Application, Appendix, DEQ Supplement, Direct Testimony and Exhibits of Virginia Electric and Power Company

Before the State Corporation Commission of Virginia

DTC 230 kV Line Loop and DTC Substation

Application No. 311

Case No. PUR-2021-00280

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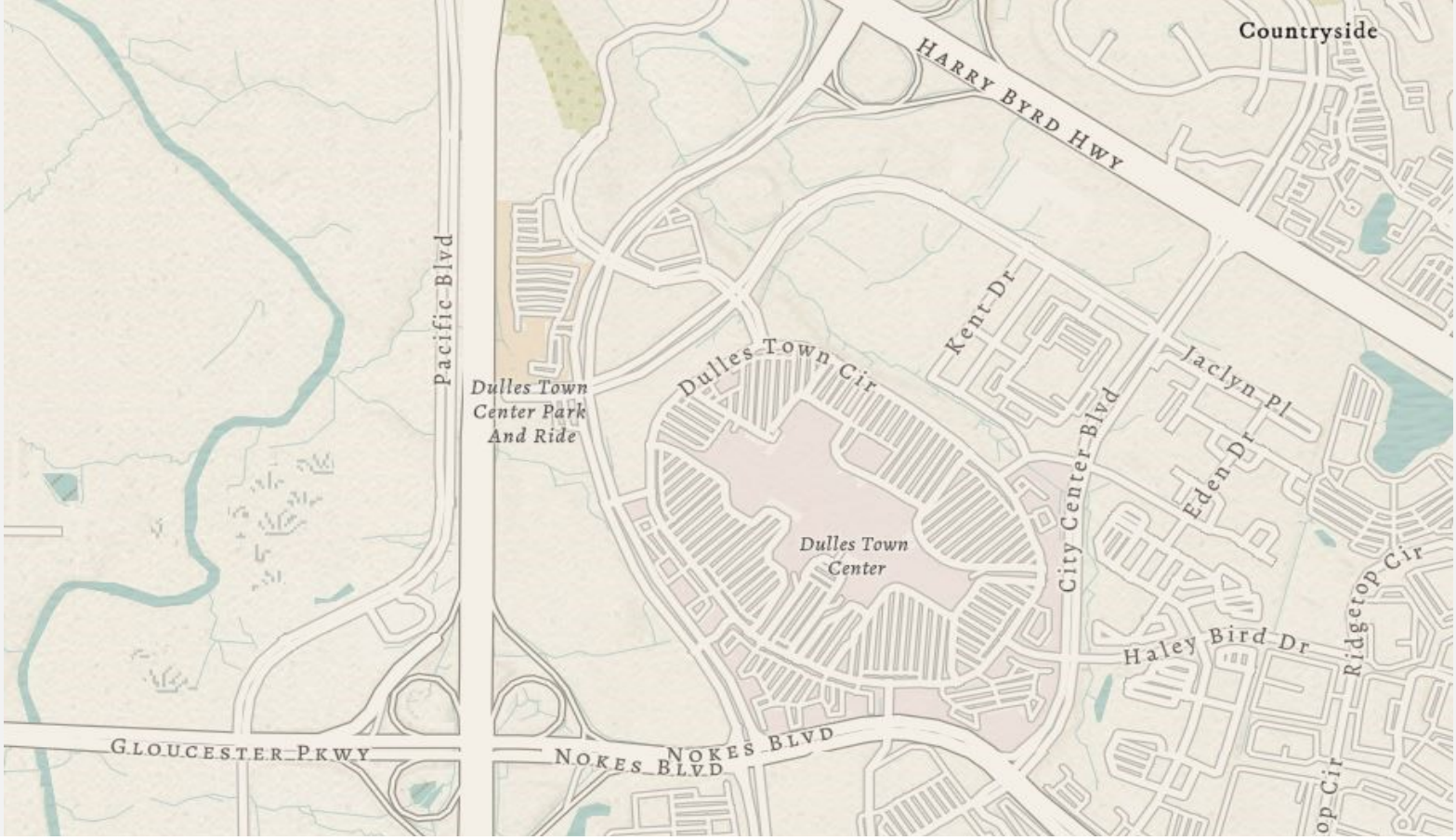
Volume 3 of 3



Dominion Energy®

Environmental Routing Study

DTC 230 kV Line Loop and DTC Substation Project

November 2021

Project No.: 0539430

The business of sustainability

ERM

Signature Page

November 2021

Environmental Routing Study

DTC 230 kV Line Loop and DTC Substation Project

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Acronyms and Abbreviations

Name	Description
ABPP	American Battlefield Protection Program
ADT	average daily traffic
AMSL	above mean sea level
BOS	Loudoun County Board of Supervisors
BRWRF	Broad Run Water Reclamation Facility
CBG	census block group
CCB	Center for Conservation Biology
Company	Virginia Electric and Power Company
CWA	Clean Water Act
D+A	Dutton + Associates, LLC
dB	decibel(s)
DC Water	District of Columbia Water and Sewer Authority
Dominion Energy Virginia	Virginia Electric and Power Company
Dominion	Virginia Electric and Power Company
Dulles Airport	Washington Dulles International Airport
EJ	environmental justice
EPA	U.S. Environmental Protection Agency
ERM	Environmental Resources Management, Inc.
ESA	Endangered Species Act
FAA	Federal Aviation Administration
FWS	U.S. Fish and Wildlife Service
GIS	geographic information systems
GPS	global positioning system
Guidelines	*Guidelines for Assessing Impacts of Proposed Electric Transmission Lines and Associated Facilities on Historic Resources in the Commonwealth of Virginia*
IPaC	Information for Planning and Consultation
Kincora	US Kincora Purchaser LLC and/or NA Dulles Real Estate
KOP	Key Observation Point

Name	Description
kV	Kilovolt
Lerner	Lerner 21000 Atlantic Boulevard
LiDAR	light detection and ranging
Loudoun Water	Loudoun County Sanitation Authority
NHD	National Hydrography Dataset
NHDE	Natural Heritage Data Explorer
NHL	National Historic Landmark
NHP	Natural Heritage Program
Notice	Notice of Proposed Construction or Alteration
NRHP	National Register of Historic Places
NWI	National Wetlands Inventory
NWP	Nationwide Permitting/Permit
PCN	Pre-construction Notification
PDIP	Planned Development Industrial Park
PDMUB	Planned Development Mixed Use Business
PDOP	Planned Development Office Park
PEM	Palustrine Emergent
PFO	Palustrine Forested
Project	DTC 230 kV Line Loop and DTC Substation Project
Route 7	Harry Byrd Highway
SCC	State Corporation Commission
SCU	Stream Conservation Unit
TERPS	terminal instrument procedures
USACE	U.S. Army Corps of Engineers
USGS	U.S. Geological Survey
Va. Code	Code of Virginia
VaFWIS	Virginia Fish and Wildlife Information Service
VCRIS	Virginia Cultural Resource Information System
VDCR	Virginia Department of Conservation and Recreation
VDEQ	Virginia Department of Environmental Quality
VDHR	Virginia Department of Historic Resources
VDOT	Virginia Department of Transportation
VOF	Virginia Outdoors Foundation
VDWR	Virginia Department of Wildlife Resources
VSR	visually sensitive resource
W&OD	Washington and Old Dominion

1. INTRODUCTION AND BACKGROUND

This report presents results of the environmental constraint identification and routing study prepared by Environmental Resources Management, Inc. (ERM) on behalf of Virginia Electric and Power Company (herein referred to as Dominion Energy Virginia; Dominion; or Company) for the proposed DTC 230 kilovolt (kV) Line Loop and DTC Substation Project (Project).

1.1 Project Description

For this Project, Dominion Energy Virginia evaluated multiple new build options that could address current demand needs and accommodate increased future demand in the Project area in Loudoun County. The Company considered the facilities required to construct and operate the new feeds; the length of new rights-of-way required for each option; the amount of existing development in each area; the potential for environmental impacts on communities; and the relative cost of each option.

After review of the new build options, Dominion Energy Virginia decided to further investigate two electrical options for this Project, both of which are located entirely within Loudoun County, Virginia.

- Option 1 involves connecting with the existing Line #2143 from a point just north of the existing BECO Substation on the west side of Pacific Boulevard and just south of Gloucester Parkway, and extending a new 230 kV double circuit transmission line northeast to the proposed DTC Substation. The DTC Substation site is located on the east side of Route 28 between Atlantic Boulevard and Century Boulevard. Option 1 includes three overhead route alternatives.
- Option 2 involves tapping the existing Line #2150 near the intersection of the Washington and Old Dominion (W&OD) Trail and Sully Road and extending a new 230 kV double circuit transmission line northeast to the proposed DTC Substation.

An underground route alternative and other overhead routes were preliminarily reviewed for Option 1 but dismissed for various reasons as described in Section 2.5. All Option 2 routes were determined not viable for reasons discussed in Section 2.5.

2. METHODOLOGY

ERM's scope of work for this study consisted of:

1. Defining and describing a study area for the Project based on Dominion Energy Virginia's transmission and service needs;
2. Participating in the public outreach efforts (e.g., the public open house) to gather information from stakeholders regarding constraints to be considered as part of the routing process;
3. Identifying and mapping routing constraints and opportunities within the study area;
4. Identifying buildable potential routes, each of which meets the Project's objective as well as the siting criteria identified in the Code of Virginia (Va. Code) and included in the Virginia State Corporation Commission's (SCC) minimum filing guidelines for transmission projects;
5. Comparing the potential routes based on an analysis of environmental impacts and utilization of routing opportunities; and
6. Recommending proposed and alternate routes.

A study area was identified to encompass areas around and between Dominion's existing BECO Substation and the proposed DTC Substation. Figures 2.0-1 and 2.0-2 in Appendix A depict the study area boundary, existing BECO Substation, proposed DTC Substation, Dominion's existing transmission lines, roads, and Loudoun County Sanitation Authority (Loudoun Water) lines in the Project vicinity. The study area encompasses an approximately 3-square-mile area that lies within the heavily developed part of Loudoun County between Sterling and Ashburn in an area north of Washington Dulles International Airport (Dulles Airport) known as "Data Center Alley." The study area includes mixed-use, commercial, and data center developments, Broad Run, a Loudoun Water treatment facility, and several planned developments. The study area generally is defined by Dominion's existing Line #2143 to the south, Loudoun County Parkway to the west, Broad Run and Route 7 (Harry Byrd Hwy) to the north, and Atlantic Boulevard and City Center Boulevard to the east.

Once the study area was defined, ERM identified and mapped existing land use, planned developments, and environmental, visual, and cultural features within the Project study area. To complete the initial study, the routing team obtained, reviewed, and utilized the following data sources:

- Loudoun County open geographic information system (GIS) datasets online portal;
- Virginia Department of Transportation (VDOT) Projects and Studies database;
- National Conservation Easement database;
- Virginia Department of Conservation and Recreation (VDCR) – Virginia conservation lands database;
- Virginia Department of Historic Resources (VDHR) Virginia Cultural Resource Information System (VCRIS); and
- Recent aerial imagery taken in May 2021.

Sensitive environmental or constructability-related features were defined as routing constraints. ERM also identified existing electric transmission and distribution lines, pipelines, roads, and other existing rights-of-way within the study area. These features were defined as routing opportunities. ERM then layered the routing opportunities over the constraints in a GIS to identify preliminary routes.

Subsequently, a more sophisticated route selection process was completed. ERM refined the preliminary routes, taking into account potential impacts on environmental resources and utilization of routing opportunities. To the extent practicable, ERM identified routes that both avoid constraints and utilize

routing opportunities, where appropriate. ERM conducted an analysis using GIS to quantify potential impacts associated with constraints and the use of opportunities for each route. Crossings of sensitive features were measured and tabulated to facilitate route comparisons. Other factors, such as visual and construction-related impacts, were assessed based on ERM's experience in electric transmission route selection.

After collecting, mapping, and evaluating constraint information within the study area, Dominion Energy Virginia and ERM identified overhead and underground routes and then evaluated and compared the routes.

Following a preliminary quantitative assessment of routes, Dominion Energy Virginia engaged the public, including elected officials, and regulatory, planning, and land managing agencies in discussions to gather feedback on the various routes. Some of this feedback resulted in adjustments being made to optimize the potential routes and, in certain cases, helped to inform the Company's decision to reject a particular route. A proposed route and route alternatives were then identified based on a comparison of advantages and disadvantages of each route. The process considered both the sensitivity and extent of the constraints affected relative to each route.

2.1 Study Area

As a first step in identifying potential transmission line routes, ERM (as directed by Dominion Energy Virginia) defined a geographic study area for the Project based on Dominion Energy Virginia's electric transmission and service needs as described above. Generally, the study area was defined to encompass the fixed beginning and ending points for the proposed facilities (i.e., the existing and proposed substations), as well as an area broad enough to allow for the identification of reasonable route alternatives meeting the Project's objective. Additionally, and to the extent practicable, the limits of the study area were defined by reference to easily distinguished features, such as roads or other linear features.

The Project study area lies within the heavily developed part of Loudoun County between Sterling and Ashburn in an area north of Dulles Airport known as "Data Center Alley." The Project study area's eastern boundary begins approximately 0.8 mile east of the proposed DTC Substation and extends south for about 2.5 miles. The eastern boundary generally follows existing roads through commercial development, including City Center Boulevard on the east side of Dulles Town Center, Nokes Boulevard, and Atlantic Boulevard. The eastern boundary ends where Atlantic Boulevard meets the W&OD Trail. From here, the southern boundary of the study area extends northwest for approximately 1.2 miles following the W&OD trail and crossing Sully Road, Pacific Boulevard, Broad Run, and the Loudoun County Parkway. The southern boundary is about 0.6 mile south of the existing BECO Substation. After crossing Loudoun County Parkway, the study area boundary heads north to form the western boundary of the study area. The boundary follows the western side of Loudoun County Parkway for about 1.6 miles, crossing Gloucester Parkway and passing the Loudoun Water Facilities Campus. The study area boundary heads northeast just south of the intersection of Loudoun County Parkway and Marblehead Drive. From here the northern study area boundary continues northeast for about 1.0 mile, generally paralleling Broad Run and crossing a portion of Kincora Village Center development, Pacific Boulevard, and Harry Byrd Highway (Route 7). The northern boundary of the study area then continues southeast for 1.2 miles, paralleling Route 7, and crossing Atlantic Boulevard and City Center Boulevard until reaching the eastern boundary of the study area. Figures 2.0-1 and 2.0-2 in Appendix A show the study area.

2.2 Inventory of Constraints and Opportunities

There are a number of environmental features and routing constraints present in the Project study area. The following list highlights the major constraints and routing opportunities that affect transmission line

routing in the Project study area (these categories [along with other constraints)] are described in more detail within Section 3):

- Existing and planned developments;
- VDOT rights-of-way;
- Loudoun Water and District of Columbia Water and Sewer Authority (DC Water) rights-of-way;
- Conservation and government held easements; and,
- Forested land.

2.3 Route Identification

After developing the study area, ERM identified multiple preliminary route alternatives that could meet the Project objectives. Given the amount of planned development in the general area, ERM focused on developing routes that follow existing roadways, transportation, and utility corridors within the study area. Subsequent to identification of those preliminary routes, ERM conducted several site visits and began evaluating the routes. The Company also began stakeholder and agency outreach during this time to assist with route evaluation.

Two electrical solutions (Options 1 and 2) were identified by Dominion that could meet the Project need. Both options would require construction of the proposed new DTC Substation on a parcel on the east side of Century Boulevard across Atlantic Boulevard from a Marriott hotel (see Figures 2.0-1 and 2.0-2 in Appendix A). In total the substation parcel is 8.2 acres, of which approximately 6.2 acres would be disturbed by construction of the Project. The substation would occupy the same footprint for either option and for all route alternatives.

Option 1 would involve construction of a double circuit 230 kV line from existing Line #2143 just north of the existing BECO Substation to the proposed DTC Substation. Three viable route alternatives (all overhead) were identified for Option 1. ERM and Dominion Energy Virginia originally identified additional potential routes for Option 1 between the BECO Substation and the DTC Substation. These routes were subsequently rejected from further consideration for the reasons discussed in Section 2.5.

Option 2 would involve construction of an overhead double circuit 230 kV line from a tap location at Dominion Energy Virginia's existing Line #2150 along the W&OD trail and Sully Road to the proposed DTC Substation. Routes considered for Option 2 were determined not viable for reasons discussed in Section 2.5, and are not carried through the Routing Study analysis.

Section 3 describes the various resources found along each of the route alternatives for Option 1 and Section 4 discusses how the route alternatives could impact those resources. Finally, Section 5 presents the conclusions and recommendations.

2.4 Overhead Route Alternatives

As discussed above, all viable route alternatives for Option 1 would entail constructing a new double circuit 230 kV line from the existing BECO Substation and the proposed DTC Substation. The three potential routes deemed buildable and worthy of further consideration are described in the sections below.

It should be noted that Routes 1A, 1B, and 1C all follow a common alignment for the majority of their distance, with the three routes only varying for the last approximately 0.2 mile near the crossings of Russell Branch Parkway and Sully Road (see Figures 2.0-1 and 2.0-2). In addition, the three routes also share a common crossing of a Loudoun County Board of Supervisors (BOS) easement. As noted below

in Section 3.1.6, on November 10, 2021, the Loudoun County BOS approved the conveyance of an easement to Dominion over BOS's existing easement to allow for the location of any of the three routes. While this conveyance has been approved, they conveyance has not yet occurred. Therefore, this document discusses the Project's crossing of the BOS easement

A discussion of the routes rejected from further consideration is provided in Section 2.5.

2.4.1 Route 1A

Route 1A would involve construction of an overhead double circuit 230 kV line from existing Line #2143 just north of the existing BECO Substation to the proposed DTC Substation. The length of Route 1A is approximately 1.31 miles. Beginning just north of the BECO Substation, Route 1A heads northwest for about 0.19 mile adjacent to the right-of-way for a Loudoun County Water line and across Gloucester Parkway. A portion of this segment of the route also crosses a Loudoun County BOS easement. After crossing Gloucester Parkway, the route then continues generally north for 0.57 mile, generally following the Loudoun Water line, and includes an additional crossing of the BOS easement and a crossing of Broad Run. The transmission line route then turns to the north and east for 0.19 mile (including another small crossing of the Loudoun County BOS easement) before heading due north for 0.11 mile following the west side of Russell Branch Parkway and paralleling a multi-use trail. After a 0.09-mile crossing of Russell Branch Parkway and Sully Road, the line then continues east and southeast for 0.09 mile crossing Century Boulevard. Finally, the route heads northeast for 0.07 mile and then enters the proposed DTC Substation property.

2.4.2 Route 1B

Route 1B would involve construction of an overhead double circuit 230 kV line from the existing Line #2143 just north of the existing BECO Substation to the proposed DTC Substation. The length of Route 1B is approximately 1.31 miles. Beginning just north of the BECO Substation, Route 1B heads northwest for about 0.19 mile adjacent to the right-of-way for a Loudoun County Water line and across Gloucester Parkway. A portion of this segment of the route also crosses a Loudoun County BOS easement. After crossing Gloucester Parkway, the route then continues generally north for 0.57 mile, generally following the Loudoun Water line, and includes an additional crossing of the BOS easement and a crossing of Broad Run. The transmission line route then turns to the north and east for 0.19 mile (including another small crossing of the Loudoun County BOS easement) before heading due north for 0.05 mile following the west side of Russell Branch Parkway and paralleling a multi-use trail. After a 0.10-mile crossing of Russell Branch Parkway and Sully Road, the line then turns north for 0.05 mile paralleling the east side of Sully Road and crossing the western edge of a parking lot associated with the adjacent Lerner 21000 Atlantic Boulevard (Lerner) office building. The route then continues east and southeast for 0.08 mile crossing Century Boulevard. Finally, the route heads northeast for 0.07 mile and then enters the proposed DTC Substation property.

2.4.3 Route 1C

Route 1C would involve construction of an overhead double circuit 230 kV line from the existing Line #2143 just north of the existing BECO Substation to the proposed DTC Substation. The length of Route 1C is approximately 1.30 miles. Beginning just north of the BECO Substation, Route 1C heads northwest for about 0.19 mile adjacent to the right-of-way for a Loudoun County Water line and across Gloucester Parkway. A portion of this segment of the route also crosses a Loudoun County BOS easement. After crossing Gloucester Parkway, the route then continues generally north for 0.57 mile, generally following the Loudoun Water line, and includes an additional crossing of the BOS easement and a crossing of Broad Run. The transmission line route then turns to the north and east for 0.20 mile before intersecting Russell Branch Parkway. This segment includes a second crossing of Broad Run and another short

crossing of the BOS easement. The route then turns northeast to avoid a VDOT traffic signal easement.[1] After a 0.09-mile crossing of Russell Branch Parkway and Sully Road, the line next turns north and parallels the eastern side Sully Road, crossing the western edge of a parking lot associated with the adjacent Lerner office building for 0.10 mile. From that point, the line turns east and southeast for 0.08 mile crossing Century Boulevard. Finally, the route heads northeast for 0.07 mile and then enters the proposed DTC Substation property.

2.5 Routes Rejected from Further Consideration

2.5.1 Overhead Routes

Dominion Energy Virginia reviewed additional overhead alternatives for the Project that it rejected from further consideration for the reasons described in this section. These rejected overhead routes are discussed below.

As described in Section 2.3, Option 2 would involve tapping the existing Line #2150 near the intersection of the W&OD Trail and Sully Road and extending a new 230 kV double circuit transmission line northeast to the proposed DTC Substation (see figure 2.5.1-1). Due to the extent of existing development between the tap point and the proposed DTC Substation, limited routing opportunities are present in this area. Two routes were identified as part of Option 2 (Route 2A and Route 2B). The two routes would follow a common alignment along Sully Road from the tap point to Nokes Boulevard. The routes would diverge at this point. Route 2A would turn northwest, extend in front of the Dulles Town Center Mall, and terminate at the proposed DTC Substation. Alternatively, Route 2B would turn northeast, extend behind the Dulles Town Center Mall, and terminate at the proposed DTC Substation.

Both routes involved paralleling Sully Road for approximately 1.0 mile and then crossing either in front of or behind the Dulles Town Center Mall through the mall parking lots. In conversations with Loudon County, the County indicated that they would not be supportive of a route of this length along Sully Road and also expressed concern about the visual impacts of the routes on the area in the vicinity of the Dulles Town Center Mall, as did the mall owner. In addition, the owner of the Dulles Town Center Mall informed Dominion that they are considering a redevelopment plan for the mall property. Both Option 2 routes would directly conflict with this plan. Finally, the Option 2 routes are both significantly longer than Option 1 routes (between approximately 0.8 and 1.2 miles longer) and would have added substantial cost to the Project. For these reasons, Option 2 routes were determined to not be viable routes.

Dominion Energy also reviewed additional Option 1 routes that were rejected and not carried through for further analysis. Two of these routes (Route 1D and Route 1E) headed east from the BECO Substation crossing the VDOT cloverleaf interchange of Gloucester Parkway and Sully Road (see figure 2.5.1-1). From here, the routes extended northwest either in front of or behind the Dulles Town Center Mall through the mall parking lots along a similar alignment as the Option 2 routes. Consultation with VDOT determined that while crossing this interchange was possible from an engineering point of view, it would cause significant schedule delays to the Project due to limited construction access across the cloverleaf. In addition, the segments of Routes 1D and Route 1E extending across the Dulles Town Center Mall would produce the same visual impacts and the same conflicts with the potential mall redevelopment plan. Finally, these two routes were both longer than the viable Option 1 routes (between approximately 0.3 and 0.7 mile longer) and would have added cost to the Project and possible traffic interference/delays

[1] This VDOT traffic signal easement was created based on a prior proffered usage of the land, which at the time was designated for mixed-use development. If VDOT agrees to vacate the easement based on a different development on the land, Dominion would seek the flexibility of modifying the alignment in this area to shift the route up to 100 feet to the south to further reduce impacts of the transmission line on any planned development in this area.

during construction. For these reasons, routes across the Gloucester Parkway and Sully Road interchange were determined to not be viable.

Prior to finalizing alternative Routes 1A, 1B, and 1C, Dominion Energy Virginia reviewed a number of variations of these route alternatives that extended north from the BECO Substation towards the proposed DTC Substation. These variations would cross Loudoun Water and lands owned by both US Kincora Purchaser LLC and/or NA Dulles Real Estate (Kincora) in locations that vary from Routes 1A, 1B, and 1C. Based on consultations with Loudoun Water and Kincora, these alternative alignments were determined to not be feasible due to future development plans on the Loudoun Water Ashburn Campus as part of Loudoun Water's Master Plan, and development plans on Kincora associated with a proposed school and athletic field. Moreover, Dominion worked with Loudoun Water and Kincora to find a more preferable alignment for crossing their lands, resulting in the development of Routes 1A, 1B, and 1C. For these reasons, these other route alignments considered between the BECO Substation and the proposed DTC Substation were rejected from further analysis.

Lastly, prior to finalizing Option 1 Routes 1A, 1B, and 1C, Dominion reviewed variations to the crossings of Russell Branch Parkway and Sully Road. These included a diagonal crossing of Russell Branch Parkway and Sully Road and attempting to utilize the median between the two roads as a routing opportunity by siting the line within the median. Based on discussions with Kincora and Lerner, Dominion believed that a diagonal crossing was most preferable to these property owners, and therefore proposed the option to VDOT. Both Russell Branch Parkway and Sully Road are managed by VDOT with Sully Road classified as a limited access highway and Russell Branch Parkway as a non-limited access highway. After consideration, VDOT determined that its regulations would not permit a diagonal crossing of these roads, however, and stated that it would permit a perpendicular crossing of Russell Branch Parkway and Sully Road, thereby eliminating the possibility of a diagonal crossing.[2]

Regarding the use of the median between Russell Branch Parkway and Sully Road, it was determined based on an engineering review that there was not adequate space in the median for the required 100-foot transmission line right-of-way. Additionally, the median in this area has a side slope, which would preclude the construction of a transmission line. For these reasons, the route variations which would require a diagonal crossing of Russell Branch Parkway and Sully Road or the use of the median between the two roads were determined not to be viable.

2.5.2 Underground Routes

Dominion thoroughly reviewed an underground alternative (Underground Route 1A) from the BECO substation to the proposed DTC Substation (see figure 2.5.1-1). This alternative would require construction of a new approximately 4-acre transition station on a parcel just north of the existing BECO Substation. From the transition station, the route would head north in Pacific Boulevard, cross Gloucester Parkway, and would extend north and be constructed within Russell Branch Parkway. The route would cross Russell Branch Parkway and Sully Road at the same location as Route 1A, and generally follow the same alignment as Route 1A for the remainder of the route to the DTC Substation.

The land in the area where the transition station would be located is owned by Kincora and is part of an ongoing zoning/development plan with Loudoun County. The land also is part of a BOS-managed, open-space easement and contains tree, riparian, and wetland conservation/proffer areas associated with planned development on the parcel. The area of the transition station site was identified as a Riparian Reforestation Area and is within areas of both open space, preservation, and floodplain easements. Permitting a transition station in this area would have posed significant challenges and likely delayed the

[2] *See* 24 VAC 30-151-310 (8) and 24 VAC 30-151-330 (1).

Project schedule. The following justifications/requirements would have been necessary for permitting a transition station within these easement areas:

- Demonstrating that the facility is necessary for the operation of a public utility, including documentation on alternatives and justification that there is no other location to accommodate the facility.
- Demonstrating that the facility or facilities are not intended to serve a single user, but rather are necessary to meet the public's energy demands in the area.
- Loudoun's Floodplain Team / Natural Resources Team in the Department of Building & Development would also likely recommend that the applicant co-process a Floodplain Alteration application with the special exception to help better understand potential impacts on the floodplain.

Additionally, in order to cross Russell Branch Parkway and Sully Road, this underground alternative would have required two 200-foot by 200-foot workspaces (one on either side of the road crossing) for equipment to complete the bored crossing of the roadways. The excavation of these workspaces would have resulted in significant ground disturbance. In particular, the workspace on the eastern side of Russell Branch Parkway would conflict with Kincora's development plans for this area.

In addition, in conversations with DC Water, Dominion became aware of vibration concerns in the Project area associated with construction near the Potomac Interceptor sanitary sewer line. The underground alternative would cross and parallel the Potomac Interceptor in areas where the line has not been upgraded and significant vibration concerns exist. Upon review of the vibration associated with the equipment needed for completing the bore crossing of Russell Branch Parkway and Sully Road, it was determined that an underground route at this location would not be feasible due to the maximum vibration limits DC Water imposes for construction near the Potomac Interceptor.

Dominion Energy also reviewed the possibility of an underground route from the W&OD trail to the proposed DTC Substation as a potential routing approach for Option 2. This alternative would have also required an approximately 4-acre transition station north of the W&OD trail. This is a highly developed area, and minimal space is available for a transition station. An underground route in this area would have been longer (by approximately 1 mile) than an alternative from the BECO Substation, and therefore would have significantly added to the cost of the Project. Due to the cost and real estate challenges, underground routes from the W&OD trail to DTC were not considered viable.

2.6 Structure Types and Right-Of-Way Widths

Dominion Energy Virginia would use several structure configurations for Project (see proposed structure types in Appendix B). The new structures would be single pole structures constructed of weathering steel, with an approximate height ranging from 90 to 120 feet along the length of the rights-of-way for Routes 1A, 1B, and 1C. The required right-of-way width for Routes 1A, 1B, and 1C would all be 100 feet.

2.7 Construction, Operation, and Maintenance Process

Construction of new overhead transmission lines may involve some or all of the steps listed below:

- Detailed survey of the route alignment;
- Right-of-way acquisition and clearing;
- Construction of access roads, where necessary;
- Installation of tower foundations;
- Assembly and erection of new structures and/or removal of existing structures;

- Construction of temporary power lines (in the rebuild scenario);
- Stringing and tensioning of the conductors; and
- Final clean-up and land restoration.

All appropriate materials for the Project's 230 kV structures would be delivered and assembled at each structure location in the right-of-way. Detailed foundation design would not be completed until prior to construction; however, depending on soil conditions, the foundation design could include poured concrete that requires excavation or steel piles or caissons that might be vibrated, drilled, or driven into place. Structures would be erected with a crane and anchored to the foundation during final assembly. If there is excess soil from foundation construction, it would be evenly distributed at each structure and the soil replanted and stabilized. In wetland areas, excess soil would be removed and evenly distributed on an upland site within Dominion Energy Virginia's right-of-way. Typical construction equipment may include hole diggers or drilling equipment, cranes, wire-stringing rigs, tensioners, backhoes, and trucks.

All conductors and shield wires would be strung under tension. This system involves stringing a "lead line" between structures for the conductors and ground wires. The rope pulls a steel cable that is connected to the conductors and shield wires, which are pulled through neoprene stringing blocks to protect the conductor and shield wire from damage. Stringing the conductors and shield wires under tension protects the wires from possible damage should they be allowed to touch the ground, fences, or other objects.

Maintaining the right-of-way under the transmission lines is essential for the reliable operation of the line as well as public safety. Operation and maintenance of the line would consist of periodic inspections of the line and the right-of-way; occasional replacement of hardware as necessary; periodic clearing of vegetation, either mechanically or by selective, low-volume application of approved herbicides within the corridor; and the cutting of danger trees outside the right-of-way. Danger trees are trees outside the cleared corridor that are sufficiently tall enough to fall into the right-of-way and potentially impact the transmission line. Periodic inspections would utilize both aerial and walking patrols. Normal operation and maintenance would require only infrequent visits by Dominion Energy Virginia or its contractors.

Most maintenance activities consist of selective, low-volume herbicide applications targeting only tree species on the right-of-way every 3 to 5 years, and the cutting of danger trees every 3 years. Dominion Energy Virginia only uses herbicides that are approved by the U.S. Environmental Protection Agency (EPA) on power line rights-of-way.

3. INVENTORY OF EXISTING CONDITIONS

After defining the study area, ERM developed a list of routing criteria to help guide the routing process and provide a basis for comparing potential routes (see Table 3-1). The routing criteria include routing constraints (i.e., sensitive environmental resources and existing and planned developments) and routing opportunities (i.e., existing corridors) as described in more detail in Section 4. ERM inventoried existing conditions, routing constraints, and routing opportunities using information obtained from publicly available GIS databases, agency websites, and databases; published documents, such as county or municipal land use plans; and communication with agency and county staff, stakeholders, and elected officials. In those cases where GIS data were not available for a particular environmental resource or other feature, ERM obtained the best available hard-copy or online map and hand digitized the information needed to complete the study.

The existing conditions along the route alternatives that were identified are discussed below. Table 3-1 identifies the categories of environmental features considered in the study area. Descriptive information regarding these features within the study area is provided in subsequent sections.

Table 3-1: Features Considered for Routing

Feature Type	Description
Existing Corridors	
Existing electric facilities	■ Transmission or distribution lines
Other utilities	■ Pipelines
Transportation infrastructure	■ Roads, railroads, and related corridors
Land Ownership	■ Federal, state, and local lands ■ Private lands
Land Uses	
Existing land use and land cover	■ Existing subdivisions ■ Land cover types (e.g., forested, agricultural, developed) ■ Residences, churches, schools, cemeteries
Recreational areas	■ Federal, state, county, or municipal parks ■ Federal-, state-, county- or municipal-managed recreation areas ■ Golf courses ■ Recreation trails (biking, hiking, birding, wildlife)
Land use planning and zoning	■ Zoning districts
Planned developments	■ Planned, proposed, or conceptual residential, commercial, or industrial developments
Conservation lands and easements	■ Virginia Outdoors Foundation (VOF) and VDCR conservation land and easements ■ Loudoun County conservation easements ■ Other conservation lands ■ Wetland mitigation banks ■ Other conservation lands
Transportation	■ Road crossings ■ Railroad crossings ■ Private airport facilities

Feature Type	Description
Natural Resources	
Surface waters	■ Wetlands ■ Waterbodies
Protected or managed areas	■ Resource protection areas ■ Wildlife management areas
Protected species	■ Natural heritage resources ■ Threatened and endangered species ■ Bald Eagles
Vegetation	■ Vegetation characteristics ■ Forested land and urban tree canopy
Visual Resources	
Visually sensitive areas	■ Viewsheds to and from visually sensitive areas ■ Scenic rivers ■ Scenic byways
Cultural Resources	
Cultural resource sites	■ Archaeological sites ■ Historical or architectural sites and districts ■ National Register of Historic Places (NRHP) listed and eligible properties ■ Battlefields ■ VDHR protected easements
Geological Resources	
Mineral resources	■ Mines or quarries
Environmental Justice	■ Low-income populations ■ Minority populations ■ Age groups (under age 5 and over age 64) ■ Linguistically isolated communities

3.1 Land Use

3.1.1 Land Ownership

ERM quantified information on land ownership in the Project area using publicly available GIS databases and digital tract data obtained from Loudoun County. These data indicate that the majority of lands within the study area are privately owned land, with one parcel owned by the Loudoun Water, three parcels owned by the BOS (Fire Station 24, Vestals Gap Overlook Park, DTC Park and Ride), one parcel owned by the Northern Virginia Park Authority W&OD Trail, and road rights-of-way owned by VDOT. While not owned by BOS, a BOS easement is also held on portions of one large parcel owned by Kincora. Routes 1A, 1B, 1C, would all cross the BOS easement; however, all land crossed is privately owned.

3.1.2 Recreation Areas

ERM reviewed digital data sets and maps, U.S. Geological Survey (USGS) topographic quadrangles, recent (2021) digital aerial photography, and county websites. As discussed below, seven existing recreation areas were identified within the Project study area. In addition, there are two planned

recreation areas located within the study area, both associated with the Kincora Village Center planned development. Recreation areas within the study area are depicted on Figure 3.1.2-1 in Appendix A and described below.

3.1.2.1 W&OD Railroad Regional Park

The W&OD Railroad Regional Park is a 45-mile paved trail that follows the old Alexandria, Loudoun, and Hampshire Railroad between Shirlington and Purcellville. An adjacent gravel horse trail is also available for a 32-mile stretch of the park. The park is part of the NOVA Parks system and the first segment of the park opened in 1974 (NOVA Parks, 2021). The W&OD park runs along the southern border of the study area adjacent to Dominion's existing Line #2150. Parking and trail access are available where the trail crosses Pacific Boulevard.

3.1.2.2 Vestals Gap Overlook Park

Vestals Gap Overlook Park is part of the Loudoun County park system and is located at 45335 Century Boulevard in the northern portion of the study area. This approximately 8-acre park is primarily wooded with nature trails, interpretive signs, and benches (Loudoun County, 2021a). The park is located across the street from the proposed DTC Substation site.

3.1.2.3 Dulles Golf Center and Sports Park

The Dulles Golf Center and Sports Park is a privately owned outdoor recreation center located on Jesse Court between Route 28 and Atlantic Boulevard. The facility includes a golf practicing range, 18-hole miniature golf course, batting cages, volleyball courts, and gemstone panning areas (Dulles Golf, 2021).

3.1.2.4 Autobahn Indoor Speedway

The Autobahn Indoor Speedway is a privately owned indoor recreation facility located on East Severn Way between Route 28 and Atlantic Boulevard. The indoor facility includes high-speed indoor go-kart racing and axe throwing. The location hosts company events, birthday parties, field trips, and camps (Autobahn Indoor Speedway, 2021).

3.1.2.5 The Michael & Son Sportsplex at Dulles

The Michael & Son Sportsplex at Dulles is a privately owned indoor recreation facility located off Atlantic Boulevard in the southeast portion of the study area. The indoor facility includes three large turf fields, one small turf field, three small courts, and four party rooms. The facility hosts adult sports leagues including soccer, cornhole, basketball, flag football, pickleball, volleyball, spike ball, and inline hockey. Youth leagues and programs are also available along with facility rentals and sports camps (Dulles Sportsplex, 2021).

3.1.2.6 Dulles Town Commons/Hadley's Park and Playground

Dulles Town Commons/Hadley's Park and Playground is a small neighborhood park located at the corner of Champion Drive and Dulles Center Boulevard. The park includes open fields and playground equipment.

3.1.2.7 Kincora Heron Nature Trails

Broad Run is home of one of the largest great blue heron rookeries on the East Coast. As part of the Kincora planned development, existing trails will be maintained and additional trails added to build a trail network around Broad Run and the Kincora property. Final site plans for these trails have not been

approved by the county; however, preliminary plans show the trails wrapping around the portion of the Kincora development currently under construction (off of Kincora Drive/Pacific Boulevard). The current trail includes a heron observation deck lookout, with additional trails heading south along the eastern side of Broad Run (Kincora, 2021). The developer will be providing an updated trail system on their property along Broad Run. These trails are part of the developer's proffers with the county for their planned development. The location of these trails within the southern portion of the Kincora property are unknown and therefore not depicted on Figure 3.1.2-1 (Appendix A).

3.1.2.8 Temple Baptist School Planned Athletic Fields

The Temple Baptist Church of Herndon recently purchased two parcels that were originally associated with the Kincora Village Center planned development. Temple Baptist Church of Herndon is a contract purchaser of 12.65 acres of property in the Kincora development area. Temple Baptist Church of Herndon plans to relocate their church, private school and associated recreational facilities. Final site plans for the school, church, and recreation area have not been approved by the county. The proposed school would be located northwest of the Kincora Fire Station on the western side of Russell Branch Parkway. The planned recreational facilities would be located behind the church/school, between the church/school and Broad Run. At this time, the facilities would include a baseball field with lights and a natural-surface soccer field with lights.

3.1.3 Existing Land Use and Land Cover

Land use and land cover within the study area were classified using a combination of local and commonwealth-wide datasets (Virginia Geographic Information Network, 2016) as well as aerial photo interpretation to identify the most current uses for a given area. Land use and land cover in the Project study area can be broken down into the following four main categories:[3]

- Developed Lands: These are areas characterized by medium to high density constructed buildings, such as certain residential subdivisions and commercial areas, and impervious surfaces.
- Open Space: These are areas primarily covered by planted grasses, including vegetation planted in developed settings for erosion control or aesthetic purposes, but also natural herbaceous vegetation and undeveloped land, parks, and open-space recreational facilities.
- Forested Lands: These are areas where land cover consists of natural or semi-natural woody vegetation.
- Open Water: These are open-water features, including rivers, streams, lakes, canals, waterways, reservoirs, ponds, bays, estuaries, and ocean.

Figure 3.1.3-1 (Appendix A) depicts land use/land cover in the study area. Each of the land use/land cover categories described above would be crossed by the routes discussed in this report.

The SCC requires that the number of dwellings and businesses within 500 feet of the route be considered. ERM identified buildings (including dwellings), including those within 500 feet of each route, through review of various digital data sets and maps, USGS topographic quadrangles, and recent (2021) aerial photography. No single-family residences or multi-family residences were identified within 500 feet of the route centerlines. While the eastern portion of the study area is more highly developed with commercial and industrial development, the western portion has more open space. The only buildings within 500 feet of the routes include: Loudoun Water Ashburn Campus facilities, the Lerner office building, and a Marriott hotel.

[3] For purposes of land use/land cover, wetland areas have been classified as open space, forested land, or open water depending on wetland type. Wetlands near the routes are discussed separately in Section 4.2.1, Wetlands.

There are no existing schools, churches, or cemeteries located within the study area. There is one planned school located in the study area, which is discussed in the existing and planned developments section below.

3.1.4 Existing and Planned Developments

ERM obtained information on planned future developments through publicly available data on county websites, and consultations with county and city planning officials and other stakeholders. Unless otherwise noted, information on these planned developments was found on the Loudoun County Online Land Application System (Loudoun County, 2021b). The planned developments that are crossed by or within 0.25 mile to the routes and existing developments that are crossed by the routes are identified in Table 3.1.4-1 and described below. Figure 3.1.4-1 in Appendix A depicts existing and planned developments.

Table 3.1.4-1: Existing and Planned Developments Within 0.25 Mile of Routes

Development Name	Status	Routes Crossed
Kincora Village Center—Parcel #041194573	Planned Development – Submitted to County	All
Kincora Village Center—Parcel #041398662	Preliminary Planned Development	All
Lerner 21000 Atlantic Boulevard	Existing	Route 1B and Route 1C
Loudoun Water Ashburn Campus	Existing and Planned	All
Temple Baptist Church, School, and Park	Planned	None
Wawa	Planned	None

3.1.4.1 Kincora Village Center—Parcel #041194573

The Kincora Village Center development was originally created in 2008 as part of ZMAP 2008-0054 and has undergone several modifications over the years, with the most recently amended application approved by the BOS on April 20, 2021, in ZCPA 2018-0013, ZMAP 2018-0014, and ZRTD 2020-0005. The property is subject to the proffers revised through April 14, 2021, and its associated development plan dated January 4, 2019, and revised through April 14, 2021. Kincora is a 6.7-million-square-foot, mixed-use development that is currently under construction and bounded by Broad Run to the north and west, Pacific Boulevard to the east, and Gloucester Parkway to the south. In total, the Kincora site is approximately 424 acres and will include a mix of housing, retail, hotel, office, school, and a large BOS open-space easement along the east bank of Broad Run. The open-space easement was dedicated to the BOS in 2002 for its scenic, natural, and aesthetic value with the overarching purpose of conserving the site's wetlands and woodlands adjacent to Broad Run. Additional information on the easements associated with the Kincora development are provided in Section 3.1.6. The open-space easement preserves a natural heron rookery and provides passive recreation through a planned trail system along Broad Run. The trail system will likely be tied in to other planned trail connections under Loudoun County's Emerald Ribbons trail and parks system, a proposed countywide interconnected system of linear parks and trails. Kincora has gone through numerous planning reviews over the past decade and construction on the northern portion of the development has commenced. As of May 2021, developers have completed a number of luxury apartment and condominium buildings on the northwest side of the site. Further planning approvals and construction will continue until full build-out. Due to the number of ongoing zoning map amendments, site plan amendments, and special exemption plats, the ratio of

proposed residential/office/institutional/commercial uses is not yet clear. As proposed, the residential areas will be located on the north and west side of the site giving way to commercial and public/institutional uses to the west and south. Notable planned development at Kincora includes a children's Science Center, The National Museum of Intelligence and Special Operations, and a recently approved private primary and secondary school with athletic fields.

Parcel #041194573 encompasses approximately 220 acres of the total site. As described above, further planning approvals and construction will continue until full build-out. Based on Kincora's April 14, 2021, Proffer Statement, the majority of this parcel is slated as riparian preservation areas, riparian reforestation areas, wetland mitigation areas, and public/recreational/institutional uses.

3.1.4.2 Kincora Village Center—Parcel #041398662

Parcel #041194573 encompasses approximately 24 acres of the overall Kincora Village Center development. While development plans for this parcel have not been filed with Loudoun County, Dominion has had conversations with the developer who has indicated that the site is slated for data center development. This parcel was purchased by Kincora on August 26, 2021. Based on preliminary plans provided by the developer, the site will include four 26,200-square-foot data halls, associated generators and skids, office and support buildings, and a 150,700-square-foot substation.

3.1.4.3 Loudoun Water Ashburn Campus and Capital Improvement Plan

Loudoun Water owns and operates the 10 million gallon per day Broad Run Water Reclamation Facility (BRWRF) located west of Broad Run and north of Gloucester Parkway at the Loudoun Water Ashburn Campus. Loudoun Water is a political subdivision of the Commonwealth and is not a department of Loudoun County, although its Board of Directors is appointed by the BOS. The existing facility consists of administrative offices, maintenance facilities, and the water reclamation facility complex. The Loudoun Water *2021–2030 Capital Improvement Plan* envisions expanding the existing Loudoun Water facilities to support a 15 million gallon per day capacity. The proposed expansion, which would take place over the next 10 years, would include expanding the water reclamation facility complex to the north of the existing complex, the construction of new administrative and lab buildings, a research and education center, new storm water ponds, water storage tanks, and maintenance and warehouse buildings. The BRWRF Campus Land Use Master Plan map shows that nearly all the non-forested area of the existing 340-acre property would be developed to accommodate the expansion. BRWRF expansion to the east is constrained by the floodplain, forest, and wetlands adjacent to Broad Run, which is further encumbered by restrictive easements and buried water/sewer infrastructure, including the Russell Branch Diversion Sewer (Loudoun Water, 2020).

3.1.4.4 Lerner 21000 Atlantic Boulevard

The Lerner 21000 Atlantic Boulevard is a seven-story Class 'A' office building in The Corporate Park at Dulles Town Center. The building offers 184,000 square feet of first-class office space, panoramic views, surface parking, loading area and storage spaces, fitness center, onsite market, conference center, and collaborative workspaces, and is one of the only Class 'A' multi-story office towers in the area. The building's location is conveniently located in proximity to Dulles Town Center mall and several residential communities with easy access by car, public transportation, and bike, and is less than 10 minutes from Dulles Airport (Lerner Office, 2021).

3.1.4.5 Temple Baptist Church, School, and Park

Temple Baptist Church of Herndon is a contract purchaser of 12.65 acres of property in the Kincora development area. Development plans include a church/school building, parking areas, and recreational

areas (baseball and soccer fields). On July 7, 2020 the county accepted an easement application for the vacation and creation of open space easements in association with the Kincora ZCPA. The easement swap would allow the Temple Baptist Church of Herndon to replace the 4.13-acre portion of dedicated open space land that will be lost as a result of the ballfield development with an alternative 4.85-acre portion of land that is still a part of the overall Kincora development. This easement swap, along with approval for construction within a floodplain, were approved by the county in January 2021. A site plan for the church/school was approved in April 2021. The developer submitted a site plan revision in August 2021 which is still being reviewed. A site plan for the recreational area was submitted in September 2020, with comments provided to the applicant in June 2021. Final plans for the recreational area have not been approved by the county.

3.1.4.6 Wawa

Loudoun County supervisors approved a plan for a Wawa convenience store in 2019. The store will be located on Russell Branch Parkway at the southern entrance to the proposed Kincora development near the Gloucester Parkway extension. The site will have frontage on Route 28, Gloucester Parkway, and Russell Branch Parkway. The proposed establishment will have a 6,001-square-foot retail building and eight fuel pumps with 16 fueling stations. According to the company's website, the store is on track for a Fall/Winter 2021 opening.

3.1.5 Land Use Planning and Zoning

3.1.5.1 Land Use Planning

Section 15.2-2223 of the Va. Code requires local planning commissions to adopt a comprehensive plan that provides guidance for the physical development of the territory within its jurisdiction. The plan looks at existing and future land uses, anticipates development trends, and makes recommendations for guiding long-term development decisions of a city or county. To implement objectives of the comprehensive plan, local governments use zoning. A zoning ordinance creates land use categories that separates incompatible uses and establishes development standards to guide orderly and efficient land use. Virginia requires that a comprehensive plan be reviewed at least once every 5 years to adjust to actual or projected changes in land use conditions or needs. Zoning ordinances may be modified by the local land manager and governing bodies or through requests from residents or businesses to change zoning designations or approved new uses. Loudoun County has adopted a comprehensive plan and zoning ordinances within its jurisdiction. The Loudoun County comprehensive plan was most recently updated in 2019.

3.1.5.2 Zoning

Route 1A

Route 1A crosses Planned Development Mixed Use Business (PDMUB) zoned land for the first 0.36 mile of the route crossing Gloucester Parkway and heading north. The route then crosses approximately 0.46 mile of land zoned as Planned Development Industrial Park (PDIP). This land is all associated with the Loudoun Water Ashburn Campus. Route 1A then continues across a small (0.03 mile) segment of PDMUB-zoned land before crossing another 0.28 mile of PDIP-zoned land on the west side of Russell Branch Parkway. The route then continues across Russell Branch Parkway and Sully Road and crosses 0.18 mile of land zoned as Planned Development Office Park (PDOP) until reaching the planned DTC Substation. The substation parcel is also zoned as PDOP.

Route 1B

Route 1B crosses PDMUB-zoned land for the first 0.36 mile of the route crossing Gloucester Parkway and heading north. The route then crosses approximately 0.46 mile of land zoned as PDIP. This land is all associated with the Loudoun Water Ashburn Campus. Route 1B then continues across a small (0.03 mile) segment of PDMUB-zoned land before crossing another 0.22 mile of PDIP-zoned land on the west side of Russell Branch Parkway. The route then continues across Russell Branch Parkway and Sully Road and crosses approximately 0.24 mile of land zoned as PDOP until reaching the planned DTC Substation. The substation parcel is also zoned as PDOP.

