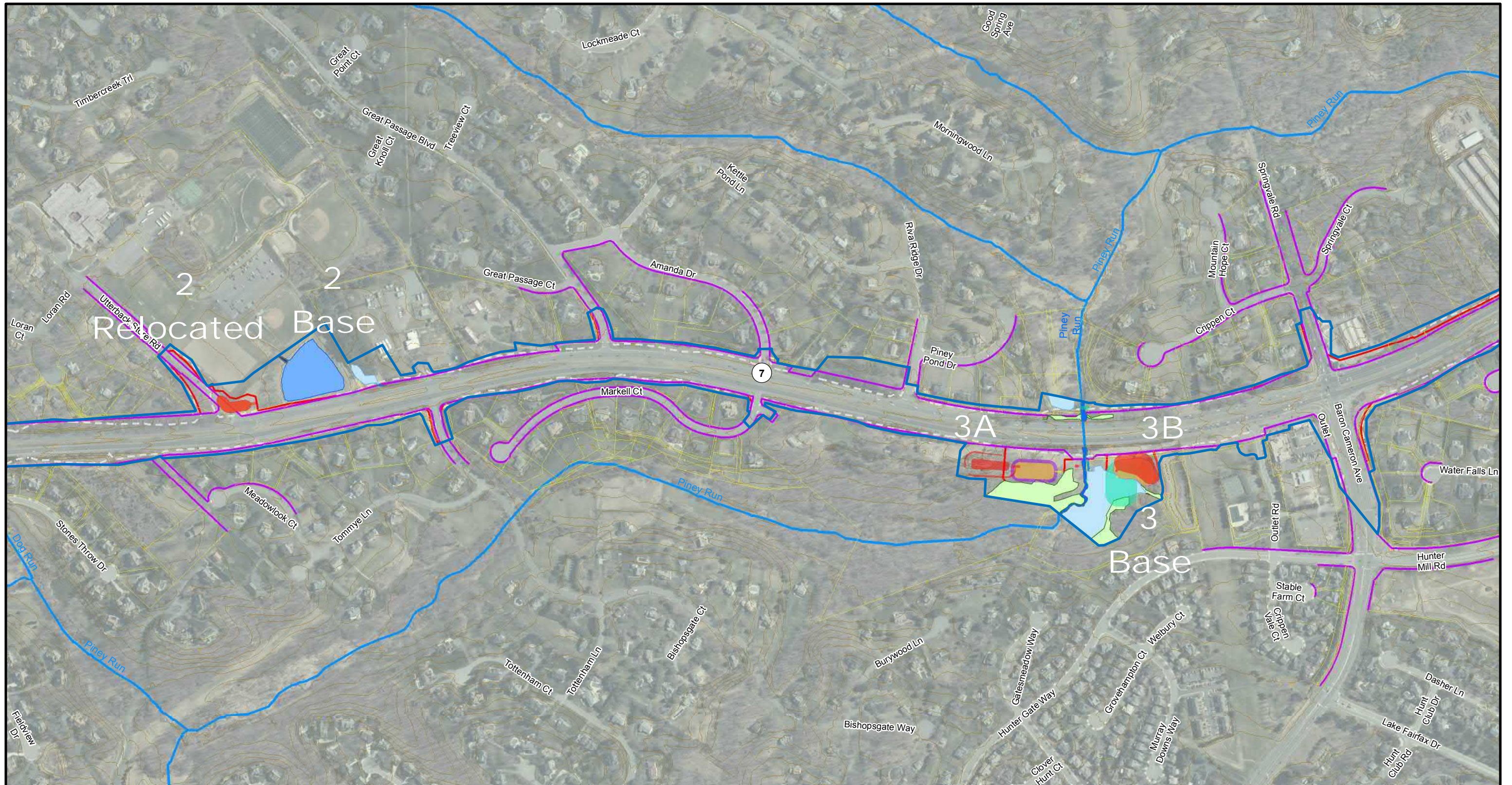
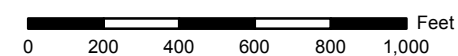


Figure 2-3: Stormwater Management Pond Avoidance and Minimization

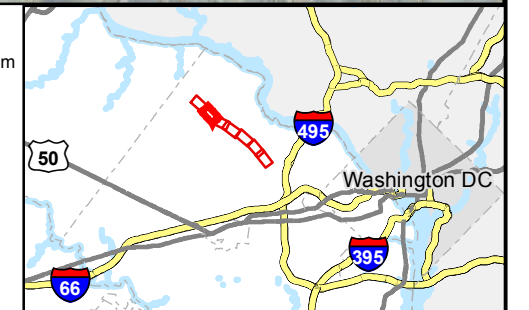


Virginia Department of Transportation
Route 7 Corridor Improvements
VDOT Project No. 0007-029-128; UPC 99478



Source: VDOT, ESRI

- | | | |
|-----------------------------|-----------------------|-------------------------------|
| Study Area | SWM Ponds Base Design | Perennial/Intermittent Stream |
| Parcels | SWM Ponds Iteration 1 | Ephemeral Stream |
| Existing ROW | SWM Ponds Iteration 2 | PSS |
| Proposed ROW | SWM Ponds Iteration 3 | POW |
| Construction Limits In Fill | | PFO |
| Construction Limits In Cut | | PEM |



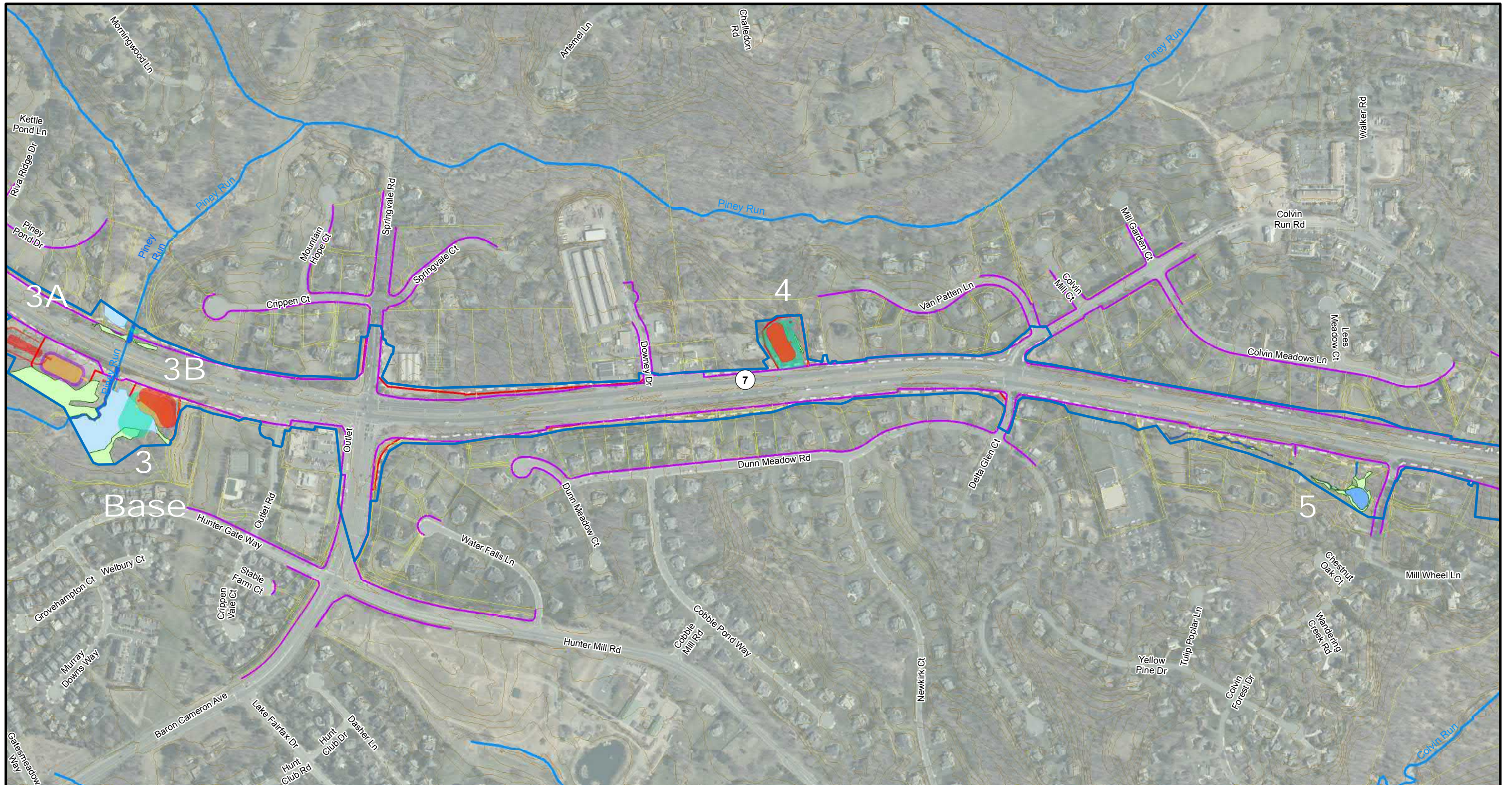
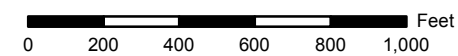


Figure 2-3: Stormwater Management Pond Avoidance and Minimization

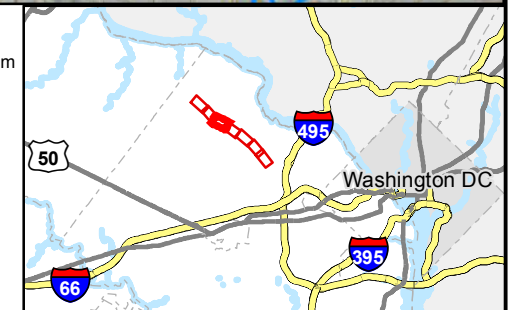


Virginia Department of Transportation
Route 7 Corridor Improvements
VDOT Project No. 0007-029-128; UPC 99478



Source: VDOT, ESRI

- | | | |
|-----------------------------|-----------------------|-------------------------------|
| Study Area | SWM Ponds Base Design | Perennial/Intermittent Stream |
| Parcels | SWM Ponds Iteration 1 | Ephemeral Stream |
| Existing ROW | SWM Ponds Iteration 2 | PSS |
| Proposed ROW | SWM Ponds Iteration 3 | POW |
| Construction Limits In Fill | | PFO |
| Construction Limits In Cut | | PEM |



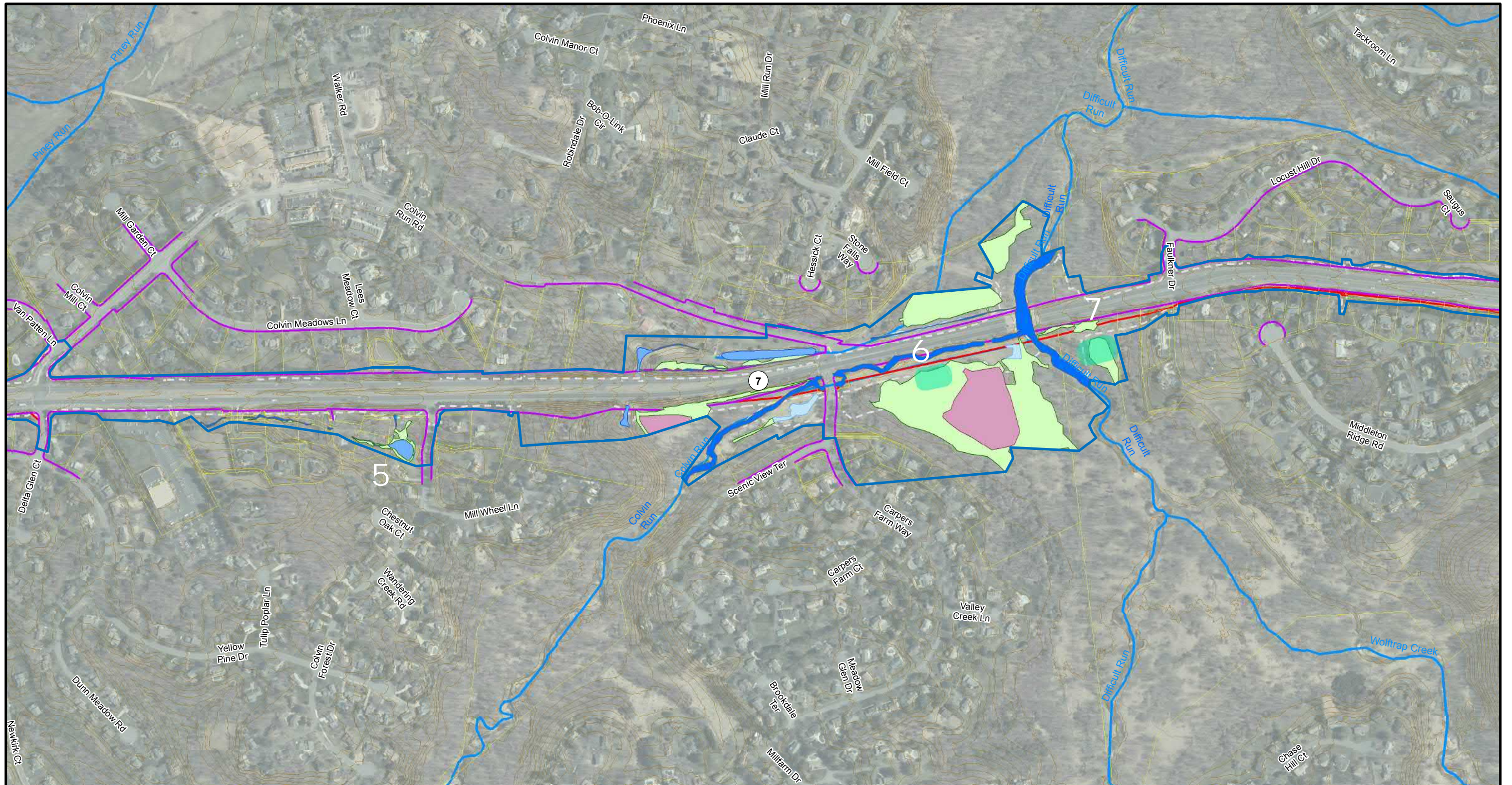
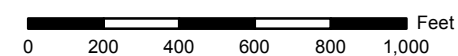


Figure 2-3: Stormwater Management Pond Avoidance and Minimization

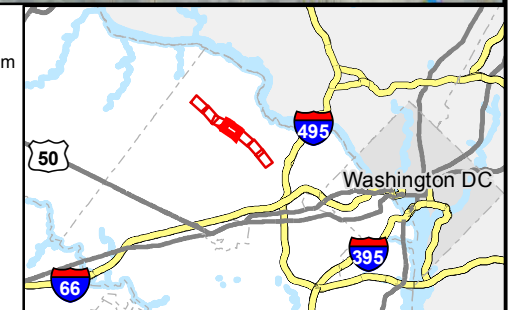


Virginia Department of Transportation
Route 7 Corridor Improvements
VDOT Project No. 0007-029-128; UPC 99478



Source: VDOT, ESRI

- | | | |
|-----------------------------|-----------------------|-------------------------------|
| Study Area | SWM Ponds Base Design | Perennial/Intermittent Stream |
| Parcels | SWM Ponds Iteration 1 | Ephemeral Stream |
| Existing ROW | SWM Ponds Iteration 2 | PSS |
| Proposed ROW | SWM Ponds Iteration 3 | POW |
| Construction Limits In Fill | | PFO |
| Construction Limits In Cut | | PEM |



