Dominion Energy®

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

Before the State Corporation Commission of Virginia

230 kV Apollo-Twin Creeks Lines and Twin Creeks, Sycolin Creek, Starlight, Lunar, and Apollo Substations

Application No. 334

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Environmental Routing Study

Apollo-Twin Creeks 230 kV Electric Transmission Project

PREPARED FOR

Dominion Energy Virginia

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Apollo-Twin Creeks 230 kV Electric Transmission Project

0655669

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ACRONYMS AND ABBREVIATIONS

Acronyms	Description
A-3	Agricultural/Residential Zoning District
AIOD	Airport Impact Overlay District
AMSL	above mean sea level
BOS	Board of Supervisors
CBG	Census Block Group
CCB	Center for Conservation Biology
CDP	Census Designated Place
Company	Virginia Electric and Power Company
CFR	Code of Federal Regulations
CPCN	Certificate of Public Convenience and Necessity
CTP	Loudoun County Countywide Transportation Plan
CWA	Clean Water Act
dB	decibel
DTCI	Loudoun County Department of Transportation and Capital Infrastructure
Dulles International Airport	Washington Dulles International Airport
EJ	environmental justice
ERM	Environmental Resources Management, Inc.
ESA	Endangered Species Act
FAA	Federal Aviation Administration
FCV	Forest Conservation Value
FOD	Floodplain Overlay District
GI	General Industry Zoning District
GIS	geographic information system
HDD	horizontal directional drill
HOA	Homeowners' Association
HUC	hydrologic unit code
I-1	Industrial/Research Park Zoning District
ID	Identification
IP	Industrial Park Zoning District

Acronyms	Description
IPaC	Information for Planning and Consultation
IVMP	Integrated Vegetation Management Plan
JLMA	Joint Land Management Area
KOP	key observation point
kV	kilovolt
LandMARC	Land Management, Applications, Research and Coordination System
MP	milepost
MRHI	Mineral Resource-Heavy Industry Zoning District
NA	not applicable
NERC	North American Electric Reliability Corporation
NHD	National Hydrography Dataset
NHL	National Historic Landmark
NHP	Natural Heritage Program
NRHP	National Register of Historic Places
NWI	National Wetlands Inventory
OP	Office Park Zoning District
PD-H4	Planned Development-Housing 4 Zoning District
PD-H6	Planned Development-Housing 6 Zoning District
PEM	palustrine emergent
PFO	palustrine forested
Project	Apollo-Twin Creeks 230 kV Electric Transmission Project
PSH	Predicated suitable habitat
PSS	palustrine scrub-shrub
ROW	right-of-way
Rt.	Virginia State Route
Rt. 7	Virginia State Route 7 (Leesburg Pike)
SCC	State Corporation Commission
SCUs	stream conservation units
TERPS	Terminal instrument procedures
TOYRs	Time-of-year restrictions
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service

Acronyms	Description
USEPA	U.S. Environmental Protection Agency
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
VDHR Guidelines	*Guidelines for Assessing Impacts of Proposed Electric Transmission Lines and Associated Facilities on Historic Resources in the Commonwealth of Virginia*
VDOT	Virginia Department of Transportation
VDWR	Virginia Department of Wildlife Resources
VEJA	Virginia Environmental Justice Act
VOF	Virginia Outdoors Foundation
VSR	visually sensitive resource
W&OD	Washington and Old Dominion
WERMS	Wildlife Environmental Review Map Service
WWTP	Wastewater treatment plant

1. INTRODUCTION AND BACKGROUND

This report presents the results of an 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 the Company) for a new proposed 230 kilovolt (kV) double circuit transmission line (Apollo-Twin Creeks Lines) and five proposed 230 kV substations (Twin Creeks, Sycolin Creek, Starlight, Lunar, and Apollo Substations) in Loudoun County, Virginia. These facilities collectively are referred to as the Apollo-Twin Creeks 230 kV Electric Transmission Project or the Project.

1.1 PROJECT DESCRIPTION

Dominion Energy Virginia proposes to construct and operate a new double circuit 230 kV transmission line to provide requested service to three data center customers in eastern Loudoun County, Virginia. In developing a route for the Apollo-Twin Creeks Lines, ERM and the Company considered the facilities needed to construct and operate the new feeds, the required locations of the substations (delivery points), the width of new right-of-way that would be required, the amount of existing and proposed development in the area, the potential for impacts on environmental resources and communities, and the cost of each option.[1]

The purpose of the Project is to:

- Provide service requested by three data center customers (collectively, the Customers) in Loudoun County; and
- Maintain reliable electric service consistent with North American Electric Reliability Corporation (NERC) Reliability Standards for growth in the load area encompassing the eastern Leesburg area in Loudoun County (hereafter, the Leesburg Load Area).