Route 1C

Route 1C crosses PDMUB-zoned land for the first 0.36 mile of the route crossing Gloucester Parkway and heading north. The route then crosses approximately 0.46 mile of land zoned as PDIP. This land is all associated with the Loudoun Water Ashburn Campus. Route 1C then continues across a small (0.03 mile) segment of PDMUB-zoned land before crossing another 0.18 mile of PDIP-zoned land on the west side of Russell Branch Parkway. The route then continues across Russell Branch Parkway and Sully Road and crosses 0.27 mile of land zoned as Planned PDOP until reaching the planned DTC Substation. The substation parcel is also zoned as PDOP.

3.1.6 Conservation Easements

The Virginia Open-Space Land Act provides for the creation of open-space easements by public bodies as a means of preserving open-space or significant natural, cultural, and recreational resources on public or private lands. Most easements created under the Virginia Open-Space Land Act are held by the Virginia Outdoors Foundation (VOF), but any state agency is authorized to create and hold an open-space easement. The Virginia Conservation Easement Act similarly provides for the creation of conservation easements on public or private lands but under the auspices of charitable organizations (such as conservation trusts) rather than public agencies. In both cases, these easements are designed to preserve and protect open-space or other resources in perpetuity. Easements negotiated with private landowners allow the lands to remain in private ownership but with protections imposed to limit or restrict land uses on the property. Dominion understands that properties are placed under easement throughout the year, and additional easements may be identified as the Project moves forward. Dominion will continue to consult with the various land managing entities regarding potential new easements in the Project area.

3.1.6.1 Virginia Outdoors Foundation

The VOF leads Virginia in land conservation, protecting over 850,000 acres across the state. The VOF was created under the Virginia Open-Space Land Act, which is described above in Section 3.1.6. Most easements created under the Virginia Open-Space Land Act are held by the VOF, but any state agency is authorized to create and hold an open-space easement. These easements are designed to preserve and protect open-space or other resources in perpetuity. Easements negotiated with private landowners allow the lands to remain in private ownership but with protections imposed to limit or restrict land uses on the property (VOF, 2021). There are currently no VOF easements crossed by any of the routes.

3.1.6.2 Agricultural and Forestal Districts

The Virginia Agricultural and Forestal Districts Act provides for the creation of conservation districts (Commonwealth of Virginia, 1997). These districts are designed to conserve, protect, and encourage the development and improvement of a locality's agricultural and forested lands for the production of food and other products, while also conserving and protecting land as valued natural and ecological resources.

These districts are voluntary agreements between landowners and the locality, and offer benefits to landowners when they agree to keep their land in its current use for between 4 and 10 years. A district must contain at least 200 acres. No Virginia Agricultural and Forestal Districts are crossed by any of the routes considered.

3.1.6.3 Loudoun County Conservation Easements

Loudoun County has developed the Loudoun County Conservation Easement Stewardship Program. There are over 75,000 acres of land included in the program. Loudoun County easements can restrict the use or development of a property for a variety of purposes including:

- Retaining or protecting natural or open-space values of the property;
- Assuring its availability for agricultural, forestal, recreational, or open-space use;
- Protecting natural resources;
- Maintaining or enhancing air or water quality; or
- Preserving the historical, architectural, or archaeological aspects of the property.

Easements negotiated with private landowners allow the lands to remain in private ownership but with protections imposed to limit or restrict land uses on the property. There is one Loudoun County conservation easement in the study area as shown on Figure 3.1.6-1 (Appendix A).

Kincora Planned Development Easements and Proffers

As discussed in Section 3.1.4, Kincora Village Center Parcel #041194573 has several different easements on it as well as multiple proffers stated in its proffers document. Information specific to this easement and proffers was found on the Loudoun County Online Land Application System. Below is a description of each.

Open-Space Easement (BOS): In 2002, a portion of what is now the Kincora property was placed into an open-space easement with Loudoun County. The easement was located entirely south of present Gloucester Parkway. The easement was created to preserve the dominant agricultural, woodland, and wetland character of the property. The easement restricts excavation and dredging on the property as well as the removal of trees. In 2012, portions of the property that had been placed into the easement were needed for the development of Gloucester Parkway. At that time, an amendment to the original easement was agreed upon and the areas required for the expansion and development of Gloucester Parkway were removed from the easement, while lands north of Gloucester Parkway were now added into the easement areas. Figure 3.1.6-1 in Appendix A depicts the full extent of the open-space easement as amended. Exceptions to the explicit use of the easements are outlined in the easement document and include language specific to the construction, maintenance, and repair of existing and future utility lines and facilities. Based on ERM's review of the open-space easement language, it appears that these exceptions do not include electric transmission lines, and are likely referring to electric distribution lines and other smaller utility corridors. At the November 10, 2021 Loudoun County BOS public hearing, the BOS approved conveyance of approximately 6.85 acres of easements to Dominion required for the Project. The conveyance of easement has not yet occurred, therefore our discussion includes descriptions of the routes crossing the BOS easement. All three routes cross the open-space easement in the same location.

Floodplain Easement: Also in 2002, a portion of the Kincora property was conveyed to Loudoun County and placed into a floodplain easement. The easement encompasses the full extent of the 2002 open-space easement with the exception of the 2002 BECO Substation Footprint. The substation has since been expanded into the floodplain easement, per approval from Loudoun County. To date, the portions of

the floodplain easement that overlapped with the 2012 vacated open-space easement have not also been vacated. The easement stipulates that activity within the easement area shall not interfere with the natural drainage of the area. This includes the placement of structures or fill that would impede the natural drainage of the easement area. At the November 10, 2021 Loudoun County BOS public hearing, the BOS approved conveyance of about 6.85 acres of conservation easements (which includes some areas of floodplain easement) to Dominion. The conveyance of easement has not yet occurred. All three routes cross the easement in the same location.

Preservation Easement: When the amendment to the open-space easement was established in 2012, a preservation easement was also developed for most of the current Kincora property, with the exception of the existing Loudoun Water and DC Water easement areas already in place across the property, see Figure 3.1.6-1 in Appendix A. The preservation easement is intended to preserve the areas by prohibiting the following actions:

- Discharge of dredged or fill material;
- Destruction or alteration of watercourse; and
- Land disturbance or land clearing.

Exceptions to this rule include the construction, installation, operation, and maintenance of utilities including electric utilities. Based on ERM's review of the Preservation Easement language, it appears that these exceptions do not include electric transmission lines, and are likely referring to electric distribution lines and other smaller utility corridors. The easement stipulates that if any future development would result in any impacts on a jurisdictional wetland or waterbody within the preservation easement, the applicant would be required to submit a Pre-construction Notification (PCN) to the U.S. Army Corps of Engineers (USACE) as part of the Nationwide Permitting (NWP) process to satisfy Section 404 of the Clean Water Act (CWA). Typically, there are thresholds that need to be met before a PCN is required. If these thresholds are not met, then the applicant may self-verify they have met the conditions of the NWP and move forward with a project under the approved NWP. Should an applicant propose to impact a wetland or waterbody within the easement, the applicant would need to submit a PCN to the USACE for their review and approval before being able to move forward with their project. All three routes cross the easement in the same location.

Kincora Proffers: As part of the development plan that was reviewed by Loudoun County, Kincora established a proffers statement that outlined how the development proposes to enrich the use of the area for the county residents. Several of the statements referenced in the proffers document may have a bearing on the Project. These statements are discussed below:

- The limits of clearing and grading within the development must be depicted on the Concept Plan. Encroachments beyond the limits of said clearing and grading shall be permitted only for utilities among other approved actions.
- Wetland and stream mitigation, riparian preservation, and reforestation and wetland mitigation banks have been established within the development as depicted on the Concept Plan. Should the impacts associated with the development, including utilities, exceed the quantities stated in the proffers, the owners shall provide additional mitigation elsewhere as defined in the proffers. All three routes cross some of these areas.
- As the mitigation areas stated above are located within the existing open-space easement, the open-space easement will be amended to grant the county access to the easement to complete the required mitigation should Kincora fail to complete the mitigation.

- Within the areas labeled “Tree Preservation Outside Riparian Preservation Areas” on the Concept Plan, preservation of a minimum of 80 percent of the existing canopy is required. A maximum of 20 percent of existing canopy may be removed for utilities and similar facilities.
- The River and Streams Corridor Resources area (defined as including the 100-year floodplains, adjacent steep slopes of 25 percent or greater, starting within 50 feet of streams and floodplains and extending no farther than 100 feet beyond the originating stream or floodplain, and the 50-foot management buffer surrounding floodplains and such adjacent steep slopes) shall be preserved and remain in their natural state. Should areas be disturbed, replanting within or adjacent to the 100-year floodplain is required, as defined in the proffers. While these areas are not mapped in the Kincora 2021 documents, given that the routes would all include two crossings of Broad Run, based on the definition above they would cross River and Stream Corridor Resources areas.
- Upon completion of the wetland mitigation banking areas on the property, Kincora will convey the 162-acre River and Stream Corridor Resources area to the county to be used as a parkland. Once in the county’s possession, no utility easements or other easement shall be granted on the dedicated land that would negatively impact or conflict with the proffers. Prior to conveying the land to the county, Kincora reserves the right to establish easements within the dedicated lands that are reasonably required for the development of the Kincora property, provided the easements shall not unreasonably interfere with the proposed development of the county parkland. All three routes cross through these areas.

3.1.7 Other Conservation Lands

ERM obtained information on other conservation lands through review of a digital dataset obtained from the VDCR and Loudoun County. The dataset identifies “lands of conservation and recreational interest” in Virginia, including federal, state, local, and privately owned lands. There are no VDCR Stream Conservation Units (SCU) or other conservation lands within the study area.

3.1.8 Transportation

Major public roads within the study area include Loudoun County Parkway, Sully Road, Gloucester Parkway, Russell Branch Parkway, Nokes Boulevard, Route 7, and Atlantic Boulevard (see Figures 2.0-1 and 2.0-2 in Appendix A). All of these major roads are maintained by VDOT. Many smaller public roads also exist within the study area. Based on consultations with Loudoun County Department of Transportation and Capital Infrastructure and VDOT, there are no planned road projects in the study area.

3.1.8.1 Route 1A

Beginning just north of the BECO Substation, Route 1A heads northwest across Gloucester Parkway. The route continues in a generally northeastern direction and parallels the western side of Russell Branch Parkway for about 0.1 mile before crossing Russell Branch Parkway and Sully Road. The route then continues east and crosses Century Boulevard before entering the proposed DTC Substation parcel.

3.1.8.2 Route 1B

Beginning just north of the BECO Substation, Route 1B heads northwest across Gloucester Parkway. The route continues in a generally northeastern direction and parallels the western side of Russell Branch Parkway for about 0.05 mile before crossing Russell Branch Parkway and Sully Road. The route then continues north paralleling the east side of Sully Road for 0.05 mile before heading east, crossing Century Boulevard, and entering the proposed DTC Substation parcel.

3.1.8.3 Route 1C

Beginning just north of the BECO Substation, Route 1C heads northwest across Gloucester Parkway. The route continues in a generally northeastern direction and crosses Russell Branch Parkway and Sully Road. The route then continues north paralleling the east side of Sully Road for 0.1 mile before heading east, crossing Century Boulevard, and entering the proposed DTC Substation parcel.

3.1.9 Airport Facilities

Transmission line towers have the potential to affect airspace in and around airports. In routing and building new overhead electric transmission lines, airports are an important consideration. The following is a summary of the airports in the vicinity of the Project area and the airspace regulations that could have an impact on the Project.

3.1.9.1 Airports Near the Project Area

ERM reviewed the Federal Aviation Administration's (FAA) website to identify public use airports, airports operated by a federal agency or the U.S. Department of Defense, airports or heliports with at least one FAA-approved instrument approach procedure, and public use or military airports under construction (FAA, 2021). Based on this review, there are five airports, private airstrips, or heliports located within 10 nautical miles of the Project facilities (see Figure 3.1.9-1 in Appendix A). Table 3.1.9-1 lists the airport, heliport, or private airstrip name/owner in the vicinity of the Project, including airport identification number, distance, and direction from the nearest route alternative or substation, type of use, and maximum runway length.

Table 3.1.9-2: Airports and Heliports Located in the Vicinity of the Project

Airport/Heliport Name	Approximate Distance and Direction From Nearest Project Facility (miles)	Use	Maximum Runway Length (feet)
Washington Dulles International Airport	2.7 – south	Public	42,901
Leesburg Executive Airport	6.6 – west	Public	5,500
Loudoun Hospital Center Heliport	3.5 – northwest	Private	N/A
Reston Hospital Center Heliport	5.8 – southwest	Private	N/A
Stone Springs Hospital Heliport	8.1 – southwest	Private	N/A

N/A = not applicable

3.1.9.2 Federal Aviation Regulations

The FAA is responsible for overseeing air transportation in the United States. The FAA focuses on air transportation safety, including the enforcement of safety standards for aircraft manufacturing, operation, and maintenance. The FAA also manages air traffic in the United States and evaluates physical objects that may affect the safety of aeronautical operations through an obstruction evaluation. The prime objective of the FAA in conducting an obstruction evaluation is to ensure the safety of air navigation and the efficient utilization of navigable airspace by aircraft.

The regulations that govern objects that may affect navigable airspace are codified in the Code of Federal Regulations, Title 14, Part 77 (14 CFR Part 77). A summary of the rule as it relates to the Project is provided below, and the full rule is provided in Appendix C.

Civil Airport Imaginary Surfaces

Civil airport imaginary surfaces have been established with relation to each airport and each runway. The imaginary surfaces were developed to prevent existing or proposed objects from extending from the ground into navigable airspace. Following is a description of the civil imaginary surfaces.

- **Horizontal surface**: A horizontal plane 150 feet above the established airport elevation, the perimeter of which is constructed by swinging arcs of specified radii from the center of each end of the primary surface of each runway and connecting the adjacent arcs by lines tangent to those arcs.
- **Conical surface**: A surface extending outward and upward from the periphery of the horizontal surface at a slope of 20 to 1 for a horizontal distance of 4,000 feet.
- **Primary surface**: A surface longitudinally centered on a runway. The primary surface extends 200 feet beyond the end of each runway. The elevation of any point on the primary surface is the same as the elevation of the nearest point on the runway centerline.
- **Approach Surface**: A surface longitudinally centered on the extended runway centerline and extending outward and upward from each end of the primary surface. An approach surface is applied to each end of each runway based upon the type of approach available or planned for that runway end (e.g., precision instrument approach, visual approach).
- **Transitional Surface**: These surfaces extend outward and upward at right angles to the runway centerline and the runway centerline extended at a slope of 7 to 1 from the sides of the primary surface and from the sides of the approach surfaces. Transitional surfaces for those portions of the precision approach surface that project through and beyond the limits of the conical surface extend a distance of 5,000 feet measured horizontally from the edge of the approach surface and at right angles to the runway centerline.

Terminal Instrument Procedures

In addition to the civil airport imaginary surfaces, there are imaginary surfaces associated with terminal instrument procedures (TERPS). TERPS are procedures for instrument approach and departure of aircraft to and from civil and military airports. TERPS are used for airport obstruction analysis to protect airspace by establishing restrictions on the height of buildings, antennas, trees, and other objects as necessary to protect the airspace needed for aircraft during preparation for, and completion of, the landing or departure phases of flight. None of the route alternatives discussed in this report would exceed the TERPS surfaces of the airports identified in Table 3.1.9-1.

FAA Notice Requirements and Timing

Based on the runway categories and dimensional standards described above, a notice must be filed with the FAA if:

- Any construction or alteration is more than 200 feet above ground level at its site.
- Any construction or alteration exceeds an imaginary surface extending outward and upward at the following slope:
    - 25 to 1 for a horizontal distance of 5,000 feet from the nearest point of the nearest landing and takeoff area of each heliport;
    - 50 to 1 for a horizontal distance of 10,000 feet from the nearest point of the nearest runway that is no more than 3,200 feet in actual length; and

- 100 to 1 for a horizontal distance of 20,000 feet from the nearest point of the nearest runway that is more than 3,200 feet in actual length.

- If requested by the FAA.

Construction or alteration of any structure that meets the notification requirements set forth above requires submittal of an FAA Form 7460-1, *Notice of Proposed Construction or Alteration* (Notice), to the FAA Regional office having jurisdiction over the area within which the construction or alteration will be located or submitted electronically via the FAA website. The information that needs to be provided with the Notice includes the coordinates, site elevation, and structure height above ground level for each pole/structure and the height of construction equipment, such as cranes.

Based on the current plans, the Project transmission line structures would range in height from 90 to 120 feet tall for Routes 1A, 1B, and 1C. It is anticipated that cranes would be used to install the structures. Based on current plans, the Project would not exceed FAA notification thresholds at any airports. Figure 3.1.9-2 in Appendix A depicts the maximum tower height that would be allowed for each structure location based on airport surfaces.

State and Local Regulations

Commonwealth of Virginia Aviation Regulations

Section 5.1-25.1 of the Va. Code establishes that it is unlawful for a person to erect any structure that penetrates into or through any licensed airport's clear zone, approach zone, imaginary surface, obstruction clearance surface, obstruction clearance zone, or surface or zone as described in regulations of the Virginia Department of Aviation or the FAA without first securing a permit for its erection from the Board of Aviation. However, it also states that this requirement does not apply to any structure to be erected in a county, city, or town that has an ordinance regulating the height of such structures to prevent the penetration of zones and surfaces provided for in 14 CFR Part 77 and Rule 19 of the Virginia Department of Aviation.

Local Airport Regulations

Va. Code Sections 15.2-2280, 15.2-2282, 15.2-2293, and 15.2-2294 give local jurisdictions the power to establish and regulate zoning districts, make airspace subject to their zoning ordinance, and establish airport safety zoning. Following is a summary of the zoning regulations applicable to the airports listed in Table 3.1.9-1.

Loudoun County has established restricted-use zones to regulate the use of property in the vicinity of Dulles Airport. The Airport Impact Overlay District is a zoning overlay district administered by the Loudoun County Department of Building and Development. This district is established to acknowledge the unique land use impacts of airports, regulate the siting of noise sensitive uses, ensure that the heights of structures are compatible with airport operations, and complement FAA regulations regarding noise and height.

The Airport Impact Overlay District boundaries are based on the 60 decibels (dB) and 65 dB Loudness Day Night noise contours and a 1-mile buffer that extends beyond the 60 dB day-night average sound level contour for Dulles Airport. The zones include all land lying beneath the approach surfaces, transitional surfaces, horizontal surfaces, and conical surfaces as they apply to this airport.

3.1.10 Environmental Justice

ERM completed a desktop environmental justice (EJ) review to identify potential EJ populations that could be affected by the route alternatives. The EJ review follows federal guidance and recommended

methodologies outlined by the Council on Environmental Quality and the Federal Interagency Working Group on Environmental Justice and National Environmental Policy Act Committee, as well as definitions provided in the Virginia Environmental Justice Act (Va. Code §§ 2.2-234, 2.2-235). The purpose of conducting the EJ review is to determine if construction or operation of the transmission line along any of the route alternatives would result in disproportionately high and adverse environmental impacts on minority and low-income populations, age-based vulnerable, or linguistically isolated communities (i.e., EJ populations). This approach also is consistent with requirements outlined in the Virginia Clean Economy Act of 2020 pertaining to the development of new, or expansion of existing, energy resources or facilities (Va. Code § 56-585.1).

In identifying potential areas of concern, federal guidelines state that the size of the area surrounding a project selected for the EJ assessment should be an appropriate unit of geographic analysis that does not artificially dilute or inflate the affected minority population. Therefore, the census block group (CBG) was used as the primary unit for analysis in the EJ review for each route alternative because it is the smallest geographic unit for which U.S. Census Bureau demographic data is available. All CBGs crossed by and within a 1-mile radius of the routes were included in the screening area. Figure 3.1.10-1 in Appendix A depicts where EJ populations were identified along the routes.

The Commonwealth of Virginia and Loudon County were used as reference populations for the desktop review. Demographic data for the Commonwealth were compared to individual CBGs to help identify potential EJ populations. For example, if the reported percentage of minority population within an individual CBG was greater than the percentage of minority population in Virginia as a whole, a potential EJ population was identified. Data for Loudon County was also included in the review as additional reference populations to address regional demographic variations. The EPA's EJ mapping and screening tool, EJSCREEN, and census data from the U.S. Census Bureau 2014–2018 American Community Survey were used to collect CBG, county, and state data.

The Commonwealth of Virginia defines a "population of color" as a group of individuals belonging to one or more of the following racial and ethnic categories: "Black, African American, Asian, Pacific Islander, Native American, other, non-white race, mixed race, Hispanic, Latino or linguistically isolated." The EJSCREEN's definition of a minority population is analogous to Virginia's definition of population of color but does not include linguistically isolated individuals. However, EJSCREEN includes a separate demographic indicator for linguistic isolation.

The Commonwealth of Virginia identifies a minority population, or what it terms a "community of color," if an analysis area has a greater "population of color" percentage than that of the state as a whole. However, if a "community of color" is composed primarily of a specific "population of color," then the percentage population of that single group in the commonwealth is used instead of the percentage for the total "population of color."

The Commonwealth of Virginia's criteria for an identified "community of color" or minority population and what constitutes an EJ population have a lower threshold and are more inclusive than federal guidance. Therefore, the state's criteria were used to identify minority populations in the EJ screening of the routes.

Federal guidelines recommend using an appropriate poverty threshold and comparing the analysis area to a reference population to identify low-income populations. The Commonwealth of Virginia identifies low-income populations in analysis areas as any CBG in which 30 percent of the population is composed of low-income residents. It defines low-income as "having an annual household income equal to or less than the greater of (i) an amount equal to 80 percent of the median income of the area in which the household is located, as reported by the Department of Housing and Urban Development, and (ii) 200 percent of the Federal Poverty Level."

For this EJ screening, if 30 percent or more of the population was characterized as low-income, then low-income populations were identified. The EJSCREEN tool provides percentages of low-income populations by CBG that are defined as households where the income is less than or equal to twice the federal poverty level as reported by the U.S. Census Bureau.

The EJ review assessed the potential for other factors that could limit low income or minority communities from reviewing and commenting on the various alternatives, including age-based vulnerabilities, linguistic isolation, and populations with less than a high school education. Vulnerabilities, such as linguistic isolation, have been used to capture the same or similar underlying constructs as the proportion of minorities in the population. It is reasonably expected that linguistically isolated households will be represented within the minority or low-income EJ communities. These communities were identified using the federal guidance of a meaningfully greater threshold. Virginia was used as the reference population. A difference of over 20 percentage points compared to the reference population was used to identify age populations, linguistically isolated populations, and populations with less than a high school education for this review.

Virginia has a population under age 5 of 6 percent and a population over age 64 of 15 percent, a linguistically isolated population of 3 percent, and a population with less than a high school education of 11 percent. When compared to the reference population, one of the CBGs in the screening area contains elderly populations, and no CBGs contain a population under age 5, linguistically isolated population, or populations with less than a high school education that exceeds 20 percentage points.

3.1.10.1 Environmental Justice Screening Results

The desktop review identified 17 CBGs within the screening area and of these, two CBGs are crossed by the Project (Figure 3.1.10-1 in Appendix A). The remaining 15 CBGs are within 1 mile and would not be directly affected by the Project. The CBGs within the analysis area are located within Loudon County. Table 3.1.10-1 provides a summary of the demographic analysis and identifies the income, racial, education, language and age characteristics for the reference population and each block group within the area of analysis (CBGs crossed by and within a 1-mile radius any of the route alternatives of the BECO or DTC Substations). Table 3.1.10-2 provides additional detail about the racial and ethnic composition of the reference population and the CBGs within the area of analysis. Specific results are discussed below, and an analysis of potential impacts on identified EJ populations is set out in Section 4.1.7.

Minority Populations

According to the U.S. Census Bureau 2014–2018 American Community Survey, data estimates 68 percent of the commonwealth's population is White, Non-Hispanic. Virginia has a total minority population comprising approximately 38 percent of the total population. Predominant minority groups include Black / African American (19 percent), Hispanic (9 percent), and Asian (6 percent). Two or more races make up 4 percent of the total population. Native Americans and Pacific Islanders make up less than 1 percent each but can occur locally in higher concentrations (Table 3.1.10-2).

There is a wide range of total minority population percentages within the analysis area, with the smallest value at 4 percent and the greatest at 76 percent. Of the 17 CBGs, within the analysis area, 15 CBGs within 1 mile of the Project have at least one race or ethnic group, or a cumulative "total minority" population that meets the definition for a community of color according to the VEJA. The most common race or ethnic group identified in the study area is Asian, Non-Hispanic. Among the 15 CBGs, all 15 contain above-average Asian populations, five contain above-average Hispanic populations, five contain populations of more than one race, two contain above-average African American populations, and one contains an above-average Native American or Alaska Native population (Table 3.1.10-2). Routes 1A,

1B, and 1C only cross two of the total 17 CBGs analyzed; only one of the two CBGs crossed by the routes is also identified as a community of color (Figure 3.1.10-1).

Low-Income Populations

Virginia has a low-income population of 25 percent. Loudon County has a low-income population of 11 percent. Among the CBGs in the analysis area, the low-income population percentages range from 4 to 57 percent. Of the 17 CBGs within the analysis area, 2 CBGs within 1 mile of the Project have low-income populations greater than or equal to the 30 percent threshold for low-income populations identified by the commonwealth. Additionally, one CBG within 1 mile of Project met both the minority and low-income definitions (Table 3.1.10-1). No low-income communities or combination minority and low-income communities are crossed by the routes.

Age Populations

One of the 17 CBGs (511076110182) has a population of 98 percent over age 64. This CBG is home to the Ashby Ponds Senior Living Community (located about 0.9 mile from the three alternative routes). The 1,600 persons residing in this community likely account for the larger, over age 64 population in the CBG which is crossed by all of the route alternatives.

Table 3.1.10-3: Total Minority and Low Income Populations in Analysis Area

State/County Census Block Group (CBG)	CBG Crossed by Centerline of Any Route Alternative (Yes/No)	Population	Minority Population (%)	Low Income Population (%)	Linguistically Isolated Population (%)	Population with Less than High School Education (%)	Population Under Age 5 (%)	Population Over Age 64 (%)
VIRGINIA		8,535,519	38	25	3	11	6	14
Loudoun County		385,143	43	11	1	6	7	9
511076110022	No	2,186	63	23	3	13	7	4
511076110061	No	2,642	52	5	1	<1	9	4
511076110151	No	2,894	52	7	1	6	5	12
511076110163	No	1,387	42	7	5	2	12	31
511076110171	No	1,804	33	4	1	<1	3	26
511076110181	No	2,088	76	36	6	15	10	7
511076110182	Yes	1,001	4	13	1	2	0	98
511076111011	No	1,962	35	9	3	5	6	7
511076111012	No	1,283	63	21	14	22	9	5
511076111013	No	1,143	55	11	6	4	3	13
511076111021	No	1,570	26	4	2	0	8	6
511076111022	No	1,450	35	4	0	5	5	12
511076111023	No	3,303	36	4	1	10	6	10
511076115011	Yes	940	47	16	11	2	14	1
511076115012	No	2,401	73	57	6	12	11	5
511076115021	No	1,682	58	8	5	8	7	5
511076116011	No	1,758	61	23	6	7	12	7

Gray shaded cells indicate reference populations.
Blue shaded cells indicate identified minority populations.
Orange shaded cells indicate identified low-income populations.
Green shaded cells indicate identified populations with less than high school education.

Source: EPA EJSCREEN (Version 2020) based on U.S. Census Bureau 2014–2018 American Community Survey data.

Table 3.1.10-4: Racial and Ethnic Groups in Analysis Area

State/County Census Block Group (CBG)	CBG Crossed by Centerline of Any Route Alternative (Yes/No)	Population	Minority Population (%)	White (%)	Black or African American (%)	American Indian and Alaska Native (%)	Asian (%)	Pacific Islander (%)	Other or More than one race (%)	Hispanic or Latino (%)
VIRGINIA		8,535,519	38	62	19	<0.1	6	<0.1	4	9
Loudoun County		385,143	43	57	7	<0.1	18	<0.1	5	14
511076110022	No	2,186	63	37	9	<0.1	9	<0.1	19	26
511076110061	No	2,642	52	48	4	<0.1	33	<0.1	7	9
511076110151	No	2,894	52	48	7	<0.1	31	<0.1	4	11
511076110163	No	1,387	42	58	9	<0.1	19	<0.1	1	13
511076110171	No	1,804	33	73	3	<0.1	15	<0.1	2	6
511076110181	No	2,088	76	24	31	<0.1	14	<0.1	4	27
511076110182	Yes	1,001	4	96	2	<0.1	1	<0.1	1	<0.1
511076111011	No	1,962	35	65	10	<0.1	8	<0.1	5	12
511076111012	No	1,283	63	37	4	<0.1	18	<0.1	7	33
511076111013	No	1,143	55	45	25	2	9	<0.1	6	12
511076111021	No	1,570	26	74	12	<0.1	4	<0.1	3	8
511076111022	No	1,450	35	65	7	<0.1	9	<0.1	11	8
511076111023	No	3,303	36	64	7	<0.1	8	<0.1	3	18
511076115011	Yes	940	47	53	14	<0.1	15	<0.1	5	13
511076115012	No	2,401	73	27	12	<0.1	12	<0.1	2	47
511076115021	No	1,682	58	42	8	<0.1	29	<0.1	4	16
511076116011	No	1,758	61	39	5	<0.1	17	<0.1	9	29

Gray shaded cells indicate reference populations.

Blue shaded cells indicate a population of color per the Virginia Environmental Justice Act.

Source: EPA EJSCREEN (Version 2020) based on U.S. Census Bureau 2014–2018 American Community Survey data.

3.2 Natural Resources

ERM utilized several desktop data sources to map wetlands and waterbodies within the route alternatives right-of-way corridors. These sources included USGS 7.5-minute series topographic quadrangle maps, National Wetlands Inventory (NWI) maps obtained from the U.S. Fish and Wildlife Service (FWS), soils data from the Natural Resources Conservation Service Web Soil Survey, recent (2021) aerial photography, the National Hydrography Dataset (NHD), and Loudoun County environmental layers. ERM did not conduct an onsite wetland delineation of wetlands or waterbodies within the study area.

ERM also utilized the following to conduct a preliminary review of ecological significance areas and protected species within the study area:

- FWS Information for Planning and Consultation (IPaC) online system (FWS, 2021);
- VDCR Natural Heritage Program (NHP) (VDCR, 2021a);
- Virginia Department of Wildlife Resources (VDWR) Fish and Wildlife Information Service (VaFWIS) (VDWR, 2021a); and
- Center for Conservation Biology (CCB) Eagle Nest Locator (CCB, 2021).

A more refined search specific to the route alternatives was then conducted to determine if any species observations have occurred in the area crossed by or adjacent to the Project (natural resources Project area).

3.2.1 Wetlands

ERM identified and mapped wetlands in the study area using publicly available GIS databases, National Agricultural Imagery Program Digital Ortho-Rectified Natural Color and Infrared Images, USGS topographic maps (1:24,000), U.S. Department of Agricultural-Natural Resources Conservation Service Soil Survey Geographic database for Loudoun County, and recent (2021) digital aerial photography. The wetlands identified are considered potentially aquatic resources that would be regulated by the USACE and Virginia Department of Environmental Quality (VDEQ) under Section 404 and Section 401 of the CWA, respectively. Wetland types and locations are depicted on Attachment 2 in Appendix D. In addition, an overview map is included as Attachment 1 in Appendix D.

The majority of the wetlands potentially affected by the Project are located adjacent to, or contiguous with, rivers and streams and their tributaries that would be considered relatively permanent waters; therefore, a significant nexus to navigable waters is assumed. As such, they would be regulated by the USACE and VDEQ under Sections 404 and 401 of the CWA, respectively.

Wetlands depicted in the Project rights-of-way are primarily Palustrine Emergent (PEM) and Palustrine Forested (PFO) wetlands associated with tributaries of the named NHD-mapped waterbody Broad Run.

3.2.2 Waterbodies

ERM identified and mapped waterbodies in the study area using publicly available GIS databases, USGS topographic maps (1:24,000), and recent (2021) digital aerial photography. The route alternatives cross perennial and intermittent waterbodies (rivers, streams, tributaries). No navigable waterbodies are crossed by any of the routes.

A general location map that illustrates waterbodies crossed by the route alternatives is included as Attachment 1 in Appendix D. Although crossings of these streams would not require a Rivers and Harbors Act Section 10 authorization, activities within and over subaqueous lands of Virginia with over 5 square-

mile drainage areas would require a permit from the Virginia Marine Resources Commission pursuant to Va. Code § 28.2-1205.

Routes 1A, 1B, and 1C all cross Broad Run—a mapped perennial waterbody—in two separate locations.

3.2.2.1 Reservoirs, Ponds, and Other Waterbodies

In addition to wetland and waterbodies, open-water features (e.g., reservoirs, ponds, and other waterbodies visible from review of NWI/NHD datasets and/or aerial imagery) were considered in ERM's review; however, no open-water features are crossed by any of the route alternatives.

3.2.3 Areas of Ecological Significance

The initial VDCR NHP review identifies areas of ecological significance out to a 100-foot buffer around the study area for datasets, which include Conservation Sites and General Location Areas for Natural Heritage Resources. SCUs are identified up to 2 miles upstream and 1 mile downstream.

1. Conservation Sites identify a planning boundary delineating the NHP's best determination of the land and water area occupied by one or more natural heritage resources (exemplary natural communities and rare species) and are necessary to maintain ecological processes that will facilitate long-term survival of these resources. The size and dimensions of a conservation site are based on the habitat requirements of the natural heritage resources present and the physical features of the surrounding landscape. Features taken into consideration include hydrology, slope, aspect, vegetation structure, current land uses, and potential threats from invasive species. Conservation sites do not necessarily preclude human activities, but a site's viability may be greatly influenced by human activities. Conservation sites may require ecological management, such as invasive species control or water management, in order to maintain or enhance their viability. Each conservation site is given a biodiversity significance ranking based on rarity, quality, and number of natural heritage resources it contains.
2. General Location Areas for Natural Heritage Resources represent the approximate locations of documented natural heritage resource occurrences that were not incorporated into Conservation Sites, either because they are poor quality, their location was not precisely identified, or they have not been verified in over 20 years. These approximate locations, marked with the 100-foot buffer, are included in the screening coverage because they indicate areas with relatively high potential for natural heritage resource occurrences to be documented. Depending on the apparent suitability of local habitat, VDCR may recommend biological surveys when reviewing projects that intersect these locations.
3. SCUs identify stream reaches that contain aquatic natural heritage resources, including upstream and downstream buffers and tributaries associated with the reach. SCUs are given a biodiversity significance ranking based on the rarity, quality, and number of natural heritage resources they contain. SCUs can be used to identify land management needs, protection priorities, and potential conflicts with development activities.

The VDCR reviewed Dominion Energy Virginia's proposed Project area on October 15, 2021, and no SCUs were identified (VDCR, 2021b). The VDCR data did not depict any State Natural Area Preserves or state-listed plants or insects crossed by the routes.

The VDCR did identify an Ecological Core map unit (Core ID 31766, 216 acres) within the 100-foot buffer of the Project area, described as having an ecological integrity ranking of C5 (General). DCR ranks ecological cores using five categories of ecological integrity: C1 - Outstanding; C2 - Very High; C3 - High; C4 - Moderate; and C5 - General. Ecological cores have been mapped for the entire Commonwealth of Virginia and a 20-mile buffer around the state. Over 50 attributes were assigned to the ecological cores

providing information about rare species and habitats, environmental diversity, species diversity, patch characteristics, patch context, and water quality benefits. To assist in identifying highly significant ecological cores, VDCR selected nine ecological attributes and used them in a principal components analysis to develop prioritization and ranking by ecological integrity (e.g., C1, C2, C3, C4, and C5). All of the route alternatives cross the Ecological Core map unit described above (Core ID 31766) in the same location (see Figure 3.2.4-1 in Appendix A). VDCR data did not depict any State Natural Area Preserves in the Project area.

3.2.4 Protected Species

To protect and recover imperiled species and the ecosystems they depend on, Congress passed the Endangered Species Act (ESA) in 1973, which states that threatened and endangered plant and animal species are of aesthetic, ecological, educational, historic, and scientific value to the United States, and protection of these species and their habitats is required. The ESA is administered by both the National Oceanic and Atmospheric Administration and the FWS. It protects fish, wildlife, plants, and invertebrates that are federally listed as endangered or threatened by prohibiting the “take” of these species and the interstate or international trade, including their parts and products, unless federally permitted.

Take is defined as “to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect or attempt to engage in any such conduct.” A federally endangered species is any species that is in danger of extinction throughout all or a significant portion of its range, with exceptions for certain insect pests. A federally threatened species is any species that is likely to become endangered in the near future throughout all or a significant portion of its range.

Virginia has adopted separate acts for protecting animals and plants in the state. The Virginia ESA (Va. Code §§ 29.1-563 - 29.1-570) designates the VDWR as the state agency with jurisdiction over state-listed endangered or threatened fish and wildlife. The Virginia ESA authorizes the Board of the VDWR to adopt the federal list of endangered and threatened species and to identify and protect state-listed wildlife. The Virginia ESA prohibits by regulation the taking, transportation, processing, sale, or offer for sale of those species.

Under the Endangered Plant and Insect Species Act (2 VAC 5-320-10), the taking or possession of endangered or threatened plant and insect species is prohibited. The VDCR represents the Virginia Department of Agriculture and Consumer Services, which is responsible for state-listed plants and insects, in providing comments regarding potential effects on state-listed plant and insect species.

ERM obtained query results from the VDCR’s Natural Heritage Data Explorer (NHDE), which includes the Project study area and a 100-foot buffer, VDWR VaFWIS, and the FWS IPaC to identify federally and state-listed species that may occur within the natural resources Project area. Digital data were obtained from the VDCR NHDE to identify locations within the study area and the 100-foot buffer that potentially support protected species. Query results from FWS IPaC includes species that may occur within the natural resources Project area (FWS, 2021). Query results from NHDE include species known to occur in the study area and communities known to historically or currently contain protected species (VDCR, 2021a). Query results from VaFWIS include species known to occur or likely to occur within a 2-mile radius from the geographic center of the natural resources Project area (VDWR, 2021a).

The VDCR’s element occurrence representations are mapped representations of plants, animals, and exemplary natural communities, which are tracked by the VDCR NHP due to their rarity. Each occurrence is represented by a polygon indicating its known location. The polygons are intended to indicate the full known aerial extent of the occurrence, modified to account for the locational uncertainty of the source data. The VDWR’s Species Observation dataset includes all verified species documentations maintained by VDWR.

Three federally listed and 10 state-listed threatened or endangered species, as well as seven state-rare plant species, were reviewed for potential of occurrence within and adjacent to the Project areas. A summary of the findings is provided in Section 3.2.4.1 and Section 3.2.4.2.

3.2.4.1 Federally and State-Listed Endangered and Threatened Species

Because the various queries that indicate potential or actual occurrences of protected species in the vicinity of the Project do not specify exact occurrence locations, a summary of the federally and state-listed species documented in the vicinity of the natural resources Project area is presented in Table 3.2.4-1. Rare species are summarized in Section 3.2.4.2.

The IPaC database query identified two federally listed species: northern long-eared bat (*Myotis septentrionalis)* and dwarf wedgemussel (*Alasmidonta heterodon*). According to the review, each of these species has potential to occur in the Project area, however, neither have confirmed occurrences. The VDWR operates a Northern Long-eared Bat Winter Habitat and Roost Trees online mapping system, which shows general locations of known northern long-eared bat hibernacula and roost trees. A review of this system did not show a hibernaculum or roost tree in Loudoun County. Dwarf wedgemussel has potential to occur in perennial waterbodies.

The dwarf wedgemussel is described by VDWR as a habitat “generalist” in terms of its preference for stream size, substrate, and flow conditions. This mussel species can live in a range of habitats, from small streams less than 5 meters wide, to large rivers more than 100 meters wide. It can inhabit a variety of substrate types including clay, sand, gravel, and pebble, and sometimes in silt depositional areas near banks. Dwarf wedgemussel occurrences are usually associated with hydrologically stable areas, including very shallow water along streambanks and under root mats of trees along streambanks (VDWR, 2021a).

The VDCR and VDWR database queries identified 13 state-listed species (which includes the 2 federally listed species described above) and one additional federally listed species (yellow lance [*Elliptio lanceolate*]) that have the potential to occur within 2 miles of the geographic center of the natural resources Project area. Of the 13 species identified, only the Wood turtle has been historically documented by state agencies in areas adjacent to or crossed by any of the routes. The VDWR operates a *Little Brown Bat and Tri-colored Bat Winter Habitat and Roosts Application* online mapping system, which shows general locations of known little brown bat and tri-colored bat hibernacula and roost trees. A review of this system did not show a hibernaculum or roost trees in Loudoun County (VDWR, 2021b).

Table 3.2.4-1: Potential Federally-and State-Listed Species in the Project Area

Common Name	Scientific Name	Federal Status	State Status	Global Rank	Habitat	Potential Route Occurrence	Source
FEDERALLY LISTED SPECIES							
Mammals							
Northern long-eared bat	*Myotis septentrionalis*	LT	LT	G4	Generally associated with old-growth or late successional interior forests. Partially dead or decaying trees are used for breeding, summer day roosting, and foraging. Hibernation occurs primarily in caves, mines, and tunnels.	All	IPaC VaFWIS VDWR-Winter Habitat and Roost Tree Map
Invertebrates							
Dwarf wedgemussel	*Alasmidonta heterodon*	LE	LE	G1	Deep quick running water on cobble, fine gravel, or on firm silt or sandy bottoms.	All	IPaC VaFWIS
Yellow lance	*Elliptio lanceolata*	LT	LT	G3G4	Main channels of drainages and streams as small as one meter across with clean, coarse, medium-sized sand or gravel substrate.	All	VaFWIS
STATE-LISTED SPECIES							
Mammals							
Little brown bat	*Myotis lucifugus*	None	LE	G3	Roosts in caves, buildings, rocks, trees, under bridges, and in mines and tunnels. Found in all forested regions of the state.	All	VaFWIS VDWR-Winter Habitat and Roost Tree Map
Tri-colored bat	*Perimyotis subflavus*	None	LE	G3	Typically roost in trees near forest edges during summer. Hibernate deep in caves or mines in areas with warm, stable temperatures during winter.	All	VaFWIS VDWR-Winter Habitat and Roost Tree Map
Invertebrates							
Appalachian grizzled skipper	*Pyrgus Wyandot*	None	LT	G5	Semi-open slopes with sparse herbaceous vegetation and exposed rock or soil.	All	VaFWIS

Common Name	Scientific Name	Federal Status	State Status	Global Rank	Habitat	Potential Route Occurrence	Source
Brook floater	*Alasmidonta varicosa*	None	LE	G3	Creeks and small rivers, found among rocks in gravel substrates and in sandy shoals, flowing-water habitats only.	All	VaFWIS
Green floater	*Lasmigona subviridis*	None	LT	G3	Small to medium streams in quiet pools and eddies with gravel and sand substrates.	All	VaFWIS
Birds							
Henslow's sparrow	*Ammodramus henslowii*	None	LT	G4	Open grasslands with few or no woody plants and tall dense grasses and litter layer.	All	VaFWIS
Loggerhead shrike, and migrant Loggerhead shrike	*Lanius ludovicianus* (*Lanius ludovicianus migrans)*	None	LT	G4	Open country with scattered shrubs and trees or other tall structures for perching.	All	VaFWIS
Peregrine falcon	*Falco peregrinus*	None	LT	G4	Tall structures, such as powerline poles, buildings, and rock ledges, in generally open landscapes.	All	VaFWIS
Reptiles							
Wood turtle	*Glyptemys insculpta*	None	LT	G3	Forested floodplains, fields, wet meadows, and farmland with a perennial stream nearby.	All	VaFWIS

Federal/State Status:
LE Listed as endangered.
LT Listed as threatened.

Global Rank:
G1 Critically Imperiled: At very high risk of extinction due to extreme rarity (often five or fewer populations), very steep declines, or other factors.
G2 Imperiled: At high risk of extinction due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors.
G3 Vulnerable: At moderate risk of extinction due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors.
G4 Apparently Secure: Uncommon but not rare; some cause for long-term concern due to declines or other factors.
G5 Secure: Common, widespread, and abundant.

Sources: FWS, 2021; VDCR, 2021a; VDWR, 2021a and 2021b

3.2.4.2 Bald Eagle Management

The bald eagle (*Haliaeetus leucocephalus*) is no longer federally listed under the ESA, but it is a state-listed threatened species in Virginia under the Virginia ESA and is protected under Va. Code § 29.1-521 and VDWR regulations (4 VAC 15-30-10). The bald eagle is also protected under the federal Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act. The "Management of Bald Eagle Nests, Concentration Areas, and Communal Roosts in Virginia: A Guide for Landowners," issued by the then Virginia Department of Game and Inland Fisheries (now VDWR) provides management practices for avoiding the take of bald eagles and outlines restrictions on construction activities within defined management zones. Proposed activities that have the potential to affect bald eagles are evaluated by the agency on a case-by-case basis (Virginia Department of Game and Inland Fisheries et al. 2012).

To obtain the most current eagle nest data, ERM reviewed the CCB website (CCB, 2021), which provides information about the Virginia bald eagle population, including the results of the CCB's annual eagle nest survey. According to the CCB database, there is one known bald eagle nest within 5 miles of the study area, and it is located approximately 1.6 miles southwest of the BECO Substation. Nest LD 1901 was documented to be occupied in 2019. None of the route alternatives are within the 660-foot management buffer for the nest.

3.2.4.3 Species of Concern and Other Documented Occurrences

A summary of the results of the VDCR review are included in Table 3.2.4-2. Species of Concern typically are not afforded the same level of protection as federally and state-listed endangered and threatened species. NatureServe, an international network of NHPs, assigns a Global Rank based on rarity and conservation status. Species ranked "G1" (global rank 1 / critically imperiled) or "G2" (global rank 2/imperiled) are most at risk.

The VDCR conducted an official review of the Project on October 15, 2021. As part of this review, the VDCR concluded that the Project as planned would not affect any documented state-listed plants or insects, and does not cross any State Natural Area Preserves under VDCR's jurisdiction. However, the VDCR indicated that several rare plants have the potential to occur in the study area if suitable habitat is present (VDCR, 2021b). These plants are typically associated with prairie vegetation and have potential to inhabit semi-open diabase glades in Virginia. A list of these species is provided in Table 3.2.4-2.

Table 3.2.4-2: Rare Plant Species with the Potential to Occur in the Project Area

Common Name	Scientific Name	Federal Status	State Status	Global Rank	State Rank	Habitat	Source
Plants							
Earleaf False Foxglove	*Agalinis auriculata*	None	None	G3	S1	Exposed Diabase flatrock located within Triassic Basins	VDCR
Purple Milkweed	*Asclepias purpurascens*	None	None	G5?	S2	Exposed Diabase flatrock located within Triassic Basins	VDCR
American Bluehearts	*Buchnera americana*	None	None	G5?	S1S2	Exposed Diabase flatrock located within Triassic Basins	VDCR

Common Name	Scientific Name	Federal Status	State Status	Global Rank	State Rank	Habitat	Source
Downy Phlox	*Phlox pilosa*	None	None	G5	S1	Exposed Diabase flatrock located within Triassic Basins	VDCR
Torrey's Mountain-mint	*Pycnantheum torreyi*	None	None	G2	S2	Exposed Diabase flatrock located within Triassic Basins	VDCR
Stiff Goldenrod	*Solidago rigida var. rigida*	None	None	G5	S2	Exposed Diabase flatrock located within Triassic Basins	VDCR
Hairy Hedgenettle	*Stachys arenicola*	None	None	G4?	S1	Exposed Diabase flatrock located within Triassic Basins	VDCR

Global Rank:

G1 *Critically Imperiled: At very high risk of extinction due to extreme rarity (often five or fewer populations), very steep declines, or other factors.*

G2 *Imperiled: At high risk of extinction due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors.*

G3 *Vulnerable: At moderate risk of extinction due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors.*

G4 *Apparently Secure: Uncommon but not rare; some cause for long-term concern due to declines or other factors.*

G5 *Secure: Common, widespread, and abundant.*

State Rank:

S1 *Critically Imperiled: At very high risk of extirpation in the jurisdiction due to very restricted range, very few populations or occurrences, very steep declines, severe threats, or other factors.*

S2 *Imperiled: At high risk of extirpation in the jurisdiction due to restricted range, few populations or occurrences, steep declines, severe threats, or other factors.*

S3 *Vulnerable: At moderate risk of extirpation in the jurisdiction due to a fairly restricted range, relatively few populations or occurrences, recent and widespread declines, threats, or other factors.*

S4 *Apparently Secure: At a fairly low risk of extirpation in the jurisdiction due to an extensive range and/or many populations or occurrences, but with possible cause for some concern as a result of local recent declines, threats, or other factors.*

S5 *Secure: At very low or no risk of extirpation in the jurisdiction due to a very extensive range, abundant populations or occurrences, with little to no concern from declines or threats.*

Source: VDCR, 2021b

3.2.5 Vegetation

3.2.5.1 Local Vegetation Characteristics

The vegetation of the Northern Piedmont has been severely altered by clearing as part of ongoing agricultural and silvicultural practices occurring since European settlement. Prior to the effects of European settlement, the vegetation was influenced by the practices of Native Americans. Writings from early explorers indicate that parts of the Piedmont were once open, savanna-like woodlands and grasslands. Native American practices included burning the forests to drive game and keep the understory of forests clear for hunting. More recently, forests in this area have undergone a cycle of clearing, farming, and regenerating. The fallow farmlands, if left unattended, undergo a successional regeneration process that generally results in a prevalence of early successional trees such as Virginia

pine (*Pinus virginiana*) and tulip-poplar (*Liriodendron tulipifera*), which ultimately matures into oak-hickory forest (VDCR, 2021c).