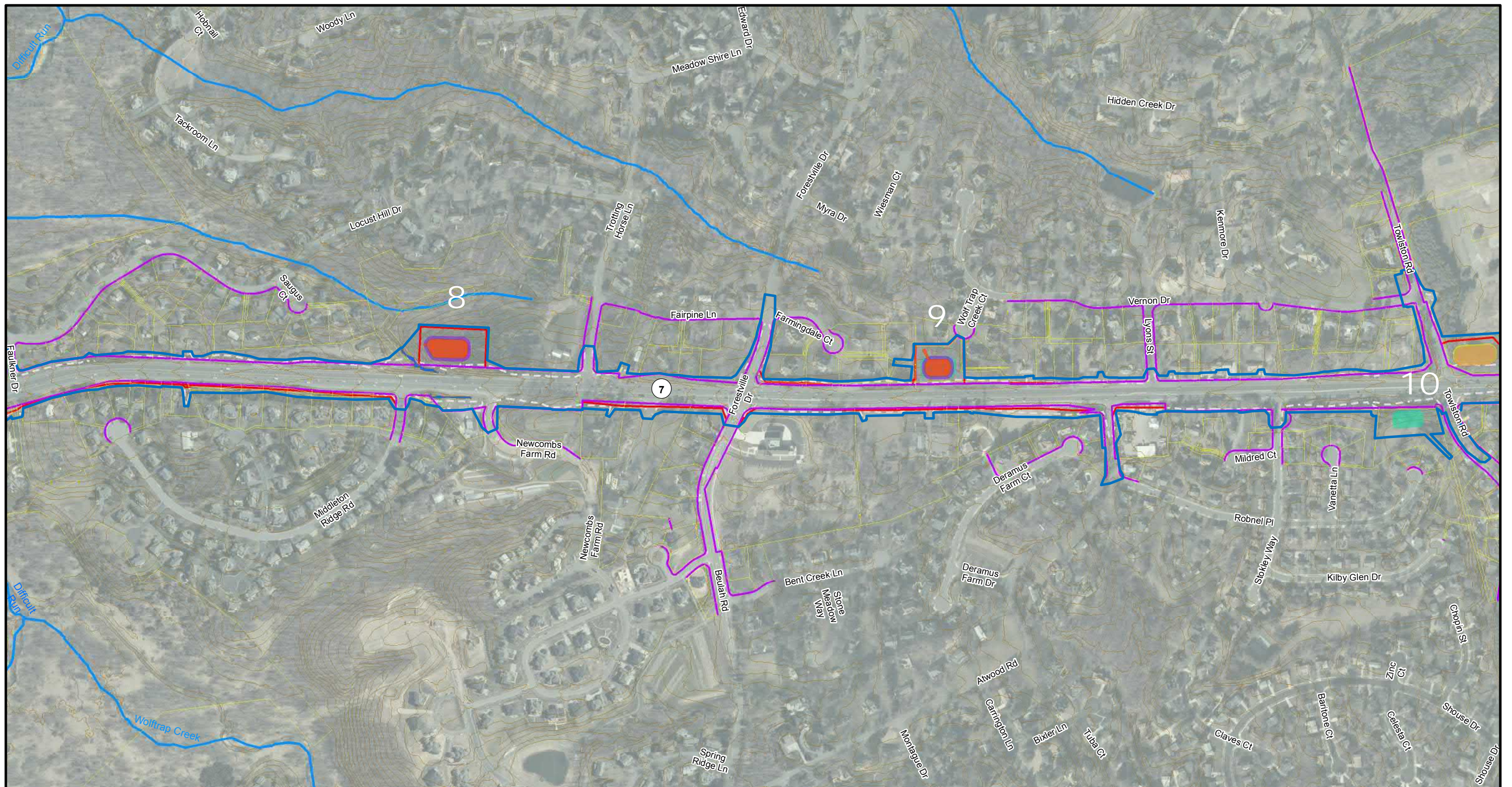
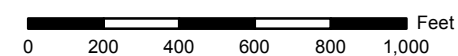


Figure 2-3: Stormwater Management Pond Avoidance and Minimization

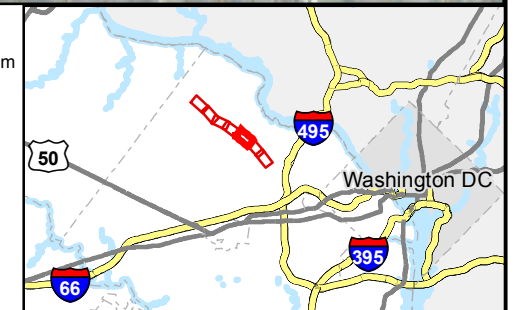


Virginia Department of Transportation
Route 7 Corridor Improvements
VDOT Project No. 0007-029-128; UPC 99478



Source: VDOT, ESRI

- | | | |
|-----------------------------|-----------------------|-------------------------------|
| Study Area | SWM Ponds Base Design | Perennial/Intermittent Stream |
| Parcels | SWM Ponds Iteration 1 | Ephemeral Stream |
| Existing ROW | SWM Ponds Iteration 2 | PSS |
| Proposed ROW | SWM Ponds Iteration 3 | POW |
| Construction Limits In Fill | | PFO |
| Construction Limits In Cut | | PEM |



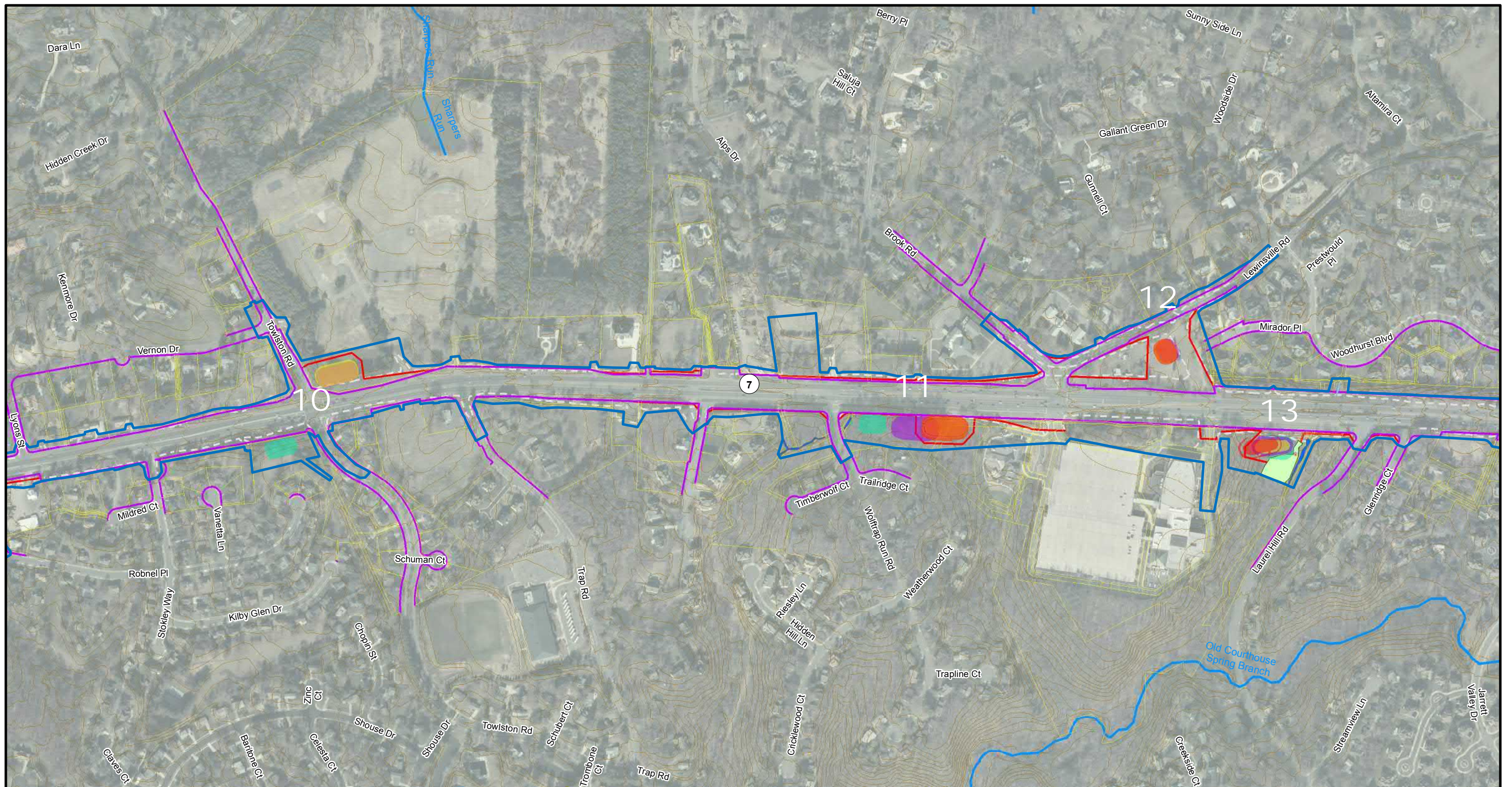


Figure 2-3: Stormwater Management Pond Avoidance and Minimization

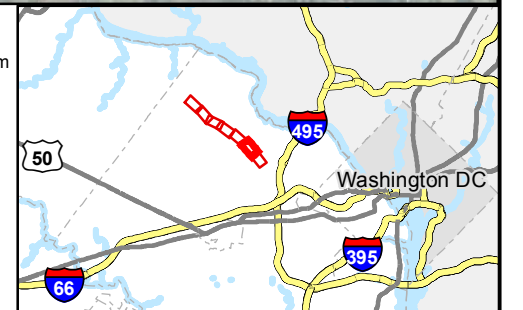


Virginia Department of Transportation
Route 7 Corridor Improvements
VDOT Project No. 0007-029-128; UPC 99478



Source: VDOT, ESRI

- | | | |
|-----------------------------|-----------------------|-------------------------------|
| Study Area | SWM Ponds Base Design | Perennial/Intermittent Stream |
| Parcels | SWM Ponds Iteration 1 | Ephemeral Stream |
| Existing ROW | SWM Ponds Iteration 2 | PSS |
| Proposed ROW | SWM Ponds Iteration 3 | POW |
| Construction Limits In Fill | | PFO |
| Construction Limits In Cut | | PEM |



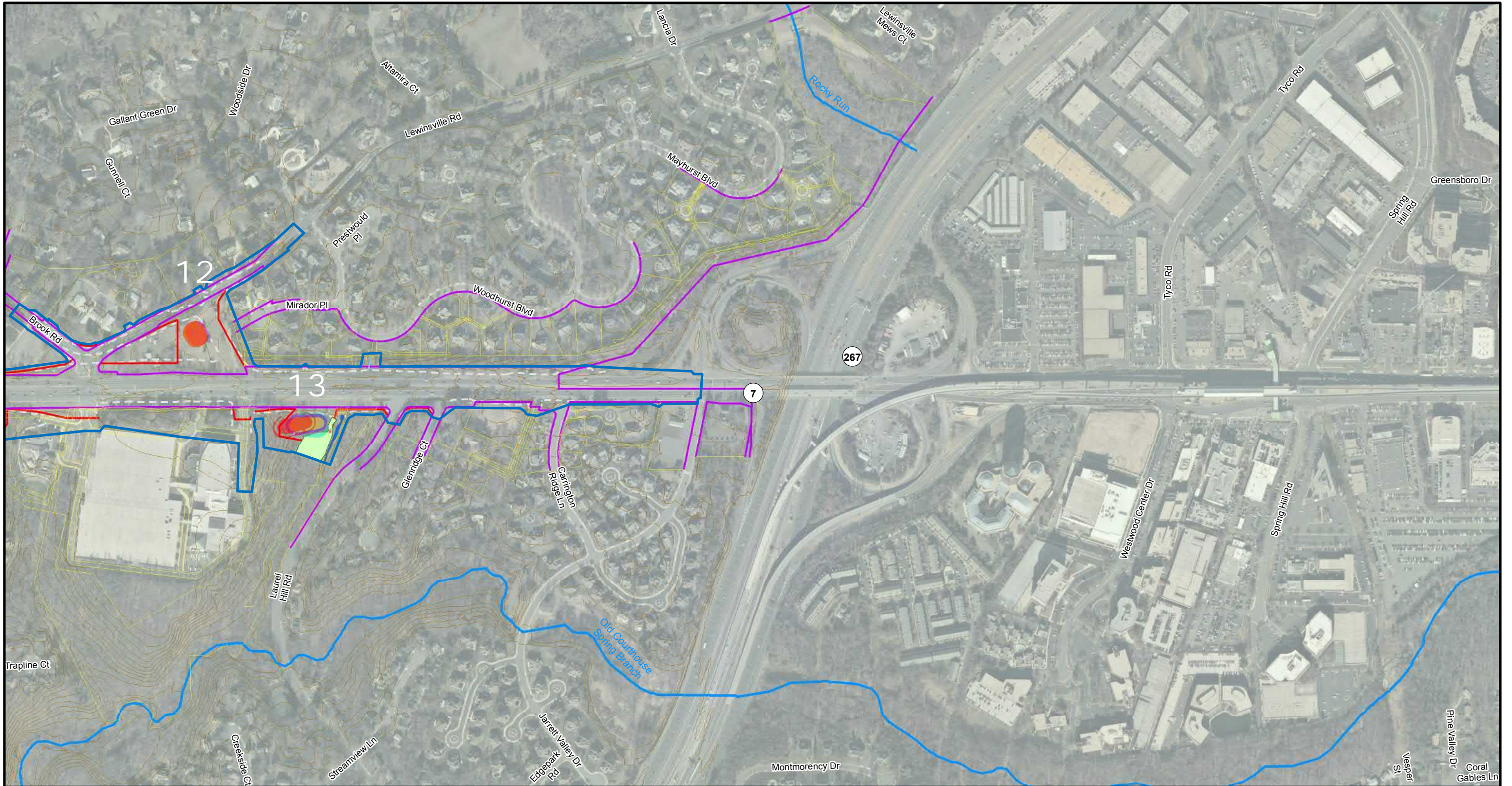
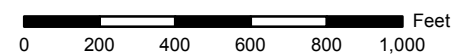


Figure 2-3: Stormwater Management Pond Avoidance and Minimization



Virginia Department of Transportation
Route 7 Corridor Improvements
VDOT Project No. 0007-029-128; UPC 99478



Source: VDOT, ESRI

- | | | |
|-----------------------------|-----------------------|-------------------------------|
| Study Area | SWM Ponds Base Design | Perennial/Intermittent Stream |
| Parcels | SWM Ponds Iteration 1 | Ephemeral Stream |
| Existing ROW | SWM Ponds Iteration 2 | PSS |
| Proposed ROW | SWM Ponds Iteration 3 | POW |
| Construction Limits In Fill | | PFO |
| Construction Limits In Cut | | PEM |

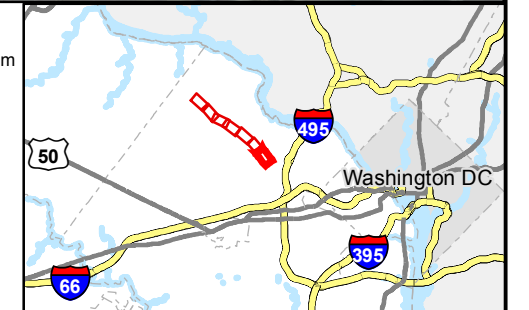


Figure 2-5:
Colvin Run Options Analyzed
But Not Retained

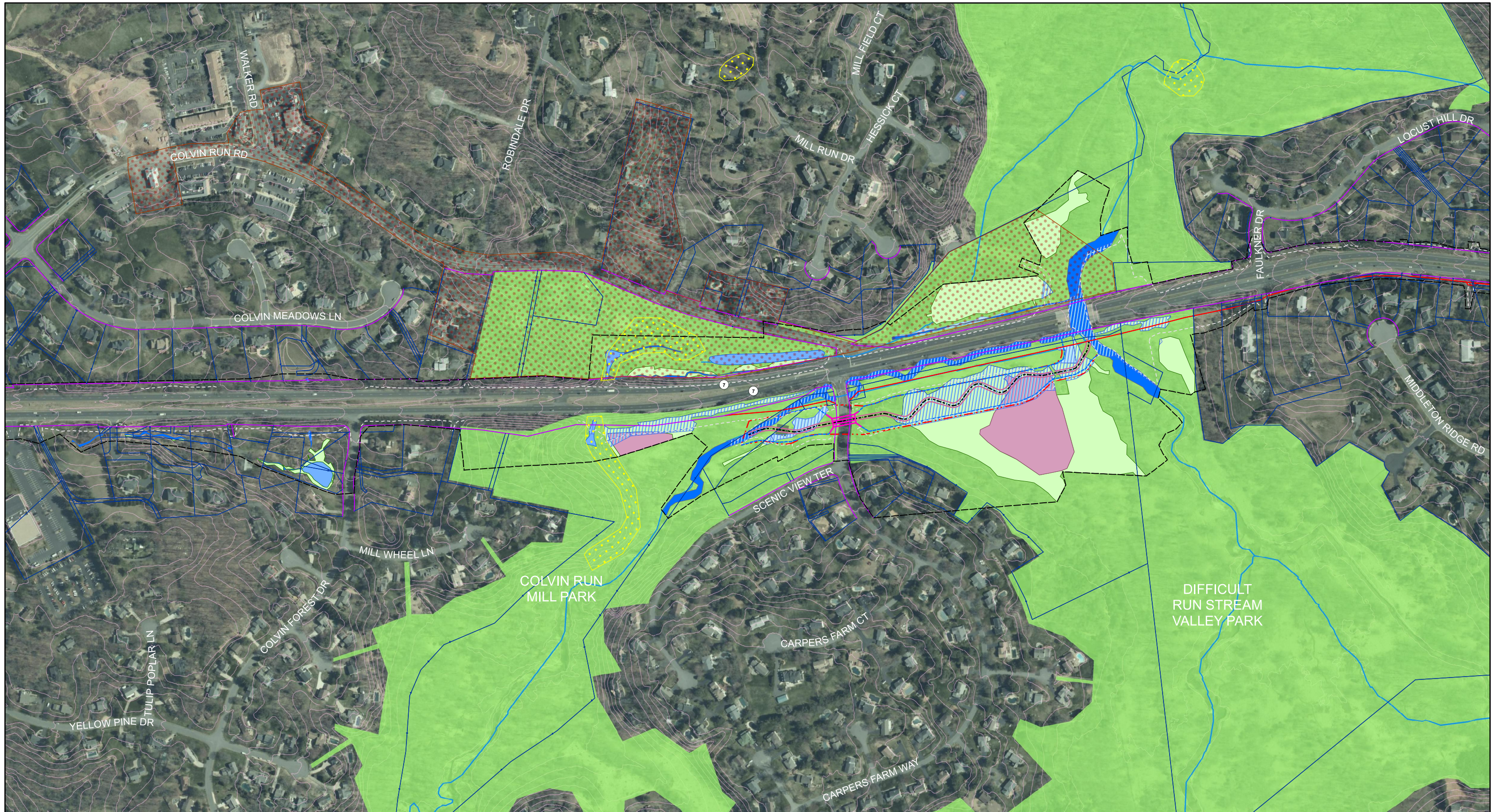
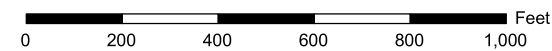