For purposes of this Application, the Leesburg Load Area is bounded to the north by Leesburg Pike (State Route 7 or Rt. 7), to the west by Crosstrail Boulevard, to the south by State Route 267 (Dulles Greenway or Rt. 267) and State Route 625 (Ashburn Farm Parkway or Rt. 267), and to the east by the community of Ashburn and State Route 901 (Claiborne Parkway or Rt. 901). Three Customers (hereafter referred to as Customers A, B, and C) have requested service for three new data center campuses in the Leesburg Load Area: Campuses A, B, and C (or collectively, the Campuses). To serve the Customers' projected load combined with emerging load in the area [approximately 1,372 megawatts (MW)], the Company is proposing to construct the proposed substations with the targeted sequencing as follows: Twin Creeks Substation (2026) to serve Campus A, the Sycolin Creek Substation (2026) and Starlight Substation (2028) to serve Campus B, and the Lunar Substation (2028) and Apollo Substation (2028) to serve Campus C.

The location of the Project is depicted on Figure 3.1-1 and Figure 3.1-2 All figures referred to in this document are provided in Appendix A.

[1] Cost is addressed elsewhere in the Company's Application for the Project.

1.2 PROPOSED FACILITIES

To provide the service requested by the Customers, maintain reliable service for overall load growth in the Leesburg Load Area, and comply with NERC Reliability Standards, Dominion proposes to construct and operate the following facilities:

1. Approximately 1.9 miles of overhead 230 kV double circuit transmission lines in new right-of-way from a cut-in along the Company's existing 230 kV Edwards Ferry-Pleasant View Line (Line #203) at Structure #203/2 to the delivery points required for the Project (i.e., the Apollo-Twin Creeks Lines); and
2. Five new 230-34.5 kV substations within Campuses A, B, and C on properties to be obtained by the Company (i.e., the Twin Creeks, Sycolin Creek, Starlight, Lunar, and Apollo Substations).

From the cut-in, the Apollo-Twin Creeks Lines would extend approximately 1.9 miles within a predominantly 100-foot-wide right-of-way, interconnecting the proposed Twin Creeks, Sycolin Creek, Starlight, and Lunar Substations and terminating at the proposed Apollo Substation. The new transmission lines would be supported primarily by double circuit, dulled galvanized steel monopoles and utilize three-phase twin-bundled 768.2 Aluminum Conductor Steel Supported/Trapezoidal Wire/High Strength (ACSS/TW/HS) type conductors with a summer transfer capability of 1,573 megavolt-amperes (MVA).

Dominion Energy Virginia determined that building a portion of the proposed Apollo-Twin Creeks Lines adjacent to a future, overhead 500 kV single circuit transmission line and 230 kV circuit (the Aspen-Golden Lines)[2] is preferred given that the facilities proposed for each project traverse the same area. Collocation of the future rights-of-way for proposed Apollo-Twin Creeks Lines and the future Aspen-Golden Lines minimizes the impacts of each project on communities and sensitive

[2] On March 7, 2024, the Company filed an application for State Corporation Commission (SCC) approval of new single circuit 500 kV and 230 kV electric transmission lines located in a new right-of-way varying between 100 and 150 feet in width and extending for approximately 9.4 miles (the future Aspen-Golden Lines) between a new 500-230 kV Aspen Substation and a new 500-230 kV Golden Substation, as well as an approximately 0.2-mile line between the new 500-230 kV Aspen Substation and the existing 500 kV Goose Creek Substation, all located in Loudoun County, Virginia (collectively, the Aspen-Golden Project). *See Application of Virginia Electric and Power Company for approval and certification of electric transmission facilities: 500-230 kV Aspen Substation, 500 kV Aspen-Goose Creek Line #5002, 500 kV and 230 kV Aspen-Golden Lines #5001 and #2333, 500-230 kV Golden Substation and Lines# 2081/#2150 Loop*, Case No. PUR-2024-00032 (filed March 7, 2024) (referred to herein as the Aspen-Golden Application). For approximately 0.9 mile of the 9.4-mile proposed route of the future Aspen-Golden Lines, the Company noted as part of the Aspen-Golden Application that it would need additional right-of-way with varying widths between 100 and 140 feet to accommodate construction of two new 230 kV double circuit lines—namely, the Apollo-Twin Creeks Lines (as defined herein but referred to in the Aspen-Golden Application as the future Twin Creeks Lines). As noted in the Aspen-Golden Application, the Company understood that it could not condemn for more than what was needed for the Aspen-Golden Project until such time as the Company sought approval of this instant Project, as defined herein, consistent with the Commission's approach in recent proceedings. *See* the Aspen-Golden Application, Appendix at n. 6. The Company is now seeking such approval in this Application, and is filing contemporaneous with the filing of this Application a motion to consolidate these two cases for purposes of judicial economy. A map depicting the total right-of-way where the Apollo-Twin Creeks Lines are proposed for collocation with the future Aspen-Golden Lines, which ranges from a total of 200 to 260 feet, is provided in Attachment II.A.6 to the Appendix. As clarification, the Company notes that the use of "collocation" in this context indicates where the rights-of-way are adjacent to and/or overlap one another as depicted in Attachment II.A.2 to the Appendix.

resources, including Goose Creek, which is designated as a scenic river by the Commonwealth of Virginia.