The effects of man's influence on the landscape for centuries has resulted in a patchwork of secondary forests, pastures, and agricultural fields. The vegetation of the remaining forests occurring throughout the Project area is now a predominant mix of pine (*Pinus* sp.) and hardwoods, likely including hickories (*Carya* sp.) and oaks (*Quercus* sp.).

ERM reviewed publicly available Forest Conservation Model data prepared by the VDCR to assess the value of forest resources crossed by the Project (VDCR, 2020). The area of forested habitat through which the route alternatives pass is ranked by the VDCR as "General." Furthermore, the forested area is ranked as C5: General for ecological core value (on a scale of C1 for outstanding value to C5 for general value). Overall, the habitats through which the routes pass are not designated as high-ranking areas for conservation planning by the VDCR.

ERM reviewed the route alternatives using recent (June 2021) Google Earth aerial imagery to assess vegetative cover in the study area. Descriptions of the vegetation communities crossed by the route alternatives are provided below.

Route 1A

Beginning at the BECO Substation, Route 1A generally trends north/northwest within the floodplain of Broad Run. The majority of the vegetation is forest deciduous species with scattered pine. There are some small grassland and potential scrub-shrub areas between the BECO Substation and Gloucester Parkway. As the route turns to the north, it remains within a forested community for approximately 0.1 mile until it turns to the east and crosses Russell Branch Parkway and Sully Road. After Crossing Sully Road, Route 1A crosses through a small forested patch before crossing Century Boulevard and terminating at the proposed DTC Substation.

Route 1B

Beginning at the BECO Substation, Route 1B generally trends north/northwest with the floodplain of Broad Run. The majority of the vegetation is forest deciduous species with scattered pine. There are some small grassland and potential scrub-shrub areas between the BECO Substation and Gloucester Parkway. As the route turns to the north, it remains within a forested community for approximately 0.05 miles until it turns to the east and crosses Russell Branch Parkway and Sully Road. After crossing Sully Road Route, 1B turns to the north for approximately 0.05 mile (crossing a treed area between the east side of Sully Road and an office building parking lot), then to the east southeast for approximately 0.06 mile where it remains within a forested community before crossing Century Boulevard and terminating at the proposed DTC Substation.

Route 1C

Beginning at the BECO Substation, Route 1C generally trends north/northwest with the floodplain of Broad Run. The majority of the vegetation is forest deciduous species with scattered pine. There are some small grassland and potential scrub-shrub areas between the BECO Substation and Gloucester Parkway. After crossing Russell Branch Parkway and Sully Road (Route 28), Route 1C turns to the north for approximately 0.1 mile (crossing a treed area between the east side of Sully Road and an office building parking lot). The route then heads east/southeast for approximately 0.05 miles where it remains within a forested community before crossing Century Boulevard and terminating at the proposed DTC Substation.

3.3 Visual Conditions

ERM conducted the following analyses to understand the existing visual conditions and potential impact from the installation of Project components:

- Identification of visually sensitive resources (VSRs) through the review of recent (2021) digital aerial photography;
- Site reconnaissance and local outreach;
- Definition of the potential user groups;
- Review of visual simulations of the route alternatives; and
- Evaluation of the routes alternatives with respect to visual impacts.

VSRs were defined as areas where the Project components and associated tree-clearing would be additions to the visual characteristics of the surrounding landscape and/or affected resources possessing unique scenic qualities or sensitive viewsheds. Examples of visually sensitive areas include residential or recreational areas; historic landscapes or districts; open space; natural features; and areas of high public concentration. VSRs that were identified and reviewed as part of this analysis include: Sully Road (State Route 28), Russell Branch Parkway, Gloucester Parkway, the Lerner office building, and the multi-use trail along Russell Branch Parkway. Routes 1A, 1B, and 1C cross Sully Road and Russell Branch Parkway and the multi-use trail perpendicular to their corridors. This crossing occurs in the general area north of the Lerner office building.

User groups present in the study area include local residents/workers, commuter/through travelers, and recreational users. Recreational users often experience the greatest visual impact based on their high sensitivity to change in the landscape. Local residents/workers may experience a similar sensitivity to change as recreational users; however, this is often centered around static views from their residences. Commuter/through travelers have the lowest sensitivity to visual change in the landscape based on their activity and average speed associated with the roadway. A description of each VSR and its associated user groups is provided in Table 3.3-1.

Table 3.3-1: Visually Sensitive Resources and User Groups

VSR Name	VSR Type	Impacted User Group	General Information/Visual Sensitivity
Sully Road	High-use public resource	Commuter/through travelers	Six-plus-lane, limited-access divided highway with a speed limit of 55 miles per hour (mph). The average daily traffic (ADT) count is 93,000. Low sensitivity to visual change.
Russell Branch Parkway	High-use public resource	Local residents/workers	Four-lane divided highway with a speed limit of 40 mph. The ADT count is unknown for this roadway. Medium sensitivity to visual change.
Gloucester Parkway	High-use public resource	Commuter/through travelers	Four-lane divided highway with a speed limit of 45 mph. The ADT count for this section of road is unknown; however, on either side of this approximately 0.9-mile corridor the count is 20,000 ADT to the east and 14,000 ADT to the west. Medium sensitivity to visual change.
Lerner's 2100 Atlantic Boulevard Office Building	High-use public resource	Local residents/workers	The building offers 184,000 square feet of Class "A" office space, with panoramic views, from all seven stories. Medium sensitivity to visual change.

VSR Name	VSR Type	Impacted User Group	General Information/Visual Sensitivity
Multi-use trail along Russell Branch Parkway	High-use public resource	Recreational users/local residents	Multi-use trail that links the residential area on Kincora Drive south to Gloucester Parkway. Trail also provides access to existing and future Kincora trails and development. High sensitivity to visual change.

To illustrate the potential change from the installation of the three routes alternatives, five individual visual simulations were prepared from four different viewpoint locations (see Appendix E). Simulation one is located along Century Boulevard, simulation two is located at the north entrance to the Lerner office building, simulation three is along Russell Branch Parkway, and simulations four and five are along Gloucester Parkway.

3.4 Cultural Resources

Dutton + Associates, LLC (D+A) conducted an analysis of potential cultural resource impacts for the route alternatives under consideration in accordance with the VDHR January 2008 *Guidelines for Assessing Impacts of Proposed Electric Transmission Lines and Associated Facilities on Historic Resources in the Commonwealth of Virginia* (VDHR, 2008) (herein referred to as "VDHR Guidelines") and the *Commonwealth of Virginia State Corporation Commission Division of Public Utility Regulation Guidelines for Transmission Line Applications Filed Under Title 56 of the Code of Virginia* (SCC, 2017). For the pre-application analysis of cultural resources, D+A considered National Historic Landmark (NHL) properties located within a 1.5 mile radius of the centerline; National Register of Historic Places (NRHP)-listed properties, NHLs, battlefields, and historic landscapes within a 1-mile radius of the centerline; NRHP eligible and listed properties, NHLs, battlefields, and historic landscapes within a 0.5 mile radius of the centerline; and all of the above qualifying architectural resources as well as archaeological sites located within the right-of-way for each route alternative. Information on the resources in each tier was collected from the VCRIS (VDHR, 2020). D+A also collected information on battlefields surveyed and assessed by the National Park Service's American Battlefield Protection Program (ABPP) (National Park Service, 2009). In its focus on nationally significant Civil War battlefields, the ABPP identifies the historic extent of the battle (study area), the areas of fighting on the battlefield (core area located within the study area), and potential NRHP boundaries. Mapping of those ABPP boundaries in the form of ArcGIS shape files was reviewed as part of the analysis of potential cultural resource impacts. In addition to those resources, Dominion Energy Virginia is considering potential effects on VDHR easements.

Three resources are currently under consideration per the VDHR tiers as described above. These include one historic resource, the Broad Run Bridge and Toll House 053-0110, an NRHP-listed resource located approximately 0.57 mile from the routes. The other resources are two archaeological sites (44LD0107 and 44LD0727, both of which are recommended ineligible for inclusion on the NRHP by the VDHR) intersect the rights-of-way of the three routes.

Many cultural resources in the vicinity of the Project have not been assessed for NRHP eligibility and therefore are not included in the pre-application analysis, per VDHR Guidelines. Until they have been assessed and a determination made by VDHR, they should be considered potentially eligible for listing in the NRHP. Likewise, there may be as-yet unreported historic and archaeological resources that may ultimately be affected by the proposed undertaking. Any such resources will be addressed during the full cultural resource survey to be conducted following SCC approval of a Project route.

Along with the records review carried out for the four tiers defined by VDHR, D+A conducted field assessments of resource 053-0110 to characterize the nature of potential viewshed impacts that would result from each route alternative in accordance with the VDHR Guidelines. Digital photographs of the resource and views toward the alternative transmission line routes were taken.

The *Stage I Pre-Application Analysis of Cultural Resources* report prepared by D+A is provided in Appendix F.

3.4.1 Archaeological Sites

Crossings of archaeological sites were considered a constraint in this study due to the potential for an electric transmission line to impact archaeological deposits in these areas (for example, due to transmission structure placement, tree clearing or heavy equipment usage within a site). There are two known archaeological sites within or adjacent to the rights-of-way of the three route alternatives, neither of which are recommended eligible for inclusion on the NRHP (Table 3.4.1-1).

Table 3.4.1-1: Archaeological Sites Considered in or Adjacent to Rights-of-Way for Routes 1A, 1B, and 1C

Location	Site Number	Description	NRHP Status
Routes 1A, 1B, and 1C	44LD0107	Unknown Prehistoric, Woodland (1200 B.C.-1606 A.D.)	DHR Staff Not Eligible
Routes 1A, 1B, and 1C	44DL0727	Unknown Prehistoric, (15000 B.C. -1606 A.D.)	DHR Staff Not Eligible

3.4.2 Historic Resources and Architectural Sites

According to VDHR's tiered study area model, each route alternative under consideration has the potential to affect one architectural resource. Table 3.4.2-1 lists the considered resources for each tier. Note that no ABPP study area, core area, or potential NRHP boundaries for battlefields are within the relevant tiers for the route alternatives.

The considered resource that lies within the VDHR tiers is the same for all three routes and is presented in Table 3.4.2-1. It was subjected to field reconnaissance and a preliminary assessment of effects. The results of that assessment are summarized in Section 4.4.

Table 3.4.2-2: Historic Resources in VDHR Tiers for Routes 1A, 1B, and 1C

Buffer (miles)	Considered Resources	Resource Number	Description
1.0 to 1.5	National Historic Landmarks	N/A	N/A
0.5 to 1.0	NRHP Properties (Listed)	053-0110	Broad Run Bridge and Toll House
0.0 to 0.5	NRHP Properties (Listed)	N/A	N/A
	NRHP–eligible	N/A	N/A
0.0 (within right-of-way)	NRHP Properties (Listed)	N/A	N/A
	NRHP–eligible	N/A	N/A

N/A = not applicable

3.4.3 Summary of Existing Survey Data Performed Under Section 106 or Section 110 of the National Historic Preservation Act

Some portions of the alternative transmission line routes have been subject to previous cultural resource survey coverage. Research indicates that 17 prior Phase I cultural resource surveys have been conducted within 1 mile of the Project study area, including 3 that overlap portions of the Project area or individual route alternatives. Because much of each route alternative is concurrent with the others, these surveys include portions of all three routes. The previous surveys relevant to Routes 1A, 1B, and 1C are in Table 3.4.3-1. The majority of the surveys were for transportation-related projects and private development tracts.

Table 3.4.3-3: Cultural Resource Surveys Covering Portions of Routes 1A, 1B, and 1C

VDHR Survey #	Title	Author	Date
FX-108	Cultural Resource Inventory and Phase I Archaeological Survey of Route 28 (Sully Rd.) from I-66 to Route 7, Fairfax and Loudoun Counties, Virginia	Presnell Associates, Inc.	1987
LD-141	Phase I Cultural Resources Inventory of 218 Acres of the 352 Loudoun County Sanitation Authority Tract, Loudoun County, Virginia	Archaeological & Cultural Solutions, Inc.	2001
LD-230	A Phase I Investigation of the Circa 420 Acre A.S. Ray Property Along Broad Run, Loudoun County Virginia	Thunderbird Archaeological Associates (Thunderbird Research Corp.)	2001

3.5 Geological Constraints

The Project area is located within the Piedmont geologic province, which is characterized by strongly weathered bedrock due to the humid climate, thick soils overlying saprolite (weathered bedrock), and rolling topography that becomes more rugged to the west near the Blue Ridge mountains. In general, the Piedmont province consists of several complex geologic terranes where faults separate rock units with differing igneous and metamorphic histories. Based on review of the Geologic Map of Virginia, the Project area is located within a basin that formed as the Atlantic Ocean began opening during the early Mesozoic Era. Within this Mesozoic-age basin, the bedrock underlying the Project area comprises Triassic-age sandstones, shales, and siltstones that were deposited between approximately 225 and 190 million years ago and were subsequently intruded by fine-grained, dark-colored igneous dikes (William and Mary Department of Geology, 2021).

3.5.1 Mineral Resources

ERM reviewed publicly available Virginia Department of Energy (2021) and USGS Mineral Resources Data System (1996) datasets, USGS topographic quadrangles, and recent (2021) digital aerial photographs to identify mineral resources in the Project area. Based on the review, no active mineral resources were identified within 0.25 mile of the Project. The closest active quarry is located approximately 3.2 miles south-southeast of the BECO Substation at the intersection of Route 606 and Route 636 near Herndon. The closest mineral occurrence is a copper mineralization located in a road outcrop on the northeast corner of Route 28 and Route 625, approximately 1.3 miles south of the BECO Substation.

3.6 Existing and Planned Corridors within the Project Area

ERM identified existing and planned corridors within the Project area through review of recent (2021) digital aerial photography, the Loudoun County 2019 General Plan (Loudoun County, 2019a), the Loudoun County *2019 Countywide Transportation Plan* (Loudoun County, 2019b), meetings with Loudoun County Department of Transportation and Capital Infrastructure, and various publicly available data layers. Existing corridors within the study area that were identified consist of existing electric transmission and pipeline facilities, electric distribution lines, utility easements, and major road corridors. These existing corridors are described below. The existing corridors were identified for the purpose of assessing their potential use as routing or collocation opportunities. These existing corridors are described below.

3.6.1 Electric Transmission Corridors

Existing electrical transmission or distribution facilities are found within the Project area, but none that are suitable for collocation purposes. Rather, the double circuit 230 kV line loop would tap into an existing 230 kV transmission line within the study area in order to connect with the DTC Substation. Figures 2.0-1 and 2.0-2 in Appendix A show the locations of the existing transmission corridors in relation to the route alternatives.

3.6.2 Pipeline Corridors

Loudoun Water and DC Water maintain sewer and water pipeline easements throughout the study area. These easements vary in width from 10 to 65 feet. Dominion was able to utilize collocation opportunities with Loudoun Water lines that run from northwest of the BECO Substation north across the Loudoun Water Ashburn Campus property. The transmission line is not allowed to overlap with the Loudoun Water easement; therefore, the transmission line rights-of-way being considered are immediately adjacent to the easements. In areas where the route alternatives would cross a Loudoun Water or DC Water easement, no towers would be placed within the easement.

3.6.3 Major Road Corridors

Major road corridors within the study area include Loudoun County Parkway, Sully Road, Gloucester Parkway, Russell Branch Parkway, Nokes Boulevard, Route 7, and Atlantic Boulevard. However, due to significant commercial and industrial development in the Project area and VDOT requirements of perpendicular road crossings, using these corridors as a collocation opportunity was not feasible in most locations. As discussed in Section 3.1.8, each of the route alternatives would parallel portions of Russell Branch Parkway and Sully Road.

4. RESOURCES AFFECTED

Environmental conditions along each of the route alternatives were identified, mapped, and reviewed, as discussed in Section 3. Refer to Table 3-1 for a list of environmental features considered during the evaluation process. To further evaluate and consider the environmental advantages and disadvantages of each route alternative, the environmental features potentially affected by these route alternatives were quantified for comparison purposes. A quantified environmental features comparison table for the five routes considered is presented in Table 4-1. Impacts associated with construction and operation of the 6.2-acre substation are included when discussing existing environmental conditions and resources affected for each route. The locations of all route alternatives are described in Section 2.4. A discussion and comparison of each route's environmental advantages and disadvantages is presented below.

Table 4-1: Feature Crossing Table

Environmental Feature [a, b]	Unit	Route 1A	Route 1B	Route 1C
Route				
Centerline Length	miles	1.3065	1.3065	1.2997
New Right-of-Way Area [c]	acres	21.24	21.24	21.15
Land Use Features / Constraints				
Existing Road Crossings	number	4	4	4
Planned Road Crossings	number	0	0	0
Parcels Crossed by Right-of-Way (total)	number	5	6	6
Private	number	5	6	6
Loudoun County Open-Space Easement Crossed	acres	4.17	4.17	4.17
Planned Developments Crossed	number	2	2	2
Zoning				
Planned Development-Office Park (PDOP)	miles	0.18	0.24	0.27
Planned Development-Industrial Park (PDIP)	miles	0.74	0.68	0.64
Planned Development-Mixed Use Business (PDMUB)	miles	0.39	0.39	0.39
Dwellings Within 500 Feet of Centerline	number	0	0	0
Dwellings Within 250 Feet of Centerline	number	0	0	0
Dwellings Within 100 Feet of Centerline	number	0	0	0
Dwellings Within Right-of-Way	number	0	0	0
Commercial Buildings Within Right-of-Way	number	0	0	0
Existing Land Use/Land Cover				
Forest	acres	14.22	14.18	14.08
Developed	acres	1.15	1.33	1.49
Open Space	acres	5.54	5.40	5.26
Open Water	acres	0.32	0.32	0.32
Environmental Features				
Waterbody Crossings [d]	number	4	4	4

Environmental Feature [a, b]	Unit	Route 1A	Route 1B	Route 1C
Perennial	number	2	2	2
Intermittent	number	2	2	2
Wetlands Crossed by Right-of-Way Total [d]	miles (acres)	0.25 2.96	0.25 2.96	0.25 2.96
Palustrine Forested (PFO) Wetlands	acres	2.02	2.02	2.02
Palustrine Emergent (PEM) Wetlands	acres	0.57	0.57	0.57
Riverine Wetlands	acres	0.37	0.37	0.37
Forested Land Crossed	acres	14.22	14.18	14.08
Areas of Ecological Significance Crossed (SCUs)	number	0	0	0
Bald Eagle Nests Within 330 Feet (Center for Biology, 2021 data)	number	0	0	0
Bald Eagle Nests Within 660 Feet (Center for Conservation Biology, 2021 data)	number	0	0	0
Cultural Resources Constraints				
Archaeology (VDHR)				
Archaeological Sites Within Right-of-Way	number	2	2	2
Architectural Resources (VDHR)				
Architectural Resources Within Right-of-Way (Battlefields listed below)	number	0	0	0
NRHP-Eligible and NRHP-Listed Properties, Battlefields, Historic Landscapes, and National Historic Landmarks within 0.5 mile	number	0	0	0
NRHP-Listed Properties, Battlefields, Historic Landscapes, and National Historic Landmarks between 0.5 and 1.0 mile	number	1	1	1
National Historic Landmarks between 1.0 and 1.5 miles	number	0	0	0
Historic Districts (VDHR) Crossed	miles	0.00	0.00	0.00
NRHP-Listed Battlefield (VDHR) Crossed	number	0	0	0
NRHP-Eligible Battlefield (VDHR) Crossed	number	0	0	0
Easements (VDHR) Crossed	number	0	0	0
Battlefields (National Park Service ABPP)	number	0	0	0
Collocation Opportunities				
Total Collocation	miles	0.93	0.93	0.92
Loudoun Water Lines	miles	0.59	0.59	0.59
Roads	miles	0.25	0.25	0.24
Loudoun Water Lines and Roads	miles	0.09	0.09	0.09

[a] The sum of the addends may not equal the totals due to rounding.

[b] The crossing lengths presented in this table for all feature categories are based on hypothetical centerlines within the right-of-way for each route alternative.

[c] Each route would require new right-of-way easements for its entire length. This number represents the total right-of-way required for each route and includes 6.21 acres required for the proposed DTC Substation

[d] *Based on results of the desktop waterbody and wetlands study (see Appendix D).*

4.1 Land Use

4.1.1 Land Ownership/Land Use

4.1.1.1 Route 1A

Route 1A crosses a total of 1.31 miles of land affecting 21.24 acres of right-of-way (including 6.21 acres for the proposed substation). All five parcels crossed are privately owned. Land use along the Route 1A right-of-way consists of 14.22 acres of forested land, 5.54 acres of open space, 1.15 acres of developed land, and 0.32 acre of open water. The majority (0.59 mile) of privately owned land crossed by Route 1A is owned by Kincora. Dominion has consulted with these landowners regarding the routes across their property. Potential impacts associated with the route with regards to planned developments and easements on Kincora property are discussed in Sections 4.1.3 and 4.1.4.

4.1.1.2 Route 1B

Route 1B crosses a total of 1.31 miles of land affecting 21.24 acres of right-of-way (including 6.21 acres for the proposed substation). All six parcels crossed are privately owned. Land use along the Route 1B right-of-way consists of 14.18 acres of forested land, 5.50 acres of open space, 1.33 acres of developed land, and 0.32 acre of open water. The majority (0.54 mile) of privately owned land crossed by Route 1B is owned by Kincora. Dominion has consulted with these landowners regarding the routes across their property. Potential impacts associated with the route with regards to planned developments and easements on Kincora property are discussed in Sections 4.1.3 and 4.1.4. Route 1B also crosses approximately 0.05 mile of land owned by Lerner associated with their 21000 Atlantic Boulevard office building. Potential impacts associated with the route with regards to existing development on Lerner property are discussed in Section 4.1.3.

4.1.1.3 Route 1C

Route 1C crosses a total of 1.30 miles of land affecting 21.15 acres of right-of-way (including 6.21 acres for the proposed substation). All six parcels crossed are privately owned. Land use along the Route 1C right-of-way consists of 14.08 acres of forested land, 5.26 acres of open space, 1.49 acres of developed land, and 0.32 acre of open water. The majority (0.50 mile) of privately owned land crossed by Route 1C is owned by Kincora. Dominion has consulted with these landowners regarding the route across their property. Potential impacts associated with the route with regards to planned developments and easements on Kincora property are discussed in Sections 4.1.3 and 4.1.4. Route 1C also crosses approximately 0.1 mile of land owned by Lerner associated with their 21000 Atlantic Boulevard office building. Potential impacts associated with the route with regards to existing development on Lerner property are discussed in Section 4.1.3.

4.1.2 Recreational Use

No existing recreation areas would be impacted by any of the route alternatives. The three routes are all routed along a common alignment in the vicinity of recreation areas and potential impacts would be the same for all routes. As discussed in Section 3.1.2, a new church, private school, and recreational facilities have been proposed (Temple Baptist Church of Herndon). Final site plans for the school and recreation area have not been approved by the county. At this time the facilities would include a baseball field with lights and a natural surface soccer field with lights. None of the routes would cross areas associated with this planned recreation area. As site plans have not been finalized, it is unknown if the routes would be

visible from the planned recreation area. However, given the existing tree cover in this area, it is not anticipated that the route would be visible from the planned recreation area.

As discussed above, the developer will be providing an updated trail system on their property along Broad Run. These trails are part of the developer's proffers with the county for their planned development. The location and design of these planned trails have not been finalized; however, it is anticipated that the routes would all cross one or more locations of a proposed trail. Transmission lines are often collocated with or traverse across trail systems, and Dominion will coordinate with Kincora and the county to minimize visual impacts in these areas as trail planning continues.

4.1.3 Existing and Planned Development

4.1.3.1 Kincora Village Center—Parcel #041194573

All three routes cross Kincora Village Center—Parcel #041194573 along the same alignment and potential impacts would be the same for all routes. Based on the most recently filed plans with the county for this parcel, the three routes would not cross any areas slated for development. Impacts on this parcel would be in areas plotted as riparian preservation areas, riparian reforestation areas, wetland mitigation areas, and open-space easements. A discussion of impacts on these areas is provided in Section 4.1.4.

4.1.3.2 Kincora Village Center—Parcel #041398662

While development plans for this parcel have not been filed with Loudoun County, Dominion has had conversations with the developer who has indicated that the parcel is slated for data center development. Route 1A crosses the longest distance on this parcel (0.22 mile) and consequently would have the greatest impact on the data center, followed by Route 1B (0.17 mile), and Route 1C, which crosses the shortest distance (0.12 mile).

Based on preliminary development plans, both Routes 1A and 1B cross portions of the parcel slated for placement of generators associated with the data center. The placement of such generators under a transmission line are not permissible for safety reasons and also would conflict with the maintenance of the transmission line. Therefore, for Routes 1A and 1B to be built, the data center developer would need to reduce the size of the planned development to allow space for the transmission line right-of-way and relocate the generators elsewhere on the property. The developer purchased this parcel in August of 2021 with the intention of being able to develop the entirety of the parcel and has indicated that the placement of a transmission line in the location of Routes 1A and 1B would render their development plan non-viable.

Route 1C also crosses a portion of this data center parcel; however, the crossing is in an area of greenspace and access roads. Route 1C does not overlap with any areas slated for data centers, generators, or other conflicting uses. Route 1C has been routed to avoid a traffic signal easement associated with the Kincora Village Center. This VDOT traffic signal easement was created based on a prior proffered usage of the land which at the time was designated for mixed use development. If VDOT agrees to vacate the easement based on a different development on the land, Dominion would seek the flexibility of modifying the alignment in this area to shift the route up to 100 feet to the south to further reduce impacts of the transmission line on any planned development in this area.

4.1.3.3 Loudoun Water Ashburn Campus Capital Improvement Plan

All three routes cross Loudoun Water property along the same alignment, and potential impacts would be the same for all routes. Dominion has been coordinating with Loudoun Water to minimize impacts on their property. The routes do not cross portions of Loudoun Water property that have been identified for future development in their Master Plan. Loudoun Water did express concern regarding potential interference

the transmission line could have on an AM radio station located on their property. The radio station and three associated radio towers are about 0.6 mile from the route alternatives at their nearest point. Dominion is in the process of having a study completed to determine if any radio frequency interference would occur from the Project and will continue to coordinate with Loudoun Water.

4.1.3.4 Lerner—21000 Atlantic Boulevard

21000 Atlantic Boulevard is an existing development and Lerner has no current plans for expansion. Routes 1B and 1C both cross portions of the parking lot and vegetative strip located between the development and Sully Road. While no transmission structures would be located within the parking lot, light posts in the parking lot within the right-of-way would likely need to be relocated. Cars would still be able to park within the right-of-way. As the transmission line would not conflict with the existing use of the land, impacts associated with this crossing are limited to visual impacts, which are discussed in Section 4.3.

4.1.3.5 Temple Baptist Church, School, and Park

As discussed in Section 3.1.4.5, Temple Baptist Church of Herndon is a contract purchaser of 12.65 acres of property in the Kincora development area. Development plans include a church/school building, parking areas, and recreational areas (baseball and soccer fields). None of the route alternatives would cross areas associated with this planned development and it is not anticipated that the transmission line would be visible from this development.

4.1.3.6 Wawa

As discussed above in Section 3.1.4.6, Loudoun County supervisors approved a plan for a Wawa convenience store located on Russell Branch Parkway at the southern entrance to the proposed Kincora development near the Gloucester Parkway extension. The site will have frontage on Route 28, Gloucester Parkway, and Russell Branch Parkway. According to the company's website, the store is on track for a Fall/Winter 2021 opening. None of the route alternative would cross areas associated with this planned development and it is not anticipated that the transmission line would be visible from this development.

4.1.4 Conservation Lands

4.1.4.1 Kincora Planned Development Easements and Proffers

As discussed in Section 3.1.6, Kincora Village Center Parcel #041194573 has several different easements on it as well as multiple proffers stated in its proffers document. The three routes cross this parcel along the same alignment and impacts would be the same for all routes.

Open-Space Easement (BOS): The open-space easement is crossed by all routes in the same three locations for a total crossing length of 0.35 mile. The first crossing (0.17 mile) occurs where the routes tap off existing Line #2143 north of the BECO Substation and cross Gloucester Parkway. The second crossing (0.15 mile) of the easement occurs between the north side of Gloucester Parkway until the routes cross Broad Run. The easement is crossed for a third time (0.03 mile), where the routes turn east and cross Broad Run for a second time.

In order to maximize collocation opportunities and minimize the creation of a new corridor across the easement, the majority of the alignment across the easement was collocated with the existing Loudoun Water right-of-way. Dominion has been coordinating with Loudoun County regarding the crossing of this easement. At the November 10, 2021 Loudoun County BOS public hearing, the BOS approved conveyance of approximately 6.85 acres of easements to Dominion required for the Project. The conveyance of this easement has not yet occurred, but will occur prior to construction of the Project. .

Floodplain Easement: The three routes cross the floodplain easement along the same alignment for approximately 850 feet while collocated with the existing Loudoun Water lines. At the November 10, 2021 Loudoun County BOS public hearing, the BOS approved conveyance of approximately 6.85 acres of conservation easements (which includes some areas of floodplain easement). The conveyance of this easement has not yet occurred, but will occur prior to construction of the Project. It is anticipated that up to two new structures would need to be located within the area currently identified as floodplain easement. The foundations would be considered permanent fill, removing this area from flood capacity; however, the foundations would likely not impede the natural drainage of the area. BMPs would be installed to route water to acceptable areas and prevent silt laden water from easily flowing from the construction areas.

Preservation Easement: In areas crossed by the routes, the preservation easement occupies the same footprint as the above mentioned open-space easement. Impacts on the preservation easement would be the same as outlined in the above review of the open-space easement. It is anticipated that there would be some wetland and waterbody impacts on the easement. This would require Dominion to submit the proposed impacts on the USACE through a PCN for a NWP. Should the need for compensatory mitigation be required due to the impacts, Dominion would coordinate with the USACE and local mitigation banks to acquire the required mitigation credits. Work on the Project would not commence until a permit is received from the USACE.

Kincora Proffers: As part of the development plan that was reviewed by the county, Kincora has developed a proffers statement that outlines how the development proposes to enrich the use of the area for the residences of the county. Several of the statements referenced in the proffers document may have a bearing on the Project. Below is a review of the impacts the route alternatives may have on these proffers. Dominion will work with Kincora to determine if additional mitigation is needed based on the Project impacts.

- Wetland and stream mitigation, riparian preservation and reforestation, and wetland mitigation banks: The route alternatives all cross mitigation areas (0.11 acre of wetland mitigation area, 2.53 acres of riparian reforestation areas, and 0.88 acre of riparian preservation area). Impacts on these areas would include tree removal, which would result in temporary impacts on waterbodies and both temporary and permanent impacts on wetlands. In those locations where tree removal would be required in wetland areas, the wetland would not be allowed to regrow to a forested wetland and instead would be converted to a scrub shrub wetland. Removal of trees in riparian preservation and reforestation areas would result in a loss of function in those areas, likely resulting in the need to acquire additional compensatory mitigation in areas outlined in the proffers. Dominion will work with Kincora, and the relevant state and federal agencies, to determine if compensatory mitigation is required for the crossings of these resources.
- River and Streams Corridor Resources Area: These areas exist along the floodplain for Broad Run. Impacts on these areas would include tree removal and temporary access during construction. Grading of the right-of-way in these areas would likely not be required and tree stumps would be left in place to reduce erosion. Revegetation of the area would begin as soon as construction is complete. Underbrush that would not grow above 10 feet tall would be allowed to reestablish in the right-of-way. Given these areas would be disturbed from their natural state, replanting as outlined in the proffer would be required. Dominion will coordinate with Kincora on best locations for replanting.
- Conveyance of 162 acres of River and Stream Corridor Resource Area to the County: Typically, it takes multiple years for wetland and stream mitigation banks to be developed and restored to state and federal standard, thus it is not likely that this conveyance to the county will take place prior to construction of the Project. However, if the mitigation areas were completed before a transmission

line easement across the property was in place, Dominion would coordinate with the county on the proposed crossing.

4.1.5 Transportation

All three routes cross the same four roads: Gloucester Parkway, Russell Branch Parkway, Sully Road, and Century Boulevard. All road crossings would be spanned. There are no planned road projects in the Project vicinity.

Temporary closures of roads and or traffic lanes would be required during Project construction. No long-term impacts on roads are anticipated. The Company will comply with VDOT requirements for access to the rights-of-way from public roads as well as the underground crossings of the roads. At the appropriate time, the Company will obtain the necessary VDOT permits as required and comply with permit conditions.

4.1.6 Airports

Dominion reviewed the height limitation associated with FAA-defined imaginary surveys for all runways associated with the Dulles Airport, and all other public or private registered airfields to determine whether any of the tower heights associated with each specific tower location would penetrate any of the relevant flight surfaces for any of the runways. Dominion conducted a preliminary evaluation of the tower heights and locations using the FAA-defined Civil and Department of Defense Airport Imaginary Surfaces and applying standard GIS tools, including ESRI's ArcMap 3D and Spatial Extension software. This software was used to create and geo-reference the imaginary surfaces in space and in relationship to the transmission towers.

Dulles Airport was the only airport/heliport that had the potential to impact the height limitations of the Project towers. The ground surface data for the Project area was derived by using USGS 10 Meter Digital Elevation Model. Civil airport imaginary surfaces have been established by the FAA with relation to each airport and to each runway. The imaginary surfaces were developed to prevent existing or proposed objects from extending from the ground into navigable airspace. The civil Airport Imaginary Surfaces evaluated for the Project include:

- **Horizontal surface at 463 feet above mean sea level (AMSL):** A horizontal plane 150 feet above the established airport elevation of 313 feet AMSL, the perimeter of which is constructed by swinging arcs of radius 10,000 feet from the center of each end of the primary surface of each runway and connecting the adjacent arcs by lines tangent to those arcs.
- **Conical surface**: A surface extending outward and upward from the periphery of the horizontal surface at a slope of 20 to 1 for a horizontal distance of 4,000 feet. The conical surfaces for this airport have an elevation that extends from 313 feet to 513 feet AMSL.
- **Primary surface**: A surface longitudinally centered on the runway. The primary surface extends 200 feet beyond each end of the runway. The elevation of any point on the primary surface is the same as the elevation of the nearest point on the runway centerline (313 feet AMSL). The width of the primary surface is 1,000 feet.
- **Approach surface**: A surface longitudinally centered on the extended runway centerline and extending outward and upward from the end of each primary surface. The inner edge of the approach surface is the same width as the primary surface, and it expands uniformly to a width of 16,000 feet. The approach surfaces extend for a horizontal distance of 10,000 feet at a slope of 50 to 1 with an additional 40,000 feet at a slope of 40 to 1.

- **Transitional surface**: These surfaces extend outward and upward at right angles to the runway centerline and the runway centerline extended at a slope of 7 to 1 from the sides of the primary surface and from the sides of the approach surfaces.

The Project would be within approximately 3.8 miles of Runway 19C of the Dulles Airport. The airport surveyed ground elevation is 313 AMSL. The ground elevation in the Project vicinity ranges from 215 AMSL on the southern end of the Project to 300 AMSL at the northern end. The Project is located approximately 25,000 feet north of the end of Runway 19L. Based on the ground elevation at the Project area and the distance from the end of the nearest runway, there would be no potential for impacts on any of the imaginary surfaces or TERPS imaginary surfaces associated with the Dulles Airport. Structures associated with the Project would range from 90 to 120 feet in height. Dominion does not propose to place structures below any of these surfaces, thus no impacts on the Dulles Airport is anticipated.

Since the FAA manages air traffic in the United States, it will evaluate any physical objects that may affect the safety of aeronautical operations through an obstruction evaluation. If required during the permitting process, Dominion will submit an FAA Form 7460-1 Notice pursuant to 14 CFR Part 77, for any tower locations that meet the review criteria.

4.1.7 Environmental Justice

The Project study area extends far beyond areas where Project impacts are anticipated and this analysis focuses on the CBGs that are crossed by the Project. No CBGs with low-income communities alone, or combined minority and low-income communities that exceed the state average are crossed by Routes 1A, 1B, or 1C. The Project crosses one CBG with minority populations and one CBG with a percentage of elderly persons that exceeds the state average by more than 20 percent.

In assessing whether a community with a CBG that is crossed by the routes would bear a disproportionate impact of the negative environmental and health related effects of the Project, ERM considered temporary construction impacts, visual impacts, property devaluation, and electric and magnetic fields.

Construction activities would be temporary and are expected to have minimal impact on area residents due to the distance between residences and the rights-of-way for Routes 1A, 1B, and 1C. The nearest residential communities in the CBG crossed by the three routes with an identified EJ population is about 0.5 mile or more from the Project and no residences are located within 500-feet of the routes (see Section 3.1.3).

During operation, the long-term presence of new structures along overhead Routes 1A, 1B, or 1C, are not expected to result in disproportionately high and adverse impacts on EJ populations because they cross developed areas and commercial/industrial land rather than visually sensitive areas, and are located at least 0.5 mile away from the nearest residential communities in a CBG with an identified EJ population. Additionally, the nearest elderly population is almost 1 mile from the routes.

Indirect impacts on property value caused by direct visual impacts of high-voltage transmission lines (i.e., lines carrying more than 69 kV) depend on proximity, visibility, size and type of transmission structures, easement landscaping, and surrounding topography. Based on a review of peer-reviewed and industry research published in peer-reviewed journals and trade journals, residential property values and sales prices are primarily affected by factors unrelated to the presence of a transmission line. Other factors, such as location, type and condition of improvements to the property, neighborhood, and local real estate market conditions, are shown through research to have greater influence on the value of residential property than the presence of a transmission line (Jackson and Pitts 2010; Anderson et al. 2017). Because the Project crosses developed areas and commercial/industrial land, and no residential

dwellings are close proximity to the route alternatives, the Project is unlikely to result in property devaluation.

Scientific evidence does not indicate that any adverse health effects are caused by sources of electric and magnetic fields in the environment, including transmission lines and other parts of the electric system, appliances within household, etc. As such, the impacts of constructing and operating any of the route alternatives on the natural and human environments are not anticipated to be significant.

The desktop review suggests that an EJ population would not bear disproportionate impacts related to negative environmental and health related effects of the Project regardless of which route alternative is selected. Should outreach reveal that there are EJ community concerns or language translation needs in the Project area, Dominion will develop additional communications or outreach that is designed to proactively engage any EJ communities, to invite their participation in review of the Project and to provide feedback so their views can be considered by Dominion.

4.2 Natural Resources

4.2.1 Wetlands

To minimize impacts on wetland areas, the transmission line has been designed to span or avoid wetlands where possible. Most of the wetlands in the area are associated with streams and rivers, and it is anticipated that these features can be spanned keeping tower locations outside of wetlands. Where the removal of trees or shrubby vegetation occurs within wetlands, Dominion Energy Virginia would use the least intrusive method reasonably possible to clear the corridor. Hand-cutting of vegetation would be conducted, where needed, to avoid and minimize impacts on streams and/or wetlands. There would be no change in contours or redirection of the flow of water, and the amount of spoilage from foundations and structure placement would be minimal. Excess soil in wetlands generated through foundation construction would be removed from the wetland.

Mats would be used for construction equipment to travel over wetlands, as appropriate. Due to the absence of an existing right-of-way, some new temporary access roads may be necessary along the route. If a section of line cannot be accessed from existing roads, Dominion Energy Virginia may need to install a culvert, ford, or temporary bridge along the right-of-way to cross small streams. In such cases, some temporary fill material in wetlands adjacent to such crossings may be required. This fill would be placed on erosion control fabric and removed when work is completed, returning ground elevations to original contours. Potential direct impacts on wetlands would be temporary in nature, but a reduction in wetland functions and values would occur where tree clearing within wetlands is necessary.

Upon SCC approval of a route and final line engineering, Dominion Energy Virginia will obtain the appropriate permits from the USACE and VDEQ for work within wetlands and waterbodies to ensure full compliance with Section 404 and 401 of the CWA and to minimize potential impacts on aquatic resources located within the transmission line corridor.

4.2.1.1 Route 1A

Based on ERM's desktop wetland and waterbody analysis, Route 1A is approximately 1.31 miles and encompasses a total of approximately 15.03 acres of right-of-way and 6.21 acres of substation, for a total of 21.42 acres. Based on the methodology discussed in Appendix D, the right-of-way and substation would encompass approximately 13.82 percent (2.96 acres) of land with a medium/high or higher probability of containing wetlands and waterbodies. Of these 2.96 acres, 0.57 acre consist of PEM wetlands, 2.02 acres of PFO wetlands, and 0.37 acre of riverine wetlands.

4.2.1.2 Route 1B

Based on ERM's desktop wetland and waterbody analysis, Route 1B is approximately 1.31 mile and encompasses a total of approximately 15.03 acres of right-of-way and 6.21 acres of substation, for a total of 21.42 acres. Based on the methodology discussed in Appendix D, the right-of-way would encompass approximately 13.82 percent (2.96 acres) of land with a medium/high or higher probability of containing wetlands and waterbodies. Of these 2.96 acres, 0.57 acre consist of PEM wetlands, 2.02 acre of PFO wetlands, and 0.37 acre of riverine wetlands.

4.2.1.3 Route 1C

Based on ERM's desktop wetland and waterbody analysis, Route 1C is approximately 1.30 mile and encompasses a total of approximately 14.95 acres of right-of-way and 6.21 acres of substation, for a total of 21.15 acres. Based on the methodology discussed in Appendix D, the right-of-way would encompass approximately 14.00 percent (2.96 acres) of land with a medium/high or higher probability of containing wetlands and waterbodies. Of these 2.96 acres, 0.57 acre consist of PEM wetlands, 2.02 acre of PFO wetlands, and 0.37 acre of riverine wetlands.

4.2.2 Waterbodies

Short-term, minor water quality impacts could occur during the construction of any of the route alternatives. Such impacts would be associated with the soils from disturbed areas being transported by storm water into adjacent waters during rain events. Increased turbidity and localized sedimentation of the stream bottom may occur as a result of the runoff. However, these impacts would be significantly reduced by the implementation of Dominion Energy Virginia's erosion control measures, including the installation of erosion control structures and materials.

Waterways crossed by the Project would be maintained for proper drainage through the use of culverts or other crossing devices, according to Dominion Energy Virginia's standard policies. Where clearing of trees and/or woody shrubs is required, clearing within 100 feet of a stream would be conducted by hand. Vegetation would be at or slightly above ground level, and there would be no grubbing of stumps. Dominion Energy Virginia would use sediment barriers along waterways and steep slopes during construction to protect waterways from soil erosion and sedimentation. If a section of line cannot be accessed from existing roads, Dominion Energy Virginia may need to install a culvert or temporary bridge to cross small streams. In such case, there may be some temporary fill material required that would be placed on erosion control fabric and removed when work is completed, returning the surface to original contours.

Routes 1A, 1B, and 1C all cross three waterbodies having perennial to intermittent flow. The crossings for all route alternatives total approximately 0.36 acre in size. One of these waterbodies is Broad Run, which would be crossed twice, and the other two are unnamed tributaries to Broad Run.

4.2.3 Areas of Ecological Significance

According to the Project review completed by the VDCR on October 15, 2021, the alternative transmission line routes within the Project area would not affect Conservation Sites, SCUs, General Location Areas for Natural Heritage Resources, or State Natural Area Preserves. The VDCR identified one Ecological Core (Core ID 31766) within the study area, with an ecological integrity ranking of C5, which is depicted by DCR in association with a forested vegetation community. According to the VDCR, Ecological Cores are ranked from C1 to C5, with C5 being the least ecologically relevant. All of the route alternatives cross the Ecological Core map unit described above (Core ID 31766) in the same location. Tree clearing in the core would be required.

4.2.4 Protected Species

4.2.4.1 Federally and/or State-Listed Species

Three federally listed and 13 state-listed species (which includes the 3 federally listed species) were identified that may potentially occur within the Project area. This includes two federally listed species identified in the IPaC query and one additional federally listed species identified in the VaFWIS query. These species are identified in Table 4.2.4-1, along with potential impacts anticipated to result from the Project. Based on landscape and vegetation within the Project area, each route alternative crosses a variety of potential habitat types. These habitats include forested land, shrub land, grass land, and waterbodies with intermittent and perennial stream flow. Within each of the alternatives routes, these habitat types each could have potential to provide suitable habitat for one or more of the species identified in Table 4.2.4-1.

Of the 13 species identified, only the Wood turtle has been historically documented by state agencies in areas adjacent to or crossed by any of the routes. Dominion will coordinate with state and federal agencies as needed to determine if any surveys, construction-timing windows, or other mitigation would be required for the Project.

Table 4.2.4-1: Federal and State Listed Species Conclusion Table

Common Name	Scientific Name	Species Info/Habitat	Results – Potential Impacts
FEDERALLY LISTED SPECIES			
Mammals			
Northern long-eared bat	*Myotis septentrionalis*	Generally associated with old-growth or late successional interior forests. Partially dead or decaying trees are used for breeding, summer day roosting, and foraging. Hibernation occurs primarily in caves, mines, and tunnels.	Species not confirmed as present, and no known hibernacula or maternity roost trees are documented within the Project area. Project would require clearing of forested areas; however, given lack of confirmed species presence, impacts are not anticipated.
Invertebrates			
Dwarf wedgemussel	*Alasmidonta heterodon*	Deep quick running water on cobble, fine gravel, or on firm silt or sandy bottoms.	Species not confirmed as present and no instream work would be performed. No impacts are anticipated.
Yellow lance	*Elliptio lanceolata*	Main channels of drainages and streams as small as one meter across with clean, coarse, medium-sized sand or gravel substrate.	Species not confirmed as present and no instream work would be performed. No impacts are anticipated.
STATE-LISTED SPECIES			
Mammals			
Little brown bat	*Myotis lucifugus*	Roosts in caves, buildings, rocks, trees, under bridges, and in mines and tunnels. Found in all forested regions of the state.	Species not confirmed as present and no hibernaculum identified within 0.5-mile-radius of the Project. No impacts are anticipated.

Common Name	Scientific Name	Species Info/Habitat	Results – Potential Impacts
Tri-colored bat	*Perimyotis subflavus*	Typically roost in trees near forest edges during summer. Hibernate deep in caves or mines in areas with warm, stable temperatures during winter.	Species not confirmed as present and no hibernaculum identified within 0.5-mile-radius of the Project. No impacts are anticipated.
Invertebrates			
Appalachian grizzled skipper	*Pyrgus Wyandot*	Semi-open slopes with sparse herbaceous vegetation and exposed rock or soil.	VaFWIS Search Report listed as not confirmed. No impacts are anticipated.
Brook floater	*Alasmidonta varicosa*	Creeks and small rivers, found among rocks in gravel substrates and in sandy shoals, flowing-water habitats only.	VaFWIS Search Report listed as not confirmed and no instream work would be performed. No impacts are anticipated.
Green floater	*Lasmigona subviridis*	Small to medium streams in quiet pools and eddies with gravel and sand substrates.	VaFWIS Search Report listed as not confirmed and no instream work would be performed. No impacts are anticipated.
Birds			
Henslow's sparrow	*Ammodramus henslowii*	Open grasslands with few or no woody plants and tall dense grasses and litter layer.	VaFWIS Search Report listed as not confirmed. No impacts are anticipated.
Loggerhead shrike, and migrant Loggerhead shrike	*Lanius ludovicianus* (*Lanius ludovicianus migrans)*	Open country with scattered shrubs and trees or other tall structures for perching.	VaFWIS Search Report listed as not confirmed. No impacts are anticipated.
Peregrine falcon	*Falco peregrinus*	Tall structures, such as powerline poles, buildings, and rock ledges, in generally open landscapes.	VaFWIS Search Report listed as not confirmed. No impacts are anticipated.
Reptiles			
Wood turtle	*Glyptemys insculpta*	Forested floodplains, fields, wet meadows, and farmland with a perennial stream nearby.	Confirmed in VAFWIS Search Report, no instream work would be performed but forested floodplains may be cleared. Coordination with VDWR will be needed to determine if surveys and/or construction timing windows are needed for the Project.

Sources: FWS, 2021; VDCR, 2021a; VDWR, 2021a and 2021b

4.2.4.2 Bald Eagle Management

The study area is not located within an Eagle Concentration Area, and none of the route alternatives are located within the Primary or Secondary Buffers of any documented eagle nest locations. The southern terminus of each route alternative is nearest to the eagle nest (nest code LD 1901); the nest is approximately 8,640 feet (1.64 miles) southwest of the routes and outside the 660-foot management buffer. The nest was last occupied in 2019. If additional eagle nests are identified within 660 feet of the

Project right-of-way, Dominion Energy Virginia will work with the appropriate jurisdictional agencies to minimize any impacts on this species.

4.2.4.3 Federally Listed Species of Concern and Other Documented Occurrences

No federally listed Species of Concern were identified in the FWS IPaC review of the Project area.

4.2.5 Vegetation

ERM reviewed publicly available recent (2021) Loudoun County aerial photography to calculate impacts on vegetation. Herbaceous vegetation could be temporarily affected by construction and vehicular movement. In forested areas, trees would be cleared from the right-of-way during construction and maintained with an herbaceous cover during operations. Disturbed areas resulting from use of temporary workspace would revert back to preconstruction vegetative conditions. As shown in Table 4.2.5-1, the vegetation resource primarily affected by the three routes would be forested land.

Table 4.2.5-2: Vegetation Impacts (acres)

Vegetation Type	Route 1A	Route 1B	Route 1C
Forest	14.22	14.18	14.08
Open Space	5.54	5.40	5.26
Total	**19.76**	**19.58**	**19.34**

4.3 Visual Assessment

The purpose of this visual assessment was to:

- Define the aesthetic components evaluated for each route alternative.
- Inventory and evaluate existing visual sensitive features and user groups within the study area.
- Describe the appearance of the visible components of the Project facility.
- Evaluate potential facility visibility within the study area.
- Identify Key Observation Points (KOPs) for visual assessment.
- Assess the visual impacts associated with the Project facility.
- Determine the need for visual mitigation and propose conceptual mitigation options.