Figure 2-5: Colvin Run Options Analyzed But Not Retained
Stream Relocation Option 1

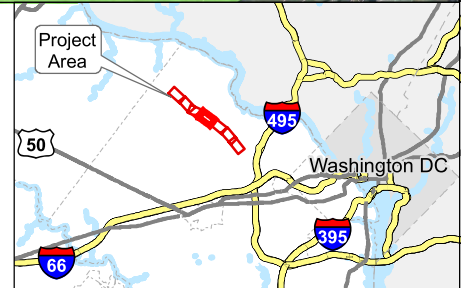


Virginia Department of Transportation
Route 7 Corridor Improvements
VDOT Project No. 0007-029-128; UPC 99478



Source: VDOT, ESRI

- | | | | |
|-----------------------------|-------------------------------|--------------------------------------|----------------------|
| Parcels | NHD Stream | Wetland Delineation Boundary | Ephemeral Stream |
| Existing ROW | Non-County Park | Area of Impact for Stream Relocation | PSS |
| Proposed ROW | County Park | Limits of Inset Floodplain | POW |
| Construction Limits In Fill | Contour | Limits of Relocated Channel | PFO |
| Construction Limits In Cut | CEADAR Archaeology | Box Culvert | PEM |
| CEADAR Architecture | Thalweg | Waters of the US Impacts | Channel Underlayment |
| | Perennial/Intermittent Stream | | |



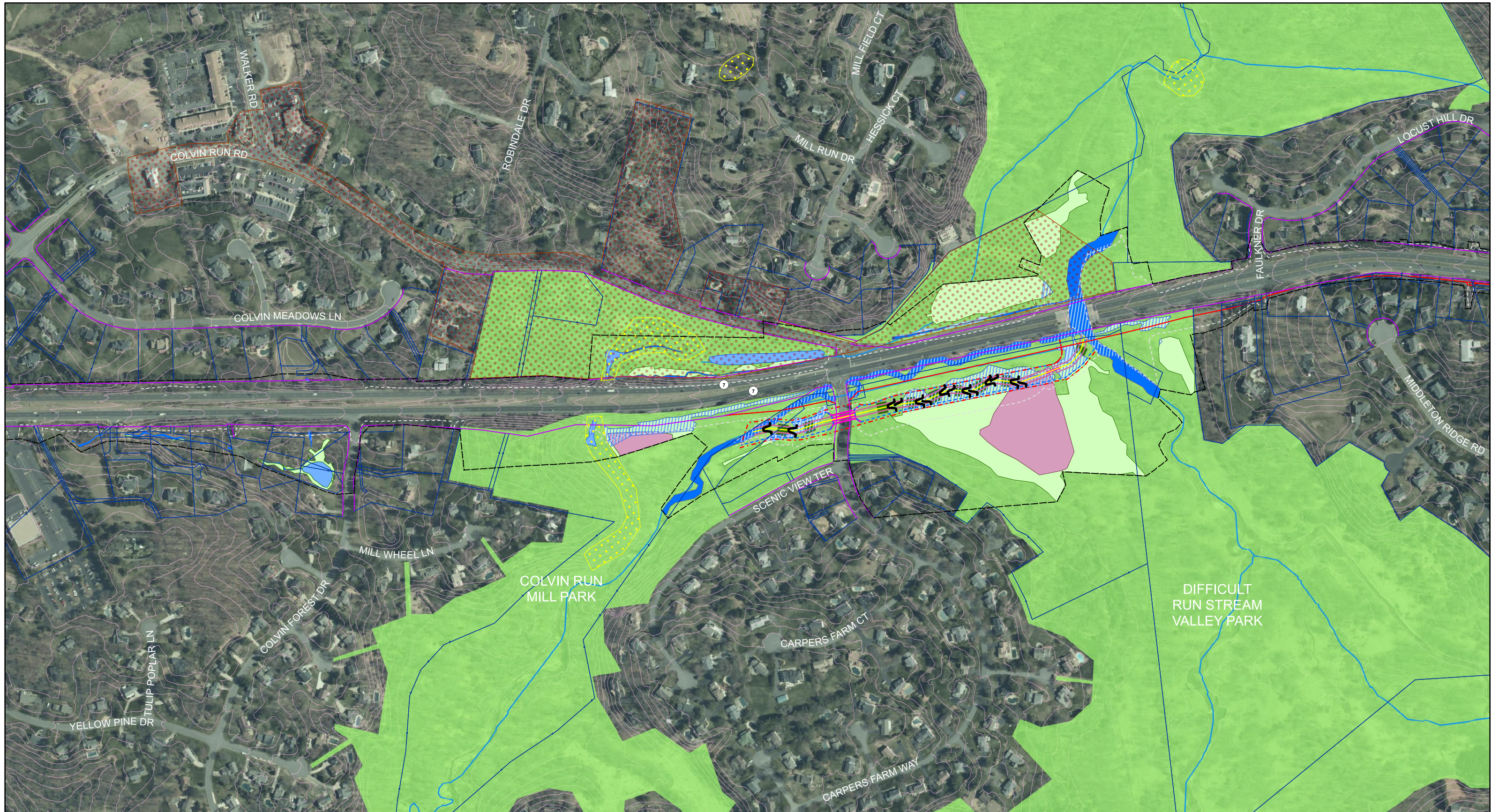
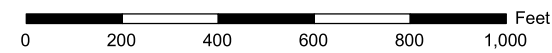


Figure 2-5: Colvin Run Options Analyzed But Not Retained
Stream Relocation Option 2

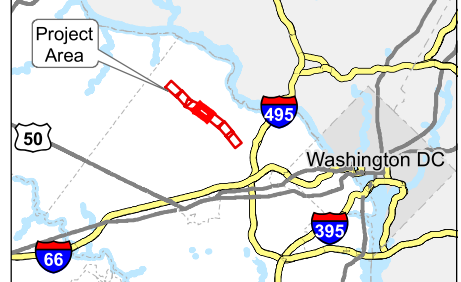


Virginia Department of Transportation
Route 7 Corridor Improvements
VDOT Project No. 0007-029-128; UPC 99478



Source: VDOT, ESRI

- | | | | |
|--|---|---|--|
| <ul style="list-style-type: none"> Parcels Existing ROW Proposed ROW Construction Limits In Fill Construction Limits In Cut CEDAR Archaeology CEDAR Architecture | <ul style="list-style-type: none"> NHD Stream Non-County Park County Park Contour | <ul style="list-style-type: none"> Wetland Delineation Boundary Area of Impact for Stream Relocation Limits of Inset Floodplain Limits of Relocated Channel Box Culvert Relocated Stream Cross Rock Vane Rock Vane Waters of the US Impacts Perennial/Intermittent Stream | <ul style="list-style-type: none"> Ephemeral Stream PSS POW PFO PEM Channel Underlayment |
|--|---|---|--|



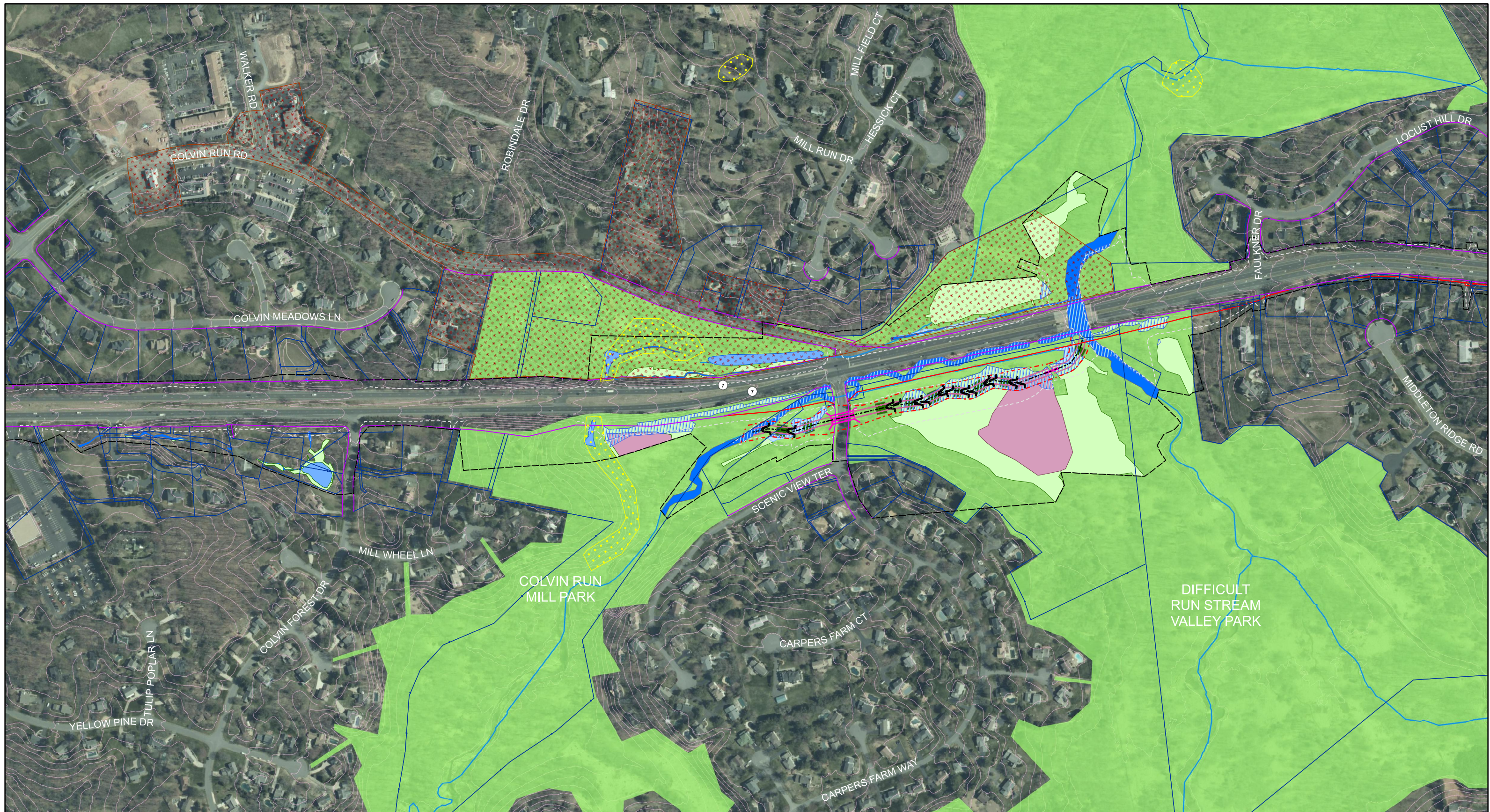
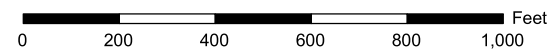


Figure 2-5: Colvin Run Options Analyzed But Not Retained
Stream Relocation Option 3

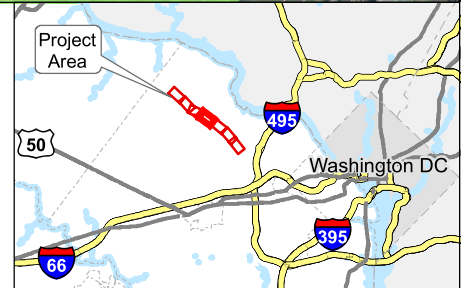


Virginia Department of Transportation
Route 7 Corridor Improvements
VDOT Project No. 0007-029-128; UPC 99478



Source: VDOT, ESRI

- Parcels
- Existing ROW
- Proposed ROW
- Construction Limits In Fill
- Construction Limits In Cut
- CEDAR Archaeology
- CEDAR Architecture
- NHD Stream
- Non-County Park
- County Park
- Contour
- Wetland Delineation Boundary
- Area of Impact for Stream Relocation
- Limits of Relocated Channel
- Box Culvert
- Thalweg
- Cross Rock Vane
- Rock Vane
- Waters of the US Impacts
- Perennial Stream
- Intermittent Stream
- Ephemeral Stream
- PSS
- POW
- PFO
- PEM
- Channel Underdayment



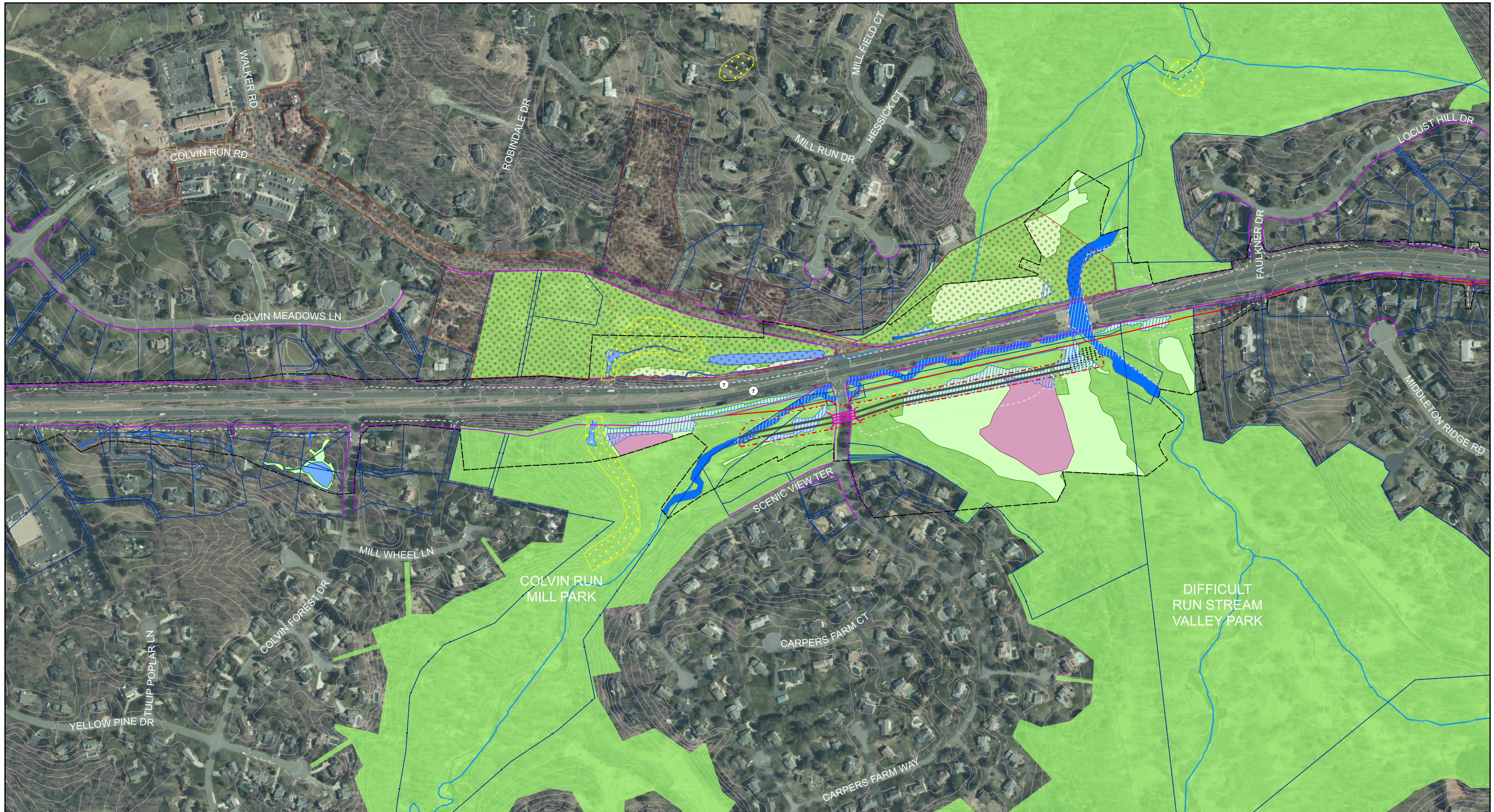


Figure 2-5: Colvin Run Options Analyzed But Not Retained
Stream Relocation Option 4



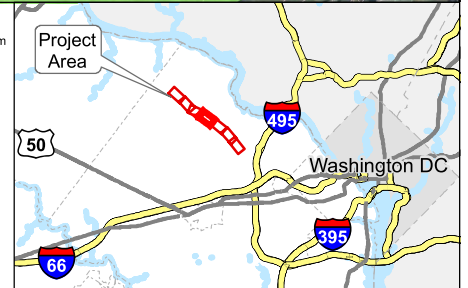
Virginia Department of Transportation
Route 7 Corridor Improvements