To assess potential visual impact on VSRs associated with each route and the DTC Substation (which would be required regardless of which route is selected), ERM reviewed aerial photographs, online resources, and feedback from affected landowners. Specific user groups considered, as identified in Section 3.3, include local residents/workers, recreationalists, and commuters/through travelers. In addition, 3D visual simulations were prepared for the three routes (1A, 1B, and 1C). Five visual simulations were prepared from four KOPs aimed at capturing potential views that represent associated VSRs and user groups. A field investigation was undertaken on May 24, 2021 to assess possible visual impacts on visually sensitive features and user groups that each alternative introduces.

For each alternative considered, the new rights-of way would result in a visible change due to the introduction of new vegetation clearing and a new transmission line crossing area where clearing, structures, and associated equipment did not previously exist. Although none of the alternatives would be co-located within an existing transmission or distribution line right-of-way, multiple transmission and distribution corridors do exist and crisscross around and adjacent to the study area concentrated at the BECO Substation in the southern portion of the study area. The new transmission corridor would have

possible impacts on users of Sully Road, Russell Branch Parkway, Gloucester Parkway, the identified multi-use trail along Russell Branch Parkway, and the Lerner office building.

As discussed in Section 3.3, Sully Road has the highest number of users traveling along its corridor; however, the landscape is not highly scenic and the most common user group and commuters/through travelers have a low sensitivity to visual change. User groups along Russell Branch Parkway and the adjacent multi-use trail include local residents/workers traveling at low speeds in their cars or by alternative transportation on the multi-use trail. Users of the multi-use trail would have a high sensitivity to change in the landscape based on the type of recreational and static activities that are taking place. The Lerner office building rounds out the VSRs and user groups possibly affected in the study area by highlighting the workers that would experience the landscape from day to day and have a similar sensitivity to the local residents who live in the area. The highway corridors along with the multi-use trail bisect the study area from north to south and are potentially impacted differently by the routes and how the route designs interact and impact the potential user groups and identified VSRs.

4.3.1 KOP Selections

Based on VSR research, the use of aerial photography, and onsite reconnaissance, a total of five KOPs were identified and chosen to be developed into visual simulations. The KOPs were chosen to represent the criteria/conditions below:

- Illustrate visibility from specific VSRs.
- Illustrate representative views that would be available to identified user groups.
- Illustrate the route alternatives and the DTC Substation.
- Provide open views of the Project structures and vegetative clearing.

Following is a table of the selected KOPs, information about their individual locations, reason for being included, and the routes being represented.

Table 4.3-1: Key Observation Points

KOP #	Latitude/Longitude	Location	Reason for Inclusion	Routes
1	39.038428°, 77.429386°	Century Boulevard	View of proposed DTC Substation and associated clearing	1A, 1B, & 1C
2	39.035650°, -77.429945°	North façade/entrance Lerner Office Building	View associated with various user groups and an identified VSR	1A, 1B, & 1C
3	39.036216°, -77.432072°	Russell Branch Parkway	View associated with local residents/workers and recreational users along the road and path rights-of-way	1A, 1B, & 1C
4	39.028016°, -77.437003°	Gloucester Parkway (Recreational Path)	View associated with commuters/through travelers and local residents/workers	1A, 1B, & 1C
5	39.028016°, -77.437003° (same location as KOP 4)	Gloucester Parkway (Recreational Path)	View of proposed BECO Substation upgrades	1A, 1B, & 1C

4.3.2 3D Rendering Development Approach

4.3.2.1 Visualization Tools Approach

Visual resources in both urban and rural environments are becoming increasingly important to the public. Often these impacts are perceived rather than actual, this analysis relies on visual simulations to accurately depict the potential changes to the landscape.

4.3.2.2 Visual Simulation Approach

A visual simulation is a photorealistic computer representation of a proposed Project based on engineered data. These simulations are routinely used to demonstrate before and after construction conditions, alternative analysis, material/design comparison, mitigation measures and long-term maintenance and monitoring plans. Visual simulations explain visual changes to the environment, within the context of the public viewshed.

4.3.2.3 KOP Identification

In evaluating visual impacts for transmission line projects, KOPs were identified through work with Dominion and locations are refined as needed as the Project evolves. KOP coordinates were loaded into a resource grade GPS and prepared for further data collection.

- Photographic Imagery: Imagery of the proposed Project location were captured using the appropriate focal length to accurately represent the proposed technology.
    - Reference conditions—The following conditions/information were documented to enhance rendering accuracy.
        - Date, time of day (hour/minutes)—Determines color of sunlight, shadow location and irradiance levels.
        - Atmospheric conditions—Haze and light diffusion have an impact on contrast at distance and amount of ambient light.
        - Lens length—Determines amount of parallax and depth of field between objects in view.
        - Available reference photography—Used to accurately represent color temperature, saturation, and contrast.
- 3D Existing Conditions Modeling: An existing conditions 3D model of the study area, including terrain, vegetation, and structures was created. The 3D model was geo-referenced and compiled with aerial imagery and available light detection and ranging (LiDAR) data to ensure spatial accuracy. Structures, vegetation clusters, and skylines were cross referenced with LiDAR data and reference imagery to ensure accurate representation of scale and placement within the visual simulation.
- 3D Sun and Atmospheric Conditions: Atmospheric data was imported into the 3D model to develop a sun and atmospheric system that matches the location specific reference data.
- 3D Proposed Project Development: Based on computer aided design, GIS and power line systems computer aided design data provided by the client, a 3D model of the Project was constructed. All information was imported into the 3D existing conditions model using the same geo-reference and projection then validated for accuracy. 3D materials and associated specular reflectance information was applied to the proposed 3D information.
- 3D Rendering: After all information has been properly aligned, atmospherics checked and materials applied, the 3D information was then rendered using highly accurate raytraced render engines.

Rendered elements were separated into multiple passes including foreground, background, and vegetation layers to allow for precise compositing and fine-tuning using photo editing software.

- Photo Editing Software: The use of photo editing software was necessary to achieve realistic representation of referenced atmospherics, grunge and vegetation depicted in a 3D rendering to match the existing conditions photo. Additional imagery was cross-referenced to ensure accurate depiction camera effects like chromatic aberration, noise, and depth of field.

Each KOP has a selection of visual simulations representing each alternative. Below is an assessment of the existing conditions and potential changes that may occur from the route alternatives. Simulations were completed for each KOP with the option of galvanized steel or weathering steel for tower material. Visual simulations are provided in Appendix E. The proposed structure locations for the various routes are depicted on Figure 4.3-1 in Appendix A.

KOP 1

Existing Conditions: KOP 1 is looking southwest from Century Boulevard at a divided four-lane arterial road with a mix of deciduous trees and shrub vegetation aligning both sides of the roadway. The road allows for a small glimpse into the background at agricultural fields that are reverting back to fallow land.

Visual Simulation: The visual simulation illustrates the change in visual conditions from the installation of the proposed DTC Substation. At this viewpoint, Routes 1A, 1B, and 1C share the same design, with one turning structure located in the center of the frame that crosses Century Boulevard. The most noticeable change from the installation of the substation is the removal of existing vegetation on the site. Although quite dramatic from this viewpoint, few viewers would be present on this road as it is a local road connecting Atlantic Boulevard to a few office buildings. Additionally, based on surrounding conditions, including development associated with the Dulles Town Center, construction and tree clearing along Atlantic Boulevard to accommodate the Lerner office building and the Courtyard by Marriott, their sensitivity to visual change would be low. Because the structure is backlit completely by sky the galvanized material further blends into the background where the weathering steel introduces a strong dark vertical contrast into the view. The change in landscape based on the introduction of the transmission line and the DTC Substation has a low impact on scenic quality at this KOP. The visual impact at this location would be the same regardless of which route alternative is selected.

KOP 2

Existing Conditions: KOP 2 is looking north from the formal walkway leading from the northern parking lot of the Lerner office building to the north façade/entrance. Cars and maintained vegetation associated with the parking lot dominate the foreground with the vegetation forming an alley into the middle ground. Mature trees create an edge to the view of the left side fading as the eye travels to the right side for the frame. Existing parking lot lights create vertical elements that are backlit by the sky, creating a visual contrast.

Visual Simulation: This simulation was completed to represent users of the Lerner 21000 Atlantic Boulevard office building and how their daily views may be altered by the different route alternatives. This KOP is representative of the most common view that all users of the building will experience. Views from the upper floors of the building are selective and although potentially impactful, they do not represent the majority of building users. Noticeable in all the alternatives is a structure located in the center background of the view. Because of the distance from the viewer and existing tall trees and light poles, the structure remains below the tallest element in the view, limiting the visibility and potential impact. Route 1A is the furthest north from the office building, limiting the amount of tree clearing and structures visible. However, the existing landscape vegetation works to screen the vegetation removal and turning structure in both Routes 1B and 1C. The material of the visible poles has similar interactions with the landscape as with KOP 1 because the majority of the structures are against the sky and not vegetation. A 3D rendering of the potential view from the upper floors of the Lerner building facing north, with views

toward the proposed project, is provided in Attachment III.B.4 of the Appendix, Viewpoint 6. The 3D rendering displays the amount of vegetation removal based on Proposed Route 1C. It does not include the various options A through C and represents the structures with a galvanized finish. From this elevated location, the structures reach beyond the tree line and extend into the sky. The visual change from the removal of vegetation along the proposed right-of-way is minimally noticeable in comparison to the structures against the sky. The removal does not reveal any additional visual concerns because it retains the vegetation along the Sully Road corridor. The change in landscape due to the varying amounts of tree clearing associated with each alternative route has a minimal change between options and overall has a low impact on scenic quality at this KOP. Choice of alternative route option does not impact the view at this location.

KOP 3

Existing Conditions: KOP 3 is looking north from the median of Russell Branch Parkway. The view captures a four lane divided road surface with an adjacent multi-use trail. The left side of the view is inhabited by a forest stand of mature deciduous trees and thick understory growth. Limited traffic is present on the roadway and no streetlights or existing structures add any human-made vertical elements.

Visual Simulation: This simulation illustrates the three route alternatives as they are designed to parallel the multi-use trail and road surface for a small distance on the western side and then cross the road. Routes 1A and 1B would both require an extra structure along the recreational path adjacent to the road surface, creating a more industrial feel than the current wooded edge as well as clearing a portion of the adjacent vegetation. Route 1C does not parallel the road or multi-use trail and therefore limits the duration a user would experience the new structures and minimizes the industrial feel that has been introduced to the view of Routes 1A and 1B. Considering the lower half of the visible structures are the dominant feature in the foreground of this simulation and backgrounded by vegetation, the weathering steel material would appear more natural and blend with the vegetation. However, based on the amount of structure above the tree line and the existing colors associated with the roadway, the galvanized material further blends into the view. This is most noticeable in the Route 1A background, where the weathering steel introduces a strong dark vertical contrast into the view. Route 1C also limits the amount of tree clearing along the right-of-way keeping more mature vegetation within the view, thereby minimizing the potential contrast at this KOP as associated with the recreational and local resident user groups and their respective sensitivity to visual change in the landscape.

KOP 4

Existing Conditions: KOP 4 looking west along Gloucester Parkway contains a four lane divided roadway that goes from the near foreground on the left side of the frame and travels on a light diagonal into the background. Associated road signs and guardrails are present as well. The middle ground is made up of a strong vegetated hedge that travels across the frame and is dissected by the roadway. Foreground vegetation is of shrub brush and what appears to be a recessional field.

Visual Simulation: This simulation illustrates the three route alternatives crossing Gloucester Parkway in between the viewer and the middle ground vegetation line. At this viewpoint, Routes 1A, 1B, and 1C share the same alignment and design. Limited vegetation removal is noticeable however the structures are taller than the vegetation reaching into the sky and add a new vertical element to the view. The strong vegetated horizontal line transecting the frame still dominates the view as the route alternatives parallel the forest edge and work with the vegetation to blend the new structures and not create a contrasting element in the landscape. The distance of the viewer from the structures also limits the change noticed between the two material options. Although the different alternatives are not applicable at this location the viewpoint is representative of the proposed conditions from an identified VSR. Regardless of the route or material selection, the introduction of the Project within this view has a low impact on the scenic quality and minimal impacts are anticipated for the user group.

KOP 5

Existing Conditions: KOP 5 has the lowest scenic quality of all the views looking south across Gloucester Parkway at the intersection of Pacific Boulevard and the existing BECO Substation. Lighting masts and interconnection structures associated with the substation are just taller than the intervening vegetation and blend with the tops of the trees. Associated traffic signals with the intersection introduce a vertical

element and provide contrast in color against the blue background sky. Foreground vegetation is of shrub brush and what also appears to be a recessional field.

Visual Simulation: This simulation illustrates updates associated with the interconnection of the route alternatives with the existing Line #2143 just north of the BECO Substation. At this viewpoint, Routes 1A, 1B, and 1C share the same alignment and design. New infrastructure interacts with the existing equipment blending the new structures into the existing landscape. This is further noticed in the simulation representing the galvanized material as the existing equipment associated with the substation and supporting structures are galvanized as well. This portion of the study area has existing infrastructure and is more developed, thereby minimizing the impact on scenic quality and user group sensitivity that the vegetation removal and introduction of new structures has on the view.

4.3.2.4 Conclusions

The impact of changes in visual conditions is a function of both the nature of the change (i.e., the presence of new Project structures and rights-of-way, where no such development currently exist) as well as the sensitivity of user groups to such changes. User group/viewer sensitivity is inherently subjective, and each user group has their own opinion of what constitutes a positive or negative change in visual conditions within the landscape. However, as discussed in Section 3.3, specific user groups have a preset interaction with visual changes to the landscape.

This analysis identifies VSRs within the study area, user groups and their associated sensitivity to visual changes in the landscape and visual simulations that represent the various views that would be experienced from not only the chosen VSRs and KOPs but from throughout the study area as a whole. The available information provided through the analysis indicates that overall visual impacts of the Project would be relatively low depending on the selected route or structure material and would not be perceived as a fundamental change in the landscape conditions within the study area. The visibility of Project structures and vegetative clearing from the five KOPs evaluated in this analysis is broadly representative of views and potential impacts of the Project throughout the study area. Based on the identified VSRs, potential user groups and visual simulations, Route 1C utilizing galvanized structure material would have the least predicted visual impact on sensitive user groups and activities.

Route 1A would have impacts on both local residents/workers and recreational users along the multi-use trail as well as those same local residents/workers driving the Russell Branch Parkway to and from various existing and proposed Kincora residential properties.

Route 1B would have noticeable impacts on commuters/through travelers interacting with Sully Road as well as impacts on recreational users and local residents/workers utilizing Russell Branch Parkway and the multi-use trail. As represented by the visual simulations in Appendix E, there would be impacts on occupants of the Lerner office building and potential impacts on existing and future Kincora residential and office development. The Project would have minimal impacts on the existing landscape and current medium scenic quality. However, since the construction of Route 1B would cause changes to scenic quality both to Sully Road and the Russell Branch multi-use trail and road rights-of-way, a variety of user groups would be impacted. Recreational users with a higher sensitivity to change would experience alterations to the foreground views, which would have impacts on the existing scenic quality.

Route 1C would be the least impactful to the user group and VSRs with the highest sensitivity to changes in the visual environment. Commuters/through travelers driving along Sully Road would continue to have a vegetative buffer adjacent to the roadway west of the right-of-way, while the eastern edge would abut one of the existing Lerner parking lots. Existing light poles within the parking lot are painted white and therefore further blend with the galvanized material option. As shown in the simulation from KOP 2, differences between the route alignments would not impact the Lerner building as much as they would the multi-use trail and local roadway (see KOP 3).

4.4 Cultural Resources

Effects for the considered resources relevant to each route alternative are discussed below. The full *Stage I Pre-Application Analysis of Cultural Resource* report prepared by D+A is provided in Appendix F.

4.4.1 Archaeology Findings

A review of the VDHR VCRIS indicates that two previously recorded archaeological sites (44LD0107 and 44LD0727) fall within or adjacent to the right-of-way for the Routes 1A, 1B, and 1C (VDHR, 2020). Neither have been listed as eligible for consideration by the VDHR. Because formal archaeological survey has not been conducted as part of this Project, impacts have not yet been fully determined. These resources should be further considered for existing conditions and potential Project impacts as additional Project details become available.

4.4.2 Aboveground Historic Properties

Only one considered resource defined in accordance with VDHR Guidelines is associated with all of the route alternatives. The Broad Run Bridge and Toll House (053-0110) is a ca. 1820 stone building with later frame additions that served as a toll house for an adjacent bridge that historically carried the Leesburg Turnpike over Broad Run. All that remains of the bridge are stone abutments on either side of Brad Run. Located approximately 0.57 mile at its nearest point, the landscape between the resource and the study area is undulating, with undeveloped portions remaining thickly wooded. However, there has been extensive development between the resource and the study routes, including several transportation networks, a large campus of the Virginia Cooperative Extension, and townhouses. Due to this extensive development and topography, it is anticipated that there would be no visibility of any of the routes from 053-0110, nor any publicly accessible locations in the immediate vicinity.

Visual impacts are defined as the introduction of visual elements that might diminish or alter the setting of any historic property listed on or eligible for listing on the NRHP. The Broad Run Bridge and Toll House is significant for its associations with Virginia's early transportation network. As such, setting as it relates to the relationship between the toll house, the remains of the associated bridge, and the water feature it crosses, are important to its interpretation, and a component of its significance; however, the wider surroundings are not inherently linked to its significance or interpretive capability. Further, the extended setting is already considered compromised by large-scale modern development and infrastructure, and not integral to the significance of the resource. It is D+A's opinion that the significant historical setting is limited to the toll house and bridge, and the immediately surrounding area. It is anticipated that there would be no visibility of any of the route alternatives, and this was confirmed as such for the nearest alternative (Route 1A). Therefore, the Project would not introduce any change in setting or viewshed and would have *no impact* on the Broad Run Bridge and Toll House (see Appendix F, Figures 5-1 through 5-5). Regardless of which route alternative is selected.

4.5 Geological Constraints

There are no mineral operations located within 0.5 mile of the proposed DTC Substation or any of the alternative transmission line routes. As such, Routes 1A, 1B and 1C would not impact any identified mineral resources.

4.6 Collocation Opportunities

4.6.1 Route 1A

Route 1A is collocated for a total of 0.93 mile, including 0.59 mile of paralleled Loudoun Water lines, 0.25 mile of paralleling and crossing roads, and 0.09 mile paralleling both Loudoun Water lines and roads.

4.6.2 Route 1B

Route 1B is collocated for a total of 0.93 mile, including 0.59 mile of paralleled Loudoun Water lines, 0.25 mile of paralleling and crossing roads, and 0.09 mile paralleling both Loudoun Water lines and roads.

4.6.3 Route 1C

Route 1C is collocated for a total of 0.92 mile, including 0.59 mile of paralleled Loudoun Water sewer lines, 0.24 mile of parallel roads, and 0.09 mile paralleling both a Loudoun Water line and roads.

5. ANALYSIS OF ROUTE ALTERNATIVES

This section provides a summary of the advantages and disadvantages of the three overhead route alternatives, Routes 1A, 1B, and 1C. Since the three routes follow a common alignment for the majority of their lengths, the differences in their impacts are restricted to the location where they diverge in the northeastern portion of the Project area at the crossing of Russell Branch Parkway and Sully Road. In many respects, most of the differences in the impacts of the routes are largely incremental. For example, the lengths of the routes differ by less than a hundredth of a mile, there is only a 0.08-acre difference in the acreages of the routes, all three routes cross the same amount of wetlands and conservation easements, and there is only a slight difference in the number of parcels crossed by the routes (five versus six). The more significant considerations relevant to selecting a Proposed Route from the three alternatives are discussed below:

Forested Land Affected: The route affecting the least amount of forested land is Route 1C (14.08 acres), followed by Route 1B (14.18 acres). Route 1A impacts the largest amount of forested land at 14.22 acres. Due to rapid development of data centers in southeastern Loudoun County, the amount of forestland in Loudoun County is quickly declining. Although the routes vary in the amount of forest land affected, it should be noted that a majority of the area within the study area is planned for development and, as a result, much of the forest land eventually will be cleared.

Visual Impacts: The route having the least predicted impact on VSRs and user groups is Route 1C, where impacts would be more focused on commuters/through travelers driving along Sully Road and occupants of the Lerner office building on the eastern side of Sully Road. Along Route 1A, impacts would occur for both local residents/workers and recreational users along the multi-use trail as well as those same local residents/workers driving the Russell Branch Parkway to and from various existing and proposed Kincora residential properties. Route 1B would impact the largest variety of user groups as the route is split between Sully Road and Russell Branch Parkway/ multi-use trail. Recreational users along the multi-use trail with a higher sensitivity to change would experience alterations to the foreground views, which would have impacts on the existing scenic quality. Along Route 1C, impacts would be more focused on commuters/through travelers driving along Sully Road as well as impacts on occupants of the Lerner office building.

Planned Developments: Of the five planned developments discussed in Section 4.1.3, only one (Kincora Village Center—Parcel #041398662) would be affected by Routes 1A, 1B and 1C. The remaining four parcels scheduled for planned development would either be crossed in areas that are not slated for actual development, rather they are areas of green/open space, or are not crossed at all. Development plans for Kincora Village Center—Parcel #041398662 have not been filed with the county, and potential impacts are based upon preliminary designs received from the developer during Project planning.

Route 1A crosses the longest distance on this parcel (0.22 mile) and consequently would have the greatest impact on the data center, followed by Route 1B (0.17 mile), and Route 1C (0.12 mile). Based on preliminary development plans, both Routes 1A and 1B cross portions of the parcel slated for placement of generators associated with the data center. The placement of such generators under a transmission line are not permissible for safety reasons and also would conflict with the maintenance of the transmission line. The developer purchased this parcel in August of 2021 with the intention of being able to develop the entirety of the parcel and has indicated that the placement of a transmission line in the location of Routes 1A and 1B would render their development plan non-viable. Route 1C also crosses a portion of this data center parcel; however, the crossing is in an area of greenspace and access roads. Route 1C does not overlap with any areas slatted for data centers, generators, or other conflicting uses.

Existing Developments: There is one existing development in the study area that could be affected by Routes 1B and 1C (i.e., Lerner 21000 Atlantic Boulevard). Route 1A does not cross this parcel; however,

as shown in Appendix E, the route would still be visible from the parking lot of the office building. Routes 1B and 1C both cross portions of the parking lot and vegetative strip located between the development and Sully Road. While no transmission structures would be located within the parking lot, light posts in the parking lot located within the right-of-way may need to be relocated. Cars would still be able to park within the right-of-way. Project impacts on the existing development would primarily be visual impacts, which are discussed above.

6. CONCLUSIONS AND RECOMMENDATIONS

The lengths of the route alternatives evaluated do not differ significantly, and the environmental features impacted do not vary substantially based on the small study area and similarity of the terrain crossed by the routes. Given the limited variability between the routes considered, the specific resources associated with some or all of the route alternatives that have a noteworthy differences include the following:

- Amount of forested lands affected;
- Visual impacts; and
- Impacts on planned and existing developments.

Considering the factors discussed in this report and listed above, ERM reached the following conclusions.

Route 1C was identified as the Proposed Route. Route 1C is slightly shorter than the other alternatives and would require correspondingly less acreage. In addition, Route 1C would cross the smallest area of the planned data center along Russell Branch Parkway and, significantly, would not conflict with the development of this facility. Route 1C also would require less clearing of forested lands than the other two routes. While Route 1C would have a visual impact on both the Lerner office building and Sully Road, a screen of trees would be maintained along the east side of Sully Road, which would reduce the visual impact of the route on Sully Road. Moreover, it should be noted that Sully Road is a limited access divided highway. Fast-moving-through travelers would have lower scenic and viewer sensitivity when compared with drivers on Russell Branch Parkway. With regards to occupants of the Lerner office building, the larger volume of views from the building are to the east and west, rather than to the north. While the transmission towers would represent new elements in a northerly view, from the ground level there are existing vertical elements present in the parking lot (light poles).

Route 1A has the greatest impact on both forested land and on the planned data center. In addition, while Russell Branch Parkway is a lower traffic volume road compared with Sully Road and has a multi-use trail along the western side of the road, visual impacts on user groups along this road/trail would be greater as Russell Branch Parkway is a local road with lower speed limits and left hand turns and recreational users would be more sensitive to visual changes. Drivers may be more focused on their surroundings than on a higher speed/traffic road. Alternatively, Route 1A avoids crossing the Lerner parcel.

Route 1B would require slightly less clearing of forested land than Route 1A (14.18 versus 14.22 acres). While Route 1B would impact the planned data center to a lesser degree than Route 1A, it still would conflict with the development of this facility. Additionally, Route 1B would have visual impacts on the largest audience as it would require a route parallel to both Russell Branch Parkway/multi-use trail and Sully Road and would be visible from the Lerner office building.

While the differences between the routes are incremental, from an environmental and land use impact perspective, Route 1C would have fewer impacts than the other two routes. Therefore, based on this analysis, ERM recommends Route 1C as the Company's Proposed Route for the Project as it is the route which would reasonably minimize adverse impacts on scenic assets, historic districts, and the environment of the area concerned. Route 1C is the shortest route and would require the least amount of clearing of forested land. In addition, the visual impacts of this route are arguably less significant than those of the other two routes. Moreover, and most importantly, Route 1C is the only route that would not conflict with the development of the proposed data center along Russell Branch Parkway. This conforms Attachment 1 *(Guidelines for the Protection of Natural, Historic, Scenic, and Recreational Values in the Design and Location of Rights-of-Way and Transmission Facilities)* to the Commission's Guidelines for Transmission Line Applications Filed under Title 56 of the Code of Virginia. Specifically, this approach is consistent with Guideline #1 of Attachment 1, which states that existing rights-of-way should be given priority when adding new transmission facilities with the purpose of minimizing conflict between the rights-

of-way and present and prospective uses of the land on which they are to be located. Even though Route 1C crosses portions of the parking lot and vegetative strip located between the Lerner development and Sully Road and light posts in the parking lot located within the right-of-way may need to be relocated, since the present use of the parking lot will be retained and cars would still be able to park within the right-of-way, Route 1C still conforms with the SCC guidance discussed above.

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APPENDIX A FIGURES

This information is for environmental review purposes only.

Centerline and Rights of Way

- Route 1A (1.31 Miles - 100ft ROW)
- Route 1B (1.31 Miles - 100ft ROW)
- Route 1C (1.30 Miles - 100ft ROW)

PROPOSED DTC SUBSTATION

BECO SUBSTATION

1A

1B

1C

Kincora Development

Loudoun County Sanitation Authority (Loudoun Water)

Kincora Development

DTC Park and Ride

Lerner Office

Courtyard by Marriott

Dulles Town Center

EdgeCore Data Center

Fire Station 24

Washington Football Team Practice Facility

Broad Run

Washington & Old Dominion Trail

Russell Branch Pkwy

Broad Run Dr

Winding Rd

Lakeside Dr

Lakemont Sq

Glenbrook Ter

Algonkian Pky

Hamilton Rd

Coleman Ln

Peyton Rd

Russell Ct

Turner Ln

Jona Dr

Dulles Center Blvd

Century Blvd

Majestic Dr

Kent Dr

Champion Dr

Signature Dr

Stanford Sq

Jaclyn Pl

Forum Ter

Stefanie Dr

Rotunda Ter

Mirage Way

Boston Ter

Vassar Ter

Colgate Ter

Hobart Ter

City Center Blvd

Haleybird Dr

Atlantic Blvd

Sully Rd

Loudoun County Pky

Smith Switch Rd

Gloucester Pkwy

Redskin Park Dr

Pacific Blvd

Squire Ct

Severn Way

Eugenia Ct

Nokes Blvd

Thayer Rd

Dulles Crossing Plz

Dulles Eastern Plz

Maries Rd

Elmwood Ct

Greenoak Way

Woodland Rd

Cedar Ln

Blackwood Ct

Jesse Ct

Brushfence Ct

Ashgrove Ct

Oakbrook Ct

Steeplechase Dr

Auto World Cir

Commercial Dr

Beverly Dr

Towlern Pl

Monterey Pl

Columbia Pl

Ruritan Rd

Caboose Ter

Locomotive Ter

Railway Ter

Elkins Ter

Baggett Ter

Thompson Sq

Magnolia Rd

Manning Sq

Golden Strike Ter

Grand Central Sq

Waterloo Station Sq

Box Car Sq

Regents Park Cir

Caboose Dr

Ladbroke Grove Ct

Tottenham Ct

Hale Ct

Brondesbury Park Ter

Willesden Junction Ter

Mornington Crescent Ter

Ruislip Manor Way

Cheswick Park Ct

Victoria Station Dr

Smoketree Ter

Haleybird Dr

808

28

7

1570

637

N

0 500 1,000 Feet

Project Location

Proposed Substation

Existing Substation

Study Area

Existing Dominion Transmission Line

Parcel Boundary

Waterbody (Loudoun County)

Potomac Interceptor (DC Water)

Loudoun Water Gravity Main

Loudoun Water Utility Line

Figure 2.0-1
Overview Map - Aerial
DTC 230 kV Line Loop and DTC Substation Project
Loudoun County, Virginia

ERM

Dominion Energy

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This information is for environmental review purposes only.

Centerline and Rights of Way

- Route 1A (1.31 Miles - 100ft ROW)
- Route 1B (1.31 Miles - 100ft ROW)
- Route 1C (1.30 Miles - 100ft ROW)

Kincora Development

PROPOSED DTC SUBSTATION

1A

1B

1C

Courtyard by Marriott

Lerner Office

Loudoun County Sanitation Authority (Loudoun Water)

Kincora Development

DTC Park and Ride

Dulles Town Center

EdgeCore Data Center

Fire Station 24

Washington Football Team Practice Facility

BECO SUBSTATION

Washington & Old Dominion Trail

0 500 1,000 Feet

Project Location

△ Proposed Substation

▲ Existing Substation

Study Area

Existing Dominion Transmission Line

Parcel Boundary

Potomac Interceptor (DC Water)

Loudoun Water Gravity Main

Loudoun Water Utility Line

Figure 2.0-2
Overview Map - Topographic
DTC 230 kV Line Loop and DTC Substation Project
Loudoun County, Virginia

ERM

Dominion Energy

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Centerline and Rights of Way

- Route 1D (100ft ROW) - 1.58 Miles
- Route 1E (100ft ROW) - 2.00 Miles
- Route 2A (100ft ROW) - 2.10 Miles
- Route 2B (100ft ROW) - 2.53 Miles
- Underground Route (80ft ROW) - 1.17 Miles

Russell Branch Pky
Broad Run Dr
Winding Rd
808
Glenbrook Ter Sq
Algonkian Pky
Hamilton Rd
Coleman Ln
Peyton Rd
Russell Ct
Turner Ln
1570
7
Jona Dr
Kincora Development
Russell Branch Pkwy
PROPOSED DTC SUBSTATION
Dulles Center Blvd
Century Blvd
Courtyard by Marriott
Loudoun County Pky
Loudoun County Sanitation Authority (Loudoun Water)
Lerner Office
Majestic Dr
Kent Dr
Champion Dr
Signature Dr
Jaclyn Pl
Forum Ter
Stanford Sq
1E
Dulles Town Cir
Mirage Way
Stefanie Dr
Rotunda Ter
Kincora Development
28
DTC Park and Ride
1D
Dulles Town Center
Sully Rd
UG 1A
Fire Station 24
EdgeCore Data Center
Atlantic Blvd
2A
2B
City Center Blvd
Boston Ter
Vassar Ter
Colgate Ter
Hobart Ter
Haleybird Dr
Smith Switch Rd
Gloucester Pkwy
1D 1E
Nokes Blvd
Washington Football Team Practice Facility
Proposed Underground Transition Station
Redskin Park Dr
BECO SUBSTATION
Thayer Rd
Dulles Crossing Plz
Dulles Eastern Plz
Maries Rd
Pacific Blvd
Squire Ct
Broad Run
Severn Way
Eugenia Ct
Jesse Ct
Woodland Rd
Greenoak Way
Elmwood Ct
Cedar Ln
Blackwood Ct
Brushfence Ct
Washington & Old Dominion Trail
28
Auto World Cir
Steeplchase Dr
2B
2A
Regents Park Cir
Ladbroke Grove Ct
Tottenham Hale Ct
Ruislip Manor Way
Cheswick Park Ct
Willesden Junction Ter
Bondesbury Park Ter
Victoria Station Dr
Smoketree Ter
Ashgrove Ct
637
Caboose Ter
Locomotive Ter
Railway Ter
Elkins Ter
Baggett Ter
Thompson Sq
Magnolia Rd
Running Sq
Grand Central Sq
Waterloo Station Sq
Golden Spike Ter
Box Car Sq
Oakbrook Ct
Commercial Dr
Beverly Dr
Towlern Pl
Monterey Pl
Columbia Pl
Puritan Rd
N
0 500 1,000 Feet

Project Location
Cincinnati
VIRGINIA
Richmond
Greensboro

- Proposed Substation
- Existing Substation
- Transition Station (Underground Route)
- Extra Temporary Workspace (Underground Route)
- Study Area
- Existing Dominion Transmission Line
- Parcel Boundary
- Waterbody (Loudoun County)
- Potomac Interceptor (DC Water)
- Loudoun Water Gravity Main
- Loudoun Water Utility Line

Figure 2.5.1-1
Routes Rejected from Further Consideration
DTC 230 kV Line Loop and DTC Substation Project
Loudoun County, Virginia

ERM

Dominion Energy

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Centerline and Rights of Way

- Route 1A (1.31 Miles - 100ft ROW)
- Route 1B (1.31 Miles - 100ft ROW)
- Route 1C (1.30 Miles - 100ft ROW)

Kincora Heron Nature Trails
Kincora Development
Vestals Gap Overlook Park
PROPOSED DTC SUBSTATION
1A
1B
1C
Courtyard by Marriott
Loudoun County Sanitation Authority (Loudoun Water)
Lerner Office
Dulles Town Commons/Hadley's Park and Playground
DTC Park and Ride
Russell Branch Pkwy
Temple Baptist School Planned Athletic Fields
Sully Rd
Dulles Town Center
EdgeCore Data Center
Fire Station 24
Gloucester Pkwy
Washington Football Team Practice Facility
BECO SUBSTATION
Broad Run
Autobahn Indoor Speedway
Severn Way
Washington and Old Dominion Railroad Regional Park
Dulles Golf Center and Sports Park
The Michael & Son Sportsplex at Dulles
28

N

0 500 1,000 Feet

Project Location

Proposed Substation
Existing Substation
Study Area
Existing Dominion Transmission Line
Parcel Boundary
Waterbody (Loudoun County)
Loudoun County Park
Kincora Heron Nature Trail
Recreation Area
Northern Virginia Regional Park Authority

Figure 3.1.2-1
Recreation Areas
DTC 230 kV Line Loop and DTC Substation Project
Loudoun County, Virginia

ERM

Dominion Energy

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Centerline and Rights of Way
- Route 1A (1.31 Miles - 100ft ROW)
- Route 1B (1.31 Miles - 100ft ROW)
- Route 1C (1.30 Miles - 100ft ROW)

PROPOSED DTC SUBSTATION
BECO SUBSTATION
1A
1B
1C
Kincora Development
Loudoun County Sanitation Authority (Loudoun Water)
Lerner Office
Courtyard by Marriott
DTC Park and Ride
Dulles Town Center
EdgeCore Data Center
Fire Station 24
Washington Football Team Practice Facility
Broad Run
Russell Branch Pkwy
Broad Run Dr
Winding Rd
Algonkian Pky
Loudoun County Pky
Dulles Center Blvd
Century Blvd
Majestic Dr
Dulles Town Cir
Sully Rd
Gloucester Pkwy
Smith Switch Rd
Redskin Park Dr
Nokes Blvd
Dulles Crossing Plz
Dulles Eastern Plz
Pacific Blvd
Severn Way
Atlantic Blvd
City Center Blvd
Haleybird Dr
Steeplchase Dr
Auto World Cir
Washington & Old Dominion Trail
Purtan Rd
Hamilton Rd
Coleman Ln
Peyton Rd
Russell Ct
Turner Ln
Jona Dr
Jaclyn Pl
Kent Dr
Champion Dr
Signature Dr
Stanford Sq
Forum Ter
Stefanie Dr
Rotunda Ter
Mirage Way
Boston Ter
Vassar Ter
Colgate Ter
Hobart Ter
Thayer Rd
Maries Rd
Elmwood Ct
Woodland Rd
Greenoak Way
Blackwood Ct
Cedar Ln
Ashgrove Ct
Brushfence Ct
Victoria Station Dr
Smoketree Ter
Brondesbury Park Ter
Willesden Junction Ter
Mornington Crescent Ter
Ruislip Manor Way
Cheswick Park Ct
Tottenham Hale Ct
Ladbroke Grove Ct
Blossom Dr
Regents Park Cir
Caboose Ter
Railway Ter
Locomotive Ter
Elkins Ter
Waterloo Station Sq
Grand Central Sq
Oakbrook Ct
Box Car Ct
Golden Spike Ter
Magnolia Ring Sq
Thompson Sq
Baggett Ter
Eugenia Ct
Jesse Ct
Pacific Blvd
Squire Ct
Severn Way
Towlern Pl
Beverly Dr
Monterey Pl
Columbia Pl
Commercial Dr
Lakeside Dr
Glenbrook Ter
Broad Run Dr
808
1570
7
28
637

0 500 1,000 Feet

Project Location

△ Proposed Substation
▲ Existing Substation
Study Area
Existing Dominion Transmission Line

Land Cover Type
- Developed
- Forest
- Open Space
- Open Water

Figure 3.1.3-1
Existing Land Cover Type
DTC 230 kV Line Loop and DTC Substation Project
Loudoun County, Virginia

ERM

Dominion Energy

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Centerline and Rights of Way

- Route 1A (1.31 Miles - 100ft ROW)
- Route 1B (1.31 Miles - 100ft ROW)
- Route 1C (1.30 Miles - 100ft ROW)

PROPOSED DTC SUBSTATION

1A

1B

1C

Kincora Village Center Parcel #041398662

Kincora Village Center Parcel #041194573

Loudoun Water Ashburn Campus

Temple Baptist School

Fire Station 24

Planned Wawa

Kincora Village Center

BECO SUBSTATION

Lerner 21000 Atlantic Boulevard

DTC Park and Ride

EdgeCore Data Center

Russell Branch Pkwy

Majestic Dr

Dulles Center Blvd

Dulles Town Cir

Sully Rd

Atlantic Blvd

Gloucester Pkwy

Pacific Blvd

Nokes Blvd

28

N

0 200 400 Feet

Project Location

VIRGINIA

Richmond

Greensboro

△ Proposed Substation

▲ Existing Substation

Existing Dominion Transmission Line

Parcel Boundary

Planned Development

Existing Development

Figure 3.1.4-1
Planned and Existing Developments
DTC 230 kV Line Loop and DTC Substation Project
Loudoun County, Virginia

ERM

Dominion Energy

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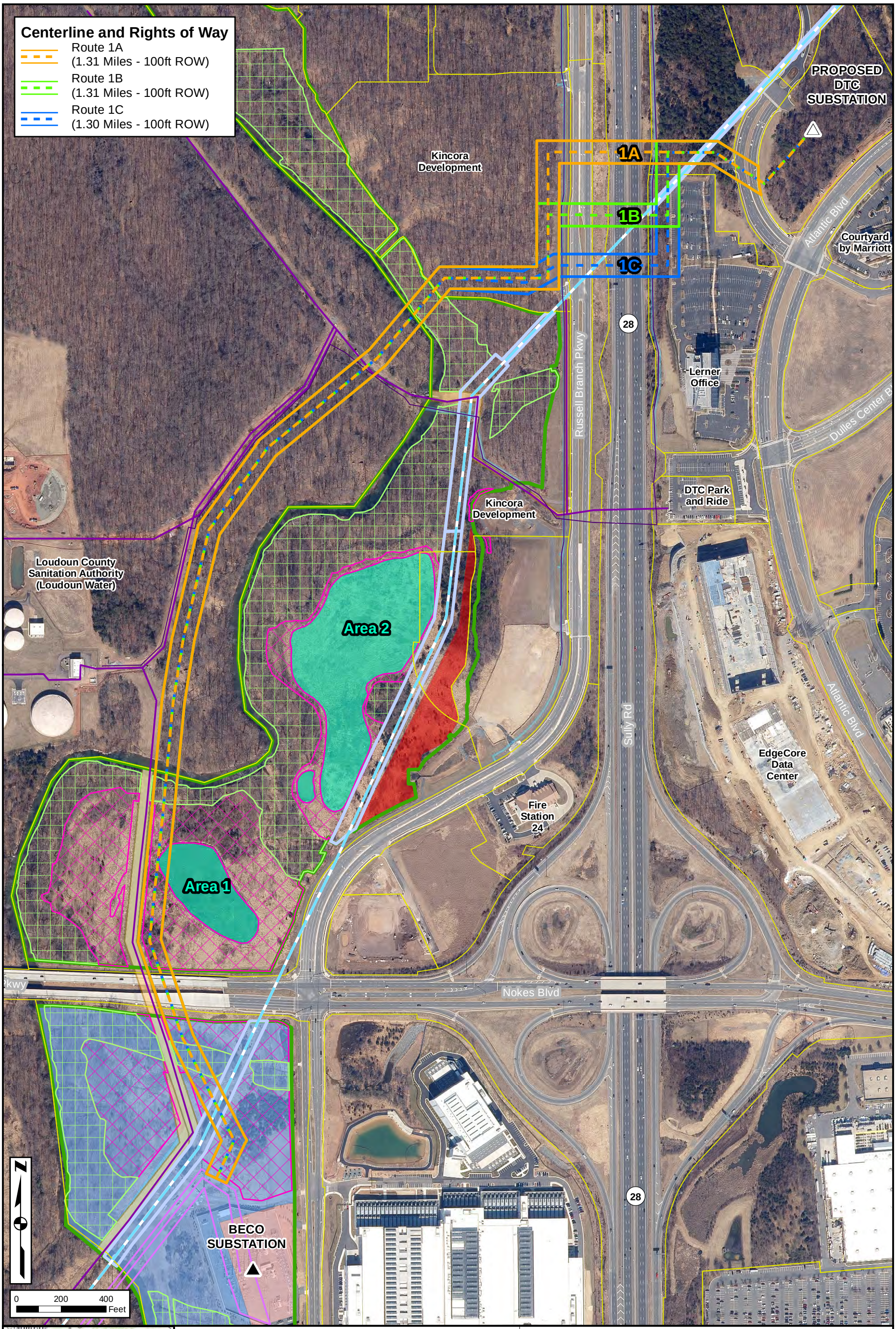

Figure 3.1.6-1
Conservation Easements
DTC 230 kV Line Loop and DTC Substation Project
Loudoun County, Virginia

ERM

Dominion Energy

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Proposed DTC Substation

BECO Substation

Leesburg Executive Airport

Loudoun Hospital Center

Reston Hospital Center

Stone Springs Hospital

Inova Fair Oaks Hospital

Fairfax County Police

State Police Area 48 Office

Washington Dulles International Airport

Tuscarora
Monocacy NRMA
Furnace Br
MARYLAND
VIRGINIA
FREDERICK
MONTGOMERY
Dickerson
Barnesville
723 ft
Clarksburg
Black Hill Regional Park
Little Seneca Reservoir
Germantown
Waterford
White's Ford Regional Park
Temple Hall Farm Regional Park
Woodstock Equestrian Park
Beallsville
Hoyles Mill Conservation Park
Raspberry Falls Golf and Hunt Club
Paeonian Springs
Golf Club Of Virginia at Beacon Hill
Morven Park
Poolesville
Little Seneca SVU 1
Strider WMA
Seneca Creek State Park
500 ft
Ida Lee Park
Leesburg
Broad Run SVP
Horsepen Branch
River Creek Club
Westpark Golf Club
Muddy Branch SVU 3
North
Muddy Branch SVU 1
Travilah
McKee-Beshers WMA
Seneca Creek State Park
Seldens Island
Belmont Country Club
Algonkian Regional Park
Lowes Island
Seneca Regional Park
Potomac River
MARYLAND
VIRGINIA
Loudoun County Landfill
Sterling
1757 Golf Club
LOUDOUN
Great Falls
Rock Ridge HS
Reston
Lake Fairfax Park
Dulles Airport Access Rd
Arcola
Wolf Trap
Fred Crabtree Park
Vienna
South Riding Golf Club
FAIRFAX
Richard W Jones Park
Chantilly
Oak Marr Park
Oakton
Elklick Preserve
Halifax Point District Park
Cub Run Stream Valley Park
Army Navy Golf Course
Centreville
Fairfax
Poplar Ford Park
Manassas National Battlefield Park
Vulcan Materials
George Mason University
Bull Run
PRINCE WILLIAM
Lick Branch
Little Bull Run
481 ft
0 2.5 5 Miles

Project Location

△ Proposed Substation
▲ Existing Substation
Route Alternatives
10-Mile Buffer of Proposed Alternatives
Airport
Heliport

Figure 3.1.9-1
Airports Within 10 Miles
DTC 230 kV Line Loop and DTC Substation Project
Loudoun County, Virginia

ERM
Dominion Energy

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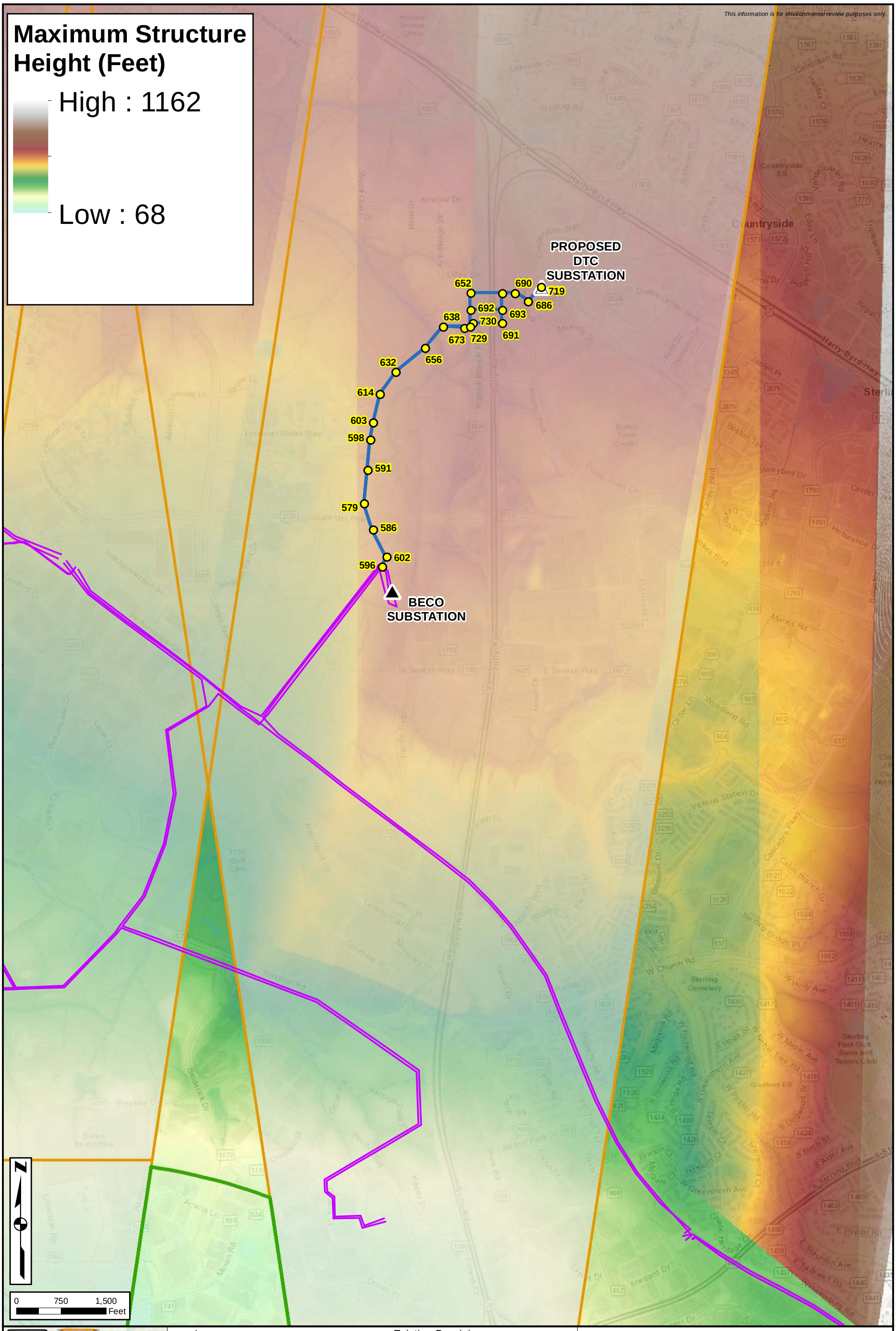

Figure 3.1.9-2
Dulles Airport Surfaces and Maximum Structure Heights
DTC 230 kV Line Loop and DTC Substation Project
Loudoun County, Virginia

ERM

Dominion Energy

MPLS M:\Clients\D-F\DOM\DTC\ArcGIS\2021\11\Routing_Study_DOM_DTC_RS_Fig_3_1_9_2_Airport_Surfaces.mxd | REVISED: 11/08/2021 | SCALE: 1:18,000 when printed at 11x17 DRAWN BY: 0239

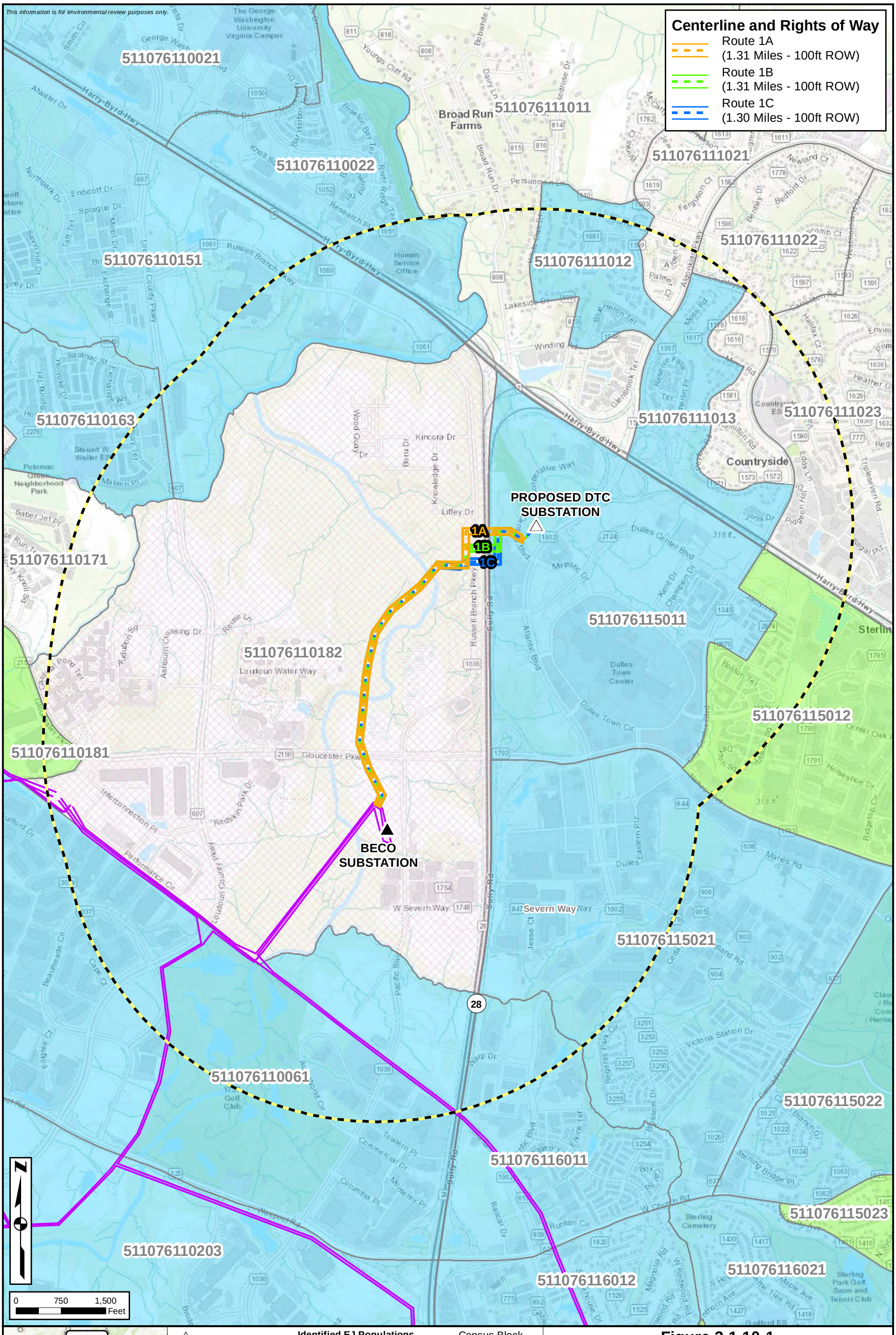

Figure 3.1.10-1
Identified Environmental Justice Populations in Census Block Groups
DTC 230 kV Line Loop and DTC Substation Project
Loudoun County, Virginia

ERM

Dominion Energy

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This information is for environmental review purposes only.

Centerline and Rights of Way

- Route 1A (1.31 Miles - 100ft ROW)
- Route 1B (1.31 Miles - 100ft ROW)
- Route 1C (1.30 Miles - 100ft ROW)

Kincora Development

PROPOSED DTC SUBSTATION

1A

1B

1C

Majestic Dr

31766

Lerner Office

Loudoun County Sanitation Authority (Loudoun Water)

Russell Branch Pkwy

Dulles Center Blvd

Kincora Development

DTC Park and Ride

28

Dulles Town Cir

Sully Rd

Atlantic Blvd

EdgeCore Data Center

Fire Station 24

Gloucester Pkwy

Nokes Blvd

32138

BECO SUBSTATION

N

0 200 400 Feet

Project Location

VIRGINIA

Richmond

Greensboro

△ Proposed Substation

▲ Existing Substation

Existing Dominion Transmission Line

Parcel Boundary

Stream (Loudoun County)

Waterbody (Loudoun County)

C5: General Ecological Core

Figure 3.2.4-1
Ecological Cores
DTC 230 kV Line Loop and DTC Substation Project
Loudoun County, Virginia

ERM

Dominion Energy

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This information is for environmental review purposes only.

Centerline and Rights of Way

- Route 1A (1.31 Miles - 100ft ROW)
- Route 1B (1.31 Miles - 100ft ROW)
- Route 1C (1.30 Miles - 100ft ROW)

Kincora Development
PROPOSED DTC SUBSTATION
1A
1B
1C
Majestic Dr
Loudoun County Sanitation Authority (Loudoun Water)
Russell Branch Pkwy
DTC Park and Ride
Dulles Center Blvd
Kincora Development
28
Dulles Town Cir
Sully Rd
Atlantic Blvd
EdgeCore Data Center
Broad Run
Fire Station 24
Gloucester Pkwy
Nokes Blvd
Pacific Blvd
BECO SUBSTATION
N
0 200 400 Feet

Project Location
Cincinnati
VIRGINIA
Richmond
Greensboro

△ Proposed Substation
▲ Existing Substation
Existing Dominion Transmission Line
Parcel Boundary
Proposed Structure Location
Waterbody (Loudoun County)

Figure 4.3-1
Structure Locations
DTC 230 kV Line Loop and DTC Substation Project
Loudoun County, Virginia

ERM
Dominion Energy

MPLS M:\Clients\D-F\DOM\DTC\ArcGIS\2021\11\Routing_Study_DOM_DTC_RS_Fig_4_3_1_Structure_Locations.mxd | REVISED: 11/08/2021 | SCALE: 1:4,800 when printed at 11x17 | DRAWN BY: 0239

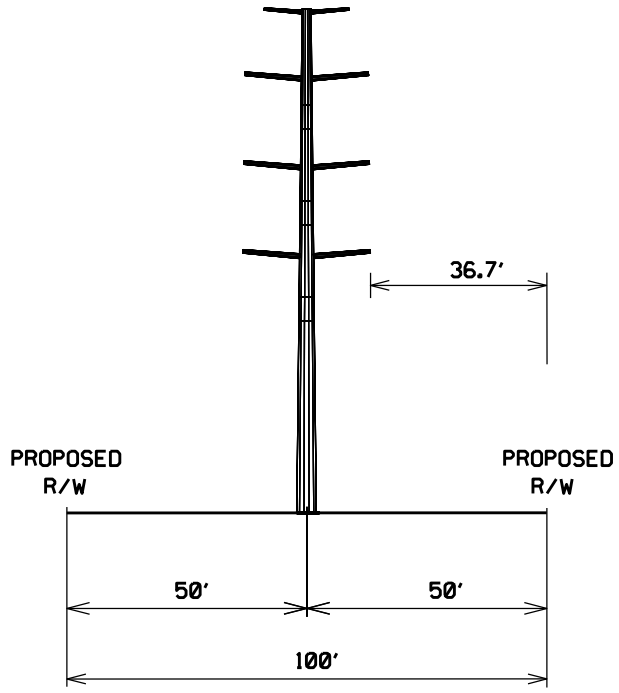
APPENDIX B STRUCTURAL DRAWINGS

DTC

PRELIMINARY

PROPOSED
230KV CIRCUIT
(LINE •2143)

PROPOSED
230KV CIRCUIT
(LINE •2249)



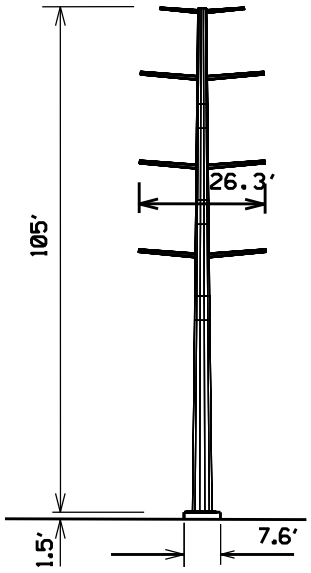
PROPOSED CONFIGURATION
TYPICAL CORRIDOR LOOKING TOWARD DTC

NOTE: Information contained on drawing is to be considered preliminary in nature and subject to change based on final design.

$DGNSPEC$

DOUBLE CIRCUIT DOUBLE DEADEND STEEL POLE

PRELIMINARY



PROPOSED STRUCTURES

a. MAPPING THAT IDENTIFIES EACH PORTION OF THE PREFERRED ROUTE:
SEE ATTACHMENT II.B.111

b. RATIONALE FOR THE SELECTION OF THE STRUCTURE TYPE: ALLOWS THE INSTALLATION OF TWO 230kV CIRCUITS IN A 100' R/W AND MINIMIZES FOOTPRINT OF STRUCTURE

c. NUMBER OF EACH TYPE OF STRUCTURE AND LENGTH OF EACH PORTION OF THE R/W:
15 AND 1.3 MILES

d. STRUCTURE MATERIAL AND RATIONALE FOR THE SELECTION OF SUCH MATERIAL:
GALVANIZED STEEL TO MATCH EXISTING STEEL POLES OUTSIDE BECO.

e. FOUNDATION MATERIAL: CONCRETE

F. AVERAGE WIDTH AT CROSSARM: 26.3'

g. AVERAGE WIDTH AT BASE: 7.6' DIAMETER (RANGE OF 5.5' - 10.5')

H. MAX. MIN. AND AVERAGE STRUCTURE HEIGHTS: 120 FEET, 90', AND 105'
(DOES NOT INCLUDE FOUNDATION REVEAL)

I. AVERAGE SPAN LENGTH: 404 FEET (RANGE 158 - 634 FEET)

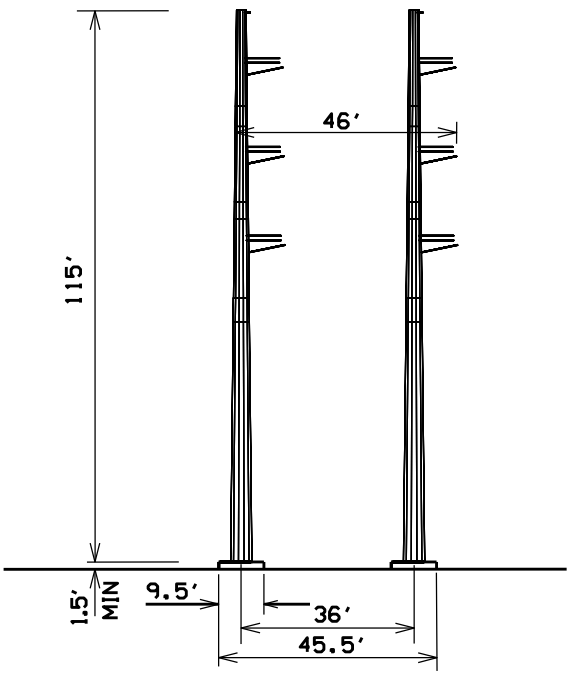
j. MINIMUM CONDUCTOR-GROUND CLEARANCE UNDER MAXIMUM OPERATING CONDITIONS: 22.5'

NOTE: Information contained on drawing is to be considered preliminary in nature and subject to change based on final design.

$DGNSPEC$

DOUBLE CIRCUIT DOUBLE DEADEND STEEL 2-POLE

PRELIMINARY



PROPOSED STRUCTURES

a. MAPPING THAT IDENTIFIES EACH PORTION OF THE PREFERRED ROUTE:
SEE ATTACHMENT II.B.III

b. RATIONALE FOR THE SELECTION OF THE STRUCTURE TYPE: ALLOWS THE INSTALLATION OF TWO 230KV CIRCUITS IN A 100' R/W AND REDUCES FOUNDATION LOADING

c. NUMBER OF EACH TYPE OF STRUCTURE AND LENGTH OF EACH PORTION OF THE R/W:
2 AND 1.3 MILES

d. STRUCTURE MATERIAL AND RATIONALE FOR THE SELECTION OF SUCH MATERIAL:
GALVANIZED STEEL TO MATCH EXISTING STEEL POLES OUTSIDE BECO.

e. FOUNDATION MATERIAL: CONCRETE

F. AVERAGE WIDTH AT CROSSARM: 46'

G. AVERAGE WIDTH AT BASE: 45.5'

H. MAX. MIN. AND AVERAGE STRUCTURE HEIGHTS: 120 FEET, 110', AND 115'
(DOES NOT INCLUDE FOUNDATION REVEAL)

I. AVERAGE SPAN LENGTH: 404 FEET (RANGE 158 - 634 FEET)

j. MINIMUM CONDUCTOR-GROUND CLEARANCE UNDER MAXIMUM OPERATING CONDITIONS: 22.5'

NOTE: Information contained on drawing is to be considered preliminary in nature and subject to change based on final design.

$DGNSPEC$

APPENDIX C DEPARTMENT OF TRANSPORTATION FEDERAL AVIATION ADMINISTRATION 14 CFR PART 77. JULY 21, 2010. FINAL RULE: SAFE EFFICIENT USE AND PRESERVATION OF THE NAVIGABLE AIRSPACE.

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 77

[Docket No. FAA–2006–25002; Amendment No. 77–13]

RIN 2120–AH31

Safe, Efficient Use and Preservation of the Navigable Airspace

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final rule.

SUMMARY: This action amends the regulations governing objects that may affect the navigable airspace. These rules have not been revised in several decades, and the FAA has determined it is necessary to update the regulations, incorporate case law and legislative action, and simplify the rule language. These changes will improve safety and promote the efficient use of the National Airspace System.

DATES: This amendment becomes effective January 18, 2011.

FOR FURTHER INFORMATION CONTACT: For technical questions about this final rule contact Ellen Crum, Air Traffic Systems Operations, Airspace and Rules Group, AJR–33, Federal Aviation Administration, 800 Independence Ave., SW., Washington, DC 20591; telephone (202) 267–8783, facsimile (202) 267–9328. For legal questions about this final rule contact Lorelei Peter, Office of the Chief Counsel–Regulations Division, Federal Aviation Administration, 800 Independence Ave., SW., Washington, DC 20591; telephone (202) 267–3134, facsimile 202–267–7971.

SUPPLEMENTARY INFORMATION:

Authority for This Rulemaking

The Administrator has broad authority to regulate the safe and efficient use of the navigable airspace (49 U.S.C. 40103(a)). The Administrator is also authorized to issue air traffic rules and regulations to govern the flight, navigation, protection, and identification of aircraft for the protection of persons and property on the ground, and for the efficient use of the navigable airspace (49 U.S.C. 40103(b)). The Administrator may also conduct investigations and prescribe regulations, standards, and procedures in carrying out the authority under this part (49 U.S.C. 40113). The Administrator is authorized to protect civil aircraft in air commerce (49 U.S.C. 44070(a)(5)).

Under § 44701(a)(5), the Administrator promotes safe flight of civil aircraft in air commerce by prescribing regulations and minimum standards for other practices, methods, and procedures necessary for safety in air commerce and national security. Also, § 44718 provides that under regulations issued by the Administrator, notice to the agency is required for any construction, alteration, establishment, or expansion of a structure or sanitary landfill, when the notice will promote safety in air commerce, and the efficient use and preservation of the navigable airspace and airport traffic capacity at public use airports. This statutory provision also provides that, under regulations issued by the Administrator, the agency determines whether such construction or alteration is an obstruction of the navigable airspace, or an interference with air navigation facilities and equipment or the navigable airspace. If a determination is made that the construction or alteration creates an obstruction or otherwise interferes, the agency then conducts an aeronautical study to determine adverse impacts on the safe and efficient use of the airspace, facilities, or equipment.

I. Background

A. Summary of the Notice of Proposed Rulemaking (NPRM)

On June 13, 2006, the FAA published an NPRM that proposed to amend the regulations governing objects that may affect the navigable airspace (71 FR 34028). The FAA proposed to: Establish notification requirements and obstruction standards for transmitting on certain frequencies; revise obstruction standards for civil airport imaginary surfaces to more closely align these standards with FAA airport design and instrument approach procedure (IAP) criteria; revise current definitions and include new definitions; require proponents to file with the FAA a notice of proposed construction or alteration for structures near private use airports that have an FAA-approved IAP; and increase the number of days in which a notice must be filed with the FAA before beginning construction or alteration. The comment period closed on September 11, 2006.

B. Summary of the Final Rule

The following is a discussion of the major changes contained in the final rule. The provisions of the final rule that were modified based on comments the FAA received are discussed in the "Discussion of the Final Rule" section. Most of the amendments implemented by the rule are intended to simplify the existing regulations.

This rule adds § 77.29 to incorporate the specific factors listed in P.L. 100–223 for consideration during an aeronautical study. The specific factors are listed in Appendix A to this preamble. Including this language in part 77 does not add or remove any of the factors currently considered in an aeronautical study.

This rule provides for an FAA Determination of Hazard or Determination of No Hazard to become effective 40 days after the date of issuance, unless a petition for discretionary review is received by the FAA within 30 days of issuance. In addition, the rule stipulates that a Determination of No Hazard to air navigation will expire 18 months after the effective date of the determination, or on the date the proposed construction or alteration is abandoned. Also, the rule specifies that a Determination of Hazard to Air Navigation does not expire.

This final rule adds information about the processing of petitions for discretionary review. It also excludes determinations for temporary structures and recommendations for marking and lighting from the discretionary review process. Because of the nature of temporary structures, it is not possible to apply the lengthy discretionary review process to these structures. Also, since marking and lighting recommendations are simply recommendations, there is a separate process for a waiver of, or deviation from, the recommendations.

This rule expands the requirements for notice to be sent to the FAA for proposed construction or alteration of structures on or near private use airports that have an IAP. Accordingly, if a private use airport has an FAA-approved IAP, then a construction sponsor must notify the FAA of a proposed construction or alteration that exceeds the notice criteria in § 77.17. This action will give the FAA enough time to adjust the IAP, if needed, and to inform those who use the IAP.

Also, IAPs at private use airports or heliports are not currently listed in any aeronautical publication. Sponsors of construction or alteration at or near a private use airport or heliport should consult the FAA Web site to determine whether an FAA-approved IAP is listed for that airport.[1] If the airport is listed on the Web site, the sponsor must file notice with the FAA.

Lastly, this rule incorporates minor edits to the regulatory text to distinguish

[1] *https://oeaaa.faa.gov.*

FAA surveillance systems from communication facilities.

C. Summary of Comments

The FAA received approximately 115 comments from individuals, aviation associations, industry spectrum users, airlines, and other aviation businesses. Many commenters, including the Air Transport Association, generally supported the NPRM. Commenters supported specific proposals concerning evaluating the aeronautical impact of proposed construction on IAPs at private use airports; evaluating antenna installations that might affect air traffic or navigation; and the update and reformat of the regulations. Comments that did not support the proposed rule, and suggested changes, are discussed more fully in the "Discussion of the Final Rule" section.

The FAA received substantive comments on the following general areas of the proposal:

- Frequency notification requirements
- Time requirement to file notice with the FAA
- Civil Airport Imaginary Surfaces [2]
- One Engine Inoperative Procedures (OEI)
- Definitions
- Miscellaneous

II. Discussion of the Final Rule

A. Frequency Notification

The FAA's primary focus during the obstruction evaluation process is safety and efficiency of the navigable airspace. It is critical for the agency to be notified of pending construction of physical objects that may affect the safety of aeronautical operations. (*See* 49 U.S.C. 44718.) In today's National Airspace System (NAS), however, electromagnetic transmissions can adversely affect on-board flight avionics, navigation, communication, and surveillance facilities. The FAA has extensive authority to prescribe regulations and minimum standards necessary for safety in air commerce. (*See* 49 U.S.C. § 44701(a)(5).) In addition, the FAA has broad authority to develop policy and plans for the use of the navigable airspace. (*See* 49 U.S.C. 40103.) The FAA relied on these authorities in proposing the notice requirements for broadcast transmissions in the specified bands. As stated in the proposal, broadcast transmission on certain frequencies can pose serious safety threats to avionics and ground based facilities. At the same time, the FAA recognizes the authority of the National Telecommunications and Information Administration (NTIA) and the Federal Communications Commission (FCC) to manage use of the radio spectrum.

The FAA concludes that its proposal to require notice for the proposed frequency bands was too broad. The proposed frequencies from the NPRM are listed in Appendix B to this preamble. The proposed frequencies in the shared (Federal and Non-Federal) bands are managed by an existing process involving several Federal agencies with an interest in spectrum use, which NTIA oversees under the Department of Commerce. It is not the FAA's intent to add a duplicative review and coordination process to that already stated above. In addition, the FAA has determined that some of the proposed frequencies originally listed and not in shared bands do not present concern. Therefore, the agency withdraws the proposed notice and obstruction standards on the shared frequency bands and those frequency bands that, historically, have not posed electromagnetic concerns,[3] when operating under typical specifications.

FM broadcast service transmissions operating in the 88.0–107.9 MHz frequency band pose the greatest concern to FAA navigation signals. The FAA, FCC and NTIA are collaborating on the best way to address this issue. A resolution of this issue is expected soon. Therefore, the proposals on FM broadcast service transmissions in the 88.0–107.9 MHz frequency band remain pending. The FAA will address the comments filed in this docket about the proposed frequency notice requirements and proposed EMI obstruction standards when a formal and collaborative decision is announced.

This rule does include evaluating electromagnetic effect (§§ 77.29 and 77.31), and it codifies the agency's current practices of studying the effects on aircraft navigation and communication facilities. These amendments in no way should be construed to affect the authority of NTIA and the FCC.

B. Time Requirement To File Notice With the FAA

Automation improvements to the FAA's obstruction evaluation program allow the public to file notices of proposed construction electronically, which facilitates the aeronautical study process and has reduced the overall processing time for these cases. The FAA proposed to require that notices of proposed construction or alterations must be filed with the FAA at least 60 days before construction starts or the application filing date for a construction permit, whichever is earliest. The current rule requires 30 days, which the FAA found inadequate for cases to be processed, particularly if additional information, via public comment period, was necessary to complete the study. At the time the FAA published the NPRM, the automation system was in the early stages, and the full benefits of the automation were not yet known. Commenters were split on their support of this proposal, depending on their interests. Comments from the aviation industry largely supported the extended time period. Comments filed by the building industry, however, opposed the extended time period, saying it was too long and would cause undue delay.

The FAA has seen great success with the automation system and concludes that requiring notice to be filed 60 days before construction or the permit application is not necessary. There are cases where circulating the proposal for public comment may be necessary and, consequently, these cases may require up to 45 days for processing. Therefore, the FAA adopts the requirement that notice must be filed with the FAA for proposed construction or alteration at least 45 days before either the date that construction begins, or the date of the construction permit application, whichever is earliest.

Because applications are required within 45 days of construction, the FAA, Department of Defense, and Department of Homeland Security should work together to conduct timely reviews. To that end, the FAA will respond to inquiries from applicants regarding the status of applications, the reason(s) for any delay, and the projected date of completion. As appropriate, the FAA will engage with other Federal Agencies such as the Department of Defense, the Department of Homeland Security, the Department of Energy, and the Department of Interior to expedite any further regulatory modifications and improvements to 14 CFR Part 77 to ensure there is a predictable, consistent, transparent, and timely application process for the wind industry.

Several commenters recommended separate notice requirements for reviewing a temporary structure that might be necessary under emergency-type circumstances. An example

[2] Civil airport imaginary surfaces are established surfaces based on the runway that are used to identify objects that may impact airport plans or aircraft departure/arrival procedures or routes. Section 77.19 describes five types of imaginary surfaces: horizontal, conical, primary, approach and transitional.

[3] 54–88 MHz; 150–216 MHz; 406–430 MHz; 931–940 MHz; 952–960 MHz; 1390–1400 MHz; 2500–2700 MHz; 3700–4200 MHz; 5000–5650 MHz; 5925–6225 MHz; 7450–8550 MHz; 14.2–14.4 GHz.

submitted in the comments was a construction crane that was necessary to replace air conditioning units on the roof of factories. The commenters contend that it is neither logical nor feasible to shut down a factory for 30 days while the FAA studies this temporary structure.

Situations like the one presented by these commenters are not uncommon. Regardless of whether the structure is temporary, it remains critical for the FAA to have notice of tall structures that can affect aeronautical operations. In most cases, the proponent of the structure contacts the FAA Obstruction Evaluation (OE) specialist and identifies the need for a quick review, for which the agency readily responds. While the FAA regrets any past delay in taking quick action on a particular case, the agency declines to set-up special procedures to address such cases. On the FAA's OE Web site,[4] the agency lists the contact information for the FAA specialist. If a sponsor is concerned with the time frame for the FAA's review, the agency encourages the sponsor to contact the FAA specialist directly.

C. Civil Airport Imaginary Surfaces

The NPRM proposed, for a visual runway used by small aircraft or restricted to day-only instrument operations, that the width of the imaginary approach surface expand uniformly to 1,250 ft. If the runway is a visual runway, used by other than small aircraft or for instrument night circling, the surface width expands uniformly from 1,500 ft. to 3,500 ft. If the runway is a non-precision instrument or precision instrument runway, the surface width expands uniformly to 4,000 ft. and 16,000 ft., respectively. Other changes include removing approach surface widths of 1,500 ft. and 2,000 ft., and increasing the width for some non-precision runways from 2,000 ft. to 4,000 ft. The NPRM also proposed expanding the width of the primary approach surface of a non-precision instrument runway or precision instrument runway from 500 feet to 1,000 ft.

Many commenters opposed the proposed expansion of the primary surface. They argued that the proposed expansion would require airport operators to remove existing structures that would fall within the proposed expanded surface, which would result in a financial burden to airport owners and managers. Southwest Airlines, on the other hand, supported the proposal and stated the ability to study and review more proposed structures is positive for airport safety.

Several comments stated that the imaginary surfaces in part 77 do not comport clearly with the surfaces used for obstacle clearance under the United States Standard for Terminal Instrument Procedures (TERPS) and, therefore, makes the part 77 surfaces useless as a project planning tool for airport development.

Similarly, another commenter argued that the Required Navigation Performance (RNP) lateral protection area is greater than the width of the primary surface and the RNP procedures TERPS surface is outside the part 77 imaginary surface. The commenter contends that an obstacle can adversely impact an RNP procedure, but not be characterized as an obstruction. This commenter recommends that the imaginary surfaces be expanded to include RNP procedures.

Several commenters specifically questioned whether current obstructions that fall within the newly expanded primary surface could impact an instrument procedure and result in the airport losing the instrument procedure. One airport authority was concerned about marking and lighting recommendations for existing structures that will now fall under the expanded primary surface.

The FAA proposed these changes to more closely align regulatory provisions in part 77 with TERPS criteria and airport design standards. The inconsistency between IAP criteria, airport design standards, and part 77 surfaces has been a source of confusion for both airport managers and the FAA. These specific proposals would not have altered the notice criteria. Instead, the proposals were meant to identify more proposed structures as obstructions that the FAA could study to determine if they would adversely affect the NAS.

However, since publication of the NPRM, the FAA has begun a coordinated effort to consolidate all agency requirements for the treatment of obstacles in the airport environment. Once completed, the new requirements will form the basis for revised civil airport imaginary surfaces. Thus, it would not be prudent to codify the proposals. Further, amending or expanding any of the civil airport imaginary surfaces at this time would not be in the best interest of the public. The FAA, therefore, withdraws all proposed modifications to the civil airport imaginary surfaces, including the chart format. The FAA will keep the civil airport imaginary surfaces rule as it is currently described in 14 CFR 77.25.

D. One Engine Inoperative Procedures

The NPRM specifically states that OEI procedures were not a part of the rulemaking. The NPRM further notes that the FAA has tasked the Airport Obstruction Standards Committee (AOSC) with examining this issue. Comments from the Air Transport Association, individual airlines, local airport authorities, and aviation organizations, asked the FAA to address OEI procedures. These comments have been forwarded to the AOSC for consideration. As appropriate, the FAA will advise the aviation industry and other interested persons, through the AOSC, of any policy changes.

E. Definitions

The NPRM proposed replacing the term "utility runway" with the phrase "runway used by small aircraft". In addition, the NPRM proposed amending the definitions for precision, non-precision, and visual runways, as these definitions were no longer up-to-date with industry practices. The term "utility runway" is not widely used in industry so the NPRM proposed replacing the term. In addition, the NPRM proposed amending the definitions for precision and non-precision runways to address approaches that use other than ground based navigational aids, such as flight management systems (FMS) and global navigation satellite systems (GNSS). Because of technological advances, the former definitions for precision and non-precision runways are no longer accurate.

By removing the term "utility runway", commenters stated the portions of the rule that include the term became confusing. They note that the runway classifications and corresponding widths for the primary and approach surfaces in the tables in § 77.19(d)(e) are difficult to understand.

Several commenters confused the proposed definitions for precision and non-precision instrument runways with the definitions for precision and non-precision instrument approach procedures.[5] One commenter suggested the non-precision runway definition should exclude a runway that has a developed instrument approach procedure with visibility minimums of

[4] *https://oeaaa.faa.gov.*

[5] The FAA proposed definitions for the terms "precision instrument runway" and "non-precision instrument runway" to be based on the use of visibility minimums, rather than approach procedure classification, given that visibility is the critical factor during the visual portion of the approach.

one statute mile. This commenter contends that many small, general aviation airports have published procedures with one mile visibility under the current obstruction criteria of a utility runway. The commenter also notes that if the FAA adopts the proposal to limit non-precision runways to procedures with visibility minimums of one statute mile, then these small airports would need to have the more demanding primary surfaces and approach criteria. The commenter further says this could result in financial hardship for these airports and the airports may need to double the designated airspace around the runway. Another commenter stated that the new definition for a non-precision runway conflicts with FAA Advisory Circular 150/5300–13, Airport Design.

Commenters also indicated that the new definition and associated surfaces would take runways that currently qualify as utility into the non-precision category. They say these modifications could result in unfunded economic burdens on outlying airports with IAPs to utility runways that experience lower traffic densities. Additionally, commenters noted that many of these airports are configured with minimal infrastructure and could face significant airport expansion to obtain IAP services if the runway is categorized as non-precison.

Several commenters also stated that the proposed definitions of precision and non-precision runways try to redefine the current precision and non-precision instrument procedures because satellite technology could, in the future, enable non-precision approaches to become precision approaches.

Although the FAA proposed to revise these definitions, on further review, the agency has determined it should not revise them at this time. The definitions were proposed to support implementing satellite-based navigation. However, as the satellite-based navigation program has evolved during development of this rulemaking, the agency has learned of unintended consequences of the proposed definitions. For example, changing the runway definition creates infrastructure requirements that may be needed as the technology evolves. The FAA believes a more measured approach is needed before making any changes to the definitions. Thus, the agency will not adopt the proposed revisions to the definitions in this final rule.

F. Extension to a Determination of No Hazard

The NPRM proposed a provision for which an extension to the expiration date for a Determination of No Hazard may be granted. Specifically, it proposed that for structures not subject to FCC review, a Determination of No Hazard can be extended for a maximum of 18 months, if necessary. If more than 18 months is necessary, then a new aeronautical study would be initiated. For structures that require an FCC construction permit, the NPRM proposed that a Determination of No Hazard can be extended for up to 12 months, provided the sponsor submits evidence that an application for a construction permit was filed within 6 months of the date of issuance. The NPRM also proposed that if the FCC extends the original FCC construction completion date, the sponsor must request an extension of the FAA's Determination of No Hazard.

Many commenters found that the two time periods (18 and 12 months) were confusing. The FAA's review of this matter concluded that it is not necessary to continue the distinction between structures subject to FCC review from structures that do not need this review, simply to extend the expiration date. Therefore, for simplification and standardization, the FAA amends the time period for extensions to determinations of structures to 18 months, regardless of whether an FCC construction permit is necessary.

In addition, the FAA unintentionally omitted a section of the current rule from the NPRM. That section states that if the FCC denies a construction permit, the final determination expires on the date of the denial. The FAA has reinserted that section in this final rule.

G. Effective Date

The effective date of this final rule is 180 days from the date the rule is published in the **Federal Register**. The FAA needs this time to amend the automation system it uses to evaluate obstructions, amend relevant FAA orders, train employees, and educate the public.

H. Miscellaneous

One commenter said the requirement to file notice should extend to structures that would penetrate an imaginary surface relative to a planned or proposed airport. Specifically, this commenter seeks to incorporate the imaginary surfaces for evaluating obstructions under § 77.19(a) in the notice requirements for structures that are on or around a planned airport.

Section 77.9 requires notice for construction on an existing airport or an airport under construction. This section specifies an imaginary surface extending from the runway (in increments of 20,000 feet, 10,000 ft., or 5,000 ft., depending on the length of the airport's runway or heliport) at a specific slope for which notice is required if it would penetrate one of the surfaces for either an existing airport or an airport under construction. The above referenced surfaces, for which the longest surface would extend approximately 3.78 miles from the end of the runway, do not apply to a planned airport for which construction has yet to begin.

The effect of this commenter's request would be to require notice for up to approximately 3.5 miles (for the longest runway) for any construction that penetrates the 100 to 1 surface for a planned or proposed airport.

This comment is outside the scope of the NPRM. The essence of this comment would be a new notice requirement for planned or proposed airports. To accommodate this comment without providing the public an opportunity to comment on its impact would violate the Administrative Procedure Act.

Notwithstanding the above scope issue, to apply the imaginary surface from the notice requirements to planned or proposed airports would be difficult to implement. A planned or proposed airport can be at varying stages of development, with runway(s) location and configuration undetermined, navigational aids not sited, and instrument approach and departure procedures yet to be developed. It would be impossible for the FAA to study (and apply the obstruction standards) with any degree of certainty, to a proposed structure when the above listed airport issues are not defined. In addition, airport development can be subject to environmental laws and lengthy processes with alternative plans that must be analyzed. The FAA cannot "reserve" airspace on such speculative plans. The agency does study the impact of structures that are identified as obstructions on planned or proposed airports that are on file with the FAA. As the details of a planned airport become part of the "plan on file" with the FAA or the Airport Layout Plan, on which the FAA can rely, the FAA includes those details during the study.

Several commenters questioned the proposed removal of the regulatory provisions addressing antenna farms and whether any antenna farms currently exist. The FAA has not established any antenna farm area. Moreover, the regulations governing structures addresses the FAA needs

here. Thus, this rule removes the provisions governing antenna farms.

One commenter questioned why an object that is shielded by another structure is not subject to the notice requirements. This commenter contends that if the structure that shields an unreported structure is dismantled, there is no record of the first structure, nor is there any requirement to notify the FAA of this structure if the shielding structure is dismantled.

Section 77.15(a) provides that notice is not required for a structure if the shielding structure is of a substantial and permanent nature and is located in a congested area of a city, town, or settlement where the shielded structure will not adversely affect safety in air navigation. This exception does not apply in areas where there are only one or two other structures. The FAA has not experienced a situation like the one described by the commenter that can be attributed to this exception. This rule does expand the current supplemental notice requirements in § 77.11, and specifies that if a construction or alteration is abandoned, dismantled, or destroyed, notice must be provided to the FAA within 5 days after the construction is abandoned, dismantled, or destroyed. In the rare case where a shielding structure is abandoned, dismantled, or destroyed, the proponent must notify the FAA so that appropriate actions concerning adjacent structures can be initiated.

Prior to this rule, part 77 provided that a proposed or existing structure was an obstruction to air navigation if it was higher than 500 ft. above ground level (AGL). The minimum altitude to operate an aircraft over non-congested areas is 500 feet above the surface.[6] Consequently, an aircraft could be operating at 500 ft. AGL and encounter a structure that was 500 ft. AGL that might not have been studied by the FAA during the obstacle evaluation process. The FAA adopts the proposal that lowers the height of a structure identified as an obstruction from above 500 ft. to above 499 ft. Accordingly, all structures that are above 499 ft. tall will be obstructions, and the FAA will study them to determine their effect on the navigable airspace. This will ensure that all usable airspace at and above 500 ft. AGL is addressed during the aeronautical study and that this airspace is protected from obstructions that may create a hazard to air navigation.

[6] 14 CFR Section 91.119(c) provides that "Except when necessary for takeoff and landing, no person may operate an aircraft below the following altitudes: (b) Over other than congested areas. An altitude of 500 feet above the surface except over open water or sparely populated areas. In those cases, the aircraft may not be operated closer than 500 feet to any person, vessel, vehicle, or structure."

III. Paperwork Reduction Act

The Paperwork Reduction Act of 1995 (44 U.S.C. 3507(d)) requires that the FAA consider the impact of paperwork and other information collection burdens imposed on the public. According to the 1995 amendments to the Paperwork Reduction Act (5 CFR 1320.8(b)(2)(vi)), an agency may not collect or sponsor the collection of information, nor may it impose an information collection requirement unless it displays a currently valid Office of Management and Budget (OMB) control number. As required by the Paperwork Reduction Act of 1995 (44 U.S.C. 3507(d)), the FAA submitted a copy of the new information collection requirements(s) discussed below to OMB for its review. Notice of OMB approval for this information collection will be published in a future **Federal Register** document.

Title 49 U.S.C. 44718 states, "By regulation or by order when necessary, the Secretary of Transportation shall require a person to give adequate public notice, in the form and way the Secretary prescribes, of the construction, alteration, establishment, or expansion, of a structure or sanitary landfill when public notice will promote:

(1) safety in air commerce; and

(2) the efficient use and preservation of the navigable airspace and of airport traffic capacity at public use airports."

This final rule implements the requirement for notification by requiring that notice be submitted to the FAA for proposed construction or alteration of structures on or near private use airports that have an IAP. Accordingly, if a private use airport has an FAA-approved IAP, then a construction sponsor is required to notify the FAA of a proposed construction or alteration that exceeds the notice criteria in § 77.17. This action will give the FAA adequate time to adjust the IAP, if needed, and to inform those who use the IAP. While IAPs at private use airports or heliports are not currently listed in any aeronautical publication, sponsors of construction or alteration at or near a private use airport or heliport can consult the FAA Web site[7] to determine whether an FAA-approved IAP is listed for that airport. If the airport is listed on the Web site, the sponsor must file notice with the FAA. The intent of these changes is to improve safety and promote the efficient use of the National Airspace System.

The FAA estimates that on average, 3,325 Form 7460–1s would be filed annually. It is estimated to take 19 minutes, or 0.32 hours, to fill out each form. Hence, the estimated hour burden is: 0.32 hours × 3,325 = 1,064 hours.

The average cost for a firm to prepare the form itself is approximately $40 per form. It is estimated that 20 percent of the forms filed would be filed this way. Thus, the estimated average annual reporting burden for companies to process this form in-house would be: (FAA Form 7460–1) $40 × 665 = $26,600.

The average cost for a company to outsource this function to a contractor is approximately $480 per report. It is estimated that 80 percent of the forms filed would be filed this way. Thus, the estimated average annual reporting burden for companies to outsource this function is: (FAA Form 7460–1) $480 × 2,660 = $1,276,800.

It is estimated that roughly 30 percent of firms filing FAA Form 7460–1 will need to perform a site survey to complete the form. The cost of a site survey is $790. Thus, the estimated annual reporting burden for companies who require a site survey would be: (FAA Form 7460–1) $790 × 998 = $788,420.

Hence, the total annual cost to firms that fill out FAA Form 7460–1 is $2,091,820.

In the proposed rule, the FAA asked for comments on the information collection burden. You may view the FAA's specific request in the proposed rule.[8] The FAA received comments from multiple commenters. The following is a summary of the comments with the FAA's response:

Several commenters stated that the FAA underestimated the costs, in terms of time and paperwork, associated with preparing a Form 7460–1, as well as the costs of filing an OE notice, so the FAA should revise its estimates. One commenter surveyed its members and the survey indicated that the cost of processing a Form 7460–1 in-house was $406 and took about 1.6 hours per form. Further, the average hourly labor cost was found to be $36 per hour. The commenter also stated that in addition to maps, a site survey is needed to complete Form 7460–1, which ensures the accuracy of the location and costs an average of $768. Another commenter supported the notion of including the cost of a site survey in the cost estimation for filing a Form 7460–1. Another commenter suggested that the

[7] *https://oeaaa.faa.gov.*

[8] 71 FR 34028; June 13, 2006.

FAA increase its estimate for processing a Form 7460–1 in-house to $40.

The FAA omitted the cost of a site survey in the preliminary analysis because a site survey is not required to complete a Form 7460–1. However, a site survey must be completed if it is requested by the FAA's Flight Procedure Office. The agency has revised the cost analysis to reflect the wider range of costs as supplied by the commenters. The FAA also revised its cost and paperwork analyses to include the cost of filing a form in-house, as well as the costs of a site survey.

A few commenters claimed that the FAA underestimated the time and paperwork costs associated with filing additional notices. Another commenter believed that the FAA underestimated the paperwork burden that will be placed on radio spectrum users.

The FAA completed a paperwork reduction package for the proposed rule, which did show the estimated paperwork costs. The paperwork costs were also shown in the initial regulatory evaluation and were available for review in the docket. However, the FAA has elected not to adopt the radio frequency notice requirements in this final rule. As a result, there will be no additional paperwork burden placed on radio spectrum users at this time.

A commenter stated that requiring applicants to provide notice to the FAA 60 days in advance could also increase the number of filings because of the rule change. Another commenter stated that extending the notice period for all proposed projects will cause undue delay in securing FAA approval and will delay the ability of utilities to develop new sites.

The FAA has reduced the filing time period from 60 days to 45 days. This should mitigate the delay expected by the commenters and allow them to continue their operations without much change. Thus, the FAA does not expect any delays in construction or operational deficiencies resulting from the final rule.

International Compatibility

In keeping with U.S. obligations under the Convention on International Civil Aviation, it is FAA policy to comply with International Civil Aviation Organization (ICAO) Standards and Recommended Practices to the maximum extent practicable. The FAA has reviewed the corresponding ICAO Standards and Recommended Practices and has identified no new differences with these proposed regulations.

IV. Regulatory Evaluation, Regulatory Flexibility Determination, International Trade Impact Assessment, and Unfunded Mandates Assessment

Changes to Federal regulations must undergo several economic analyses. First, Executive Order 12866 directs that each Federal agency shall propose or adopt a regulation only upon a reasoned determination that the benefits of the intended regulation justify its costs. Second, the Regulatory Flexibility Act of 1980 (Pub. L. 96–354) requires agencies to analyze the economic impact of regulatory changes on small entities. Third, the Trade Agreements Act (Pub. L. 96–39) prohibits agencies from setting standards that create unnecessary obstacles to the foreign commerce of the United States. In developing U.S. standards, this Trade Act requires agencies to consider international standards and, where appropriate, that they be the basis of U.S. standards. Fourth, the Unfunded Mandates Reform Act of 1995 (Pub. L. 104–4) requires agencies to prepare a written assessment of the costs, benefits, and other effects of proposed or final rules that include a Federal mandate likely to result in the expenditure by state, local, or tribal governments, in the aggregate, or by the private sector, of $100 million or more annually (adjusted for inflation with base year of 1995). This portion of the preamble summarizes the FAA's analysis of the economic impacts of this final rule. Readers seeking greater detail should read the full regulatory evaluation, a copy of which is in the docket for this rulemaking.

In conducting these analyses, the FAA has determined that this final rule has benefits that justify its costs and is not economically significant under Executive Order 12866; however, it is otherwise "significant" because of concerns raised by the National Telecommunications and Information Administration (NTIA) and the Federal Communications Commission (FCC) regarding the FAA's evaluation of potential electromagnetic effect during aeronautical studies. The final rule, if adopted, will not have a significant economic impact on a substantial number of small entities, will not create unnecessary obstacles to international trade, and will not impose an unfunded mandate on state, local, tribal governments, or on the private sector.

This final rule amends 14 CFR part 77. These amendments refer to the rules for obstruction evaluation standards, aeronautical studies, and notice provisions about objects that could create hazards to air navigation.

The FAA estimates the cost of this final rule to private industry will be approximately $20.9 million ($14.1 million, present value) over the next 10 years. The estimated cost of the final rule to the FAA will be approximately $18.7 million ($12.6 million, present value) over the next 10 years. Therefore, the total cost associated with the final rule will be approximately $39.6 million ($26.8 million, present value) over the next 10 years.

The final rule will enhance protection of aircraft approaches from unknown obstructions and unknown alteration projects on or near private use airports with FAA-approved instrument approach procedures (IAPs). The FAA contends that these qualitative benefits justify the costs of the final rule.

Final Regulatory Flexibility Analysis

The Regulatory Flexibility Act of 1980 establishes "as a principle of regulatory issuance that agencies shall endeavor, consistent with the objective of the rule and of applicable statutes, to fit regulatory and informational requirements to the scale of the business, organizations, and governmental jurisdictions subject to regulation." To achieve that principle, the Act requires agencies to solicit and consider flexible regulatory proposals and to explain the rationale for their actions. The Act covers a wide range of small entities, including small businesses, not-for-profit organizations and small governmental jurisdictions.

Agencies must perform a review to determine whether a proposed or final rule will have a significant economic impact on a substantial number of small entities. If the determination is that it will, the agency must prepare a regulatory flexibility analysis (RFA) as described in the Act.

However, if an agency determines that a proposed or final rule is not expected to have a significant economic impact on a substantial number of small entities, section 605(b) of the 1980 Act provides that the head of the agency may so certify and an RFA is not required. The certification must include a statement providing the factual basis for this determination, and the reasoning should be clear.

While the FAA does not maintain data on the size of businesses that file notices, the FAA estimates that approximately 40 percent of the OE notices will be filed by small businesses (comprised of business owners and private use airport owners) as defined by the Small Business Administration. Thus, in 2010 when the rule is expected to take effect, the FAA expects approximately 2,400 more OE notices

will be filed by affected parties. Of those applications filed, approximately 960 notices are estimated to be filed by small businesses (using 40 percent assumption).

For those small businesses that are inexperienced in submitting the necessary paperwork, the FAA believes they would either hire a consultant or spend as much as the consultant fee ($480) in staff time to understand, research, complete, and submit the form(s). For the purpose of this regulatory flexibility assessment, the FAA assumes that it will cost all small entities approximately $480 per case to meet the requirements of part 77.

It is unlikely that any individual small entity will file more than three OE notices in a calendar year. As a result, the FAA estimates that in virtually all cases, the cost of this rule to small businesses will not exceed $1500 per small entity, a cost the FAA does not consider significant. Therefore, as the FAA Administrator, I certify that this rule will not have a significant economic impact on a substantial number of small entities.

International Trade Impact Assessment

The Trade Agreements Act of 1979 (Pub. L. 96–39), as amended by the Uruguay Round Agreements Act (Pub. L. 103–465), prohibits Federal agencies from establishing standards or engaging in related activities that create unnecessary obstacles to the foreign commerce of the United States. Pursuant to these Acts, the establishment of standards is not considered an unnecessary obstacle to the foreign commerce of the United States, so long as the standard has a legitimate domestic objective, such as the protection of safety, and does not operate in a manner that excludes imports that meet this objective. The statute also requires consideration of international standards and, where appropriate, that they be the basis for U.S. standards. The FAA has assessed the potential effect of this final rule and determined that it will have only a domestic impact and, therefore, will not create unnecessary obstacles to the foreign commerce of the United States.

Unfunded Mandates Assessment

Title II of the Unfunded Mandates Reform Act of 1995 (Pub. L. 104–4) requires each Federal agency to prepare a written statement assessing the effects of any Federal mandate in a proposed or final agency rule that may result in an expenditure of $100 million or more (in 1995 dollars) in any one year by state, local, and tribal governments, in the aggregate, or by the private sector; such a mandate is deemed to be a "significant regulatory action." The FAA currently uses an inflation-adjusted value of $136.1 million in lieu of $100 million. This final rule does not contain such a mandate; therefore, the requirements of Title II of the Act do not apply.

Executive Order 13132, Federalism

The FAA has analyzed this final rule under the principles and criteria of Executive Order 13132, Federalism. The FAA determined that this action will not have a substantial direct effect on the States, or the relationship between the Federal Government and the States, or on the distribution of power and responsibilities among the various levels of government, and, therefore, does not have federalism implications.

Environmental Analysis

FAA Order 1050.1E identifies FAA actions that are categorically excluded from preparation of an environmental assessment or environmental impact statement under the National Environmental Policy Act in the absence of extraordinary circumstances. The FAA has determined this rulemaking action qualifies for the categorical exclusion identified in paragraph 312f and involves no extraordinary circumstances.

Regulations That Significantly Affect Energy Supply, Distribution, or Use

The FAA has analyzed this final rule under Executive Order 13211, Actions Concerning Regulations that Significantly Affect Energy Supply, Distribution, or Use (May 18, 2001). We have determined that it is not a "significant energy action" under the executive order because it is not a "significant regulatory action" under Executive Order 12866, and it is not likely to have a significant adverse effect on the supply, distribution, or use of energy.

Availability of Rulemaking Documents

You can get an electronic copy of rulemaking documents using the Internet by—

1. Searching the Federal eRulemaking Portal (*http://www.regulations.gov*);

2. Visiting the FAA's Regulations and Policies Web page at *http://www.faa.gov/regulations_policies/;* or

3. Accessing the Government Printing Office's Web page at *http://www.gpoaccess.gov/fr/index.html.*

You can also get a copy by sending a request to the Federal Aviation Administration, Office of Rulemaking, ARM–1, 800 Independence Avenue, SW., Washington, DC 20591, or by calling (202) 267–9680. Make sure to identify the amendment number or docket number of this rulemaking.

Anyone is able to search the electronic form of all comments received into any of our dockets by the name of the individual submitting the comment (or signing the comment, if submitted on behalf of an association, business, labor union, etc.). You may review DOT's complete Privacy Act statement in the **Federal Register** published on April 11, 2000 (Volume 65, Number 70; Pages 19477–78) or you may visit *http://DocketsInfo.dot.gov*.

Small Business Regulatory Enforcement Fairness Act

The Small Business Regulatory Enforcement Fairness Act (SBREFA) of 1996 requires FAA to comply with small entity requests for information or advice about compliance with statutes and regulations within its jurisdiction. If you are a small entity and you have a question regarding this document, you may contact your local FAA official, or the person listed under the **FOR FURTHER INFORMATION CONTACT** heading at the beginning of the preamble. You can find out more about SBREFA on the Internet at *http://www.faa.gov/regulations_policies/rulemaking/sbre_act/*.