VDOT Project No. 0007-029-128; UPC 99478



Source: VDOT, ESRI

- | | | | |
|-----------------------------|-------------------------------|--------------------------------------|------------------|
| Parcels | NHD Stream | Wetland Delineation Boundary | Ephemeral Stream |
| Existing ROW | Non-County Park | Option 4 | PSS |
| Proposed ROW | County Park | Area of Impact for Stream Relocation | POW |
| Construction Limits In Fill | Contour | Box Culvert | PFO |
| Construction Limits In Cut | CEDAR Archaeology | Concrete Channel | PEM |
| CEDAR Architecture | Rip Rap | Waters of the US Impacts | |
| | Perennial/Intermittent Stream | | |



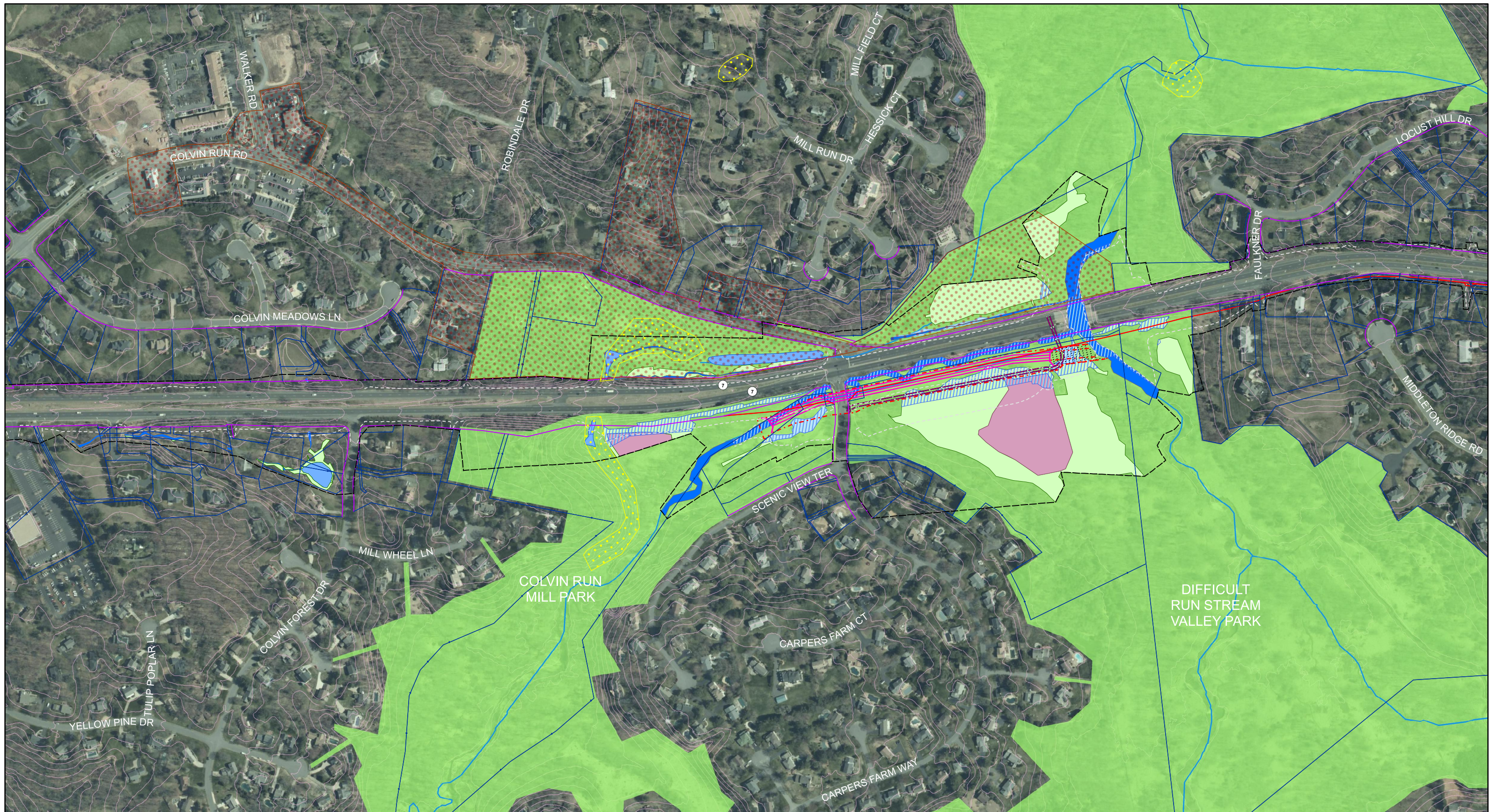
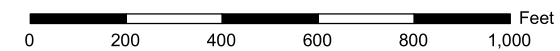


Figure 2-5: Colvin Run Options Analyzed But Not Retained
Stream Relocation Option 5

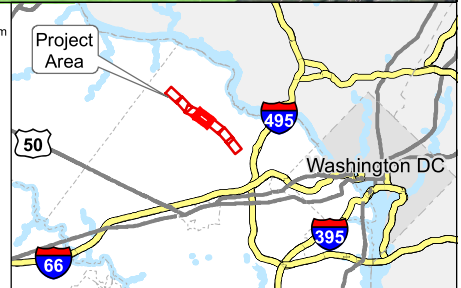


Virginia Department of Transportation
Route 7 Corridor Improvements
VDOT Project No. 0007-029-128; UPC 99478



Source: VDOT, ESRI

- | | | |
|---|---|---|
| <ul style="list-style-type: none"> Parcels Existing ROW Proposed ROW Construction Limits In Fill CEDAR Archaeology CEDAR Architecture | <ul style="list-style-type: none"> NHD Stream Non-County Park County Park Contour Wetland Delineation Boundary Area Of Impact for Stream Relocation Limits of Triple 12x12 Box Culvert Cross Country Trail Rip Rap Waters of the US Impacts Perennial/Intermittent Stream | <ul style="list-style-type: none"> Ephemeral Stream PSS POW PFO PEM |
|---|---|---|



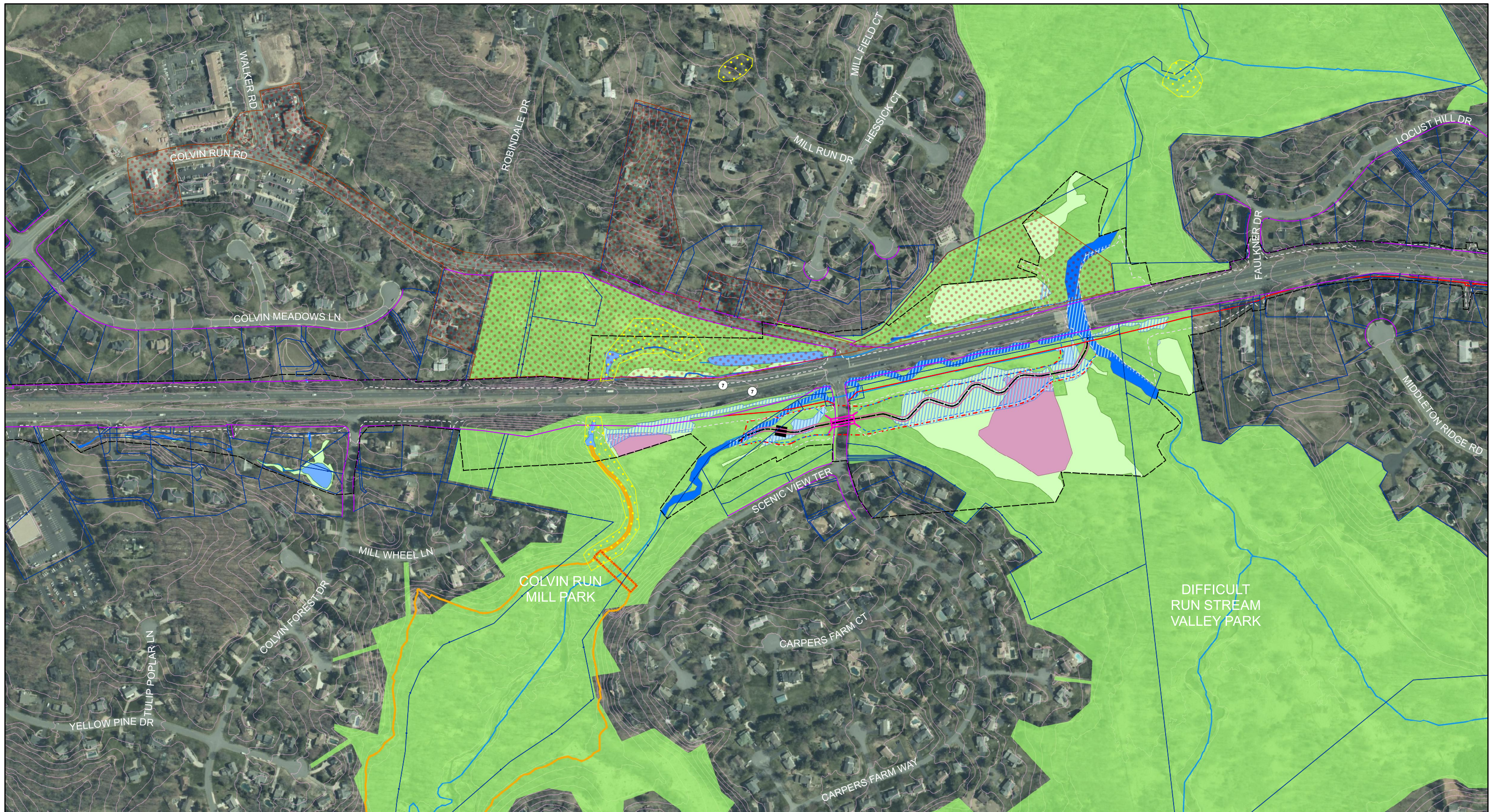


Figure 2-5: Colvin Run Options Analyzed But Not Retained
Stream Relocation Option 6



Virginia Department of Transportation
Route 7 Corridor Improvements
VDOT Project No. 0007-029-128; UPC 99478



Source: VDOT, ESRI

- | | | |
|--|---|---|
| <ul style="list-style-type: none"> Parcels Existing ROW Proposed ROW Construction Limits In Fill Construction Limits In Cut CEDAR Archaeology CEDAR Architecture | <ul style="list-style-type: none"> NHD Stream Non-County Park County Park Contour Wetland Delineation Boundary Area of Impact for Stream Relocation Limits of Inset Floodplain Limits of Relocated Channel Box Culvert Thalweg Proposed Impoundment Structure Channel Underlayment Proposed Dam Impoundment Area Waters of the US Impacts Perennial/Intermittent Stream | <ul style="list-style-type: none"> Ephemeral Stream PSS POW PFO PEM |
|--|---|---|

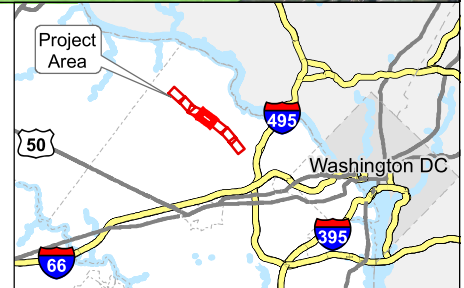




Figure 2-5: Colvin Run Options Analyzed But Not Retained
Stream Relocation Option 7



Virginia Department of Transportation
Route 7 Corridor Improvements
VDOT Project No. 0007-029-128; UPC 99478



Source: VDOT, ESRI

- Parcels
- Existing ROW
- Proposed ROW
- Construction Limits In Fill
- Construction Limits In Cut
- ☐ CEDAR Archaeology
- ☐ CEDAR Architecture
- NHD Stream
- Non-County Park
- County Park
- Contour
- Wetland Delineation Boundary
- Option 7
- Area of Impact for Stream Relocation
- Limits of Triple 12x12 Box Culvert
- ▨ Rip Rap
- ▨ Waters of the US Impacts
- ▨ Perennial/Intermittent Stream
- ▨ Ephemeral Stream
- ▨ PSS
- ▨ POW
- ▨ PFO
- ▨ PEM

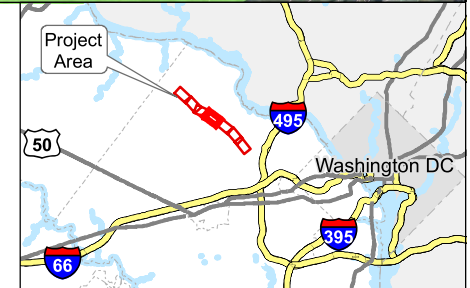
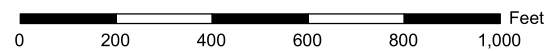




Figure 2-5: Colvin Run Options Analyzed But Not Retained
Stream Relocation Option 7a



Virginia Department of Transportation
Route 7 Corridor Improvements
VDOT Project No. 0007-029-128; UPC 99478



Source: VDOT, ESRI

- Parcels
- Existing ROW
- Proposed ROW
- Construction Limits In Fill
- Construction Limits In Cut
- CEDAR Archaeology
- CEDAR Architecture
- NHD Stream
- Non-County Park
- County Park
- Contour
- Wetland Delineation Boundary
- Option 7a
- Area of Impact for Stream Relocation
- Limits of Relocated Channel
- Limits of 12x12 Box Culvert
- Cross Country Trail
- Thalweg
- Cross Rock Vane
- Rock Vane
- Channel Underlayment
- Rip Rap
- Waters of the US Impacts
- Perennial/Intermittent Stream
- Ephemeral Stream
- PSS
- POW
- PFO
- PEM

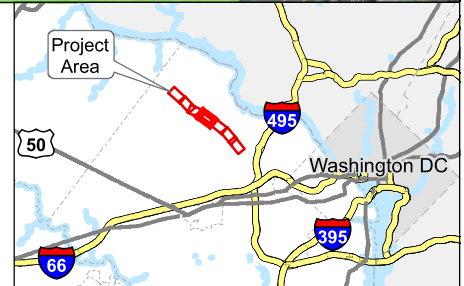


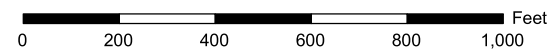


Figure 2-5: Colvin Run Options Analyzed But Not Retained
Stream Relocation Option 7b



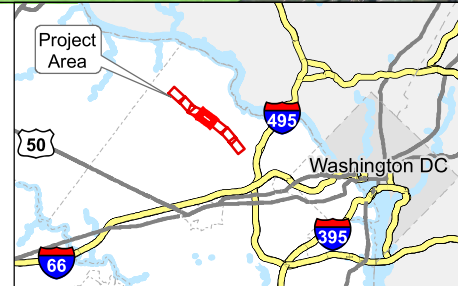
Virginia Department of Transportation
Route 7 Corridor Improvements

VDOT Project No. 0007-029-128; UPC 99478



Source: VDOT, ESRI

- Parcels
- Existing ROW
- Proposed ROW
- - - Construction Limits In Fill
- - - Construction Limits In Cut
- ☐ CEDAR Archaeology
- ☐ CEDAR Architecture
- NHD Stream
- Non-County Park
- County Park
- Contour
- Wetland Delineation Boundary
- Area of Impact for Stream Relocation
- Limits of Relocated Channel
- Limits of 12x12 Box Culvert
- Cross Country Trail
- Thalweg
- Cross Rock Vane
- Rock Vane
- Channel Underlayment
- Rip Rap
- Waters of the US Impacts
- Perennial/Intermittent Stream
- Ephemeral Stream
- PSS
- POW
- PFO
- PEM