Appendix A to the Preamble

Under regulations (49 U.S.C. 44718) prescribed by the Secretary, if the Secretary decides that constructing or altering a structure may result in an obstruction of the navigable airspace or an interference with air navigation facilities and equipment or the navigable airspace, the Secretary shall conduct an aeronautical study to decide the extent of any adverse impact on the safe and efficient use of the airspace, facilities, or equipment. In conducting the study, the Secretary shall consider factors relevant to the efficient and effective use of the navigable airspace, including—

(A) The impact on arrival, departure, and en route procedures for aircraft operating under visual flight rules;

(B) The impact on arrival, departure, and en route procedures for aircraft operating under instrument flight rules;

(C) The impact on existing public use airports and aeronautical facilities;

(D) The impact on planned public use airports and aeronautical facilities; and

(E) The cumulative impact resulting from the proposed construction or alteration of a structure when combined with the impact of other existing or proposed structures.

Appendix B to the Preamble

The NPRM proposed that notice must be filed with the FAA for any construction of a new, or modification of an existing facility, *i.e.*—building, antenna structure, or any other man-made structure, which supports a radiating element(s) for the purpose of radio frequency transmissions operating on the following frequencies:

(i) 54–108 MHz
(ii) 150–216 MHz
(iii) 406–430 MHz
(iv) 931–940 MHz
(v) 952–960 MHz
(vi) 1390–1400 MHz
(vii) 2500–2700 MHz
(viii) 3700–4200 MHz
(ix) 5000–5650 MHz
(x) 5925–6525 MHz
(xi) 7450–8550 MHz
(xii) 14.2–14.4 GHz
(xiii) 21.2–23.6 GHz

In addition, the NPRM proposed that any changes or modification to a system operating on one of the previously mentioned frequencies when specified in the original FAA determination, including:

(i) Change in the authorized frequency;

(ii) Addition of new frequencies;

(iii) Increase in effective radiated power (ERP) equal or greater than 3 decibels;

(iv) modification of radiating elements, including: (A) Antenna mounting locations(s) if increased 100 feet or more irrespective of whether the overall height is increased; (B) changes in antenna specification (including gain, beam-width, polarization, pattern); and (C) change in antenna azimuth/bearing (*e.g.* point-to-point microwave systems).

List of Subjects in 14 CFR Part 77

Administrative practice and procedure, Airports, Airspace, Aviation safety, Navigation (air), Reporting and recordkeeping requirements.

V. The Amendment

■ In consideration of the foregoing, the Federal Aviation Administration amends Chapter I of title 14, Code of Federal Regulations by revising part 77 to read as follows:

PART 77—SAFE, EFFICIENT USE, AND PRESERVATION OF THE NAVIGABLE AIRSPACE

Subpart A—General

Sec.
77.1 Purpose.
77.3 Definitions.

Subpart B—Notice Requirements

77.5 Applicability.
77.7 Form and time of notice.
77.9 Construction or alteration requiring notice.
77.11 Supplemental notice requirements.

Subpart C—Standards for Determining Obstructions to Air Navigation or Navigational Aids or Facilities

77.13 Applicability.
77.15 Scope.
77.17 Obstruction standards.
77.19 Civil airport imaginary surfaces.
77.21 Department of Defense (DOD) airport imaginary surfaces.
77.23 Heliport imaginary surfaces.

Subpart D—Aeronautical Studies and Determinations

77.25 Applicability.
77.27 Initiation of studies.
77.29 Evaluating aeronautical effect.
77.31 Determinations.
77.33 Effective period of determinations.
77.35 Extensions, terminations, revisions and corrections.

Subpart E—Petitions for Discretionary Review

77.37 General.
77.39 Contents of a petition.
77.41 Discretionary review results.

Authority: 49 U.S.C. 106 (g), 40103, 40113–40114, 44502, 44701, 44718, 46101–46102, 46104.

Subpart A—General

§ 77.1 Purpose.

This part establishes:

(a) The requirements to provide notice to the FAA of certain proposed construction, or the alteration of existing structures;

(b) The standards used to determine obstructions to air navigation, and navigational and communication facilities;

(c) The process for aeronautical studies of obstructions to air navigation or navigational facilities to determine the effect on the safe and efficient use of navigable airspace, air navigation facilities or equipment; and

(d) The process to petition the FAA for discretionary review of determinations, revisions, and extensions of determinations.

§ 77.3 Definitions.

For the purpose of this part:

Non-precision instrument runway means a runway having an existing instrument approach procedure utilizing air navigation facilities with only horizontal guidance, or area type navigation equipment, for which a straight-in non-precision instrument approach procedure has been approved, or planned, and for which no precision approach facilities are planned, or indicated on an FAA planning document or military service military airport planning document.

Planned or proposed airport is an airport that is the subject of at least one of the following documents received by the FAA:

(1) Airport proposals submitted under 14 CFR part 157.

(2) Airport Improvement Program requests for aid.

(3) Notices of existing airports where prior notice of the airport construction or alteration was not provided as required by 14 CFR part 157.

(4) Airport layout plans.

(5) DOD proposals for airports used only by the U.S. Armed Forces.

(6) DOD proposals on joint-use (civil-military) airports.

(7) Completed airport site selection feasibility study.

Precision instrument runway means a runway having an existing instrument approach procedure utilizing an Instrument Landing System (ILS), or a Precision Approach Radar (PAR). It also means a runway for which a precision approach system is planned and is so indicated by an FAA-approved airport layout plan; a military service approved military airport layout plan; any other FAA planning document, or military service military airport planning document.

Public use airport is an airport available for use by the general public without a requirement for prior approval of the airport owner or operator.

Seaplane base is considered to be an airport only if its sea lanes are outlined by visual markers.

Utility runway means a runway that is constructed for and intended to be used by propeller driven aircraft of 12,500 pounds maximum gross weight and less.

Visual runway means a runway intended solely for the operation of aircraft using visual approach procedures, with no straight-in instrument approach procedure and no instrument designation indicated on an FAA-approved airport layout plan, a military service approved military airport layout plan, or by any planning document submitted to the FAA by competent authority.

Subpart B—Notice Requirements

§ 77.5 Applicability.

(a) If you propose any construction or alteration described in § 77.9, you must provide adequate notice to the FAA of that construction or alteration.

(b) If requested by the FAA, you must also file supplemental notice before the start date and upon completion of certain construction or alterations that are described in § 77.9.

(c) Notice received by the FAA under this subpart is used to:

(1) Evaluate the effect of the proposed construction or alteration on safety in air commerce and the efficient use and preservation of the navigable airspace and of airport traffic capacity at public use airports;

(2) Determine whether the effect of proposed construction or alteration is a hazard to air navigation;

(3) Determine appropriate marking and lighting recommendations, using FAA Advisory Circular 70/7460–1, Obstruction Marking and Lighting;

(4) Determine other appropriate measures to be applied for continued safety of air navigation; and

(5) Notify the aviation community of the construction or alteration of objects that affect the navigable airspace, including the revision of charts, when necessary.

§ 77.7 Form and time of notice.

(a) If you are required to file notice under § 77.9, you must submit to the FAA a completed FAA Form 7460–1, Notice of Proposed Construction or Alteration. FAA Form 7460–1 is available at FAA regional offices and on the Internet.

(b) You must submit this form at least 45 days before the start date of the proposed construction or alteration or the date an application for a construction permit is filed, whichever is earliest.

(c) If you propose construction or alteration that is also subject to the licensing requirements of the Federal Communications Commission (FCC), you must submit notice to the FAA on or before the date that the application is filed with the FCC.

(d) If you propose construction or alteration to an existing structure that exceeds 2,000 ft. in height above ground level (AGL), the FAA presumes it to be a hazard to air navigation that results in an inefficient use of airspace. You must include details explaining both why the proposal would not constitute a hazard to air navigation and why it would not cause an inefficient use of airspace.

(e) The 45-day advance notice requirement is waived if immediate construction or alteration is required because of an emergency involving essential public services, public health, or public safety. You may provide notice to the FAA by any available, expeditious means. You must file a completed FAA Form 7460–1 within 5 days of the initial notice to the FAA. Outside normal business hours, the nearest flight service station will accept emergency notices.

§ 77.9 Construction or alteration requiring notice.

If requested by the FAA, or if you propose any of the following types of construction or alteration, you must file notice with the FAA of:

(a) Any construction or alteration that is more than 200 ft. AGL at its site.

(b) Any construction or alteration that exceeds an imaginary surface extending outward and upward at any of the following slopes:

(1) 100 to 1 for a horizontal distance of 20,000 ft. from the nearest point of the nearest runway of each airport described in paragraph (d) of this section with its longest runway more than 3,200 ft. in actual length, excluding heliports.

(2) 50 to 1 for a horizontal distance of 10,000 ft. from the nearest point of the nearest runway of each airport described in paragraph (d) of this section with its longest runway no more than 3,200 ft. in actual length, excluding heliports.

(3) 25 to 1 for a horizontal distance of 5,000 ft. from the nearest point of the nearest landing and takeoff area of each heliport described in paragraph (d) of this section.

(c) Any highway, railroad, or other traverse way for mobile objects, of a height which, if adjusted upward 17 feet for an Interstate Highway that is part of the National System of Military and Interstate Highways where overcrossings are designed for a minimum of 17 feet vertical distance, 15 feet for any other public roadway, 10 feet or the height of the highest mobile object that would normally traverse the road, whichever is greater, for a private road, 23 feet for a railroad, and for a waterway or any other traverse way not previously mentioned, an amount equal to the height of the highest mobile object that would normally traverse it, would exceed a standard of paragraph (a) or (b) of this section.

(d) Any construction or alteration on any of the following airports and heliports:

(1) A public use airport listed in the Airport/Facility Directory, Alaska Supplement, or Pacific Chart Supplement of the U.S. Government Flight Information Publications;

(2) A military airport under construction, or an airport under construction that will be available for public use;

(3) An airport operated by a Federal agency or the DOD.

(4) An airport or heliport with at least one FAA-approved instrument approach procedure.

(e) You do not need to file notice for construction or alteration of:

(1) Any object that will be shielded by existing structures of a permanent and substantial nature or by natural terrain or topographic features of equal or greater height, and will be located in the congested area of a city, town, or settlement where the shielded structure will not adversely affect safety in air navigation;

(2) Any air navigation facility, airport visual approach or landing aid, aircraft arresting device, or meteorological device meeting FAA-approved siting criteria or an appropriate military service siting criteria on military airports, the location and height of which are fixed by its functional purpose;

(3) Any construction or alteration for which notice is required by any other FAA regulation.

(4) Any antenna structure of 20 feet or less in height, except one that would increase the height of another antenna structure.

§ 77.11 Supplemental notice requirements.

(a) You must file supplemental notice with the FAA when:

(1) The construction or alteration is more than 200 feet in height AGL at its site; or

(2) Requested by the FAA.

(b) You must file supplemental notice on a prescribed FAA form to be received within the time limits specified in the FAA determination. If no time limit has been specified, you must submit supplemental notice of construction to the FAA within 5 days after the structure reaches its greatest height.

(c) If you abandon a construction or alteration proposal that requires supplemental notice, you must submit notice to the FAA within 5 days after the project is abandoned.

(d) If the construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

Subpart C—Standards for Determining Obstructions to Air Navigation or Navigational Aids or Facilities

§ 77.13 Applicability.

This subpart describes the standards used for determining obstructions to air navigation, navigational aids, or navigational facilities. These standards apply to the following:

(a) Any object of natural growth, terrain, or permanent or temporary construction or alteration, including equipment or materials used and any permanent or temporary apparatus.

(b) The alteration of any permanent or temporary existing structure by a change in its height, including appurtenances, or lateral dimensions, including equipment or material used therein.

§ 77.15 Scope.

(a) This subpart describes standards used to determine obstructions to air navigation that may affect the safe and efficient use of navigable airspace and the operation of planned or existing air navigation and communication facilities. Such facilities include air navigation aids, communication equipment, airports, Federal airways, instrument approach or departure procedures, and approved off-airway routes.

(b) Objects that are considered obstructions under the standards

described in this subpart are presumed hazards to air navigation unless further aeronautical study concludes that the object is not a hazard. Once further aeronautical study has been initiated, the FAA will use the standards in this subpart, along with FAA policy and guidance material, to determine if the object is a hazard to air navigation.

(c) The FAA will apply these standards with reference to an existing airport facility, and airport proposals received by the FAA, or the appropriate military service, before it issues a final determination.

(d) For airports having defined runways with specially prepared hard surfaces, the primary surface for each runway extends 200 feet beyond each end of the runway. For airports having defined strips or pathways used regularly for aircraft takeoffs and landings, and designated runways, without specially prepared hard surfaces, each end of the primary surface for each such runway shall coincide with the corresponding end of the runway. At airports, excluding seaplane bases, having a defined landing and takeoff area with no defined pathways for aircraft takeoffs and landings, a determination must be made as to which portions of the landing and takeoff area are regularly used as landing and takeoff pathways. Those determined pathways must be considered runways, and an appropriate primary surface as defined in § 77.19 will be considered as longitudinally centered on each such runway. Each end of that primary surface must coincide with the corresponding end of that runway.

(e) The standards in this subpart apply to construction or alteration proposals on an airport (including heliports and seaplane bases with marked lanes) if that airport is one of the following before the issuance of the final determination:

(1) Available for public use and is listed in the Airport/Facility Directory, Supplement Alaska, or Supplement Pacific of the U.S. Government Flight Information Publications; or

(2) A planned or proposed airport or an airport under construction of which the FAA has received actual notice, except DOD airports, where there is a clear indication the airport will be available for public use; or,

(3) An airport operated by a Federal agency or the DOD; or,

(4) An airport that has at least one FAA-approved instrument approach.

§ 77.17 Obstruction standards.

(a) An existing object, including a mobile object, is, and a future object would be an obstruction to air navigation if it is of greater height than any of the following heights or surfaces:

(1) A height of 499 feet AGL at the site of the object.

(2) A height that is 200 feet AGL, or above the established airport elevation, whichever is higher, within 3 nautical miles of the established reference point of an airport, excluding heliports, with its longest runway more than 3,200 feet in actual length, and that height increases in the proportion of 100 feet for each additional nautical mile from the airport up to a maximum of 499 feet.

(3) A height within a terminal obstacle clearance area, including an initial approach segment, a departure area, and a circling approach area, which would result in the vertical distance between any point on the object and an established minimum instrument flight altitude within that area or segment to be less than the required obstacle clearance.

(4) A height within an en route obstacle clearance area, including turn and termination areas, of a Federal Airway or approved off-airway route, that would increase the minimum obstacle clearance altitude.

(5) The surface of a takeoff and landing area of an airport or any imaginary surface established under § 77.19, 77.21, or 77.23. However, no part of the takeoff or landing area itself will be considered an obstruction.

(b) Except for traverse ways on or near an airport with an operative ground traffic control service furnished by an airport traffic control tower or by the airport management and coordinated with the air traffic control service, the standards of paragraph (a) of this section apply to traverse ways used or to be used for the passage of mobile objects only after the heights of these traverse ways are increased by:

(1) 17 feet for an Interstate Highway that is part of the National System of Military and Interstate Highways where overcrossings are designed for a minimum of 17 feet vertical distance.

(2) 15 feet for any other public roadway.

(3) 10 feet or the height of the highest mobile object that would normally traverse the road, whichever is greater, for a private road.

(4) 23 feet for a railroad.

(5) For a waterway or any other traverse way not previously mentioned, an amount equal to the height of the highest mobile object that would normally traverse it.

§ 77.19 Civil airport imaginary surfaces.

The following civil airport imaginary surfaces are established with relation to the airport and to each runway. The size of each such imaginary surface is based on the category of each runway according to the type of approach available or planned for that runway. The slope and dimensions of the approach surface applied to each end of a runway are determined by the most precise approach procedure existing or planned for that runway end.

(a) *Horizontal surface.* A horizontal plane 150 feet above the established airport elevation, the perimeter of which is constructed by SW.inging arcs of a specified radii from the center of each end of the primary surface of each runway of each airport and connecting the adjacent arcs by lines tangent to those arcs. The radius of each arc is:

(1) 5,000 feet for all runways designated as utility or visual;

(2) 10,000 feet for all other runways. The radius of the arc specified for each end of a runway will have the same arithmetical value. That value will be the highest determined for either end of the runway. When a 5,000-foot arc is encompassed by tangents connecting two adjacent 10,000-foot arcs, the 5,000-foot arc shall be disregarded on the construction of the perimeter of the horizontal surface.

(b) *Conical surface.* A surface extending outward and upward from the periphery of the horizontal surface at a slope of 20 to 1 for a horizontal distance of 4,000 feet.

(c) *Primary surface.* A surface longitudinally centered on a runway. When the runway has a specially prepared hard surface, the primary surface extends 200 feet beyond each end of that runway; but when the runway has no specially prepared hard surface, the primary surface ends at each end of that runway. The elevation of any point on the primary surface is the same as the elevation of the nearest point on the runway centerline. The width of the primary surface is:

(1) 250 feet for utility runways having only visual approaches.

(2) 500 feet for utility runways having non-precision instrument approaches.

(3) For other than utility runways, the width is:

(i) 500 feet for visual runways having only visual approaches.

(ii) 500 feet for non-precision instrument runways having visibility minimums greater than three-fourths statue mile.

(iii) 1,000 feet for a non-precision instrument runway having a non-precision instrument approach with visibility minimums as low as three-fourths of a statute mile, and for precision instrument runways.

(iv) The width of the primary surface of a runway will be that width prescribed in this section for the most precise approach existing or planned for either end of that runway.

(d) *Approach surface.* A surface longitudinally centered on the extended runway centerline and extending outward and upward from each end of the primary surface. An approach surface is applied to each end of each runway based upon the type of approach available or planned for that runway end.

(1) The inner edge of the approach surface is the same width as the primary surface and it expands uniformly to a width of:

(i) 1,250 feet for that end of a utility runway with only visual approaches;

(ii) 1,500 feet for that end of a runway other than a utility runway with only visual approaches;

(iii) 2,000 feet for that end of a utility runway with a non-precision instrument approach;

(iv) 3,500 feet for that end of a non-precision instrument runway other than utility, having visibility minimums greater that three-fourths of a statute mile;

(v) 4,000 feet for that end of a non-precision instrument runway, other than utility, having a non-precision instrument approach with visibility minimums as low as three-fourths statute mile; and

(vi) 16,000 feet for precision instrument runways.

(2) The approach surface extends for a horizontal distance of:

(i) 5,000 feet at a slope of 20 to 1 for all utility and visual runways;

(ii) 10,000 feet at a slope of 34 to 1 for all non-precision instrument runways other than utility; and

(iii) 10,000 feet at a slope of 50 to 1 with an additional 40,000 feet at a slope of 40 to 1 for all precision instrument runways.

(3) The outer width of an approach surface to an end of a runway will be that width prescribed in this subsection for the most precise approach existing or planned for that runway end.

(e) *Transitional surface.* These surfaces extend outward and upward at right angles to the runway centerline and the runway centerline extended at a slope of 7 to 1 from the sides of the primary surface and from the sides of the approach surfaces. Transitional surfaces for those portions of the precision approach surface which project through and beyond the limits of the conical surface, extend a distance of 5,000 feet measured horizontally from the edge of the approach surface and at right angles to the runway centerline.

§ 77.21 Department of Defense (DOD) airport imaginary surfaces.

(a) *Related to airport reference points.* These surfaces apply to all military airports. For the purposes of this section, a military airport is any airport operated by the DOD.

(1) *Inner horizontal surface.* A plane that is oval in shape at a height of 150 feet above the established airfield elevation. The plane is constructed by scribing an arc with a radius of 7,500 feet about the centerline at the end of each runway and interconnecting these arcs with tangents.

(2) *Conical surface.* A surface extending from the periphery of the inner horizontal surface outward and upward at a slope of 20 to 1 for a horizontal distance of 7,000 feet to a height of 500 feet above the established airfield elevation.

(3) *Outer horizontal surface.* A plane, located 500 feet above the established airfield elevation, extending outward from the outer periphery of the conical surface for a horizontal distance of 30,000 feet.

(b) *Related to runways.* These surfaces apply to all military airports.

(1) *Primary surface.* A surface located on the ground or water longitudinally centered on each runway with the same length as the runway. The width of the primary surface for runways is 2,000 feet. However, at established bases where substantial construction has taken place in accordance with a previous lateral clearance criteria, the 2,000-foot width may be reduced to the former criteria.

(2) *Clear zone surface.* A surface located on the ground or water at each end of the primary surface, with a length of 1,000 feet and the same width as the primary surface.

(3) *Approach clearance surface.* An inclined plane, symmetrical about the runway centerline extended, beginning 200 feet beyond each end of the primary surface at the centerline elevation of the runway end and extending for 50,000 feet. The slope of the approach clearance surface is 50 to 1 along the runway centerline extended until it reaches an elevation of 500 feet above the established airport elevation. It then continues horizontally at this elevation to a point 50,000 feet from the point of beginning. The width of this surface at the runway end is the same as the primary surface, it flares uniformly, and the width at 50,000 is 16,000 feet.

(4) *Transitional surfaces.* These surfaces connect the primary surfaces, the first 200 feet of the clear zone surfaces, and the approach clearance surfaces to the inner horizontal surface, conical surface, outer horizontal surface or other transitional surfaces. The slope of the transitional surface is 7 to 1 outward and upward at right angles to the runway centerline.

§ 77.23 Heliport imaginary surfaces.

(a) *Primary surface.* The area of the primary surface coincides in size and shape with the designated take-off and landing area. This surface is a horizontal plane at the elevation of the established heliport elevation.

(b) *Approach surface.* The approach surface begins at each end of the heliport primary surface with the same width as the primary surface, and extends outward and upward for a horizontal distance of 4,000 feet where its width is 500 feet. The slope of the approach surface is 8 to 1 for civil heliports and 10 to 1 for military heliports.

(c) *Transitional surfaces.* These surfaces extend outward and upward from the lateral boundaries of the primary surface and from the approach surfaces at a slope of 2 to 1 for a distance of 250 feet measured horizontally from the centerline of the primary and approach surfaces.

Subpart D—Aeronautical Studies and Determinations

§ 77.25 Applicability.

(a) This subpart applies to any aeronautical study of a proposed construction or alteration for which notice to the FAA is required under § 77.9.

(b) The purpose of an aeronautical study is to determine whether the aeronautical effects of the specific proposal and, where appropriate, the cumulative impact resulting from the proposed construction or alteration when combined with the effects of other existing or proposed structures, would constitute a hazard to air navigation.

(c) The obstruction standards in subpart C of this part are supplemented by other manuals and directives used in determining the effect on the navigable airspace of a proposed construction or alteration. When the FAA needs additional information, it may circulate a study to interested parties for comment.

§ 77.27 Initiation of studies.

The FAA will conduct an aeronautical study when:

(a) Requested by the sponsor of any proposed construction or alteration for which a notice is submitted; or

(b) The FAA determines a study is necessary.

§ 77.29 Evaluating aeronautical effect.

(a) The FAA conducts an aeronautical study to determine the impact of a proposed structure, an existing structure that has not yet been studied by the FAA, or an alteration of an existing structure on aeronautical operations, procedures, and the safety of flight. These studies include evaluating:

(1) The impact on arrival, departure, and en route procedures for aircraft operating under visual flight rules;

(2) The impact on arrival, departure, and en route procedures for aircraft operating under instrument flight rules;

(3) The impact on existing and planned public use airports;

(4) Airport traffic capacity of existing public use airports and public use airport development plans received before the issuance of the final determination;

(5) Minimum obstacle clearance altitudes, minimum instrument flight rules altitudes, approved or planned instrument approach procedures, and departure procedures;

(6) The potential effect on ATC radar, direction finders, ATC tower line-of-sight visibility, and physical or electromagnetic effects on air navigation, communication facilities, and other surveillance systems;

(7) The aeronautical effects resulting from the cumulative impact of a proposed construction or alteration of a structure when combined with the effects of other existing or proposed structures.

(b) If you withdraw the proposed construction or alteration or revise it so that it is no longer identified as an obstruction, or if no further aeronautical study is necessary, the FAA may terminate the study.

§ 77.31 Determinations.

(a) The FAA will issue a determination stating whether the proposed construction or alteration would be a hazard to air navigation, and will advise all known interested persons.

(b) The FAA will make determinations based on the aeronautical study findings and will identify the following:

(1) The effects on VFR/IFR aeronautical departure/arrival operations, air traffic procedures, minimum flight altitudes, and existing, planned, or proposed airports listed in § 77.15(e) of which the FAA has received actual notice prior to issuance of a final determination.

(2) The extent of the physical and/or electromagnetic effect on the operation of existing or proposed air navigation facilities, communication aids, or surveillance systems.

(c) The FAA will issue a Determination of Hazard to Air Navigation when the aeronautical study concludes that the proposed construction or alteration will exceed an obstruction standard and would have a substantial aeronautical impact.

(d) A Determination of No Hazard to Air Navigation will be issued when the aeronautical study concludes that the proposed construction or alteration will exceed an obstruction standard but would not have a substantial aeronautical impact to air navigation. A Determination of No Hazard to Air Navigation may include the following:

(1) Conditional provisions of a determination.

(2) Limitations necessary to minimize potential problems, such as the use of temporary construction equipment.

(3) Supplemental notice requirements, when required.

(4) Marking and lighting recommendations, as appropriate.

(e) The FAA will issue a Determination of No Hazard to Air Navigation when a proposed structure does not exceed any of the obstruction standards and would not be a hazard to air navigation.

§ 77.33 Effective period of determinations.

(a) A determination issued under this subpart is effective 40 days after the date of issuance, unless a petition for discretionary review is received by the FAA within 30 days after issuance. The determination will not become final pending disposition of a petition for discretionary review.

(b) Unless extended, revised, or terminated, each Determination of No Hazard to Air Navigation issued under this subpart expires 18 months after the effective date of the determination, or on the date the proposed construction or alteration is abandoned, whichever is earlier.

(c) A Determination of Hazard to Air Navigation has no expiration date.

§ 77.35 Extensions, terminations, revisions and corrections.

(a) You may petition the FAA official that issued the Determination of No Hazard to Air Navigation to revise or reconsider the determination based on new facts or to extend the effective period of the determination, provided that:

(1) Actual structural work of the proposed construction or alteration, such as the laying of a foundation, but not including excavation, has not been started; and

(2) The petition is submitted at least 15 days before the expiration date of the Determination of No Hazard to Air Navigation.

(b) A Determination of No Hazard to Air Navigation issued for those construction or alteration proposals not requiring an FCC construction permit may be extended by the FAA one time for a period not to exceed 18 months.

(c) A Determination of No Hazard to Air Navigation issued for a proposal requiring an FCC construction permit may be granted extensions for up to 18 months, provided that:

(1) You submit evidence that an application for a construction permit/license was filed with the FCC for the associated site within 6 months of issuance of the determination; and

(2) You submit evidence that additional time is warranted because of FCC requirements; and

(3) Where the FCC issues a construction permit, a final Determination of No Hazard to Air Navigation is effective until the date prescribed by the FCC for completion of the construction. If an extension of the original FCC completion date is needed, an extension of the FAA determination must be requested from the Obstruction Evaluation Service (OES).

(4) If the Commission refuses to issue a construction permit, the final determination expires on the date of its refusal.

Subpart E—Petitions for Discretionary Review

§ 77.37 General.

(a) If you are the sponsor, provided a substantive aeronautical comment on a proposal in an aeronautical study, or have a substantive aeronautical comment on the proposal but were not given an opportunity to state it, you may petition the FAA for a discretionary review of a determination, revision, or extension of a determination issued by the FAA.

(b) You may not file a petition for discretionary review for a Determination of No Hazard that is issued for a temporary structure, marking and lighting recommendation, or when a proposed structure or alteration does not exceed obstruction standards contained in subpart C of this part.

§ 77.39 Contents of a petition.

(a) You must file a petition for discretionary review in writing and it must be received by the FAA within 30 days after the issuance of a determination under § 77.31, or a revision or extension of the determination under § 77.35.

(b) The petition must contain a full statement of the aeronautical basis on

which the petition is made, and must include new information or facts not previously considered or presented during the aeronautical study, including valid aeronautical reasons why the determination, revisions, or extension made by the FAA should be reviewed.

(c) In the event that the last day of the 30-day filing period falls on a weekend or a day the Federal government is closed, the last day of the filing period is the next day that the government is open.

(d) The FAA will inform the petitioner or sponsor (if other than the petitioner) and the FCC (whenever an FCC-related proposal is involved) of the filing of the petition and that the determination is not final pending disposition of the petition.

§ 77.41 Discretionary review results.

(a) If discretionary review is granted, the FAA will inform the petitioner and the sponsor (if other than the petitioner) of the issues to be studied and reviewed. The review may include a request for comments and a review of all records from the initial aeronautical study.

(b) If discretionary review is denied, the FAA will notify the petitioner and the sponsor (if other than the petitioner), and the FCC, whenever a FCC-related proposal is involved, of the basis for the denial along with a statement that the determination is final.

(c) After concluding the discretionary review process, the FAA will revise, affirm, or reverse the determination.

Issued in Washington, DC, on July 13, 2010.

J. Randolph Babbitt,

Administrator.

[FR Doc. 2010–17767 Filed 7–20–10; 8:45 am]

BILLING CODE 4910–13–P

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 97

[Docket No. 30734; Amdt. No. 3382]

Standard Instrument Approach Procedures, and Takeoff Minimums and Obstacle Departure Procedures; Miscellaneous Amendments

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final rule.

SUMMARY: This establishes, amends, suspends, or revokes Standard Instrument Approach Procedures (SIAPs) and associated Takeoff Minimums and Obstacle Departure Procedures for operations at certain airports. These regulatory actions are needed because of the adoption of new or revised criteria, or because of changes occurring in the National Airspace System, such as the commissioning of new navigational facilities, adding new obstacles, or changing air traffic requirements. These changes are designed to provide safe and efficient use of the navigable airspace and to promote safe flight operations under instrument flight rules at the affected airports.

DATES: This rule is effective July 21, 2010. The compliance date for each SIAP, associated Takeoff Minimums, and ODP is specified in the amendatory provisions.

The incorporation by reference of certain publications listed in the regulations is approved by the Director of the Federal Register as of July 21, 2010.

ADDRESSES: Availability of matters incorporated by reference in the amendment is as follows:

For Examination—

1. FAA Rules Docket, FAA Headquarters Building, 800 Independence Avenue, SW., Washington, DC 20591;

2. The FAA Regional Office of the region in which the affected airport is located;

3. The National Flight Procedures Office, 6500 South MacArthur Blvd., Oklahoma City, OK 73169; or

4. The National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202–741–6030, or go to: *http://www.archives.gov/federal_register/code_of_federal_regulations/ibr_locations.html.*

Availability—All SIAPs and Takeoff Minimums and ODPs are available online free of charge. Visit *http://www.nfdc.faa.gov* to register. Additionally, individual SIAP and Takeoff Minimums and ODP copies may be obtained from:

1. FAA Public Inquiry Center (APA–200), FAA Headquarters Building, 800 Independence Avenue, SW., Washington, DC 20591; or

2. The FAA Regional Office of the region in which the affected airport is located.

FOR FURTHER INFORMATION CONTACT: Harry J. Hodges, Flight Procedure Standards Branch (AFS–420), Flight Technologies and Programs Divisions, Flight Standards Service, Federal Aviation Administration, Mike Monroney Aeronautical Center, 6500 South MacArthur Blvd., Oklahoma City, OK 73169 (Mail Address: P.O. Box 25082, Oklahoma City, OK 73125) Telephone: (405) 954–4164.

SUPPLEMENTARY INFORMATION: This rule amends Title 14 of the Code of Federal Regulations, Part 97 (14 CFR part 97), by establishing, amending, suspending, or revoking SIAPS, Takeoff Minimums and/or ODPS. The complete regulators description of each SIAP and its associated Takeoff Minimums or ODP for an identified airport is listed on FAA form documents which are incorporated by reference in this amendment under 5 U.S.C. 552(a), 1 CFR part 51, and 14 CFR part 97.20. The applicable FAA Forms are FAA Forms 8260–3, 8260–4, 8260–5, 8260–15A, and 8260–15B when required by an entry on 8260–15A.

The large number of SIAPs, Takeoff Minimums and ODPs, in addition to their complex nature and the need for a special format make publication in the **Federal Register** expensive and impractical. Furthermore, airmen do not use the regulatory text of the SIAPs, Takeoff Minimums or ODPs, but instead refer to their depiction on charts printed by publishers of aeronautical materials. The advantages of incorporation by reference are realized and publication of the complete description of each SIAP, Takeoff Minimums and ODP listed on FAA forms is unnecessary. This amendment provides the affected CFR sections and specifies the types of SIAPs and the effective dates of the associated Takeoff Minimums and ODPs. This amendment also identifies the airport and its location, the procedure, and the amendment number.

The Rule

This amendment to 14 CFR part 97 is effective upon publication of each separate SIAP, Takeoff Minimums and ODP as contained in the transmittal. Some SIAP and Takeoff Minimums and textual ODP amendments may have been issued previously by the FAA in a Flight Data Center (FDC) Notice to Airmen (NOTAM) as an emergency action of immediate flight safety relating directly to published aeronautical charts. The circumstances which created the need for some SIAP and Takeoff Minimums and ODP amendments may require making them effective in less than 30 days. For the remaining SIAPS and Takeoff Minimums and ODPS, an effective date at least 30 days after publication is provided.

Further, the SIAPs and Takeoff Minimums and ODPS contained in this amendment are based on the criteria contained in the U.S. Standard for Terminal Instrument Procedures

APPENDIX D WETLAND AND WATERBODY DESKTOP SUMMARY

ERM

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November 9, 2021

Ms. Bettina Rayfield, Manager
Virginia Department of Environmental Quality
Office of Environmental Impact Review
P.O. Box 1105
Richmond, Virginia 23218

Subject: Wetland and Waterbody Desktop Summary
DTC 230 kV Line Loop and DTC Substation Project
New SCC Filing

Dear Ms. Sullivan:

Environmental Resources Management (ERM), on behalf of Virginia Electric and Power Company ("Dominion Energy Virginia" or the "Company"), conducted a desktop wetland and waterbody review of publically-available information for the proposed DTC 230 kV Line Loop and DTC Substation Project located in Loudoun County, Virginia. Field delineations were not performed and would be required to verify the accuracy and extent of aquatic resource boundaries. Attachment 1 depicts the general location of the proposed project. Attachment 2 illustrates the wetland boundaries that were identified as part of the desktop review. Dominion Energy Virginia is filing an application with the State Corporation Commission (SCC) for the following:

For this Project, Dominion Energy Virginia evaluated multiple new build options that could address current demand needs and accommodate increased future demand in the Project area in Loudoun County. The Company considered the facilities required to construct and operate the new feeds; the length of new rights-of-way required for each option; the amount of existing development in each area; the potential for environmental impacts on communities; and the relative cost of each option.

After review of the new build options, Dominion Energy Virginia decided to further investigate two electrical options for this Project, both of which are located entirely within Loudoun County, Virginia.

- Option 1 involves connecting with the existing Line #2143 from a point just north of the existing BECO Substation on the west side of Pacific Boulevard and just south of Gloucester Parkway, and extending a new 230 kV double circuit transmission line northeast to the proposed DTC Substation. The DTC Substation site is located on the east side of Route 28 between Atlantic Boulevard and Century Boulevard. Option 1 includes three overhead route alternatives.
- Option 2 involves tapping the existing Line #2150 near the intersection of the Washington and Old Dominion (W&OD) Trail and Sully Road and extending a new 230 kV double circuit transmission line northeast to the proposed DTC Substation.

An underground route alternative and other overhead routes were preliminarily reviewed for Option 1 but dismissed for various reasons and are not included in our analysis. All Option 2 routes were determined not viable and are not included in our analysis.

The purpose of this desktop analysis was to identify and evaluate potential impacts of the project on wetlands and waterbodies (streams, creeks, runs, and open water features). In accordance with Virginia Department of Environmental Quality (DEQ) and the SCC's Memorandum of Agreement, the evaluation was conducted using various data sets that may indicate wetland location and type. The information summarized in this report will be submitted to the DEQ as part of the DEQ Wetland Impacts Consultation.

This assessment did not include the field investigations required for wetland delineations in accordance with the U.S. Army Corps of Engineers Wetland Delineation Manual (Environmental Laboratory, 1987) and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont Region (Version 2.0).

Project Study Area and Potential Routes

As discussed above, all viable route alternatives would entail constructing a new double circuit 230 kV line from the existing BECO Substation and the proposed DTC Substation. The three potential routes deemed buildable and worthy of further consideration are described below.

Overhead Route Alternatives

Route 1A

Route 1A would involve construction of an overhead double circuit 230 kV line from existing Line #2143 just north of the existing BECO Substation to the proposed DTC Substation. The length of the corridor for Route 1A is approximately 1.31 miles. Beginning just north of the BECO Substation, Route 1A heads northwest for about 0.19 mile adjacent to the right-of-way for a Loudoun County Water line and across Gloucester Parkway. A portion of this segment crosses a Loudoun County Board of Supervisors (BOS) easement. After crossing Gloucester Parkway, the route then continues generally north for 0.57 mile, generally following the Loudoun Water line, and includes an additional crossing of the BOS easement and a crossing of Broad Run. The transmission line route then turns to the north and east for 0.19 mile (including another small crossing of the Loudoun County BOS easement) before heading due north for 0.11 mile following the west side of Russell Branch Parkway and paralleling a multi-use trail. After a 0.09-mile crossing of Russell Branch Parkway and Sully Road, the line then continues east and southeast for 0.09 mile crossing Century Boulevard. Finally, the route heads northeast for 0.07 mile and then enters the proposed DTC Substation property.

Route 1B

Route 1B would involve construction of an overhead double circuit 230 kV line from the existing Line #2143 just north of the existing BECO Substation to the proposed DTC Substation. The length of the corridor for Route 1B is approximately 1.31 miles. Beginning just north of the BECO Substation, Route 1B heads northwest for about 0.19 mile adjacent to the right-of-way for a Loudoun County Water line and across Gloucester Parkway. A portion of this segment crosses a Loudoun County BOS easement. After crossing Gloucester Parkway, the route then continues generally north for 0.57 mile, generally following the Loudoun Water line, and includes an additional crossing of the BOS easement and a crossing of Broad Run. The transmission line route then turns to the north and east for 0.19 mile (including another small crossing of the Loudoun County BOS easement) before heading due north for 0.05 mile following the west side of Russell Branch Parkway and paralleling a multi-use trail. After a 0.10 mile crossing of Russell Branch Parkway and Sully Road, the line then turns north for 0.05 mile paralleling the east side of

Sully Road and crossing the western edge of a parking lot associated with the adjacent Lerner 21000 Atlantic office building. The route then continues east and southeast for 0.08 mile crossing Century Boulevard. Finally, the route heads northeast for 0.07 mile and then enters the proposed DTC Substation property.

Route 1C

Route 1C would involve construction of an overhead double circuit 230 kV line from the existing Line #2143 just north of the existing BECO Substation to the proposed DTC Substation. The length of the corridor for Route 1C is approximately 1.30 miles. Beginning just north of the BECO Substation, Route 1C heads northwest for about 0.19 mile adjacent to the right-of-way for a Loudoun County Water line and across Gloucester Parkway. A portion of this segment crosses a Loudoun County BOS easement. After crossing Gloucester Parkway, the route then continues generally north for 0.57 mile, generally following the Loudoun Water line, and includes an additional crossing of the BOS easement and a crossing of Broad Run. The transmission line route then turns to the north and east for 0.20 mile before intersecting Russell Branch Parkway. This segment includes a second crossing of Broad Run and another short crossing of the BOS easement. As this segment of the route heads east, the route was designed to avoid an existing VDOT traffic signal easement. After a 0.09 mile crossing of Russell Branch Parkway and Sully Road, the line next turns north and parallels the eastern side Sully Road, crossing the western edge of a parking lot associated with the adjacent Lerner 21000 Atlantic office building for 0.10 mile. From that point, the line turns east and southeast for 0.08 mile crossing Century Boulevard. Finally, the route heads northeast for 0.07 mile and then enters the proposed DTC Substation property.

Desktop Evaluation Methodology

The area of effect considered for this study consists of the proposed rights-of-way identified above within which the electric transmission lines would be constructed and operated. Data sources used for this review include the following, each of which is described briefly below:

- National Agricultural Imagery Program (NAIP) Digital Ortho-Rectified Natural Color Images, Virginia, 1-meter pixel resolution, photo date 2020;
- NAIP Digital Ortho-Rectified Infrared Images, Virginia, 1-meter pixel resolution, photo date 2020;
- U.S. Geological Survey (USGS) 7.5-minute current (2014);
- U.S. Fish and Wildlife Service (USFWS) National Wetland Inventory (NWI) mapping (2020);
- U.S. Department of Agriculture-Natural Resources Conservation Service (USDA-NRCS) Soil Survey Geographic (SSURGO) database for Loudon County, Virginia (2021); and
- Loudoun County, Virginia Weblogis – Online Mapping System (2021)

Natural Color and Infrared Aerial Photography

Recent (2020) natural color aerial photography was used to provide a visual overview of the project area and to assist in evaluating current conditions. Recent (2020) infrared aerial photography was used to identify the potential presence of wetlands based on signatures associated with the levels of reflectance. For example, areas that are inundated with water appear very dark (almost black) due to the low level of

reflectance in the infrared spectrum. The presence of these dark colors can be used as a potential indicator of hydric or inundated soils that are likely associated with wetlands.

USGS Topographic Maps

The recent (2014) USGS topographic maps show the topography of the area. The USGS topographic maps also depict other important landscape features such as forest cover, development, buildings, agricultural areas, streams, lakes, and wetlands.

NWI Maps

The NWI maps provide the boundaries and classifications of potential wetland areas as mapped by the USFWS. However, NWI data are based primarily on aerial photo interpretations with limited ground-truthing and may represent incorrect boundaries or wetland cover types. NWI data can be unreliable in some areas, especially in forested landscapes, when aerial photography is used as the major data source. The classifications of the majority of the NWI polygons in the study area appear to be accurate based on a review of the cover types observed in the aerial photography. However, in areas where there was an obvious discrepancy between the NWI classification and the aerial photography, ERM modified the classification to more accurately reflect current conditions. For example, an area mapped by NWI data as open water was adjusted to an emergent wetland type. For the purposes of this review, wetlands mapped as unconsolidated bottom or riverine were considered open water. In order to acknowledge ERM's adjustment of NWI classifications where appropriate, all of the wetland types referenced in this assessment are referred to as "assigned wetland cover types" regardless of whether the cover type was actually modified from the NWI classification.

USDA-NRCS Soils Data

The soils in the study area were identified and assessed using the SSURGO database, which is a digital version of the original county soil surveys. The attribute data within the SSURGO database provides the proportionate extent of the component soils and their properties (e.g., hydric rating) for each soil map unit. The soils in the study area were grouped into three categories based on the hydric rating of the component soils within each map unit: hydric, partially hydric, and non-hydric. Hydric soils were defined as those where the major component soils, and minor components in some cases, are designated as hydric. Hydric components in these map units account for more than 80 percent of the map unit. Partially hydric soils include map units that only contain minor component soils that are designated as hydric. The partially hydric map units in the project area contain 10 percent or less hydric soils. The remaining map units do not contain any component soils that are designated as hydric. Areas mapped as hydric or partially hydric have a higher probability of containing wetlands than areas with no hydric soils.

USGS Hydrography and Loudoun County Waterbody Datasets

The NHD and County of Loudoun Waterbody datasets contain features such as lakes, ponds, streams, rivers, and canals. The waterbodies mapped by the NHD appeared consistent with those visible on the USGS maps and aerial photography. The County of Loudoun Waterbody datasets were used in coordination with the USGS Hydrography dataset for additional refinement.

Probability Analysis

ERM used a stepwise process to identify probable wetland areas along the transmission line routes, as follows:

1. Infrared and natural color aerial photography was used in conjunction with USGS topographic maps and soils maps to identify potential wetland areas. Boundaries were assigned to the areas that appeared to exhibit wetland signatures based on this review and a cover type was determined based on aerial photo interpretation. For the purpose of the study, these areas are referred to as Interpreted Wetlands.

2. To further determine the probability of a wetland occurring within a given location, the Interpreted Wetland polygon shape files were digitally layered with the NWI mapping and soils information from the SSURGO database.

3. The probability of a wetland occurring was assigned based on the number of overlapping data layers (i.e., indicators of potential wetland presence) that occurred in a particular area.

The criteria assigned to each probability are outlined in Table 1.

Table 1: Criteria Used to Rank the Probability of Wetland Occurrence

Probability	Criteria
High	Areas where layers of hydric soils, Interpreted Wetlands, and NWI data overlap
Medium/High	NWI data overlaps hydric soils; or NWI data overlaps Interpreted Wetlands with or without partially hydric soils; or Hydric soils overlap Interpreted Wetlands
Medium	Interpreted Wetlands with or without overlap by partially hydric soils
Medium/Low	Hydric soils only; or NWI data with or without overlap by partially hydric soils
Low	Partially hydric soils only
Very Low	Non-hydric soils only

Wetland and Waterbody Crossings

The desktop analysis provides a probability of wetlands and waterbody occurrence within each route alternative. As stated above, field delineations were not performed and would be required to verify the accuracy and extent of aquatic resource boundaries. A range of wetland occurrence probabilities are reported by this study from very low to high. The probability of wetland occurrence increases as multiple indicators begin to overlap towards the “high” end of the spectrum. The medium-high and high probability category are the most reliable representation of in-situ conditions, due to overlapping data sets, and these categories are reported in the summary below as a percentage of the total acreage of each alternative route. Attachment 2 depicts the interpreted wetlands displayed on color base map images.

Results

Results of the probability analysis are presented in Table 2 below. Summaries of impacts by route are provided in the sections following the table.

Table 2: Summary of the Probabilities of Wetland and Waterbody Occurrence along Project Routes [a, b]

Probability	Total Acres [c]	Wetland and Waterbody Type (acres)			
		PFO Forested	PSS Scrub/Shrub	PEM Emergent	Riverine Stream
Route 1A					
High	0.63	0.39	0.00	0.02	0.22
Medium/High	2.33	1.63	0.00	0.55	0.15
Medium	0.10	0.02	0.00	0.08	0.00
Medium/Low	3.18	0.95	0.00	0.06	0.00
Low	14.99	0.00	0.00	0.00	0.00
Very Low	0.00	0.00	0.00	0.00	0.00
Route 1B					
High	0.63	0.39	0.00	0.02	0.22
Medium/High	2.33	1.63	0.00	0.55	0.15
Medium	0.10	0.02	0.00	0.08	0.00
Medium/Low	3.18	0.95	0.00	0.06	0.00
Low	14.99	0.00	0.00	0.00	0.00
Very Low	0.00	0.00	0.00	0.00	0.00
Route 1C					
High	0.63	0.39	0.00	0.02	0.22
Medium/High	2.33	1.63	0.00	0.55	0.15
Medium	0.10	0.02	0.00	0.08	0.00
Medium/Low	3.18	0.95	0.00	0.06	0.00
Low	14.91	0.00	0.00	0.00	0.00
Very Low	0.00	0.00	0.00	0.00	0.00

a The numbers in this table have been rounded for presentation purposes; as a result, the totals may not reflect the sum of the addends.
b Substation and transition wetlands and waterbodies are included within each route rather than individually.
c Total acres may not total the sum of wetland and waterbody types. This is due to the fact that some of the lower probability rankings do not overlap with NWI or interpreted wetlands, and therefore do not have a wetland/waterbody type associated with them.

Route 1A

The length of the corridor for the Route 1A is approximately 1.31 miles, and encompasses a total of approximately 15.03 acres of right-of-way and 6.21 acres of substation for a total of 21.42 acres. Based on the methodology discussed above, the right-of-way and substation encompass approximately 13.82 percent (2.96 acres) of land with a medium/high or higher probability of containing wetlands and waterbodies.

Route 1B

The length of the corridor for the Route 1B is approximately 1.31 mile, and encompasses a total of approximately 15.03 acres of right-of-way and 6.21 acres of Substation for a total of 21.42 acres. Based on the methodology discussed above, the right-of-way encompass approximately 13.82 percent (2.96 acres) of land with a medium/high or higher probability of containing wetlands and waterbodies.

Route 1C

The length of the corridor for the Route 1C is approximately 1.30 mile, and encompasses a total of approximately 14.95 acres of right-of-way and 6.21 acres of substation for a total of 21.15 acres. Based on the methodology discussed above, the right-of-way encompass approximately 14.00 percent (2.96 acres) of land with a medium/high or higher probability of containing wetlands and waterbodies.

Waterbody Crossings

Based on the NHD, there are a total of four waterbody crossings that would be common to all three route alternatives. These crossings include two crossings of Broad Run (a perennial waterbody) and two crossings of unnamed tributaries to Broad Run (intermittent waterbodies).

Project Impacts

Avoiding or minimizing new impacts on wetlands and streams was among the criteria Dominion Virginia Power used in developing potential routes for the rebuild project. While crossings of wetlands and streams could not be entirely avoided in siting this linear facility, Dominion Virginia Power has minimized crossings of these features to the extent practicable.

To minimize impacts on wetland areas, the rebuild would be designed to avoid wetlands where possible. Where the removal of shrubby vegetation occurs within wetlands, Dominion Virginia Power would use the least intrusive method reasonably possible to clear the corridor. Hand-cutting of vegetation would be conducted, where needed, to avoid and minimize impacts on streams and/or wetlands. There would be no change in contours or redirection of the flow of water, and the amount of spoil from trenching would be minimal. Excess soil in wetlands generated during construction would be removed from the wetland.

Mats would be used for construction equipment to travel over wetlands, as appropriate. Grading in wetlands will consist of the minimum necessary for safe and efficient equipment operation. Potential direct impacts on wetlands would be temporary in nature, but a reduction in wetland functions and values would occur where tree clearing within wetlands is necessary.

Closing

This Wetland and Waterbody Summary report was prepared in accordance with the Memorandum of Agreement between the Department of Environmental Quality and the State Corporation Commission for purposes of initiating a Wetlands Impact Consultation. Please note: a formal onsite wetland delineation was not conducted as part of this review.

In addition, we have a project website where the SCC application will be available after filing, as well as maps and discussions about the project. It can be accessed by going to dom.com and searching for “BECO to DTC”. If you have any questions regarding this wetland assessment please contact me at 804-338-9099 or by email at jason.teschler@erm.com.

Yours sincerely,

Jason Teschler, PWS
Environmental Resources Management

cc: Greg Baka, Virginia Electric and Power Company
Rachel Studebaker, Virginia Electric and Power Company

Enclosures: Attachments 1 and 2

References

County of Loudoun (VA) GIS Office. 2021. Environmental GIS Layers. Available online at https://logis.loudoun.gov/weblogis/. Accessed July 2021.

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ATTACHMENT 1

This information is for environmental review purposes only.

PROPOSED DTC SUBSTATION △

1A

1B

1C

BECO SUBSTATION ▲

0 500 1,000 Feet

Project Location

△ Proposed Substation

▲ Existing Substation

Existing Dominion Transmission Line

Proposed Substation Boundary

Centerline and Rights of Way

Route 1A (1.31 Miles - 100ft ROW)

Route 1B (1.31 Miles - 100ft ROW)

Route 1C (1.30 Miles - 100ft ROW)

Attachment 1
Overview Map
DTC 230 kV Line Loop and DTC Substation Project
Loudoun County, Virginia

ERM

Dominion Energy

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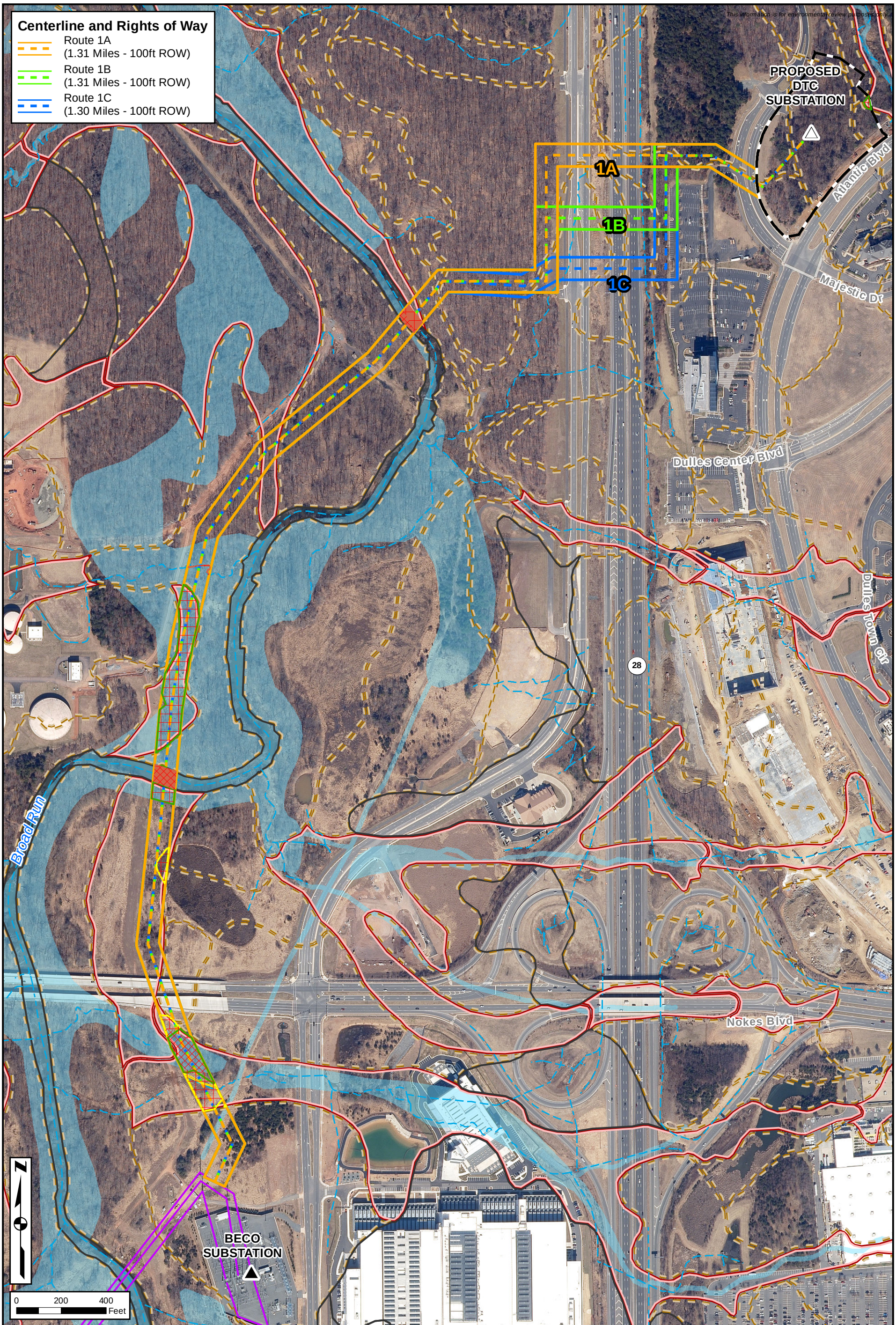
ATTACHMENT 2



Attachment 2
Wetland Probability Map
DTC 230 kV Line Loop and DTC Substation Project

Loudoun County, Virginia

ERM

Dominion Energy

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APPENDIX E VISUAL SIMULATIONS

DTC

Substation and 230 kV Transmission Project

Dominion Energy®

Existing Conditions

This image is intended to serve as a representation of the project area and is not intended for detailed engineering purposes.

DTC

Substation and 230 kV Transmission Project

Dominion Energy®

This image is intended to serve as a representation of the project area and is not intended for detailed engineering purposes.

DTC

Substation and 230 kV Transmission Project

Dominion Energy®

Proposed Conditions 1A

This image is intended to serve as a representation of the project area and is not intended for detailed engineering purposes.

DTC

Substation and 230 kV Transmission Project

Dominion Energy®

This image is intended to serve as a representation of the project area and is not intended for detailed engineering purposes.

DTC

Substation and 230 kV Transmission Project

Dominion Energy®

Proposed Conditions 1B

This image is intended to serve as a representation of the project area and is not intended for detailed engineering purposes.

DTC

Substation and 230 kV Transmission Project

Dominion Energy®

This image is intended to serve as a representation of the project area and is not intended for detailed engineering purposes.

DTC

Substation and 230 kV Transmission Project

Dominion Energy®

Proposed Conditions 1C

This image is intended to serve as a representation of the project area and is not intended for detailed engineering purposes.

DTC

Substation and 230 kV Transmission Project

Dominion Energy®

Existing Conditions

This image is intended to serve as a representation of the project area and is not intended for detailed engineering purposes.

DTC

Substation and 230 kV Transmission Project

Dominion Energy®

Route 1A

This image is intended to serve as a representation of the project area and is not intended for detailed engineering purposes.

DTC

Substation and 230 kV Transmission Project

Dominion Energy®

Proposed Conditions 1A

This image is intended to serve as a representation of the project area and is not intended for detailed engineering purposes.

DTC

Substation and 230 kV Transmission Project

Dominion Energy®

Route 1B

This image is intended to serve as a representation of the project area and is not intended for detailed engineering purposes.

DTC

Substation and 230 kV Transmission Project

Dominion Energy®

Proposed Conditions 1B

This image is intended to serve as a representation of the project area and is not intended for detailed engineering purposes.

DTC

Substation and 230 kV Transmission Project

Dominion Energy®

Route 1C

This image is intended to serve as a representation of the project area and is not intended for detailed engineering purposes.

DTC

Substation and 230 kV Transmission Project

Dominion Energy®

Proposed Conditions 1C

This image is intended to serve as a representation of the project area and is not intended for detailed engineering purposes.

DTC

Substation and 230 kV Transmission Project

Dominion Energy®

Viewpoint Locations

This image is intended to serve as a representation of the project area and is not intended for detailed engineering purposes.

DTC

Substation and 230 kV Transmission Project

Viewpoint 1

Date: 6/24/21 Time: 12:46 pm
Direction: Southeast

Looking Southeast Along Century Blvd

Existing Conditions

Proposed Conditions

Weathering Steel
Routes 1A, 1B, 1C

Dominion Energy®

Photo simulations are for discussion purposes only. Final design is subject to change pending public, utility, and regulatory review.

DTC

Substation and 230 kV Transmission Project

Viewpoint 1

Date: 6/24/21 Time: 12:46 pm

Direction: Southeast

Looking Southeast Along Century Blvd

Existing Conditions

Proposed Conditions

Galvanized Steel

Routes 1A, 1B, 1C

Dominion Energy®

Photo simulations are for discussion purposes only. Final design is subject to change pending public, utility, and regulatory review.

DTC

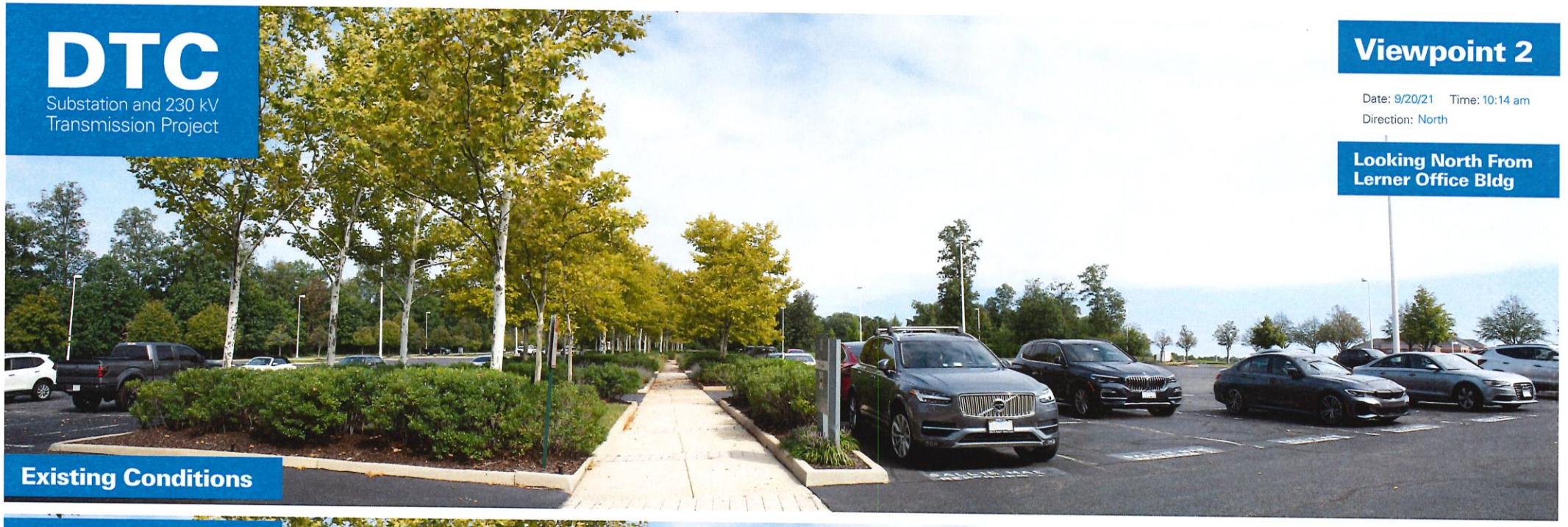
Substation and 230 kV Transmission Project

Viewpoint 2

Date: 9/20/21 Time: 10:14 am

Direction: North

Looking North From Lerner Office Bldg



Existing Conditions

Proposed Conditions

Weathering Steel | **Route 1A**

Dominion Energy®

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DTC

Substation and 230 kV Transmission Project

Viewpoint 2

Date: 9/20/21 Time: 10:14 am

Direction: North

Looking North From Lerner Office Bldg

Existing Conditions

Proposed Conditions

Galvanized Steel | **Route 1A**

Dominion Energy®

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DTC

Substation and 230 kV Transmission Project

Viewpoint 2

Date: 9/20/21 Time: 10:14 am

Direction: North

Looking North From Lerner Office Bldg

Existing Conditions

Proposed Conditions

Weathering Steel | **Route 1B**

Dominion Energy®

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DTC

Substation and 230 kV Transmission Project

Viewpoint 2

Date: 9/20/21 Time: 10:14 am

Direction: North

Looking North From Lerner Office Bldg

Existing Conditions

Proposed Conditions

Galvanized Steel | **Route 1B**

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DTC

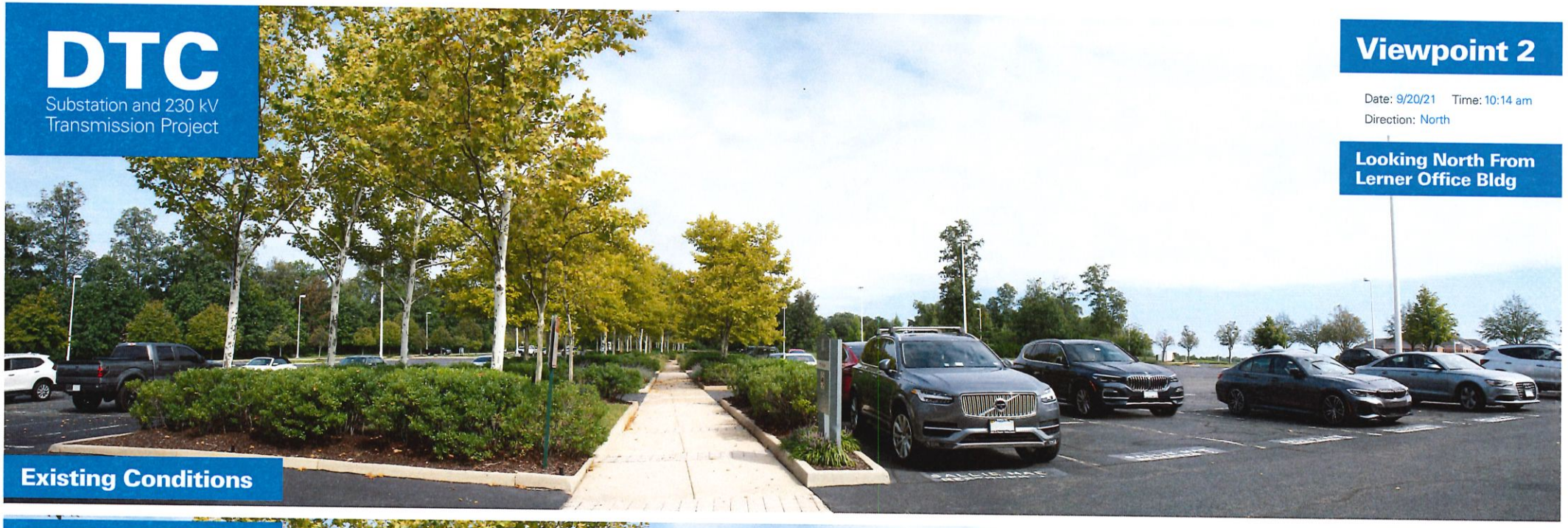
Substation and 230 kV Transmission Project

Viewpoint 2

Date: 9/20/21 Time: 10:14 am

Direction: North

Looking North From Lerner Office Bldg



Existing Conditions

Proposed Conditions

Weathering Steel | **Route 1C**

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DTC

Substation and 230 kV Transmission Project

Viewpoint 2

Date: 9/20/21 Time: 10:14 am

Direction: North

Looking North From Lerner Office Bldg

Existing Conditions

Proposed Conditions

Galvanized Steel | **Route 1C**

Dominion Energy®

Photo simulations are for discussion purposes only. Final design is subject to change pending public, utility, and regulatory review.

DTC

Substation and 230 kV Transmission Project

Viewpoint 3

Date: 8/24/21 Time: 12:02 pm

Direction: North

Looking North Along Russell Branch Pkwy

Existing Conditions

Proposed Conditions

Weathering Steel | **Route 1A**

Dominion Energy®

Photo simulations are for discussion purposes only. Final design is subject to change pending public, utility, and regulatory review.

DTC

Substation and 230 kV Transmission Project

Viewpoint 3

Date: 8/24/21 Time: 12:02 pm

Direction: North

Looking North Along Russell Branch Pkwy

Existing Conditions

Proposed Conditions

Galvanized Steel | **Route 1A**

Dominion Energy®

Photo simulations are for discussion purposes only. Final design is subject to change pending public, utility, and regulatory review.

DTC

Substation and 230 kV Transmission Project

Viewpoint 3

Date: 8/24/21 Time: 12:02 pm
Direction: North

Looking North Along Russell Branch Pkwy

Existing Conditions

Proposed Conditions

Weathering Steel | **Route 1B**

Dominion Energy®

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DTC

Substation and 230 kV Transmission Project

Viewpoint 3

Date: 8/24/21 Time: 12:02 pm

Direction: North

Looking North Along Russell Branch Pkwy

Existing Conditions

Proposed Conditions

Galvanized Steel | **Route 1B**

Dominion Energy®

Photo simulations are for discussion purposes only. Final design is subject to change pending public, utility, and regulatory review.

DTC

Substation and 230 kV Transmission Project

Viewpoint 3

Date: 8/24/21 Time: 12:02 pm

Direction: North

Looking North Along Russell Branch Pkwy

Existing Conditions

Proposed Conditions

Weathering Steel | **Route 1C**

Dominion Energy®

Photo simulations are for discussion purposes only. Final design is subject to change pending public, utility, and regulatory review.

DTC

Substation and 230 kV Transmission Project

Viewpoint 3

Date: 8/24/21 Time: 12:02 pm

Direction: North

Looking North Along Russell Branch Pkwy

Existing Conditions

Proposed Conditions

Galvanized Steel | **Route 1C**

Dominion Energy®

Photo simulations are for discussion purposes only. Final design is subject to change pending public, utility, and regulatory review.

DTC

Substation and 230 kV Transmission Project

Viewpoint 4

Date: 6/24/21 Time: 10:37 am

Direction: Southwest

Looking West Down Gloucester Pkwy

Existing Conditions

Proposed Conditions

Weathering Steel

Routes 1A, 1B, 1C

Dominion Energy®

Photo simulations are for discussion purposes only. Final design is subject to change pending public, utility, and regulatory review.

DTC

Substation and 230 kV Transmission Project

Viewpoint 4

Date: 6/24/21 Time: 10:37 am

Direction: Southwest

Looking West Down Gloucester Pkwy

Existing Conditions

Proposed Conditions

Galvanized Steel

Routes 1A, 1B, 1C

Dominion Energy®

Photo simulations are for discussion purposes only. Final design is subject to change pending public, utility, and regulatory review.

DTC

Substation and 230 kV Transmission Project

Viewpoint 5

Date: 6/24/21 Time: 10:37 am
Direction: South

Looking South Across Gloucester Pkwy

Existing Conditions

Proposed Conditions

Weathering Steel

Routes 1A, 1B, 1C

Dominion Energy®

Photo simulations are for discussion purposes only. Final design is subject to change pending public, utility, and regulatory review.

DTC

Substation and 230 kV Transmission Project

Viewpoint 5

Date: 6/24/21 Time: 10:37 am

Direction: South

Looking South Across Gloucester Pkwy

Existing Conditions

Proposed Conditions

Galvanized Steel

Routes 1A, 1B, 1C

Dominion Energy®

Photo simulations are for discussion purposes only. Final design is subject to change pending public, utility, and regulatory review.

APPENDIX F STAGE 1 PRE-APPLICATION ANALYSIS OF CULTURAL RESOURCES

REPORT >

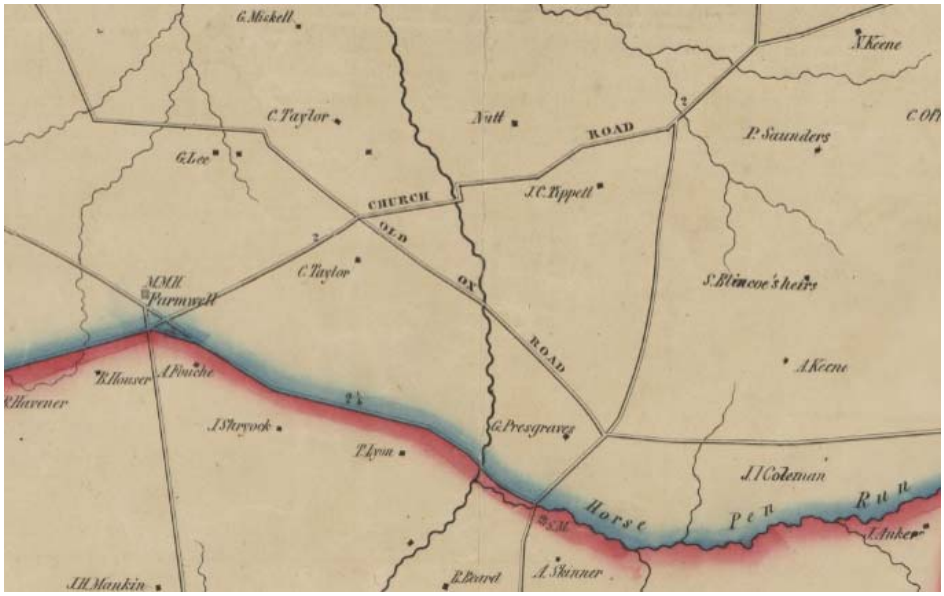
Pre-Application Analysis Of Cultural Resources for the DTC 230kV Line Loop and DTC Substation

LOCATION > Loudoun County, Virginia

DATE> SEPTEMBER 2021

PREPARED FOR >

Dominion Energy



"Loudoun County", 1854 Yardley Taylor. Source: Library of Congress

PREPARED BY >

Dutton + Associates, LLC

PROJECT REVIEW # >

Dutton + Associates

CULTURAL RESOURCE SURVEY, PLANNING, AND MANAGEMENT

SCC Pre-Application Analysis of Cultural Resources for the DTC 230kV Line Loop and DTC Substation

Loudoun County, Virginia

PREPARED FOR:
DOMINION ENERGY
10900 NUCKOLS ROAD, 4TH FLOOR
GLEN ALLEN, VA 23060

PREPARED BY:
DUTTON + ASSOCIATES, LLC
1115 Crowder Drive
Midlothian, Virginia 23236
804.644.8290

PRINCIPAL INVESTIGATOR:
Robert J. Taylor, Jr. M.A.

September 2021

ABSTRACT

In September 2021, Dutton + Associates, LLC (D+A) completed a Pre-Application Analysis (analysis) of cultural resources for the DTC 230kV Line Loop and DTC Substation Project in Loudoun County, Virginia. The analysis was performed for Dominion Energy Virginia (Dominion) in support of a State Corporation Commission (SCC) application. The analysis was conducted in accordance with Virginia Department of Historic Resources' (VDHR) guidance titled Guidelines for Assessing Impacts of Proposed Electric Transmission Lines and Associated Facilities on Historic Resources in the Commonwealth of Virginia (January 2008) and Commonwealth of Virginia State Corporation Commission Division of Public Utility Regulation Guidelines for Transmission Line Applications Filed Under Title 56 of the Code of Virginia (August 2017).

The DTC 230kV Line Loop and DTC Substation Project entails the construction of a new electric transmission line to connect to the proposed DTC substation in the Sterling vicinity of Loudoun County. The project is proposed in order to provide service requested by a retail electric service customer (the "Customer"); to maintain reliable service for the overall growth in the area; and to comply with mandatory North American Electric Reliability Corporation ("NERC") Reliability Standards.

The background research conducted as part of this analysis was consistent with VDHR guidance and designed to identify all previously recorded National Historic Landmarks (NHL) located within 1.5-miles of the proposed project or closer, all National Register of Historic Places (NRHP)-listed properties, battlefields, and historic landscapes located within 1-mile of the proposed project or closer, all historic properties considered eligible for listing in the NRHP located within 0.5-miles of the proposed project or closer, and all archaeological sites located directly within the proposed project area. Historic properties include architectural and archaeological (terrestrial and underwater) resources, historic and cultural landscapes, battlefields, and historic districts. For each historic property within the defined tiers, a review of existing documentation and a field reconnaissance was undertaken to assess each property's significant character-defining features, as well as the character of its current setting. Following identification of historic properties, D+A assessed the potential for impacts to any identified properties as a result of the proposed project. Specific attention was given to determining whether or not construction related to the project could introduce new visual elements into the property's viewshed or directly impact the property through construction, which would either directly or indirectly alter those qualities or characteristics that qualify the historic property for listing in the NRHP.

Review of the VDHR VCRIS inventory records revealed a total of thirty-three (33) previously recorded architectural resources are located within 1.5 mile of the project study area. Of these, there are no (0) NHLs located within 1.5 mile of the proposed project or closer, one (1) property listed in the NRHP located within 1.0 mile or closer of the project, and no (0) properties that have been determined eligible or potentially eligible for listing in the NRHP within 0.5 mile or closer of the project. The one NRHP-listed resource is not located directly within or crossed by any of the project alternatives.

With regards to architectural resources, one (1) historic property that is either designated and NHL, listed in, or determined eligible or potentially eligible for listing in the NRHP is located within the defined study tiers. This includes no (0) NHLs located within 1.5 mile or closer of the proposed project, one (1) NRHP-listed property located 1.0 mile or closer of the project (Broad Run Bridge and Toll House/VDHR# 053-0110), and no (0) properties that have been determined eligible or potentially eligible for listing in the NRHP located within 0.5 mile or closer of the project.

Inspection from the NRHP-listed resource found that it is set within a rapidly developing suburban area with large-scale commercial and industrial properties in the vicinity. Coupled with transportation network and vegetation patterns, it is anticipated that all of the project alternatives will be completely screened from view from the resource, which is supported by photo simulation of the nearest alternative. ***It is therefore D+A's opinion that the proposed DTC 230kV Line Loop and DTC Substation Project will have no impact on any architectural resources that are designated an NHL, listed in the NRHP, or determined eligible or potentially eligible for listing.***

Potential impacts summary for architectural resources.

VDHR #	*Resource Name, Address*	*NRHP-Status*	*Distance from Project*	*Recommended Impact*
053-0110	*Broad Run Bridge and Toll House*	*NRHP-Listed*	*0.57 Mile*	*No Impact*

With regards to archaeology, two previously identified site are located within or adjacent to the project area (within 50 feet of an alternative ROW), both of which are directly crossed by all three alternatives. Both of the sites have been determined not eligible for listing in the NRHP. No archaeological field work was conducted as part of this effort and previously recorded sites within or adjacent to the project were not visited or assessed at this time. ***It is D+A's opinion that these sites should be assessed for existing conditions and project impacts as additional project construction details become available.***

Summary of potential impacts summary for archaeological resources.

VDHR#	*NRHP Status*	*Proximity to Project Area*	*Impacts*
44LD0107 (Prehistoric Unknown)	*DHR Staff: Not Eligible*	*Directly Crossed by Route 1A, 1B, and 1C*	*TBD*
44LD0727 (Prehistoric Camp)	*DHR Staff: Not Eligible*	*Directly Crossed by Route 1A, 1B, and 1C*	*TBD*

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

1. INTRODUCTION

In September 2021, Dutton + Associates, LLC (D+A) completed a Pre-Application Analysis (analysis) of cultural resources for the DTC 230kV Line Loop and DTC Substation Project in Loudoun County, Virginia (Figure 1-1). The analysis was performed for Dominion Energy Virginia (Dominion) in support of a State Corporation Commission (SCC) application. The analysis was conducted in accordance with Virginia Department of Historic Resources' (VDHR) guidance titled *Guidelines for Assessing Impacts of Proposed Electric Transmission Lines and Associated Facilities on Historic Resources in the Commonwealth of Virginia* (January 2008) and Commonwealth of Virginia State Corporation Commission Division of Public Utility Regulation *Guidelines for Transmission Line Applications Filed Under Title 56 of the Code of Virginia* (August 2017).

This analysis was performed at a level that meets the purpose and intent of VDHR and the SCC's guidance. It provides information on the presence of previously recorded National Historic Landmark (NHL) properties located within a 1.5-mile buffer area established around the project area, properties listed on the National Register of Historic Places (NRHP), battlefields, and historic landscapes located within a 1-mile buffer around the project area, and properties previously determined eligible for listing in the NRHP located within a 0.5-mile buffer area around the project area, and previously identified archaeological resources directly within the project area. This analysis will not satisfy Section 106 identification and evaluation requirements in the event federal permits or licenses are needed; however, it can be used as a planning document to assist in making decisions under Section 106 as to whether further cultural resource identification efforts may be warranted.

This report contains a research design which describes the scope and methodology of the analysis, discussion of previously identified historic properties, and an assessment of potential impacts. D+A Senior Architectural Historian Robert J. Taylor, Jr. M.A. served as Principal Investigator and oversaw the general course of the project and supervised all aspects of the work. Copies of all notes, maps, correspondence, and historical research materials are on file at the D+A main office in Midlothian, Virginia.

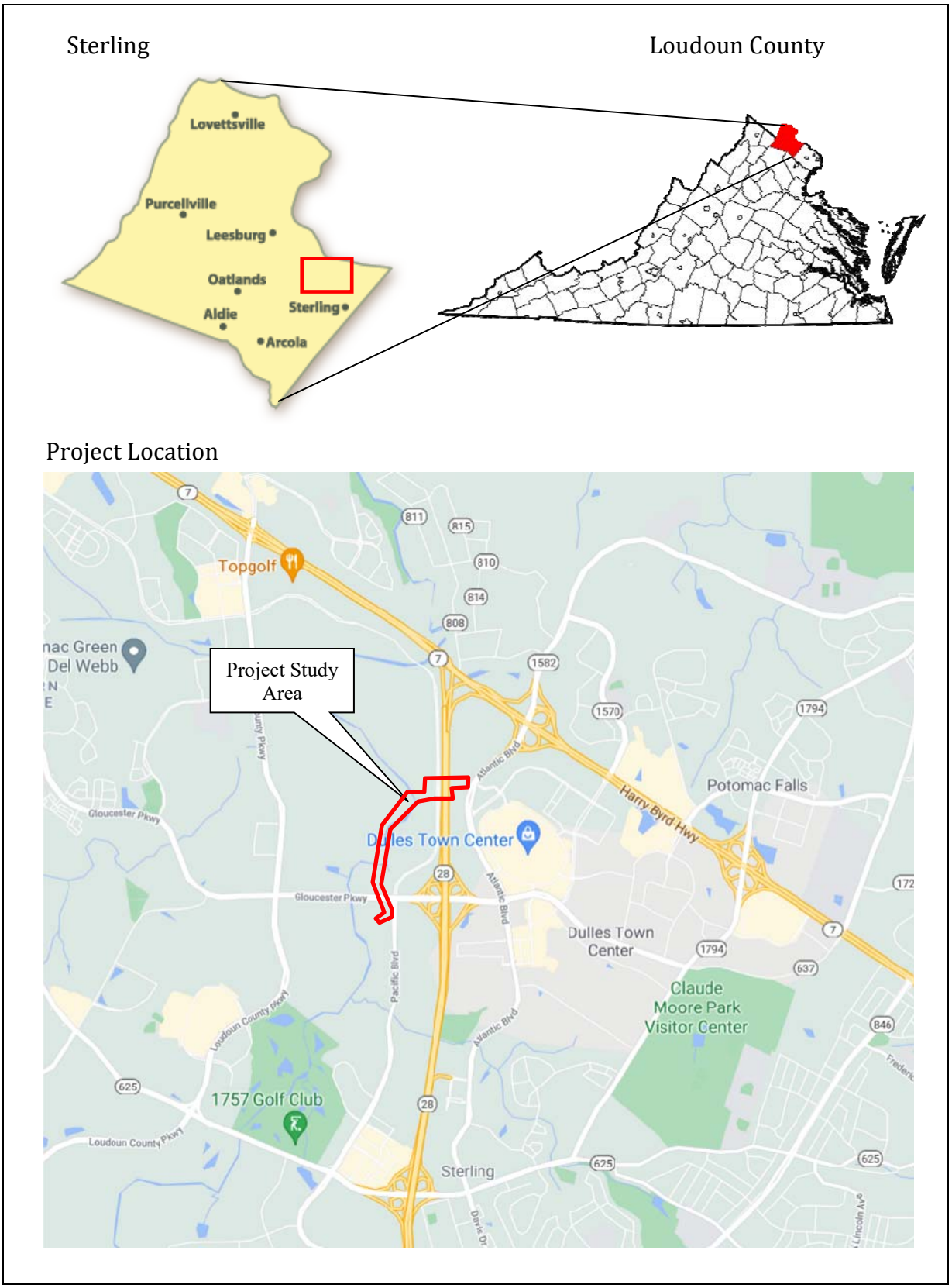


Figure 1-1: Project Study Area general location

2. PROJECT DESCRIPTION

The DTC 230kV Line Loop and DTC Substation Project entails the construction of a new electric transmission line to connect to the proposed DTC substation in the Sterling vicinity of Loudoun County. After review of the potential electrical solutions, Dominion is investigating one potential option with three total alternative alignments to provide connection to the proposed DTC substation. The option would begin at the existing Beco substation on Pacific Boulevard south of Gloucester Parkway with three overhead alternatives (Routes 1A, 1B, and 1C) extending to the proposed DTC substation (Figure 2-1).

All three route alternatives are in relatively close proximity to one other, and therefore are collectively grouped as "the project study area," however, the individual route alternatives are discussed separately within this analysis when appropriate. All three route alternatives would require a new 100-feet ROW that would extend generally from the existing Beco substation north, through property owned by the Loudoun County Sanitation Authority before turning east towards Sully Road. At Sully Road, the three alternative routes would split to cross the road at three different locations before merging on the east side of the road and extending further east into the proposed DTC substation. The proposed structures would be centered within the new ROW and be steel monopoles averaging approximately 110-feet tall (Figure 2-2).

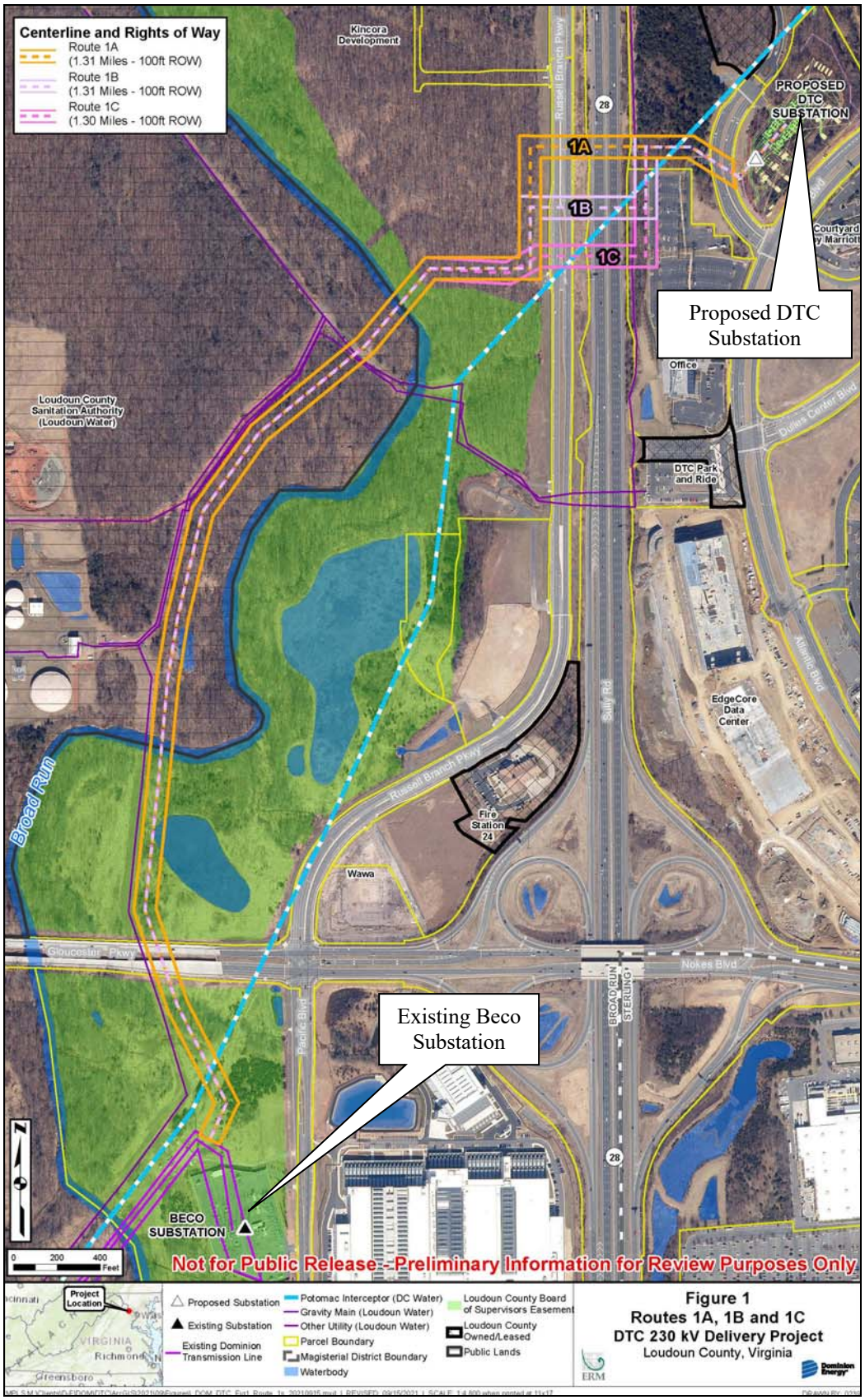


Figure 2-1: DTC 230kV Line Loop alternatives. Source: Dominion Energy

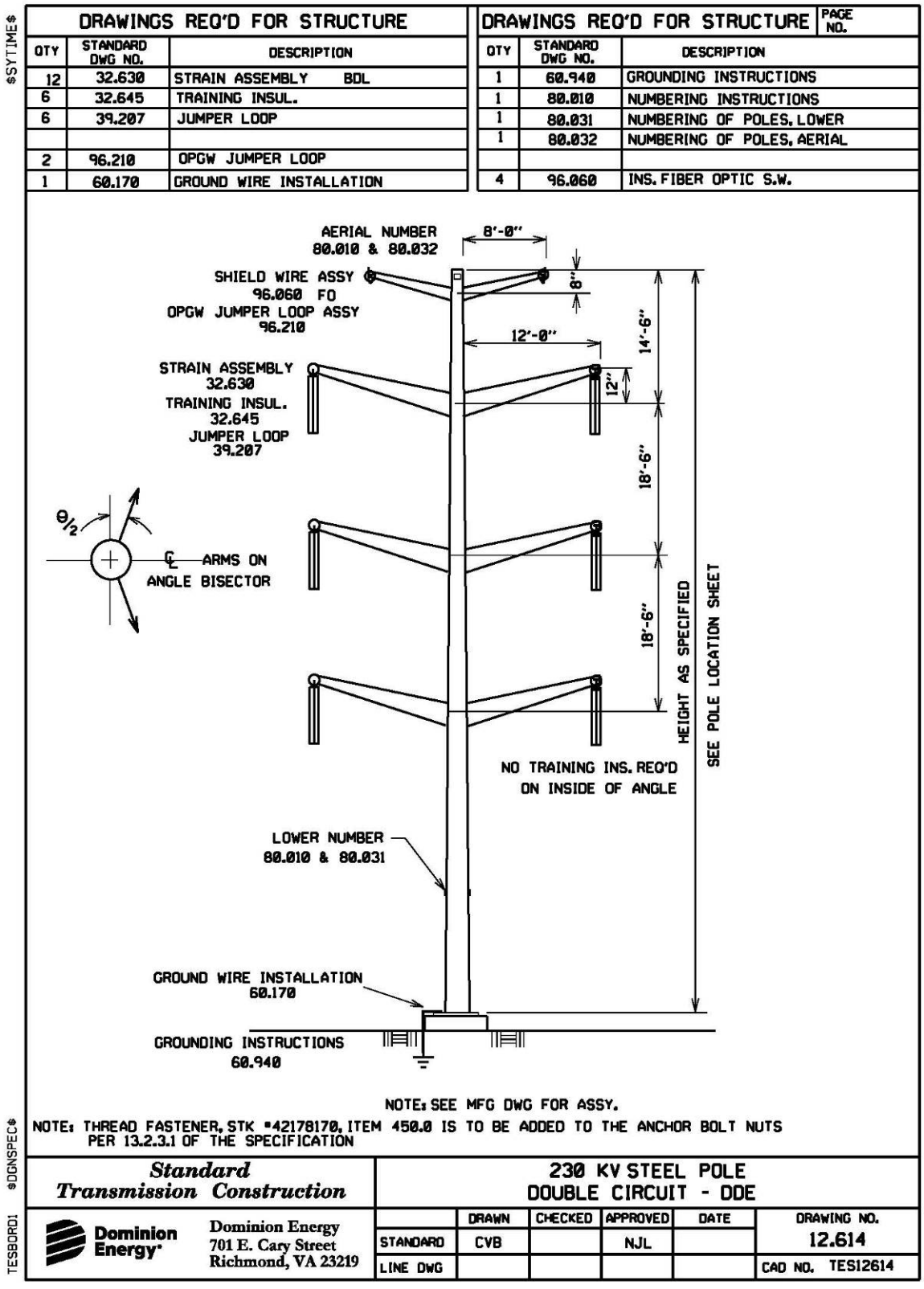


Figure 2-2: Detail of representative proposed typical structure. Source: Dominion Energy Virginia

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3. RESEARCH DESIGN

The intent of this effort was to identify all known historic properties within the vicinity of the proposed project area in order to assess them for potential impacts brought about by the project. Historic properties include architectural and archaeological (terrestrial and underwater) resources, historic and cultural landscapes, battlefields, and historic districts. For each previously recorded historic property, an examination of property documentation, current aerial photography, and a field reconnaissance was undertaken to assess each property's integrity of feeling, setting, and association, and to provide photo documentation of the property including views toward the proposed project. The D+A personnel who directed and conducted this survey meet the professional qualification standards of the Department of the Interior (48 FR 44738-9).

ARCHIVAL RESEARCH

In September 2021, D+A conducted archival research with the goal of identifying all previously recorded historic properties and any additional historic property locations referred to in historic documents and other archives, as well as consultation with local informants and other professionals with intimate knowledge of the project area as appropriate. Background research was conducted at the VDHR and on the internet and included the following sources:

- VDHR Virginia Cultural Resource Information System (VCRIS) site files; and
- National Park Service (NPS), American Battlefield Protection Program (ABPP), maps and related documentation.

Data collection was performed according to VDHR guidance in *Guidelines for Assessing Impacts of Proposed Electric Transmission Lines and Associated Facilities on Historic Resources in the Commonwealth of Virginia* (January 2008) and was organized in a multi-tier approach. As such, the effort was designed to identify all previously recorded NHL's located within 1.5-miles of the proposed project area, all historic properties listed in the NRHP, battlefields, and historic landscapes located within 1-mile of the project area, all historic properties previously determined eligible for listing in the NRHP located within 0.5-mile of the project area, and all properties located directly within the project area.

FIELD RECONNAISSANCE

Field reconnaissance included visual inspection of those previously recorded historic properties listed in the NRHP located within 1-mile of the project area, and all properties considered eligible for listing in the NRHP within 0.5-mile of the project area. Visual inspection included digital photo documentation of each property's existing conditions including its setting and views toward the proposed project. Photographs were taken of primary resource elevations, general setting, and existing viewsheds. All photographs were taken from public right-of-way or where property access was granted. No subsurface archaeological testing was conducted as part of this effort.

ASSESSMENT OF POTENTIAL IMPACTS

Following identification and field inspection of historic properties, D+A assessed each resource for potential impacts brought about by the proposed project. Assessment of impacts was conducted through a combination of field inspection, digital photography, review of topography and aerial photography, and photo simulation. Photo simulation was conducted from vantage points within or near each resource property deemed most likely to have a change in visibility as a result of the project. The photo simulation entailed digital photography, towards the project, which was then loaded into a computer with location coordinates and ground-elevation. The transmission line structures to be rebuilt as part of the project were then also computer modeled to represent the location, height, and configuration following construction. These models were then overlaid onto the digital photograph so that the existing (unaltered) view can be compared with the simulated view that illustrates the proposed structures, as they would appear on the landscape.

When assessing impacts, D+A considered those qualities and characteristics that qualify the property for listing and whether the project had the potential to alter or diminish the integrity of the property and its associated significance. Specific attention was given to determining whether or not the proposed project would introduce new visual elements into a property's viewshed, which would either directly or indirectly alter those qualities or characteristics that qualify the historic property for listing in the NRHP. Identified impacts were characterized as severe (fully visible and incompatible with character-defining viewshed or setting), moderate (partially visible and incompatible with character-defining viewshed or setting), or minimal (not visible and/or not out of character with existing viewscape).

REPORT PREPARATION

The results of the archival resource, field inspection, and analysis were synthesized and summarized in a summary report accompanied by maps, illustrations, and photographs as appropriate. All research material and documentation generated by this project is on file at D+A's office in Midlothian, Virginia.

4. ARCHIVES SEARCH

This section includes a summary of efforts to identify previously known and recorded cultural resources within the tiered project buffers. It includes lists, maps, and descriptive data on all previously conducted cultural resource surveys, and previously recorded architectural resources and archaeological sites according to the VDHR archives and VCRIS database. Because the alternatives for the DTC 230kV Line Loop and DTC Substation Project are all within close proximity of one another within a relatively small defined space, a single project study area that encompasses all alternatives was used for this analysis.

PREVIOUSLY SURVEYED AREAS

VDHR and VCRIS records indicate that there have been seventeen (17) prior Phase I cultural resource surveys within 1-mile of the project study area, including three that overlap portions of the project area or individual alternatives. These surveys are at a minimum archaeological in nature, although some include architectural resources as well. The three surveys overlapping the project area were conducted for transportation-related, utility, and private development projects. As a result of these prior surveys, the proposed underground option and transition station, as well as much of the overhead alternatives, but not all, have been subject to Phase I archaeological identification. The three previously conducted cultural resource surveys that include portions of the project area are listed in Table 4-1. All surveys conducted within one mile are illustrated in Figure 4-1.

Table 4-1: Previously conducted cultural resource surveys that include portions of the Project Area. Source: VDHR.

VDHR Survey #	Title	Author	Date
FX-108	Cultural Resource Inventory and Phase I Archaeological Survey of Route 28 (Sully Road) from I-66 to Route 7, Fairfax and Loudoun Counties, Virginia	Presnell Associates, Inc.	1987
LD-141	Phase I Cultural Resources Investigations of 218 Acres on the 352 Loudoun County Sanitation Authority Tract, Loudoun County, Virginia	Archaeological & Cultural Solutions, Inc.	2001
LD-230	A Phase I Investigation of the Circa 420 Acre A.S. Ray Property Along Broad Run, Loudoun County, Virginia	Thunderbird Archaeological Associates (Thunderbird Research Corp.)	2001

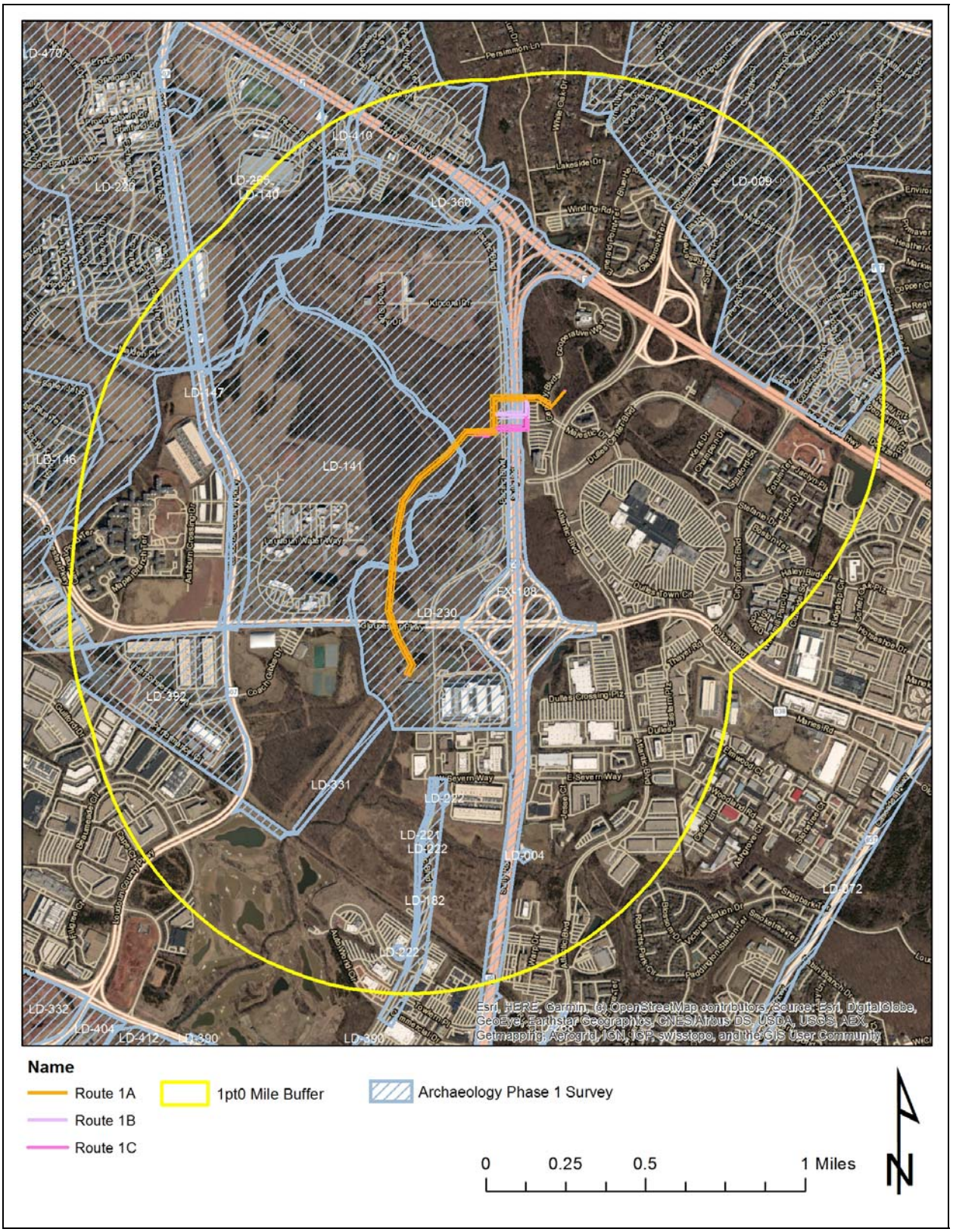

Figure 4-1: Previously conducted surveys within 1-mile of the project study area. Source: VCRIS

ARCHITECTURAL RESOURCES

Review of the VDHR VCRIS inventory records revealed a total of thirty-three (33) previously recorded architectural resources are located within 1.5 mile of the project study area. Of these, there are no (0) NHLs located within 1.5 mile of the proposed project or closer, one (1) property listed in the NRHP located within 1.0 mile or closer of the project, and no (0) properties that have been determined eligible or potentially eligible for listing in the NRHP within 0.5 mile or closer of the project. The one NRHP-listed resource is not located directly within or crossed by any of the project alternatives.