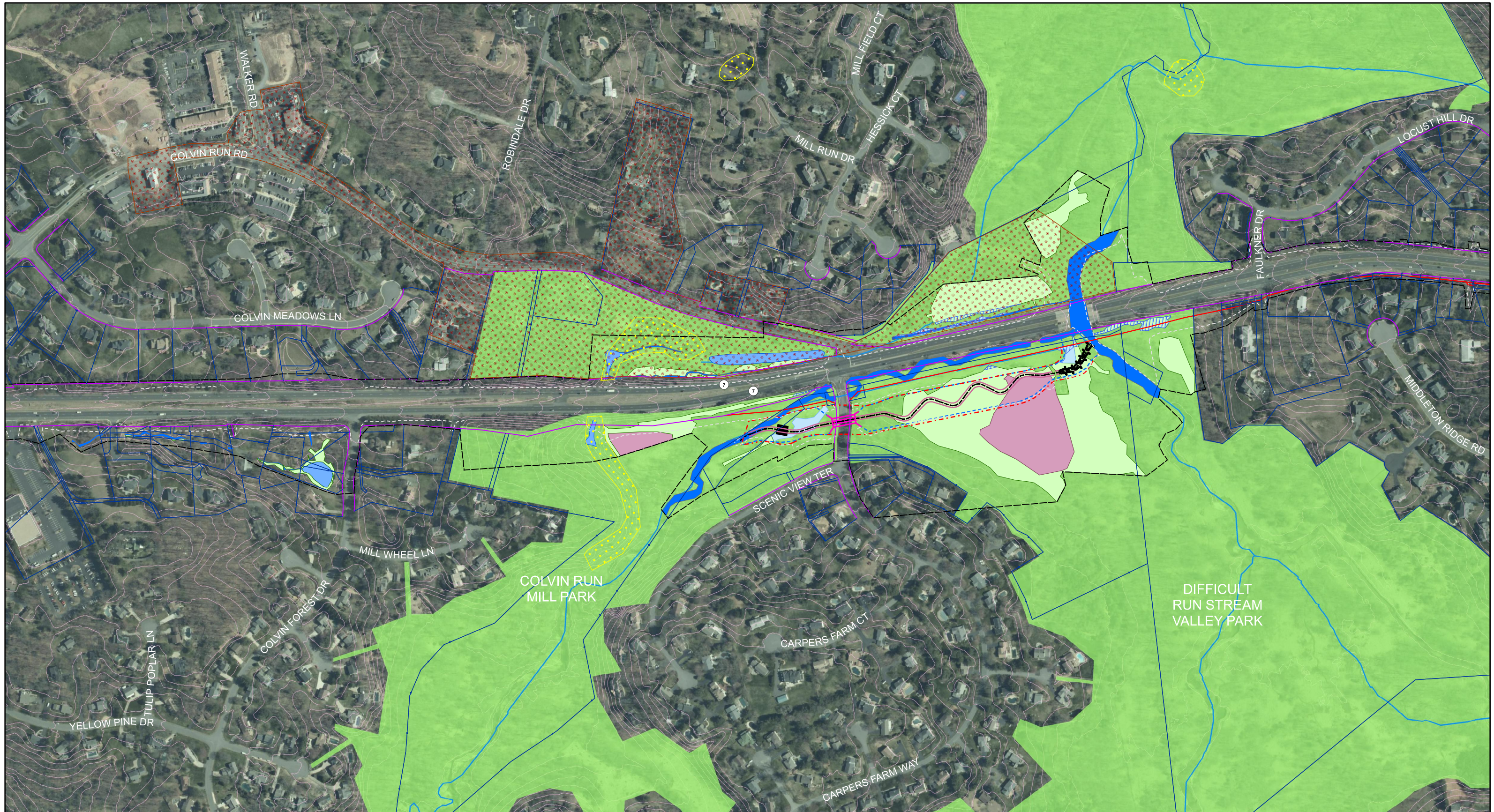


Figure 2-5: Colvin Run Options Analyzed But Not Retained
Stream Relocation Option 8

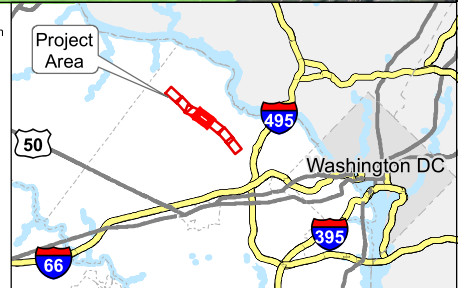


Virginia Department of Transportation
Route 7 Corridor Improvements
VDOT Project No. 0007-029-128; UPC 99478



Source: VDOT, ESRI

- | | | |
|--|--|---|
| <ul style="list-style-type: none"> Parcels Existing ROW Proposed ROW Construction Limits In Fill Construction Limits In Cut CEDAR Archaeology CEDAR Architecture | <ul style="list-style-type: none"> NHD Stream Non-County Park County Park Contour Wetland Delineation Boundary Area of Impact for Stream Relocation Limits of Inset Floodplain Limits of Relocated Channel Box Culvert Thalweg Cross Rock Vane Channel Underlayment Waters of the US Impacts Perennial/Intermittent Stream | <ul style="list-style-type: none"> Ephemeral Stream PSS POW PFO PEM |
|--|--|---|



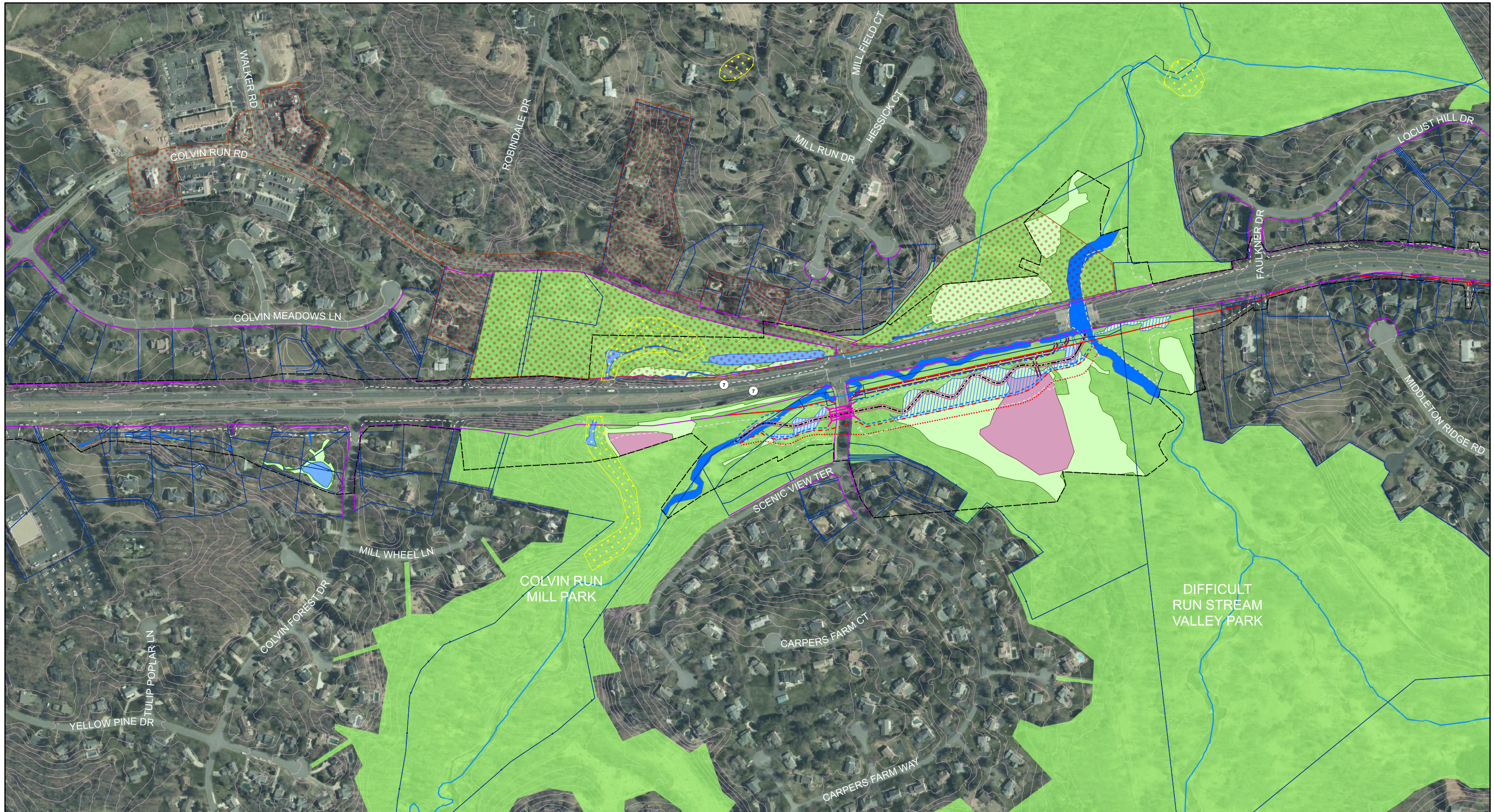
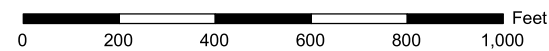


Figure 2-5: Colvin Run Options Analyzed But Not Retained
Stream Relocation Option 9a

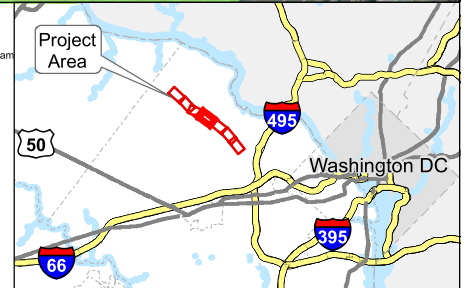


Virginia Department of Transportation
Route 7 Corridor Improvements
VDOT Project No. 0007-029-128; UPC 99478



Source: VDOT, ESRI

- | | | |
|--|---|---|
| <ul style="list-style-type: none"> Parcels Existing ROW Proposed ROW Construction Limits In Fill Construction Limits In Cut CEDAR Archaeology CEDAR Architecture | <ul style="list-style-type: none"> NHD Stream Non-County Park County Park Contour Wetland Delineation Boundary Area of Impact for Stream Relocation - Alternative 1 Area of Impact for Stream Relocation - Alternative 9a Box Culvert Cross Country Trail Limits of Inset Floodplain Limits of Relocated Channel Thalweg Waters of the US Impacts | <ul style="list-style-type: none"> Perennial/Intermittent Stream Ephemeral Stream PSS POW PFO PEM |
|--|---|---|



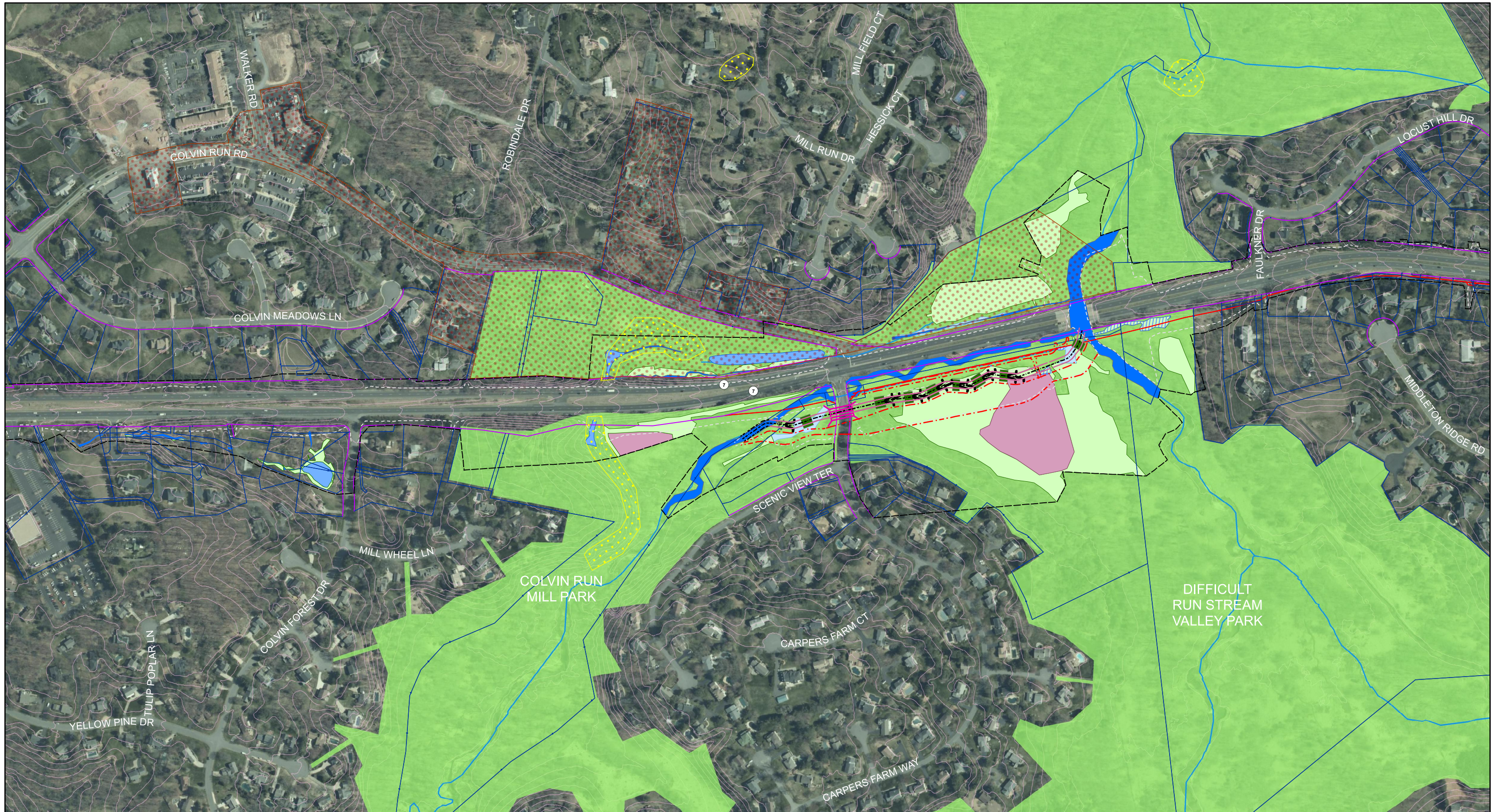
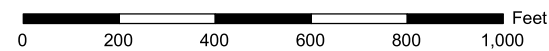


Figure 2-5: Colvin Run Options Analyzed But Not Retained
Stream Relocation Option 9b

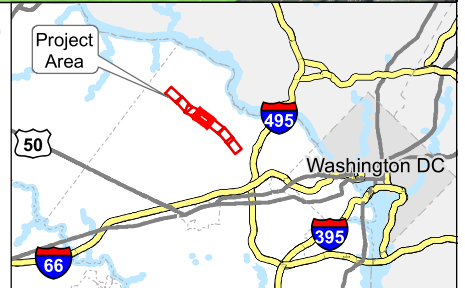


Virginia Department of Transportation
Route 7 Corridor Improvements
VDOT Project No. 0007-029-128; UPC 99478



Source: VDOT, ESRI

- | | | | |
|--|---|--|---|
| <ul style="list-style-type: none"> Parcels Existing ROW Proposed ROW Construction Limits In Fill Construction Limits In Cut CEDAR Archaeology CEDAR Architecture | <ul style="list-style-type: none"> NHD Stream Non-County Park County Park Contour | <ul style="list-style-type: none"> Wetland Delineation Boundary Option 9b Area of Impact for Stream Relocation - Alternative 9b Limits of Relocated Channel Box Culvert Thalweg Cross Rock Vane/Rock Vane Waters of the US Impacts Perennial/Intermittent Stream | <ul style="list-style-type: none"> Ephemeral Stream PSS POW PFO PEM |
|--|---|--|---|



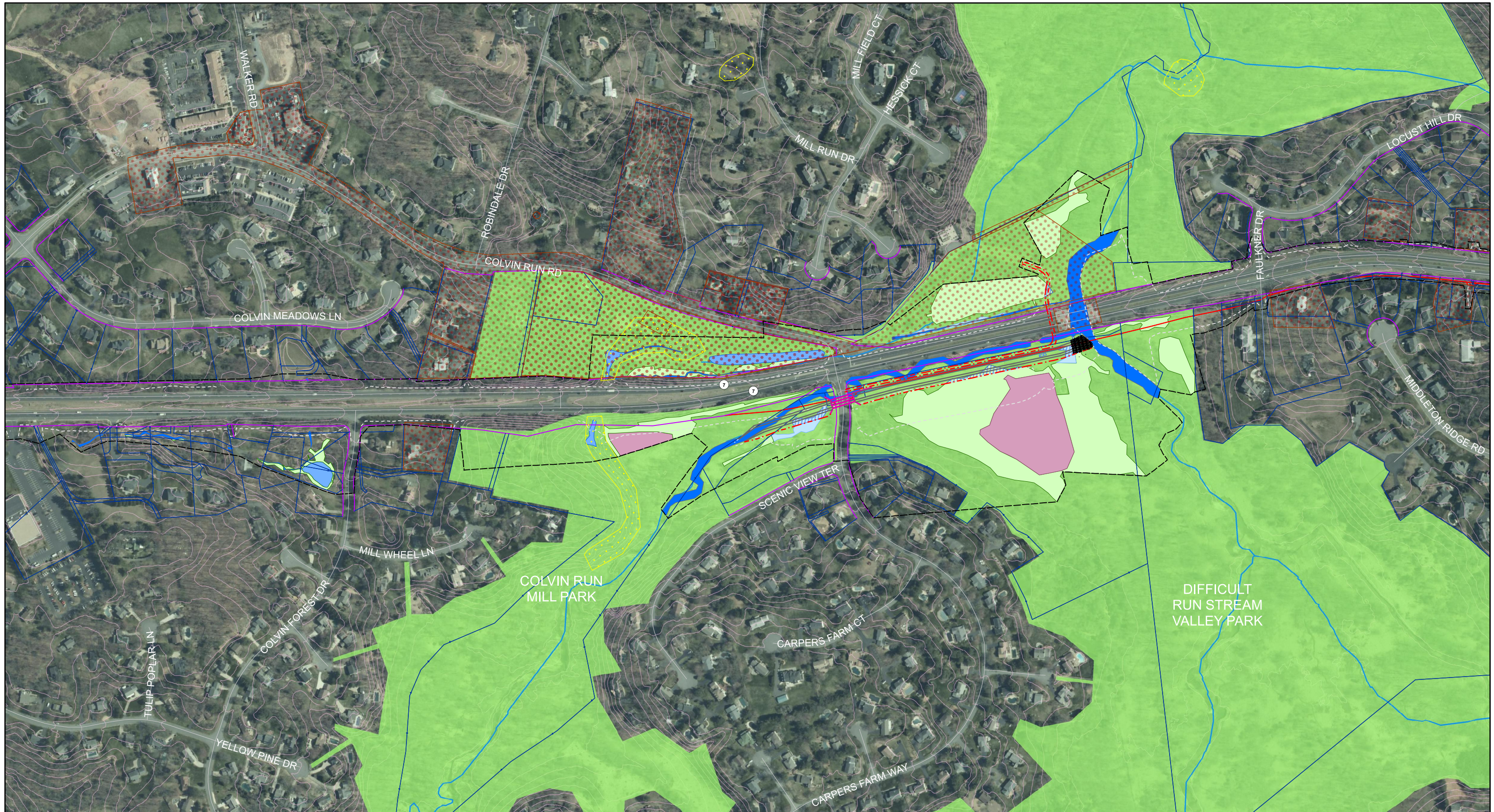
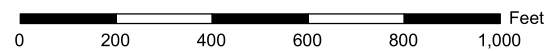