Table 4-2 lists all NHLs, NRHP-listed, and NRHP-eligible resources within their respective buffered tiers. A map of all previously recorded architectural resources within 1.5-mile of the project study area is depicted in Figure 4-2 and a map of any NHL, NRHP-listed, and NRHP-eligible resources within their respective study tiers are included in Figure 4-3.

Table 4-2: Previously recorded architectural resources within their respective tiered buffer zones around the DTC 230kV Line Loop and DTC Substation Project Study Area

Buffer(miles)	Considered Resources	VDHR #	Description
1.5	National Historic Landmarks	None	None
1.0	National Register- Listed	053-0110	Broad Run Bridge and Toll House
	Battlefields	None	None
	Historic Landscapes	None	None
0.5	National Register- Listed	None	None
	Battlefields	None	None
	Historic Landscapes	None	None
	National Register- Eligible	None	None
0.0 (ROW)	National Register- Listed	None	None
	Battlefields	None	None
	Historic Landscapes	None	None
	National Register- Eligible	None	None

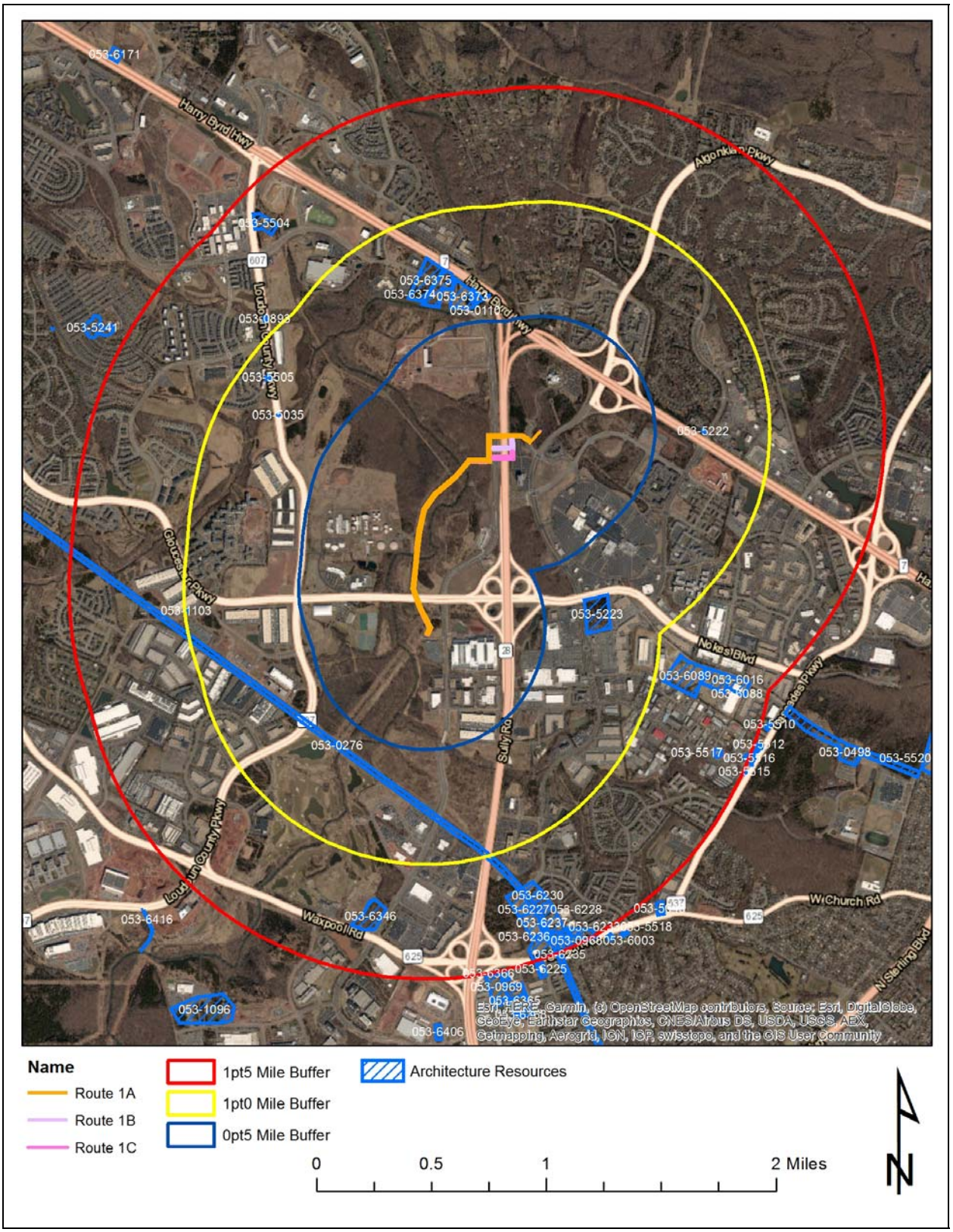

Figure 4-2: All previously identified architectural resources within 1.5-miles of the project study area. Source: VCRIS

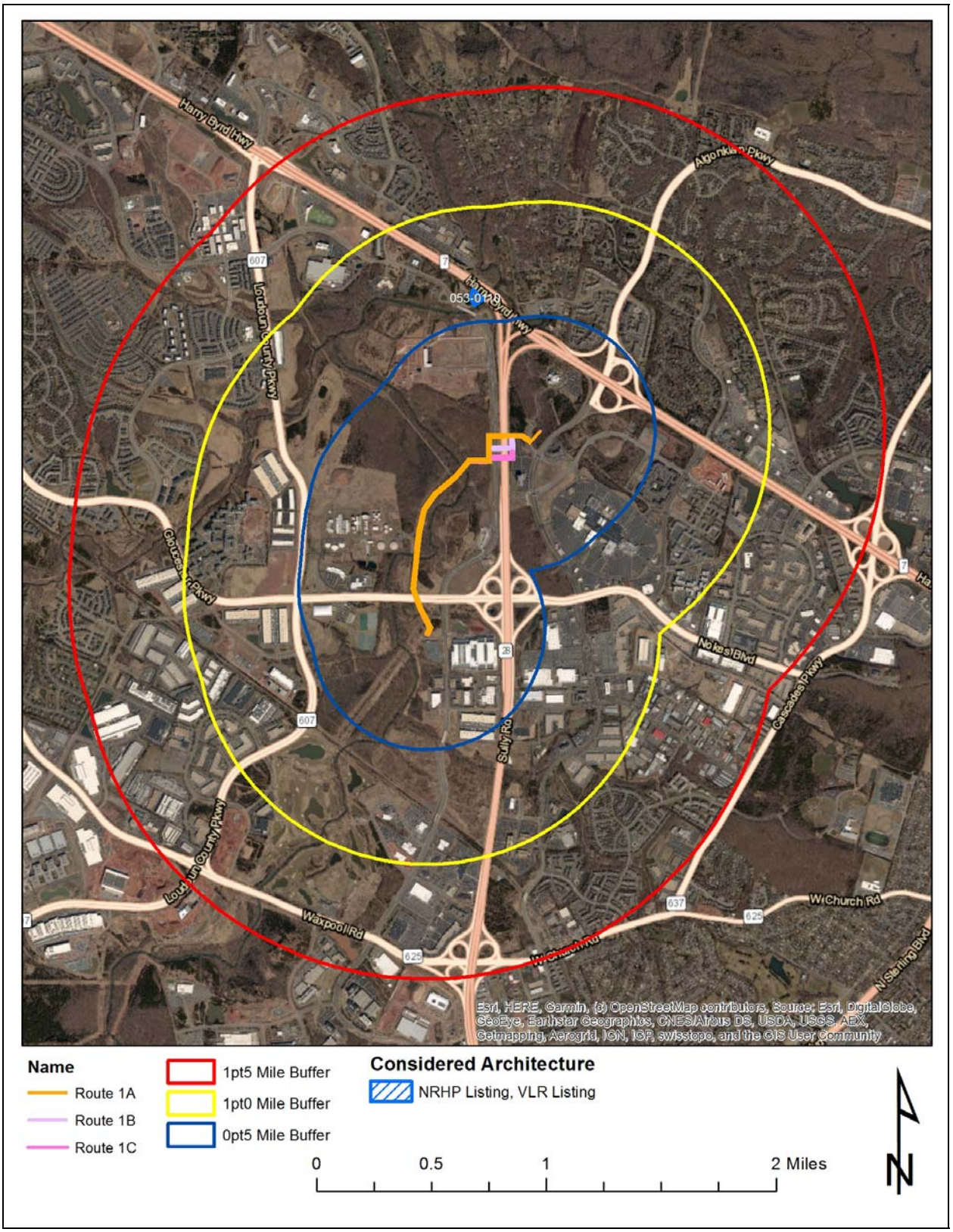

Figure 4-3: NHL, NRHP-Listed, and NRHP-Eligible architectural resources within their respective tiers around project study area. Source: VCRIS

NPS AMERICAN BATTLEFIELD PROTECTION PROGRAM (ABPP)

A review of the National Park Service (NPS) ABPP records reveals that the project study area is not located within one mile of any portions of any defined battlefields.

ARCHAEOLOGICAL SITES

Review of the VDHR VCRIS records reveals there are sixty-nine (69) previously recorded archaeological sites within one mile of the project study area. These include prehistoric lithic scatters and camps; as well as historic domestic sites, farmsteads, and trash scatters. Of these, four (4) have been determined potentially eligible for listing in the NRHP. Twenty-eight (28) sites have been determined not eligible for listing, and the remaining sites have not been formally evaluated. Two (2) of these sites are located directly within or adjacent to the project alternatives (within 50 feet of the proposed ROW); of which both been determined not eligible for listing in the NRHP.

Table 4-4 lists the previously recorded archaeological resources within one-mile of the project study area. Figure 4-4 illustrates the locations of the previously recorded sites within one mile of the project study area and Figure 4-5 illustrates the locations of sites located within or adjacent to the ROW for project alternatives.

Table 4-3: Previously recorded archaeological resources within one mile of the project study area. Bold listings denote sites listed in- or eligible for the NRHP. Orange highlight denotes site is located within or adjacent to a project alternative.

VDHR #	Type	Temporal Association	NRHP Status
44LD0020	<Null>	Prehistoric/Unknown (15000 B.C. - 1606 A.D.)	Not Evaluated
44LD0021	<Null>	Middle Archaic (6500 - 3001 B.C.), Woodland (1200 B.C. - 1606 A.D.)	Not Evaluated
44LD0103	Other	Prehistoric/Unknown (15000 B.C. - 1606 A.D.), Early Archaic (8500 - 6501 B.C.), Middle Archaic (6500 - 3001 B.C.), Late Archaic (3000 - 1201 B.C.), Woodland (1200 B.C. - 1606 A.D.), Middle Woodland (300 - 999 A.D.), Late Woodland (1000 - 1606)	DHR Staff: Not Eligible
44LD0104	<Null>	Woodland (1200 B.C. - 1606 A.D.)	DHR Staff: Not Eligible
44LD0105	<Null>	Prehistoric/Unknown (15000 B.C. - 1606 A.D.)	DHR Staff: Not Eligible
44LD0106	<Null>	Prehistoric/Unknown (15000 B.C. - 1606 A.D.)	DHR Staff: Not Eligible
44LD0107	<Null>	Woodland (1200 B.C. - 1606 A.D.)	DHR Staff: Not Eligible
44LD0108	Camp, temporary	Early Archaic (8500 - 6501 B.C.), Woodland (1200 B.C. - 1606 A.D.)	Not Evaluated
44LD0109	<Null>	Prehistoric/Unknown (15000 B.C. - 1606 A.D.)	DHR Staff: Not Eligible
44LD0110	Artifact scatter	Late Archaic Period (3000 - 1201 B.C.E), Early Woodland (1200 B.C.E - 299 C.E)	DHR Staff: Not Eligible
44LD0136	Camp, temporary	Prehistoric/Unknown (15000 B.C. - 1606 A.D.)	Not Evaluated
44LD0137	Camp, temporary	Archaic (8500 - 1201 B.C.)	Not Evaluated
44LD0138	Camp, temporary	Historic/Unknown, Prehistoric/Unknown (15000 B.C. - 1606 A.D.)	Not Evaluated
44LD0139	Camp, temporary	Prehistoric/Unknown (15000 B.C. - 1606 A.D.)	Not Evaluated
44LD0140	Barn, Camp, temporary, Dwelling, single	Prehistoric/Unknown (15000 B.C. - 1606 A.D.), 19th Century (1800 - 1899), 20th Century: 1st half (1900 - 1949)	Not Evaluated

VDHR #	Type	Temporal Association	NRHP Status
44LD0142	Camp, temporary	Pre-Contact	DHR Staff: Not Eligible
44LD0143	Camp, temporary	Late Woodland (1000 - 1606)	Not Evaluated
44LD0145	Camp, temporary	Prehistoric/Unknown (15000 B.C. - 1606 A.D.)	DHR Staff: Not Eligible
44LD0151	Camp, temporary	Late Woodland (1000 - 1606)	DHR Staff: Not Eligible
44LD0152	Camp, temporary	Prehistoric/Unknown (15000 B.C. - 1606 A.D.)	Not Evaluated
44LD0153	Camp, temporary	Prehistoric/Unknown (15000 B.C. - 1606 A.D.)	Not Evaluated
44LD0158	**Camp, temporary**	**Pre-Contact**	**DHR Staff: Eligible**
44LD0209	Camp, temporary	Prehistoric/Unknown (15000 B.C. - 1606 A.D.)	Not Evaluated
44LD0210	Camp, temporary	Prehistoric/Unknown (15000 B.C. - 1606 A.D.)	Not Evaluated
44LD0212	Camp, temporary	Prehistoric/Unknown (15000 B.C. - 1606 A.D.)	DHR Staff: Not Eligible
44LD0245	<Null>	<Null>	Not Evaluated
44LD0270	Camp, temporary, Dwelling, single	Prehistoric/Unknown (15000 B.C. - 1606 A.D.), 18th Century (1700 - 1799), 19th Century (1800 - 1899)	Not Evaluated
44LD0273	**Barn**	**19th Century (1800 - 1899)**	**DHR Staff: Eligible**
44LD0279	Lithic workshop	<Null>	Not Evaluated
44LD0285	Other	19th Century (1800 - 1899)	Not Evaluated
44LD0286	Other	18th Century (1700 - 1799)	Not Evaluated
44LD0290	Camp, temporary	Prehistoric/Unknown (15000 B.C. - 1606 A.D.)	Not Evaluated
44LD0371	Dwelling, single, Outbuilding	19th Century (1800 - 1899), 20th Century (1900 - 1999)	Not Evaluated
44LD0372	<Null>	Prehistoric/Unknown (15000 B.C. - 1606 A.D.)	DHR Staff: Not Eligible
44LD0373	<Null>	19th Century: 2nd half (1850 - 1899), 20th Century: 1st half (1900 - 1949)	Not Evaluated
44LD0375	Dwelling, single	Prehistoric/Unknown (15000 B.C. - 1606 A.D.), 19th Century: 4th quarter (1875 - 1899), 20th Century (1900 - 1999)	Not Evaluated
44LD0421	Cemetery	19th Century (1800 - 1899)	DHR Staff: Not Eligible
44LD0447	Farmstead	19th Century: 4th quarter (1875 - 1899), 20th Century (1900 - 1999)	Not Evaluated
44LD0495	<Null>	Late Archaic (3000 - 1201 B.C.), Woodland (1200 B.C. - 1606 A.D.)	DHR Staff: Not Eligible
44LD0647	Farmstead	19th Century: 2nd half (1850 - 1899)	DHR Staff: Not Eligible
44LD0648	Farmstead	19th Century: 1st half (1800 - 1849)	DHR Staff: Not Eligible
44LD0649	**Farmstead**	**19th Century: 2nd half (1850 - 1899)**	**DHR Staff: Eligible**
44LD0650	Camp, temporary	Early Archaic (8500 - 6501 B.C.)	Not Evaluated
44LD0651	Farmstead	19th Century: 1st half (1800 - 1849)	DHR Staff: Not Eligible
44LD0652	Camp, base	Early Archaic (8500 - 6501 B.C.)	DHR Staff: Not Eligible

VDHR #	Type	Temporal Association	NRHP Status
44LD0727	Camp, temporary	Prehistoric/Unknown (15000 B.C. - 1606 A.D.)	DHR Staff: Not Eligible
44LD0728	Camp, temporary	Prehistoric/Unknown (15000 B.C. - 1606 A.D.)	DHR Staff: Not Eligible
44LD0729	**Tavern/Inn**	**18th Century: 2nd half (1750 - 1799)**	**DHR Board Det. Eligible**
44LD0730	Camp, temporary	Prehistoric/Unknown (15000 B.C. - 1606 A.D.)	DHR Staff: Not Eligible
44LD0731	Farmstead	20th Century (1900 - 1999)	DHR Staff: Not Eligible
44LD0732	Camp, temporary, Trash scatter	Prehistoric/Unknown (15000 B.C. - 1606 A.D.), 19th Century: 1st half (1800 - 1849)	DHR Staff: Not Eligible
44LD0843	Dwelling, single	Early National Period (1790 - 1829), Antebellum Period (1830 - 1860), Civil War (1861 - 1865), Reconstruction and Growth (1866 - 1916)	Not Evaluated
44LD0844	Dwelling, single	19th Century (1800 - 1899), 19th Century: 2nd half (1850 - 1899), 20th Century (1900 - 1999), 20th Century: 1st half (1900 - 1949)	Not Evaluated
44LD0845	Trash scatter	19th Century: 2nd half (1850 - 1899), 20th Century: 1st half (1900 - 1949)	Not Evaluated
44LD0919	Farmstead	19th Century: 2nd half (1850 - 1899), 20th Century: 1st half (1900 - 1949), 20th Century: 3rd quarter (1950 - 1974)	DHR Staff: Not Eligible
44LD0920	Dwelling, single	20th Century: 2nd half (1950 - 1999)	DHR Staff: Not Eligible
44LD0921	Camp, temporary	Prehistoric/Unknown (15000 B.C. - 1606 A.D.)	DHR Staff: Not Eligible
44LD1196	Trash scatter, Well	19th Century: 2nd/3rd quarter (1825 - 1874), 20th Century: 1st half (1900 - 1949)	Not Evaluated
44LD1339	<Null>	Prehistoric/Unknown (15000 B.C. - 1606 A.D.)	DHR Staff: Not Eligible
44LD1343	Trash scatter	Prehistoric/Unknown (15000 B.C. - 1606 A.D.), 20th Century (1900 - 1999)	Not Evaluated
44LD1435	Farmstead	19th Century: 2nd half (1850 - 1899), 20th Century: 1st quarter (1900 - 1924)	Not Evaluated
44LD1436	Outbuilding, Road	18th Century: 4th quarter (1775 - 1799), 19th Century: 4th quarter (1875 - 1899), 20th Century: 1st half (1900 - 1949)	Not Evaluated
44LD1443	Farmstead	20th Century: 1st half (1900 - 1949)	Not Evaluated
44LD1454	Camp, temporary	Late Archaic (3000 - 1201 B.C.), Woodland (1200 B.C. - 1606 A.D.)	Not Evaluated
44LD1456	Lithic scatter	Pre-Contact	Not Evaluated
44LD1474	Farmstead	World War I to World War II (1917 - 1945), The New Dominion (1946 - 1988), Post Cold War (1989 - Present)	Not Evaluated
44LD1475	Lithic scatter	Prehistoric/Unknown (15000 B.C. - 1606 A.D.)	Not Evaluated
44LD1684	Trash pit	The New Dominion (1946 - 1988), Post Cold War (1989 - Present)	DHR Staff: Not Eligible
44LD1836	Dwelling, single	Reconstruction and Growth (1866 - 1916)	Not Evaluated

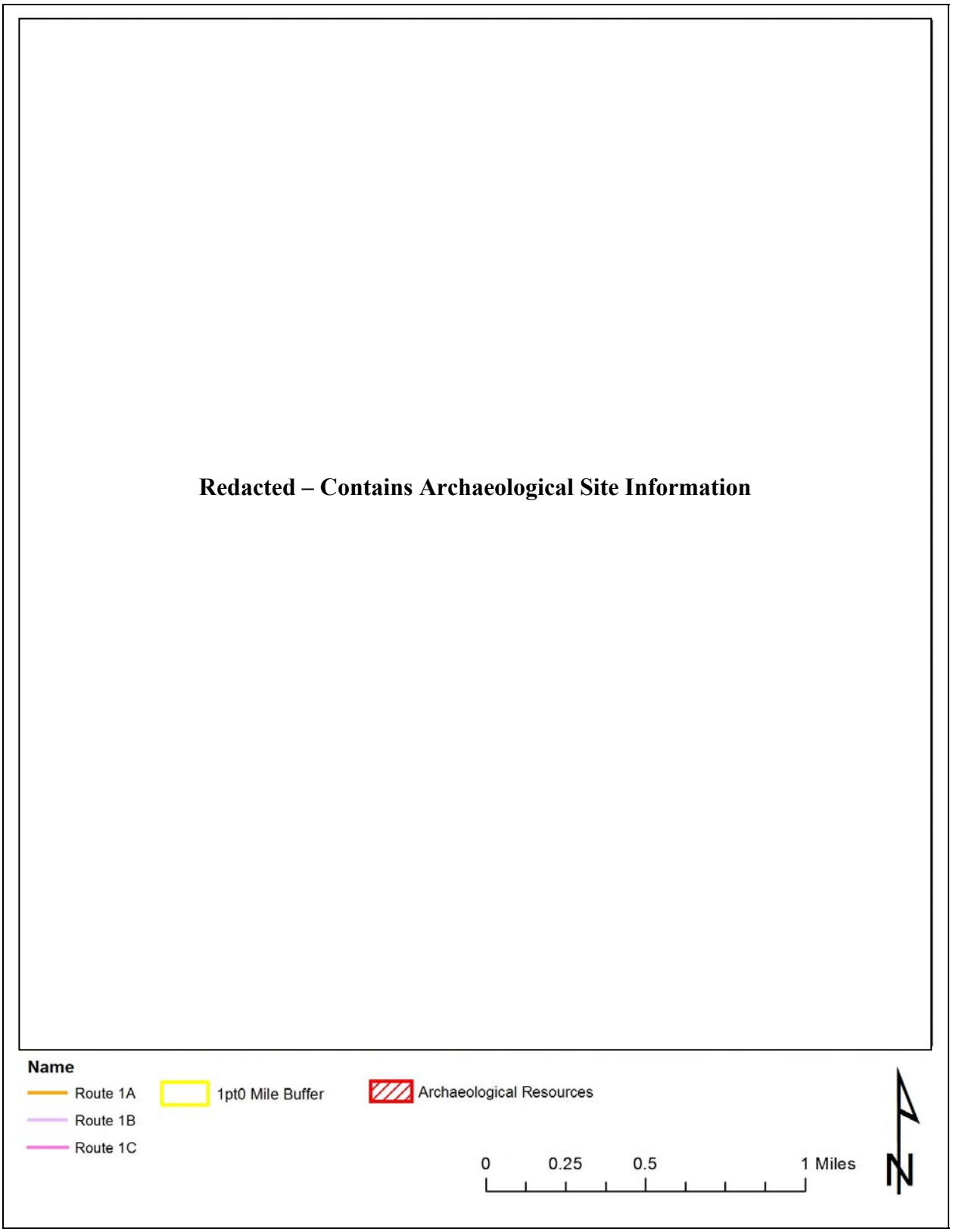

Figure 4-4: Previously recorded archaeological resources located within 1- mile of project study area. (Source: VCRIS)

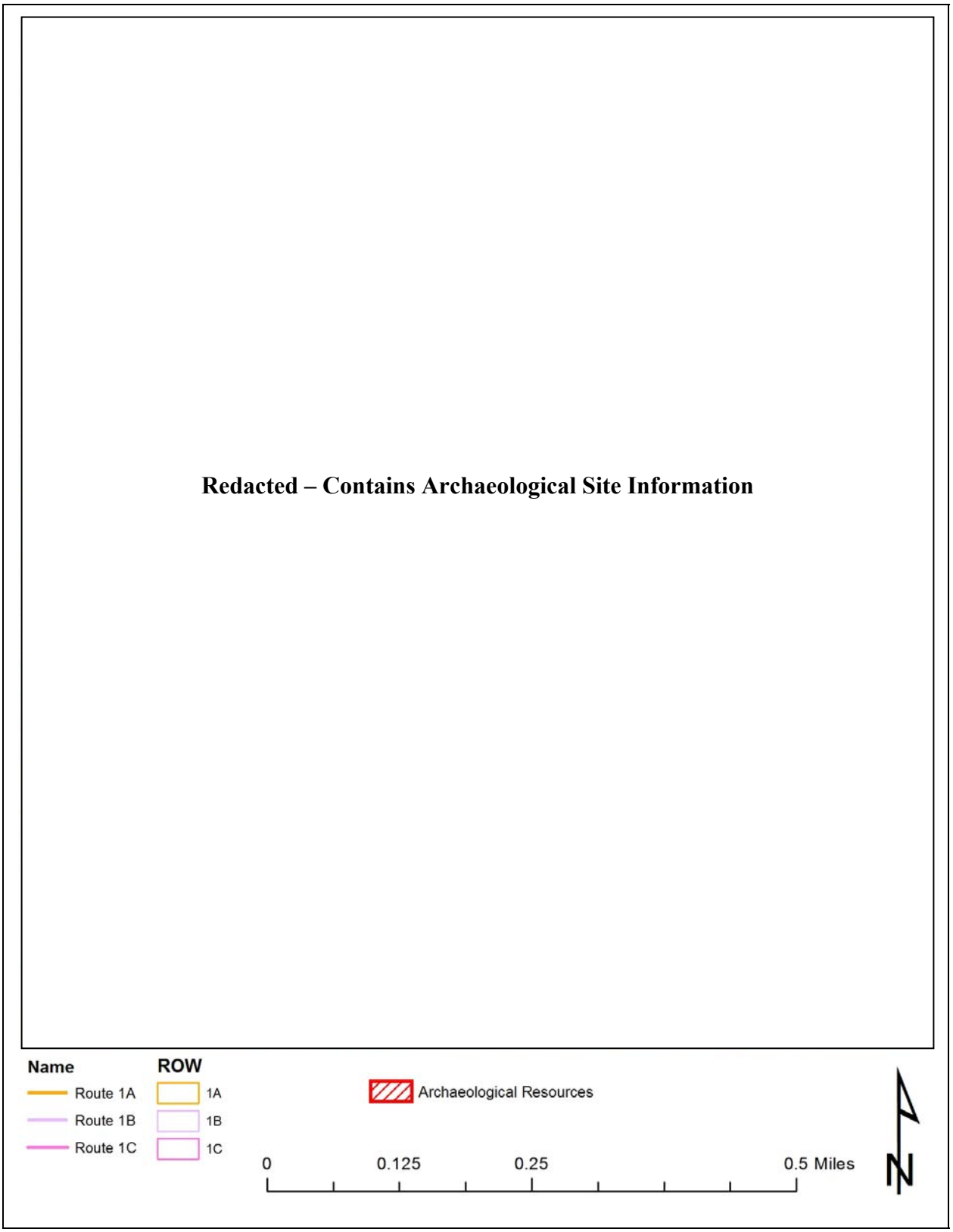

Figure 4-5: Detail of previously recorded archaeological resources located within the ROW for project alternatives. (Source: VCRIS)

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5. RESULTS OF FIELD RECONNAISSANCE

In accordance with the VDHR guidelines for assessing impacts of proposed electric transmission lines on historic resources, previously recorded historic architectural properties designated an NHL, or either listed or determined eligible or potentially eligible for listing in the NRHP located within 1.5 mile, 1.0 mile, or 0.5 mile of the project study area were field verified for existing conditions and photo documented (Table 5-1). Inspection and analysis of the setting around the resource and views towards the project alternatives were also assessed. The results of the field reconnaissance for each resource are organized by NRHP-status, and summarized in the following pages.

Table 5-1: Considered Architectural Resources within their Respective Tiered Buffer Zones for the DTC 230kV Line Loop and DTC Substation Project

VDHR #	Resource Name, Address	NRHP-Status	Distance from Project
053-0110	Broad Run Bridge and Toll House	NRHP-Listed	~0.57 Mile

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NATIONAL REGISTER OF HISTORIC PLACES – LISTED PROPERTIES
BATTLEFIELDS, AND LANDSCAPES
Located within 1.0 Mile of the Project or Closer

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Broad Run Bridge and Toll House (VDHR# 053-0110)

The Broad Run Bridge and Toll House consists of a circa 1820 stone building with later frame additions that served as a toll house for an adjacent bridge that historically carried the Leesburg Turnpike over Broad Run. The original stone bridge remained in place until the 1970s, but now all that remains are stone abutments on each side. The Leesburg Turnpike was built in the early-nineteenth century as part of a state internal improvement project to provide a link between Leesburg and Alexandria. The Broad Run Bridge and Toll House remained as a good example of infrastructure related to the turnpike and thus representative of early-nineteenth century transportation in the region. As such, it was formally listed in the NRHP in 1970.

The Broad Run Bridge and Toll House is located approximately 0.57 mile from the project study area at its nearest point. This point is the northernmost point of Route 1C, just west of the proposed site of the DTC substation. The landscape between the resource and the study area is undulating, as a result of Broad Run and several small tributaries, with a series of finger ridges and troughs. There is extensive development between the resource and the study area, including several major transportation corridors, a large campus of the Virginia Cooperative Extension, and a complex of townhouses. The undeveloped landscape generally remains thickly wooded.

In order to assess the potential impact of the proposed project, visual inspection was conducted of the setting around the Broad Run Bridge and Toll House, and photo simulation was prepared with emphasis on views from the resource towards the study area. For the purposes of this effort, the proposed structure locations on Route 1A were modeled as this alternative is the closest to the Broad Run Bridge and Toll House property. Because the property is private and gated, inspection from directly adjacent to the Toll House was not possible, however, inspection and analysis were conducted from nearby including from the modern Leesburg Pike roughly 50-feet to the north, and from a modern crossing of Broad Run on Russell Branch Parkway roughly 300-feet to the south.

Visual inspection revealed that the current landscape and setting surrounding the resource has been subject to extensive development and manipulation. The modern Leesburg Pike corridor extends immediately to the front of the building. The road is now an eight-lane highway on a built-up corridor, leaving the Broad Run Toll House within a low plane beneath the road surface. Inspection from the raised highway adjacent to the toll house revealed that intervening vegetation, including within the Broad Run Bridge and Toll House property, screens views in the direction of the project study area. Access to the property is now from a narrow private road to the west that is gated and prohibits access to the site, however, as it is at a lower elevation than the raised highway, views would be similarly screened. Inspection from a modern bridge over Broad Run on Russell Branch Parkway just to the south revealed that views in the direction of the project study area are interrupted by topography. A wooded ridge that is higher elevation than the project area extends between this location and the study area.

As such, it is anticipated that there will be no visibility of any project alternatives from the Broad Run Bridge and Toll House, or any publicly-accessible locations in the immediate vicinity. The proposed structures nearest to the resource are those within the proposed DTC substation and will be an average of 75-feet in height. The structures extending to the south and away from the

property will be average 110-feet in height. While the structures will be taller than the average mature tree cover in the area, the topography, angle of view, and intervening development are anticipated to inhibit views of the project. This was confirmed with photo simulation that illustrates all of the proposed structures along Route 1A will remain beneath the horizon and vegetation and therefore not be visible from the property.

Visual impacts are defined as the introduction of visual elements that might diminish or alter the setting of any historic property listed on or eligible for listing on the NRHP. The Broad Run Bridge and Toll House is significant for its associations with Virginia's early transportation network. As such, setting as it relates to the relationship between the toll house, the remains of the associated bridge, and the water feature it crosses, are important to its interpretation, and a component of its significance; however, the wider surroundings are not inherently linked to its significance or interpretive capability. Further, the extended setting is already considered compromised by large-scale modern development and infrastructure, and not integral to the significance of the resource. It is D+A's opinion that the significant historical setting is limited to the toll house and bridge, and the immediately surrounding area. It is anticipated that there will no visibility of any of the proposed alternatives, and was confirmed as such for the nearest alternative (Route 1A). Therefore, the DTC 230kV Line Loop and DTC Substation Project will not introduce any change in setting or viewshed and will have ***no impact*** on the Broad Run Bridge and Toll House.

Figure 5-1 depicts the location of the Broad Run Bridge and Toll House in relation to the project study area and viewshed buffers, with the location and direction of all representative photographs. Figures 5-2 through 5-5 are representative photographs of the property, as well as those taken from locations within and near the property towards the project study area. Figures 5-6 through 5-8 provide photo simulation of Route 1A, including maps with the location, direction, and structures included in the photo simulation from the property, the existing view from the simulation location, and a simulated view of the proposed structures along that alternative.

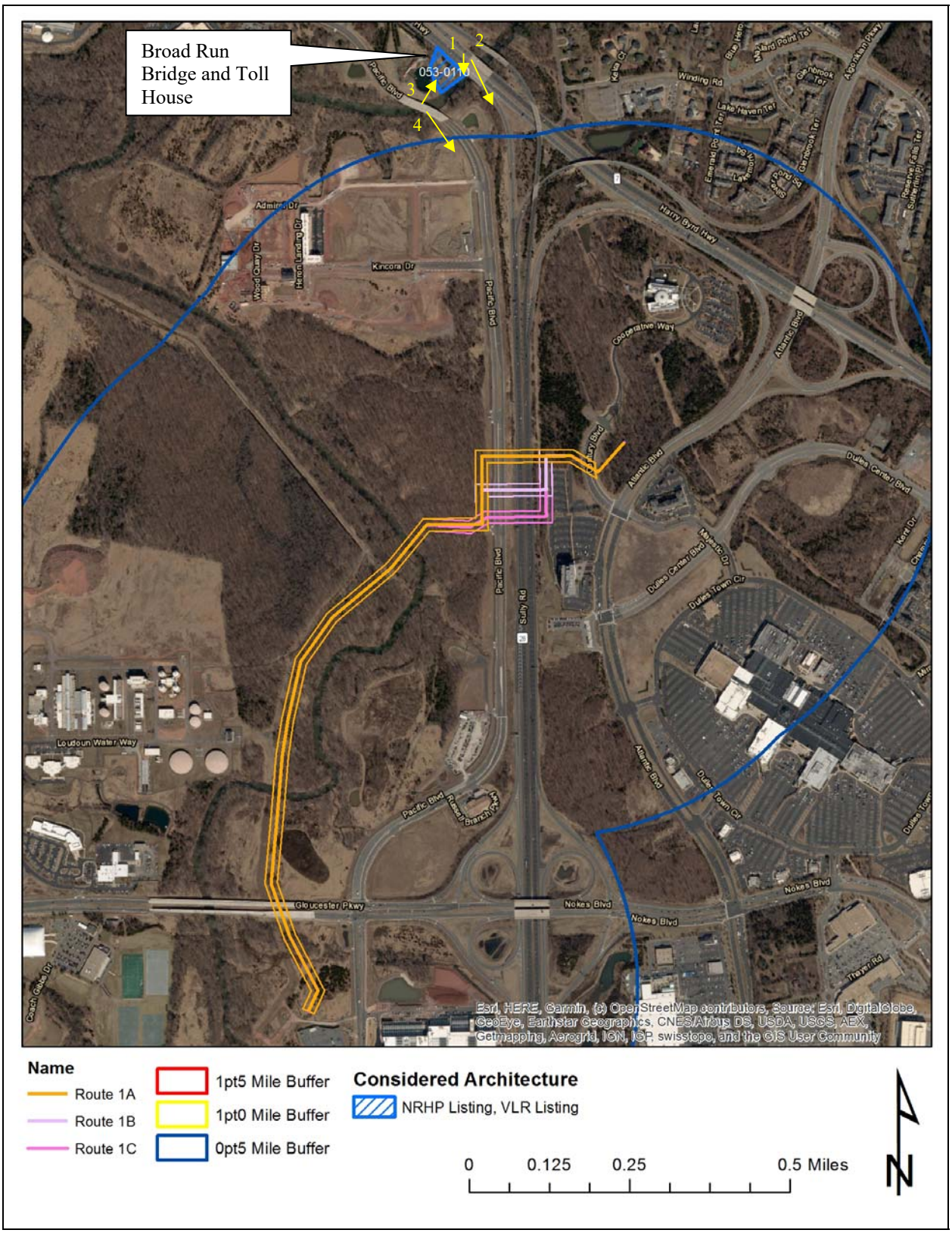

Figure 5-1: Location of Broad Run Bridge and Toll House in relation to the project alternatives (Representative photographs and views towards the project area depicted in yellow).

Figure 5-2: Photo location 1- View towards Broad Run Bridge and Toll House from SR-7 Harry Byrd Highway, facing south.

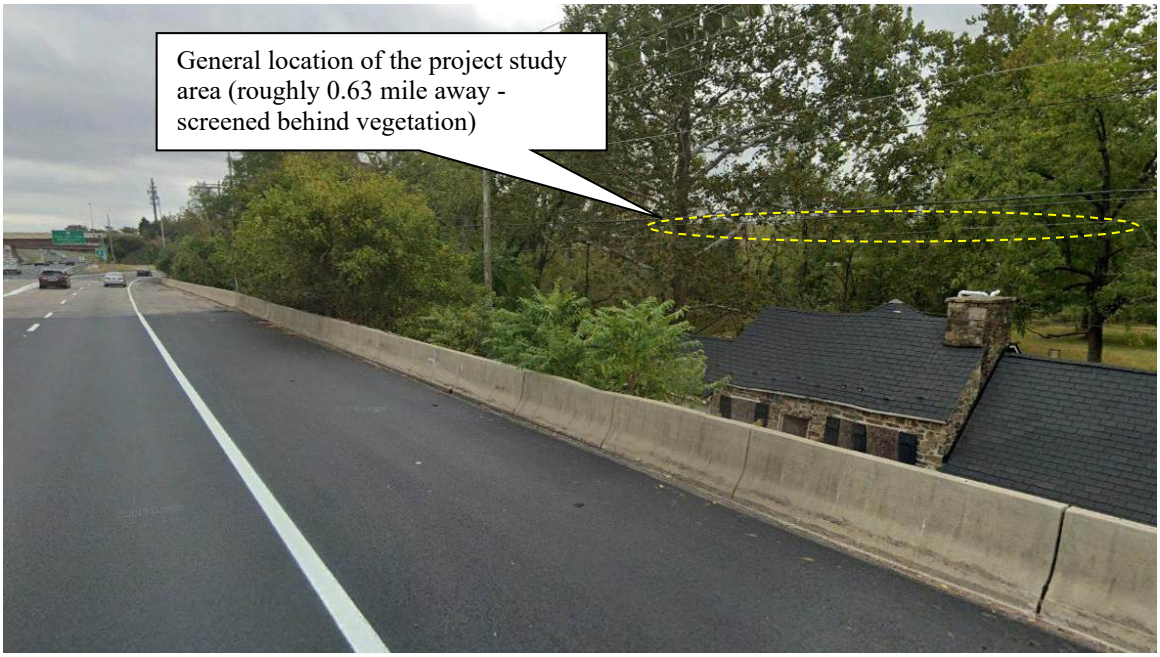

Figure 5-3: Photo location 2- View from the Broad Run Bridge and Toll House towards the project area (not visible), facing southeast.

Figure 5-4: Photo location 3- View of Broad Run Bridge and Toll House setting from Russell Branch Parkway, facing north.

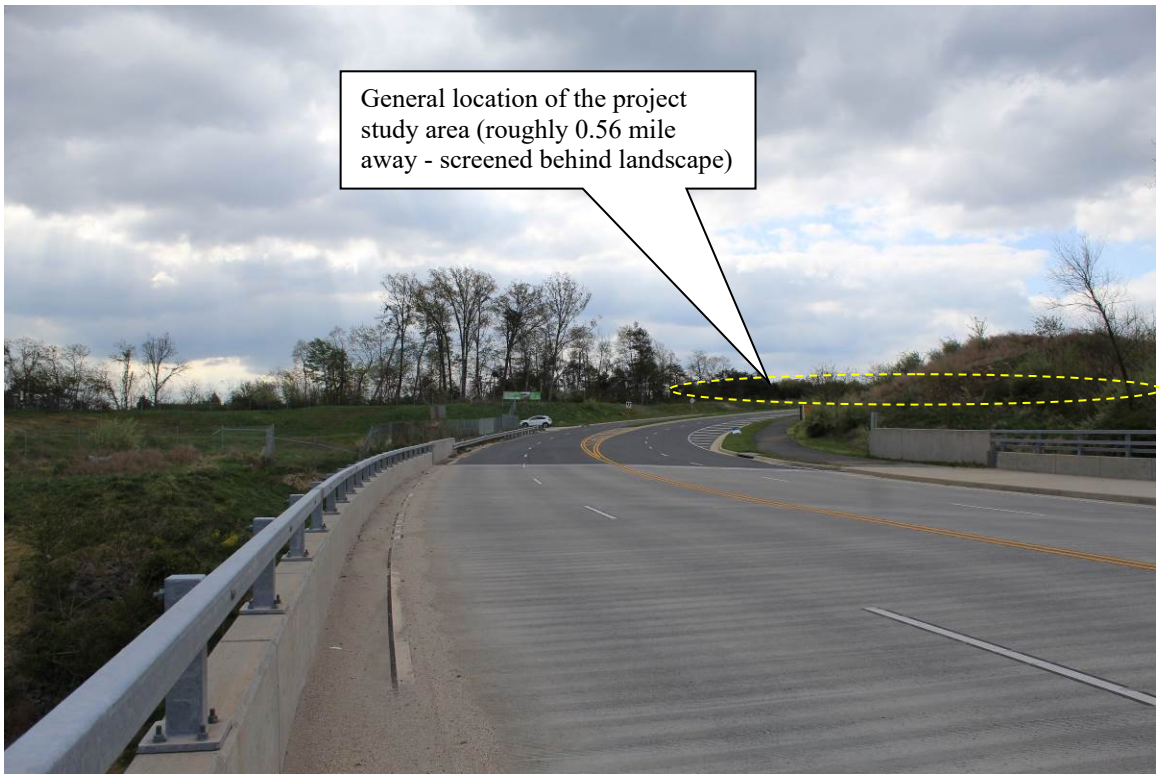

Figure 5-5: Photo location 4- View from Russell Branch Parkway near Broad Run Bridge and Toll House towards the project area (not visible), facing southeast.

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Photo simulations
prepared by:
GTTE LLC
email:
info@gttellc.com
703 447 1350

Location:
Broad Run Toll Keepers House

Project:
DTC 230kV Line Loop and DTC Substation

Structure	Distance (ft)	Height (ft)
New 1	7893	100.0
New 2	7734	100.0
New 3	7328	110.0
New 4	6928	110.0
New 5	6354	100.0
New 6	5874	90.0
New 7	5580	90.0
New 8	5092	95.0

Structure	Distance (ft)	Height (ft)
New 9	4677	90.0
New 10	4412	90.0
New 11	4081	90.0
New 12	3871	95.0
New 13	3873	110.0
New 14	3270	120.0
New 15	3412	120.0
New 16	3565	110.0

Figure 5-6: Broad Run Bridge and Tollkeepers House Photo Simulation – Simulation location, direction of view, and structures modeled on Route 1A. Source: GTTE, LLC

Photo simulations prepared by:
GTTE LLC
email:
info@gttellc.com
703 447 1350

Project: DTC 230kV Line Loop and DTC Substation

Location: Broad Run Toll Keepers House

Existing View

Photo Simulations and diagrams represent approximate heights for electric transmission structures from the conceptual design used for the proposed project. These illustrations do not necessarily depict exact structure design or location.

This simulation is designed for viewing on a computer monitor. To achieve the correct scale, the image should be increased or decreased in size until the scale above measures 4". When viewed with the eye at 31" from the screen the image will have the same scale as if the viewer were standing at the camera location.

Figure 5-7: Broad Run Bridge and Tollkeepers House Photo Simulation – Existing view towards Route 1A (roughly 0.57 mile away). Source: GTTE, LLC

Photo simulations prepared by:
GTTE LLC
email:
info@gttellc.com
703 447 1350

Project: DTC 230kV Line Loop and DTC Substation

Location: Broad Run Toll Keepers House

Proposed View
(Location of towers not visible are overlaid with yellow tower icon)

Photo Simulations and diagrams represent approximate heights for electric transmission structures from the conceptual design used for the proposed project. These illustrations do not necessarily depict exact structure design or location.

This simulation is designed for viewing on a computer monitor. To achieve the correct scale, the image should be increased or decreased in size until the scale above measures 4". When viewed with the eye at 31" from the screen the image will have the same scale as if the viewer were standing at the camera location.

Figure 5-8: Broad Run Bridge and Tollkeepers House Photo Simulation – Proposed view towards Route 1A (Roughly 0.57 miles away - Structures not visible- shown in yellow). Source: GTTE, LLC

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6. SUMMARY OF POTENTIAL IMPACTS

As part of this pre-application analysis of cultural resources for the DTC 230kV Line Loop and DTC Substation Project, potential impacts to previously recorded historic properties listed or considered eligible for listing in the NRHP within the VDHR-defined buffered tiers were assessed in accordance with the VDHR guidelines. For the purposes of this analysis, an impact is one that alters, either directly or indirectly, those qualities or characteristics that qualify a particular property for listing in the NRHP and does so in a manner that diminishes the integrity of a property's materials, workmanship, design, location, setting, feeling, and/or association. With respect to transmission lines, direct impacts typically are associated with ground disturbance resulting from ROW clearing and structure construction. Indirect impacts typically are associated with the introduction of new visual elements or changes to the physical features of a property's setting or viewshed. According to VDHR guidance, project impacts are characterized as such:

- **None** – Project is not visible from the property
- **Minimal** – Occur within viewsheds that have existing transmission lines, locations where there will only be a minor change in tower height, and/or views that have been partially obstructed by intervening topography and vegetation.
- **Moderate** – Include viewsheds with expansive views of the transmission line, more dramatic changes in the line and tower height, and/or an overall increase in the visibility of the route from the historic properties.
- **Severe** – Occur within viewsheds that do not have existing transmission lines and where the views are primarily unobstructed, locations where there will be a dramatic increase in tower visibility due to the close proximity of the route to historic properties, and viewsheds where the visual introduction of the transmission line is a significant change in the setting of the historic properties.

With regards to architectural resources, one (1) historic property that is either designated and NHL, listed in, or determined eligible or potentially eligible for listing in the NRHP is located within the defined study tiers. This includes no (0) NHLs located within 1.5 mile or closer of the proposed project, one (1) NRHP-listed property located 1.0 mile or closer of the project (Broad Run Bridge and Toll House/VDHR# 053-0110), and no (0) properties that have been determined eligible or potentially eligible for listing in the NRHP located within 0.5 mile or closer of the project.

Inspection from the NRHP-listed resource found that it is set within a rapidly developing suburban area with large-scale commercial and industrial properties in the vicinity. Coupled with transportation network and vegetation patterns, it is anticipated that all of the project alternatives will be completely screened from view from the resource, which is supported by photo simulation of the nearest alternative. ***It is therefore D+A's opinion that the proposed DTC 230kV Line Loop and DTC Substation Project will have no impact on any architectural resources that are designated an NHL, listed in the NRHP, or determined eligible or potentially eligible for listing (Table 6-1).***

Table 6-1: Potential impacts summary for architectural resources.

VDHR #	Resource Name, Address	NRHP-Status	Distance from Project	Recommended Impact
053-0110	Broad Run Bridge and Toll House	NRHP-Listed	0.57 Mile	No Impact

With regards to archaeology, two previously identified site are located within or adjacent to the project area (within 50 feet of an alternative ROW), both of which are directly crossed by all three alternatives. Both of the sites have been determined not eligible for listing in the NRHP. No archaeological field work was conducted as part of this effort and previously recorded sites within or adjacent to the project were not visited or assessed at this time. ***It is D+A's opinion that these sites should be assessed for existing conditions and project impacts as additional project construction details become available (Table 6-2).***

Table 6-2: Summary of potential impacts summary for archaeological resources.

VDHR#	NRHP Status	Proximity to Project Area	Impacts
44LD0107 (Prehistoric Unknown)	DHR Staff: Not Eligible	Directly Crossed by Route 1A, 1B, and 1C	TBD
44LD0727 (Prehistoric Camp)	DHR Staff: Not Eligible	Directly Crossed by Route 1A, 1B, and 1C	TBD

7. REFERENCES

National Park Service
2009 "Civil War Sites Advisory Commission Report Update and Resurvey," American Battlefield Protection Program

Virginia Department of Historic Resources
2008 *Guidelines for Assessing Impacts of Proposed Electric Transmission Lines and Associated Facilities on Historic Resources in the Commonwealth of Virginia*

Virginia Department of Historic Resources
2016 Virginia Cultural Resource Information System (VCRIS) database and GIS server.

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