Figure 2-5: Colvin Run Options Analyzed But Not Retained
Stream Relocation Option 10a



Virginia Department of Transportation
Route 7 Corridor Improvements
VDOT Project No. 0007-029-128; UPC 99478



Source: VDOT, ESRI

- | | | | |
|--|---|---|---|
| <ul style="list-style-type: none"> Parcels Existing ROW Proposed ROW Construction Limits In Fill Construction Limits In Cut CEDAR Archaeology CEDAR Architecture | <ul style="list-style-type: none"> NHD Stream Non-County Park County Park Contour | <ul style="list-style-type: none"> Wetland Delineation Boundary Option 10a Area of Impact for Stream Relocation - Alternative 9b Limits of Relocated Channel Box Culvert Thalweg Cross Rock Vane/Rock Vane Waters of the US Impacts Perennial/Intermittent Stream | <ul style="list-style-type: none"> Ephemeral Stream PSS POW PFO PEM |
|--|---|---|---|

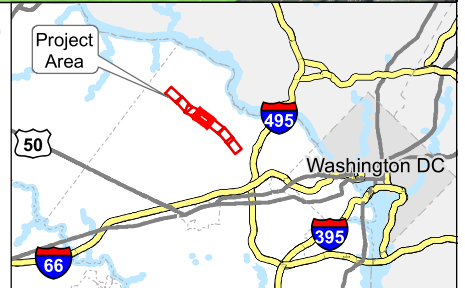
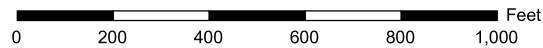




Figure 2-5: Colvin Run Options Analyzed But Not Retained
Stream Relocation Option 10b

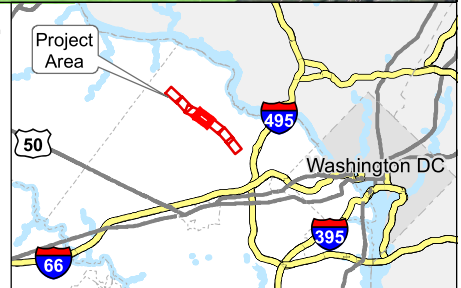


Virginia Department of Transportation
Route 7 Corridor Improvements
VDOT Project No. 0007-029-128; UPC 99478



Source: VDOT, ESRI

- | | | | |
|--|---|---|---|
| <ul style="list-style-type: none"> Parcels Existing ROW Proposed ROW Construction Limits In Fill Construction Limits In Cut CEDAR Archaeology CEDAR Architecture | <ul style="list-style-type: none"> NHD Stream Non-County Park County Park Contour | <ul style="list-style-type: none"> Wetland Delineation Boundary Option 10b Area of Impact for Stream Relocation - Alternative 9b Limits of Relocated Channel Box Culvert Thalweg Cross Rock Vane/Rock Vane Waters of the US Impacts Perennial/Intermittent Stream | <ul style="list-style-type: none"> Ephemeral Stream PSS POW PFO PEM |
|--|---|---|---|



Appendix B:
Threatened and Endangered
Species Database Searches



United States Department of the Interior



FISH AND WILDLIFE SERVICE
Virginia Ecological Services Field Office
6669 Short Lane
Gloucester, VA 23061-4410
Phone: (804) 693-6694 Fax: (804) 693-9032
<http://www.fws.gov/northeast/virginiafield/>

In Reply Refer To:

June 29, 2017

Consultation Code: 05E2VA00-2017-SLI-3798

Event Code: 05E2VA00-2017-E-08330

Project Name: Route 7 NRTR

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 et seq.). Any activity proposed on National Wildlife Refuge lands must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 et seq.), Federal agencies are required to

utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2) (c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

<http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF>

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 et seq.), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (<http://www.fws.gov/windenergy/>) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: <http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm>; <http://www.towerkill.com>; and <http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html>.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List
 - USFWS National Wildlife Refuges and Fish Hatcheries
-

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Virginia Ecological Services Field Office

6669 Short Lane

Gloucester, VA 23061-4410

(804) 693-6694

Project Summary

Consultation Code: 05E2VA00-2017-SLI-3798

Event Code: 05E2VA00-2017-E-08330

Project Name: Route 7 NRTR

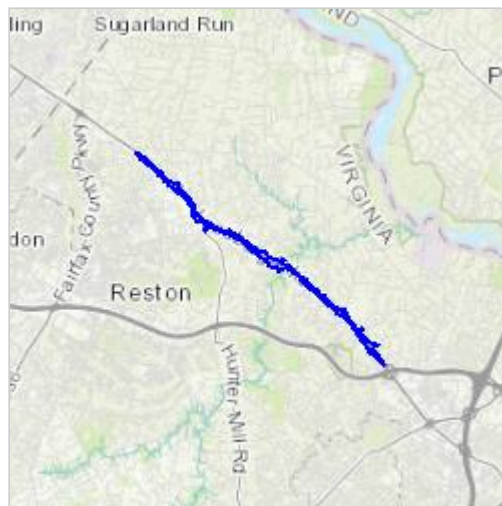
Project Type: TRANSPORTATION

Project Description: Route 7 Widening

Project Location:

Approximate location of the project can be viewed in Google Maps:

<https://www.google.com/maps/place/38.96742166199985N77.29223591111028W>



Counties: Fairfax, VA

Endangered Species Act Species

There is a total of 2 threatened, endangered, or candidate species on your species list. Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species. See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area. Please contact the designated FWS office if you have questions.

Mammals

NAME	STATUS
Northern Long-eared Bat (<i>Myotis septentrionalis</i>)	Threatened
No critical habitat has been designated for this species.	
Species profile: https://ecos.fws.gov/ecp/species/9045	

Clams

NAME	STATUS
Yellow Lance (<i>Elliptio lanceolata</i>)	Proposed Threatened
No critical habitat has been designated for this species.	
Species profile: https://ecos.fws.gov/ecp/species/4511	

Critical habitats

There are no critical habitats within your project area.

USFWS National Wildlife Refuges And Fish Hatcheries

Any activity proposed on [National Wildlife Refuge](#) lands must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

There are no refuges or fish hatcheries within your project area.

Natural Heritage Resources

Your Criteria

Taxonomic Group: Select All

Federal Legal Status: LE - Listed endangered,LT - Listed threatened,PE - Proposed endangered,PT - Proposed threatened,C - Candidate

State Legal Status: Select All

County: Fairfax

Watershed (8 digit HUC): 02070008 - Middle Potomac-Cactoctin

Subwatershed (12 digit HUC): PL22 - Difficult Run

Search Run: 6/29/2017 9:59:13 AM

Result Summary

Total Species returned: 1

Total Communities returned: 0

Click scientific names below to go to NatureServe report.

Click column headings for an explanation of species and community ranks.

Common Name/Natural Community	Scientific Name	Global Conservation Status Rank	State Conservation Status Rank	Federal Legal Status	State Legal Status	Statewide Occurrences	Virginia Coastal Zone
Fairfax Middle Potomac-Catoctin Difficult Run REPTILES Wood Turtle	Glyptemys insculpta	G3	S2	None	LT	45	Y

Note: On-line queries provide basic information from DCR's databases at the time of the request. They are NOT to be substituted for a project review or for on-site surveys required for environmental assessments of specific project areas.

For Additional Information on locations of Natural Heritage Resources please submit an [information request](#).

To Contribute information on locations of natural heritage resources, please fill out and submit a [rare species sighting form](#).

VaFWIS Search Report Compiled on 6/29/2017, 10:13:02 AM[Help](#)

Known or likely to occur within a **2 mile buffer around line beginning 38.9991000 -77.3427899**
in **059 Fairfax County, 107 Loudoun County, VA**

[View Map of Site Location](#)

733 Known or Likely Species ordered by Status Concern for Conservation
(displaying first 36) (36 species with Status* or Tier I** or Tier II**)

BOVA Code	Status*	Tier**	Common Name	Scientific Name	Confirmed	Database(s)
060003	FESE	Ia	Wedgemussel, dwarf	Alasmidonta heterodon		BOVA
010032	FESE	Ib	Sturgeon, Atlantic	Acipenser oxyrinchus		BOVA
050022	FTST	Ia	Bat, northern long-eared	Myotis septentrionalis		BOVA
050020	SE	Ia	Bat, little brown	Myotis lucifugus lucifugus		BOVA,HU6
050027	SE	Ia	Bat, tri-colored	Perimyotis subflavus		BOVA,HU6
060006	SE	Ib	Floater, brook	Alasmidonta varicosa		BOVA
030062	ST	Ia	Turtle, wood	Glyptemys insculpta	Yes	BOVA,TEWaters,Habitat,SppObs,HU6
040096	ST	Ia	Falcon, peregrine	Falco peregrinus		BOVA
040293	ST	Ia	Shrike, loggerhead	Lanius ludovicianus		BOVA
040379	ST	Ia	Sparrow, Henslow's	Ammodramus henslowii		BOVA
100155	ST	Ia	Skipper, Appalachian grizzled	Pyrgus wyandot		BOVA,HU6
060081	ST	IIa	Floater, green	Lasmigona subviridis		BOVA
040292	ST		Shrike, migrant loggerhead	Lanius ludovicianus migrans		BOVA
030063	CC	IIIa	Turtle, spotted	Clemmys guttata		BOVA,HU6
030012	CC	IVa	Rattlesnake, timber	Crotalus horridus		BOVA
010077		Ia	Shiner, bridle	Notropis		BOVA

				bifrenatus		
040092	Ia	Eagle, golden	Aquila chrysaetos			BOVA
040040	Ia	Ibis, glossy	Plegadis falcinellus			BOVA,HU6
040306	Ia	Warbler, golden-winged	Vermivora chrysoptera			BOVA
100248	Ia	Fritillary, regal	Speyeria idalia idalia			BOVA,HU6
040213	Ic	Owl, northern saw-whet	Aegolius acadicus			BOVA,HU6
040052	IIa	Duck, American black	Anas rubripes			BOVA,HU6
040033	IIa	Egret, snowy	Egretta thula			BOVA
040029	IIa	Heron, little blue	Egretta caerulea caerulea			BOVA
040036	IIa	Night-heron, yellow-crowned	Nyctanassa violacea violacea			BOVA
040181	IIa	Tern, common	Sterna hirundo			BOVA,HU6
040320	IIa	Warbler, cerulean	Setophaga cerulea	Potential		BOVA,BBA,HU6
040140	IIa	Woodcock, American	Scolopax minor			BOVA,HU6
060071	IIa	Lampmussel, yellow	Lampsilis cariosa			BOVA
060029	IIa	Lance, yellow	Elliptio lanceolata			BOVA
040203	IIb	Cuckoo, black-billed	Coccyzus erythrophthalmus	Potential		BOVA,BBA
040105	IIb	Rail, king	Rallus elegans			BOVA
040304	IIc	Warbler, Swainson's	Limnothlypis swainsonii	Potential		BOVA,BBA,HU6
070020	IIc	Amphipod, Pizzini's	Stygobromus pizzinii			HU6
100154	IIc	Butterfly, Persius duskywing	Erynnis persius persius			BOVA,HU6
100166	IIc	Skipper, Dotted	Hesperia attalus slossonae			BOVA,HU6

To view **All 733 species** [View 733](#)

*FE=Federal Endangered; FT=Federal Threatened; SE=State Endangered; ST=State Threatened; FP=Federal Proposed; FC=Federal Candidate; CC=Collection Concern

**I=VA Wildlife Action Plan - Tier I - Critical Conservation Need; II=VA Wildlife Action Plan - Tier II - Very High Conservation Need;
 III=VA Wildlife Action Plan - Tier III - High Conservation Need;
 IV=VA Wildlife Action Plan - Tier IV - Moderate Conservation Need
 Virginia Wildlife Action Plan Conservation Opportunity Ranking:
 a - On the ground management strategies/actions exist and can be feasibly implemented.;
 b - On the ground actions or research needs have been identified but cannot feasibly be implemented at this time.;
 c - No on the ground actions or research needs have been identified or all identified conservation opportunities have been exhausted.

[View Map of All Query Results from All Observation Tables](#)

Bat Colonies or Hibernacula: **Not Known**

Anadromous Fish Use Streams

N/A

Impediments to Fish Passage (7 records)

[View Map of All Fish Impediments](#)

ID	Name	River	View Map
1162	LAKE ANNE DAM	TR-COLVIN RUN	Yes
1163	LAKE FAIRFAX DAM	COLVIN RUN	Yes
1179	LAKE NEWPORT DAM	TR-COLVIN RUN	Yes
1168	PINEY RUN DAM	PINEY RUN	Yes
1182	STUMP DUMP LANDFILL DAM	TR-NICHOLS RUN	Yes
1290	WOLF TRAP FARM POND DAM	WOLF TRAP CREEK (OFFSTREAM)	Yes
1289	WOODSIDE DAM	TR-ROCKY RUN	Yes

Colonial Water Bird Survey

N/A

Threatened and Endangered Waters (29 Reaches - displaying first 20)

[View Map of All Threatened and Endangered Waters](#)

Stream Name	T&E Waters Species						View Map
	Highest TE *	BOVA Code, Status *, Tier **, Common & Scientific Name					
(029674)	ST	030062	ST	Ia	Turtle, wood	Glyptemys insculpta	Yes
Difficult Run (024652)	ST	030062	ST	Ia	Turtle, wood	Glyptemys insculpta	Yes
Difficult Run (025777)	ST	030062	ST	Ia	Turtle, wood	Glyptemys insculpta	Yes
Difficult Run (026319)	ST				Turtle,	Glyptemys	Yes

		030062	ST	Ia	wood	insculpta	
Difficult Run (026594)	ST	030062	ST	Ia	Turtle. wood	Glyptemys insculpta	Yes
Difficult Run (028927)	ST	030062	ST	Ia	Turtle. wood	Glyptemys insculpta	Yes
Difficult Run (029101)	ST	030062	ST	Ia	Turtle. wood	Glyptemys insculpta	Yes
Difficult Run (029302)	ST	030062	ST	Ia	Turtle. wood	Glyptemys insculpta	Yes
Difficult Run (030800)	ST	030062	ST	Ia	Turtle. wood	Glyptemys insculpta	Yes
Difficult Run (033271)	ST	030062	ST	Ia	Turtle. wood	Glyptemys insculpta	Yes
Difficult Run (035513)	ST	030062	ST	Ia	Turtle. wood	Glyptemys insculpta	Yes
Difficult Run (036971)	ST	030062	ST	Ia	Turtle. wood	Glyptemys insculpta	Yes
Difficult Run (037767)	ST	030062	ST	Ia	Turtle. wood	Glyptemys insculpta	Yes
Difficult Run (040286)	ST	030062	ST	Ia	Turtle. wood	Glyptemys insculpta	Yes
Nichols Run (023621)	ST	030062	ST	Ia	Turtle. wood	Glyptemys insculpta	Yes
Nichols Run (033002)	ST	030062	ST	Ia	Turtle. wood	Glyptemys insculpta	Yes
Sugarland Run (023435)	ST	030062	ST	Ia	Turtle. wood	Glyptemys insculpta	Yes
Sugarland Run (023462)	ST	030062	ST	Ia	Turtle. wood	Glyptemys insculpta	Yes
Sugarland Run (023888)	ST	030062	ST	Ia	Turtle. wood	Glyptemys insculpta	Yes
Sugarland Run (024708)	ST	030062	ST	Ia	Turtle. wood	Glyptemys insculpta	Yes
Sugarland Run (025296)	ST	030062	ST	Ia	Turtle. wood	Glyptemys insculpta	Yes
Sugarland Run (026352)	ST	030062	ST	Ia	Turtle. wood	Glyptemys insculpta	Yes

To view **All 29 Threatened and Endangered Waters records** [View 29](#)

Managed Trout Streams

N/A

Bald Eagle Concentration Areas and Roosts

N/A

Bald Eagle Nests

N/A

Species Observations (199 records - displaying first 20 , 6
Observations with Threatened or
Endangered species)[View Map of All Query Results
Species Observations](#)

obsID	class	Date Observed	Observer	N Species			View Map
				Different Species	Highest TE*	Highest Tier**	
308817	SppObs	May 31 2005	John Kleopfer, Robin Hughes	1	ST	I	Yes
65424	SppObs	May 2 2002	Joseph C. Mitchell (collector)	1	ST	I	Yes
8794	SppObs	May 25 1994	SUSAN A. BLOOMFIELD, , NATURAL RESOURCE MANAGEMENT SPECIALIST, , GREAT FALLS PARK	1	ST	I	Yes
3141	SppObs	Nov 4 1990	DCR/Div. Natural Heritage	1	ST	I	Yes
3308	SppObs	Nov 4 1990	Sue Bruenderman (has field, notes)	1	ST	I	Yes
364530	SppObs	Jan 1 1900		2	ST	I	Yes
615559	SppObs	Sep 13 2012	Shannon; Curtis Emma; Gutzler Takisha; Cannon Daniell	11		III	Yes
615556	SppObs	Sep 10 2012	Shannon; Curtis Joseph; Sanchirico Takisha; Cannon He	9		III	Yes
615544	SppObs	Aug 20 2012	Shannon; Curtis Emma; Gutzler Joseph; Sanchirico	8		III	Yes
613540	SppObs	Sep 30 2011	Chad; Grupe Danielle; Wynne Joseph; Sanchirico Shannon; Curtis Russell; Smith	17		III	Yes
608327	SppObs	Sep 22 2010	Shannon; Curtis Joseph; Sanchirico Russell; Smith	10		III	Yes
608318	SppObs	Sep 9	Shannon; Curtis Heather; Ambrose	21		III	Yes

		2010	Christopher; Mueller Chad; Grupe Eric; Forbes LeAnne; Astin				
608313	SppObs	Sep 1 2010	Heather; Ambrose Eric; Forbes Christopher; Mueller Takisha; Cannon Shannon; Curtis LeAnne; Astin	8		III	Yes
608305	SppObs	Aug 17 2010	Chad; Grupe Heather; Ambrose Shannon; Curtis Eric; Forbes	7		III	Yes
608303	SppObs	Aug 12 2010	Chad; Grupe Heather; Ambrose Eric; Forbes Christopher; Mueller	11		III	Yes
609668	SppObs	Jun 4 2010	Wayne; Starnes	12		III	Yes
600424	SppObs	Jul 31 2009	Heather; Ambrose Eric; Forbes Shannon; Curtis	11		III	Yes
600469	SppObs	Aug 26 2008	Joseph; Sanchirico Shannon; Curtis Eric; Forbes LeAnne; Astin Takisha; Cannon	16		III	Yes
604603	SppObs	Aug 19 2008	Joseph; Sanchirico Shannon; Curtis Eric; Forbes LeAnne; Astin Chad; Grupe Matthew; Meyers	19		III	Yes
321308	SppObs	Jul 7 2007	Chad Grupe	20		III	Yes

Displayed 20 Species Observations

Selected 199 Observations [View all 199 Species Observations](#)

Habitat Predicted for Aquatic WAP Tier I & II Species (9 Reaches)

[View Map Combined Reaches from Below of Habitat Predicted for WAP Tier I & II Aquatic Species](#)

Stream Name	Tier Species						View Map
	Highest TE*	BOVA Code, Status*, Tier**, Common & Scientific Name					
Captain Hickory Run (20700081)	ST	030062	ST	Ia	Turtle. wood	Glyptemys insculpta	Yes
Difficult Run (20700081)	ST	030062	ST	Ia	Turtle. wood	Glyptemys insculpta	Yes
Jefferson Branch (20700081)	ST	030062	ST	Ia	Turtle. wood	Glyptemys insculpta	Yes
Nichols Run (20700081)	ST	030062	ST	Ia	Turtle. wood	Glyptemys insculpta	Yes
Rocky Run (20700081)	ST	030062	ST	Ia	Turtle. wood	Glyptemys insculpta	Yes
Sugarland Run (20700081)	ST	030062	ST	Ia	Turtle. wood	Glyptemys insculpta	Yes
tributary (20700081)	ST	030062	ST	Ia	Turtle. wood	Glyptemys insculpta	Yes

Unnamed trib. of Potomac (20700081)	ST	030062	ST	Ia	Turtlewood	Glyptemys insculpta	Yes
--	----	--------	----	----	----------------------------	---------------------	---------------------

Habitat Predicted for Terrestrial WAP Tier I & II Species

N/A

Virginia Breeding Bird Atlas Blocks (12 records)

[View Map of All Query Results](#)
[Virginia Breeding Bird Atlas Blocks](#)

BBA ID	Atlas Quadrangle Block Name	Breeding Bird Atlas Species			View Map
		Different Species	Highest TE *	Highest Tier **	
53203	Falls Church, CW	56		III	Yes
53201	Falls Church, NW	88		II	Yes
53205	Falls Church, SW	66		II	Yes
51202	Herndon, NE	51		III	Yes
52216	Seneca, SE	79		II	Yes
52215	Seneca, SW	52		III	Yes
51216	Sterling, SE	72		III	Yes
52204	Vienna, CE	50		III	Yes
52203	Vienna, CW	50		III	Yes
52202	Vienna, NE	65		III	Yes
52201	Vienna, NW	58		III	Yes
52206	Vienna, SE	54		II	Yes

Public Holdings: (3 names)

Name	Agency	Level
George Washington Memorial National Parkway	National Park Service	Federal
Wolf Trap Farm National Performing Arts Park	National Park Service	Federal
Wolf Trap Farm National Performing Arts Park	National Park Service	Federal

Summary of BOVA Species Associated with Cities and Counties of the Commonwealth of Virginia:

FIPS Code	City and County Name	Different Species	Highest TE	Highest Tier
059	Fairfax	559	FESE	I
107	Loudoun	438	FTSE	I

USGS 7.5' Quadrangles:

Herndon
Sterling
Vienna
Seneca
Falls Church

USGS NRCS Watersheds in Virginia:

N/A

USGS National 6th Order Watersheds Summary of Wildlife Action Plan Tier I, II, III, and IV Species:

HU6 Code	USGS 6th Order Hydrologic Unit	Different Species	Highest TE	Highest Tier
PL21	Sugarland Run	63	SE	I
PL22	Difficult Run	67	ST	I
PL23	Potomac River-Nichols Run-Scott Run	69	SE	I

Compiled on 6/29/2017, 10:13:02 AM 1842300.0 report=all searchType=L dist= 3218 poi= 38.9991000 -77.3427899 siteDD= 38.9991000 -77.3427998;38.9976000 -77.3405998;38.9954000 -77.3373998;38.9938000 -77.3351998;38.9916000 -77.3321998;38.9895000 -77.3293998;38.9878000 -77.3264998;38.9868000 -77.3247998;38.9861000 -77.3237998;38.9854000 -77.3230998;38.9841000 -77.3221998;38.9824000 -77.3209998;38.9801000 -77.3189998;38.9811000 -77.3198998;38.9788000 -77.3171998;38.9777000 -77.3151998;38.9762000 -77.3105998;38.9751000 -77.3069998;38.9744000 -77.3046998;38.9738000 -77.3036998;38.9713000 -77.2990998;38.9692000 -77.2954998;38.9680000 -77.2931998;38.9661000 -77.2877998;38.9650000 -77.2847998;38.9643000 -77.2833998;38.9626000 -77.2810998;38.9589000 -77.2758998;38.9565000 -77.2724998;38.9544000 -77.2693998;38.9520000 -77.2654998;38.9503000 -77.2626998;38.9496000 -77.2618998;38.9467000 -77.2590998;38.9423000 -77.2547998;38.9386000 -77.2509998;38.9356000 -77.2480998;

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Virginia Department of Game and Inland Fisheries

6/29/2017 10:15:45 AM

Fish and Wildlife Information Service

VaFWIS Search Report Compiled on 6/29/2017, 10:15:45 AM

[Help](#)

Known or likely to occur within a **2 mile buffer around line beginning 38.9991000 -77.3427899**
 in **059 Fairfax County, 107 Loudoun County, VA**
 where (030062) [Turtle, wood](#) observed.

[View Map of Site Location](#)

Threatened and Endangered Waters where Turtle, wood (030062) observed

(29 Reaches - displaying first 20)

[View Map of All Threatened and Endangered Waters](#)

Stream Name	T&E Waters Species						View Map
	Highest TE*	BOVA Code, Status*, Tier**, Common & Scientific Name					
(029674)	ST	030062	ST	Ia	Turtle, wood	Glyptemys insculpta	Yes
Difficult Run (024652)	ST	030062	ST	Ia	Turtle, wood	Glyptemys insculpta	Yes
Difficult Run (025777)	ST	030062	ST	Ia	Turtle, wood	Glyptemys insculpta	Yes
Difficult Run (026319)	ST	030062	ST	Ia	Turtle, wood	Glyptemys insculpta	Yes
Difficult Run (026594)	ST	030062	ST	Ia	Turtle, wood	Glyptemys insculpta	Yes
Difficult Run (028927)	ST	030062	ST	Ia	Turtle, wood	Glyptemys insculpta	Yes
Difficult Run (029101)	ST	030062	ST	Ia	Turtle, wood	Glyptemys insculpta	Yes
Difficult Run (029302)	ST	030062	ST	Ia	Turtle, wood	Glyptemys insculpta	Yes
Difficult Run (030800)	ST	030062	ST	Ia	Turtle, wood	Glyptemys insculpta	Yes
Difficult Run (033271)	ST	030062	ST	Ia	Turtle, wood	Glyptemys insculpta	Yes
Difficult Run (035513)	ST						Yes

))		030062	ST	Ia	Turtle wood	Glyptemys insculpta	
Difficult Run (036971))	ST	030062	ST	Ia	Turtle wood	Glyptemys insculpta	Yes
Difficult Run (037767))	ST	030062	ST	Ia	Turtle wood	Glyptemys insculpta	Yes
Difficult Run (040286))	ST	030062	ST	Ia	Turtle wood	Glyptemys insculpta	Yes
Nichols Run (023621))	ST	030062	ST	Ia	Turtle wood	Glyptemys insculpta	Yes
Nichols Run (033002))	ST	030062	ST	Ia	Turtle wood	Glyptemys insculpta	Yes
Sugarland Run (023435))	ST	030062	ST	Ia	Turtle wood	Glyptemys insculpta	Yes
Sugarland Run (023462))	ST	030062	ST	Ia	Turtle wood	Glyptemys insculpta	Yes
Sugarland Run (023888))	ST	030062	ST	Ia	Turtle wood	Glyptemys insculpta	Yes
Sugarland Run (024708))	ST	030062	ST	Ia	Turtle wood	Glyptemys insculpta	Yes
Sugarland Run (025296))	ST	030062	ST	Ia	Turtle wood	Glyptemys insculpta	Yes
Sugarland Run (026352))	ST	030062	ST	Ia	Turtle wood	Glyptemys insculpta	Yes

To view **All 29 Threatened and Endangered Waters records** [View 29](#)

*FE=Federal Endangered; FT=Federal Threatened; SE=State Endangered; ST=State Threatened; FP=Federal Proposed; FC=Federal Candidate; CC=Collection Concern

**I=VA Wildlife Action Plan - Tier I - Critical Conservation Need;
 II=VA Wildlife Action Plan - Tier II - Very High Conservation Need;
 III=VA Wildlife Action Plan - Tier III - High Conservation Need;
 IV=VA Wildlife Action Plan - Tier IV - Moderate Conservation Need
 Virginia Wildlife Action Plan Conservation Opportunity Ranking:
 a - On the ground management strategies/actions exist and can be feasibly implemented.;
 b - On the ground actions or research needs have been identified but cannot feasibly be implemented at this time.;
 c - No on the ground actions or research needs have been identified or all identified conservation opportunities have been exhausted.

Species Observations where Turtle, wood (030062) observed (6 records , 6 Observations with Threatened or Endangered species)

[View Map of All Query Results](#)
[Species Observations where Turtle, wood \(030062\) observed](#)

obsID	class	Date Observed	Observer	N Species			View Map
				Different	Highest	Highest	

				Species	TE *	Tier **	
308817	SppObs	May 31 2005	John Kleopfer, Robin Hughes	1	ST	I	Yes
65424	SppObs	May 2 2002	Joseph C. Mitchell (collector)	1	ST	I	Yes
8794	SppObs	May 25 1994	SUSAN A. BLOOMFIELD, , NATURAL RESOURCE MANAGEMENT SPECIALIST, , GREAT FALLS PARK	1	ST	I	Yes
3141	SppObs	Nov 4 1990	DCR/Div. Natural Heritage	1	ST	I	Yes
3308	SppObs	Nov 4 1990	Sue Bruenderman (has field, notes)	1	ST	I	Yes
364530	SppObs	Jan 1 1900		2	ST	I	Yes

Displayed 6 Species Observations where Turtle, wood (030062) observed

Habitat Predicted for Aquatic WAP Tier I & II Species where Turtle, wood (030062) observed

(9 Reaches)

[View Map Combined Reaches from Below of Habitat Predicted for WAP Tier I & II Aquatic Species](#)

Stream Name	Tier Species						View Map
	Highest TE *	BOVA Code, Status *, Tier **, Common & Scientific Name					
Captain Hickory Run (20700081)	ST	030062	ST	Ia	Turtle, wood	Glyptemys insculpta	Yes
Difficult Run (20700081)	ST	030062	ST	Ia	Turtle, wood	Glyptemys insculpta	Yes
Jefferson Branch (20700081)	ST	030062	ST	Ia	Turtle, wood	Glyptemys insculpta	Yes
Nichols Run (20700081)	ST	030062	ST	Ia	Turtle, wood	Glyptemys insculpta	Yes
Rocky Run (20700081)	ST	030062	ST	Ia	Turtle, wood	Glyptemys insculpta	Yes
Sugarland Run (20700081)	ST	030062	ST	Ia	Turtle, wood	Glyptemys insculpta	Yes
tributary (20700081)	ST	030062	ST	Ia	Turtle, wood	Glyptemys insculpta	Yes
Unnamed trib. of Potomac (20700081)	ST	030062	ST	Ia	Turtle, wood	Glyptemys insculpta	Yes

Habitat Predicted for Terrestrial WAP Tier I & II Species where Turtle, wood (030062) observed

N/A

USGS National 6th Order Watersheds Summary of Wildlife Action Plan Tier I, II, III, and IV Species:

HU6 Code	USGS 6th Order Hydrologic Unit	Different Species	Highest TE	Highest Tier
PL21	Sugarland Run	63	SE	I
PL22	Difficult Run	67	ST	I
PL23	Potomac River-Nichols Run-Scott Run	69	SE	I

Compiled on 6/29/2017, 10:15:45 AM I842300.1 report=BOVA searchType=L dist= 3218 poi= 38.9991000 -77.3427899

audit no. 842300 6/29/2017 10:15:45 AM Virginia Fish and Wildlife Information Service
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6 Species Observations where Turtle, wood (030062) observed

38,59,56.7 -77,20,34.0 is the Search Point

Show Position Rings

Yes No 1 mile and 1/4 mile at the Search Point

Show Search Area

Yes No 2 Search distance miles buffer

Display Search Point is at center not at map center

Base Map Choices

Topography

Map Overlay Choices

Current List: Position, Search, SppObs

Map Overlay Legend

- Position Rings 1 mile and 1/4 mile at the Search Point
2 mile radius Search Area
Data Observation Site

Map navigation controls including Pan, Zoom, Screen Size, and Help buttons.



Point of Search 38,59,56.7 -77,20,34.0
Map Location 38,58,02.4 -77,17,43.5
Select Coordinate System: Degrees,Minutes,Seconds Latitude - Longitude
Base Map source: USGS 1:250,000 topographic maps

Map projection is UTM Zone 18 NAD 1983 with left 291535 and top 4325260. Pixel size is 24. Coordinates displayed are Degrees, Minutes, Seconds North and West.

Topographic maps and Black and white aerial photography for year 1990+- are from the United States Department of the Interior, United States Geological Survey. Color aerial photography aquired 2002 is from Virginia Base Mapping Program, Virginia Geographic Information Network.

map assembled 2017-06-29 10:15:06 (qa/qc March 21, 2016 12:20 - tn=842300.1 dist=3218 I
)
\$poi=38.9991000 -77.3427899

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Threatened and Endangered Waters where Turtle, wood (030062) observed

38,59,56.7 -77,20,34.0 is the Search Point

Show Position Rings
 Yes No
1 mile and 1/4 mile at the Search Point

Show Search Area
 Yes No
2 Search distance miles buffer

Display Search Point is at center not at map center

Base Map Choices
Topography

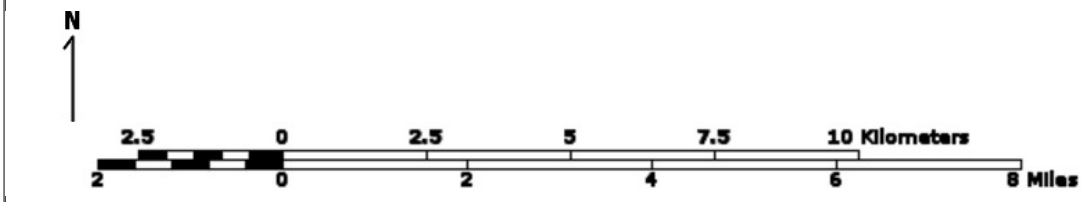
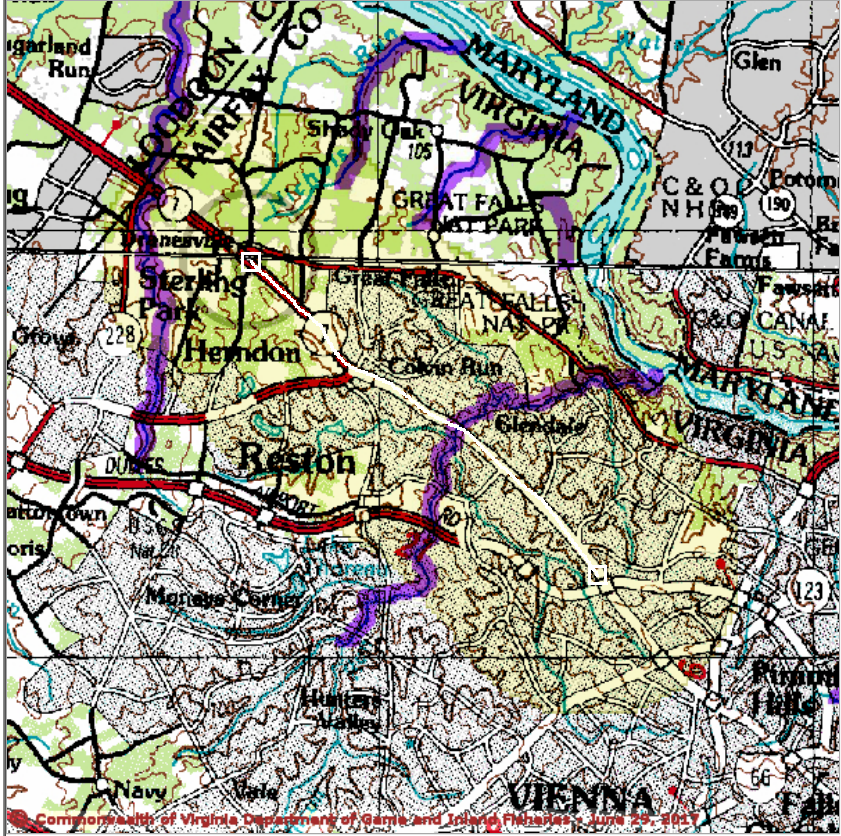
Map Overlay Choices
Current List: Position, Search, TEWaters

Map Overlay Legend

- T & E Waters**
- Federal
 - State
- Position Rings**
- 1 mile and 1/4 mile at the Search Point
 - 2 mile radius Search Area

Refresh Browser Page

Map Click **Pan** **Zoom** **M** Map Scale **In** **Zoom** **Out** Screen Size **Small** **Size** **Big** [Help](#)



Point of Search 38,59,56.7 -77,20,34.0
 Map Location 38,58,02.4 -77,17,43.5

Select Coordinate System: Degrees,Minutes,Seconds Latitude - Longitude
 Decimal Degrees Latitude - Longitude
 Meters UTM NAD83 East North Zone
 Meters UTM NAD27 East North Zone

Base Map source: USGS 1:250,000 topographic maps (see [Microsoft terraserver-usa.com](http://Microsoft.terraserver-usa.com) for details)

Map projection is UTM Zone 18 NAD 1983 with left 291535 and top 4325260. Pixel size is 24. .
 Coordinates displayed are Degrees, Minutes, Seconds North and West. Map is currently displayed as 600 columns by 600 rows for a total of 360000 pixels. The map display represents 19200 meters east to west by 19200 meters north to south for a total of 368.6 square kilometers. The map display represents 63002 feet east to west by 63002 feet north to south for a total of 142.3 square miles.

Topographic maps and Black and white aerial photography for year 1990+- are from the United States Department of the Interior, United States Geological Survey. Color aerial photography aquired 2002 is from Virginia Base Mapping Program, Virginia Geographic Information Network. Shaded topographic maps are from TOPO! ©2006 National Geographic <http://www.national.geographic.com/topo> All other map products are from the Commonwealth of Virginia Department of Game and Inland Fisheries.

map assembled 2017-06-29 10:16:24 (qa/qc March 21, 2016 12:20 - tn=842300.1 dist=3218 I
)
\$poi=38.9991000 -77.3427899

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WERMS

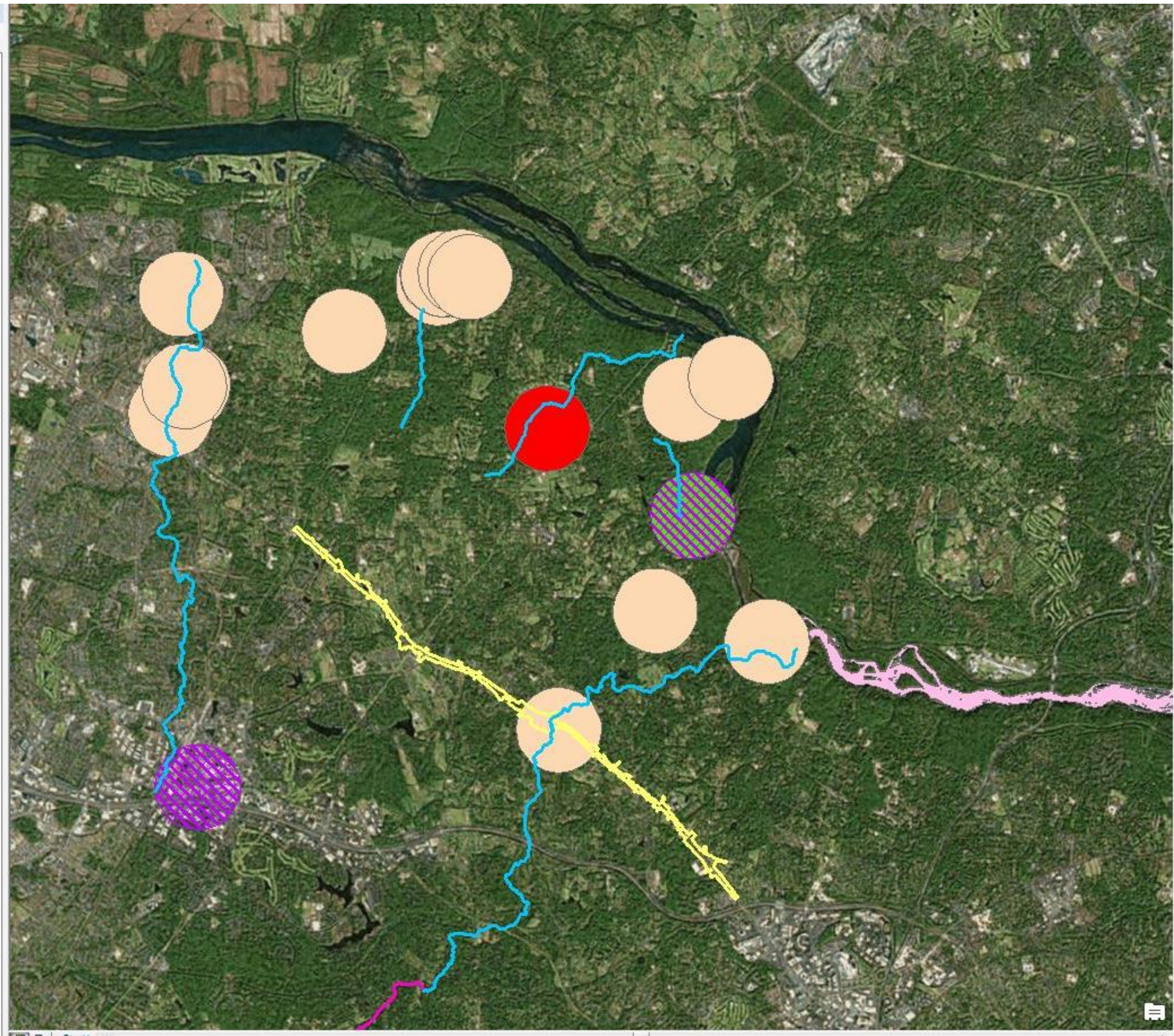
Table Of Contents

ET GeoWiza

ETGW Help

Layers

- Rt7PolylinePoint
- TE_Waters (All Wood Turtle)
- TroutStreams
- RT7Test
- SppObs_Enviro_Review_Listed
 - <all other values>
 - COMMON_NAME
 - Bat, little brown
 - Bat, tri-colored
 - Turtle, spotted
 - Turtle, wood
- AnadromousFishUse
- Export_Output_2
- Rt7Poly
- Rt7Polygon
- WofUS_9-26-16_Line2
- Basemap
 - World Imagery





Layers

Bald Eagle

VA Eagle Nest Locator

Zoom to Extents

Most recent data CCB has on bald eagle nest locations in Virginia. Data is largely from two annual aerial flights conducted in winter and spring of all tributaries of the lower Chesapeake Bay and other prominent bodies of water. Reported ground survey data is also included.

More info

VA Eagle Nest Buffers

Eagle Roosts

Eagle Roost Polygons

Eagle Roost Buffers

Eagle Roosts by Topoquad

Waterbirds

Chesapeake Bay Herons 2013

Colonial Waterbirds 2013

Colonial Waterbirds 2008

Colonial Waterbirds 2003

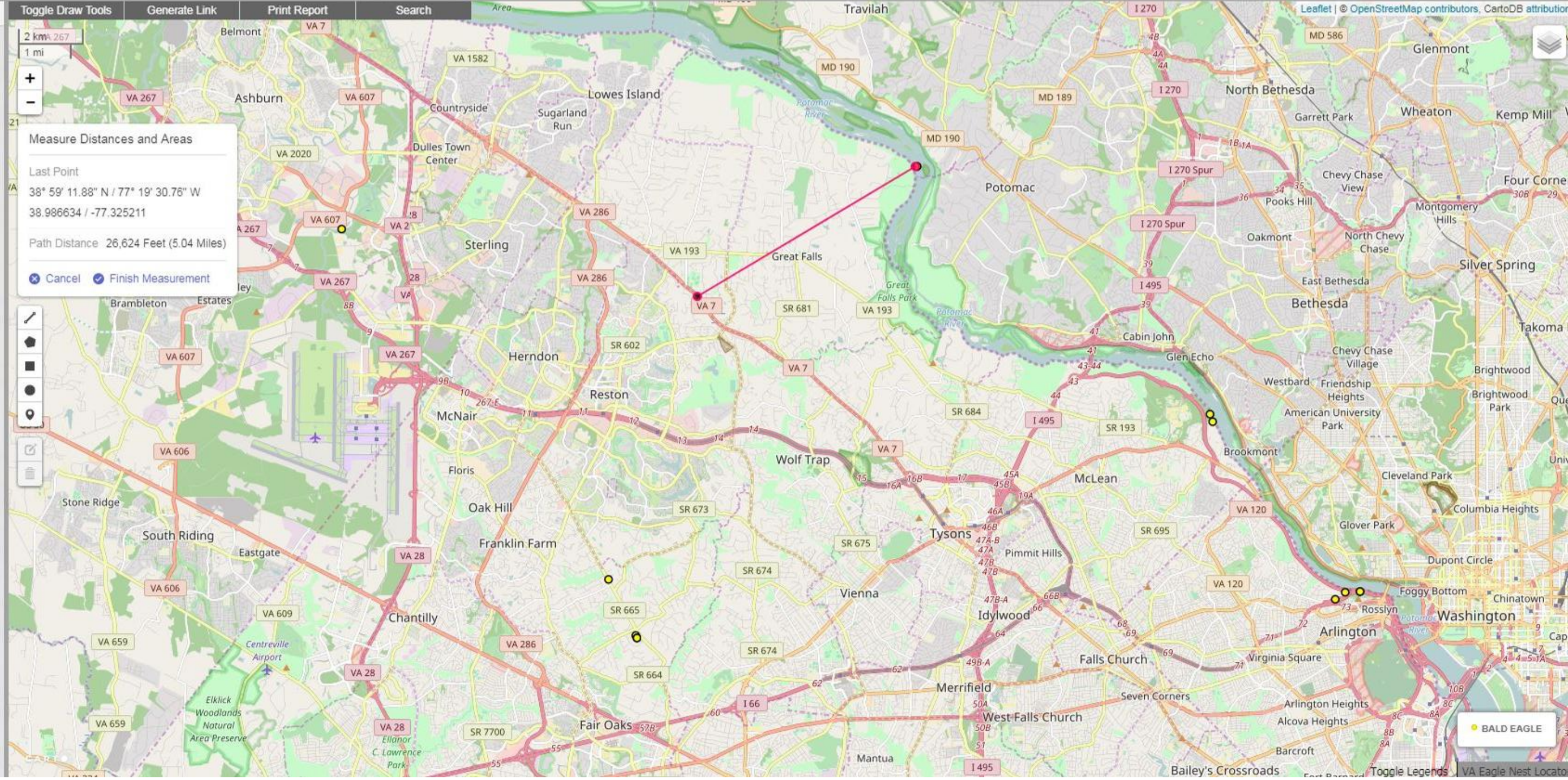
Osprey

OspreyWatch Nests

Chesapeake Bay Osprey Nests 1995-1996

Nightjars

Nightjar Survey Network Routes



Scale bar: 2 km, 1 mi

Measure Distances and Areas popup showing coordinates and path distance.

Map navigation and drawing tools.

BALD EAGLE

VA Eagle Nest Locator

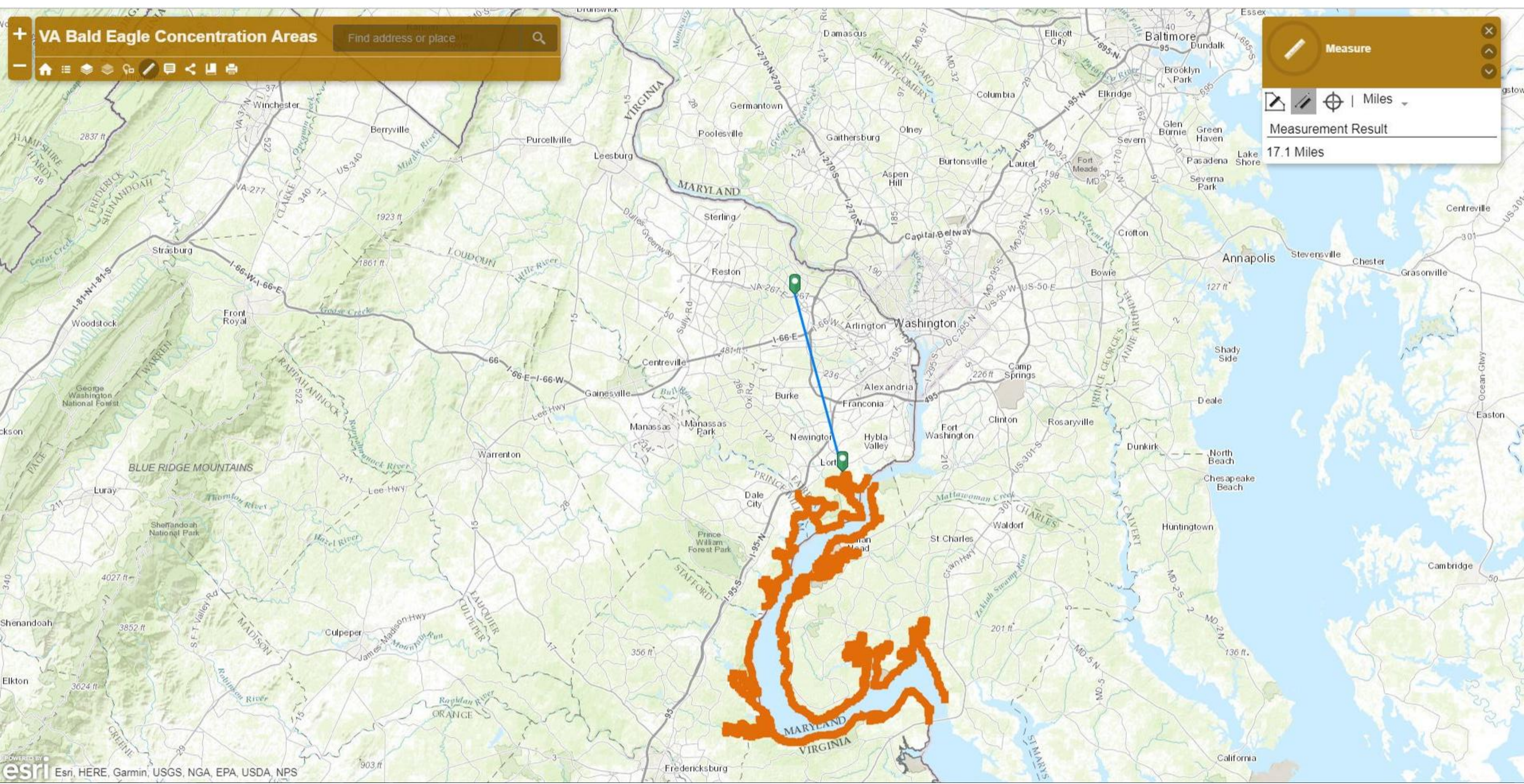
+ VA Bald Eagle Concentration Areas Find address or place

Home, Layers, Full Screen, Measure, Print, Share, Refresh, Close

Measure

Measurement Result

17.1 Miles



ROUTE 7 WIDENING - FAIRFAX COUNTY