1.3 STRUCTURE TYPES AND RIGHT-OF-WAY WIDTHS

The Apollo-Twin Creeks Lines would be constructed on new right-of-way supported primarily by double circuit, galvanized steel monopoles with an estimated minimum structure height of 85 feet, estimated maximum structure height of 135 feet, and estimated average structure height of 112 feet. The estimated heights are based on preliminary conceptual design, do not include foundation reveal, and are subject to change based on final engineering design. Section views depicting typical right-of-way widths and structure configurations are provided in Appendix B.

1.4 SUBSTATIONS

To serve the Project need, the Company is proposing to construct five substations with the targeted sequencing (planned in-service dates) for each station as follows: Twin Creeks Substation in 2026 to serve Campus A, Sycolin Creek Substation in 2026 and Starlight Substation in 2028 to serve Campus B, and Lunar Substation and Apollo Substation in 2028 to serve Campus C.

1.4.1 TWIN CREEKS SUBSTATION

The proposed Twin Creeks Substation site is located north of Cochran Mill Road, approximately 0.7 mile south of the intersection of Cochran Mill Road and Crosstrail Boulevard. The planned substation footprint occupies approximately 4.7 acres (of a 13.3-acre parcel to be obtained by the Company) all of which is forested. The area surrounding the site is largely industrial and includes existing Company substations (Pleasant View and Pleasant View 500) and transmission lines (Lines #203, #514, and #2098), material and other storage areas, and a mine/quarry. The Twin Creeks Substation is needed to meet the delivery service request of Customer A.[3]

1.4.2 SYCOLIN CREEK AND STARLIGHT SUBSTATIONS

The proposed Sycolin Creek and Starlight Substation sites are on properties associated with Campus B east of Goose Creek and approximately 0.2 mile west from the frontage of Belmont Ridge Road. To the south of Goose Creek Lane, the planned footprint of the Sycolin Creek Substation occupies approximately 4.7 acres, all of which is currently forested. To the north of Goose Creek Lane, the planned footprint of the Starlight Substation occupies approximately 4.5 acres, of which about 90 percent is forested, and 10 percent developed. The Sycolin Creek and Starlight Substations are needed to meet the delivery service request of Customer B.[4]

1.4.3 LUNAR AND APOLLO SUBSTATIONS

The proposed Lunar and Apollo Substation sites are on properties associated with Campus C east of Goose Creek near the southwest corner of the intersection of State Route 7 (Rt. 7 or Leesburg

[3] As noted in the Company's Appendix, Twin Creeks Development, LLC (Customer A) is developing Campus A, the Cochran Mill TC 2, LLC Data Center.
[4] As noted in the Company's Appendix, Loudoun GC, LLC (Customer B) is developing Campus B, the Belmont Innovation Campus.

Pike) and Belmont Ridge Road. To the south, the planned footprint of the Lunar Substation occupies approximately 4.0 acres, all of which is currently forested. To the north, the proposed footprint of the Apollo Substation occupies approximately 5.0 acres, all of which is currently forested. The Lunar and Apollo Substations are needed to meet the delivery service request of Customer C.[5]

1.5 CONSTRUCTION, OPERATION, AND MAINTENANCE PROCESS

Construction of new overhead transmission lines may involve some or all 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;
- Stringing and tensioning of conductors; and
- Final clean-up and land restoration.

All materials for the Project's 230 kV structures will be delivered and assembled at each structure location within the right-of-way. Detailed foundation design will not be completed until prior to construction; however, foundation design could include poured concrete requiring excavation or steel piles or caissons that might be vibrated, drilled, or driven into place depending on soil conditions. Structures will be erected with a crane and anchored to the foundation during final assembly. In upland areas, excess soil from foundation construction will be evenly distributed at each structure and the soil replanted and stabilized. In wetland areas, excess soil will be removed and evenly distributed on an upland site within the Project'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 will be strung under tension. This system involves stringing a "lead line" between structures for the conductors and ground wires. The line 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 them from possible damage should they touch the ground, fences, or other objects.

Once the Project is in-service, maintenance of the right-of-way under the transmission lines will be essential for the reliable operation of the lines as well as for public safety. Operation and maintenance of the Project will include periodic inspections of the lines 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 potentially impacting the transmission line. Periodic inspections will use both aerial and walking patrols. Normal

[5] As noted in the Company's Appendix, Customer C is developing Campus C.

operation and maintenance will 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 uses only herbicides that are approved by the U.S. Environmental Protection Agency (USEPA) on power line rights-of-way.

Based on a discussion between the Company and representatives of the Virginia Department of Conservation and Recreation (VDCR) Division of Natural Heritage (DNH), the Company reviewed its Integrated Vegetation Management Plan (IVMP) for application to both woody and herbaceous species based on the species list available on the VDCR website. The Company continues to coordinate with DNH on an addendum to the IVMP to further explain how the Company's operations and maintenance forestry program addresses invasive species. In November 2023, the Company submitted the addendum draft to VDCR for review and continued discussions. VDCR provided an initial response to the addendum in January 2024. The Company will continue to meet with VDCR to further discuss the documentation provided. Once the addendum is finalized, the Company will report on the results of its communications with VDCR in future transmission certificate of public convenience and necessity filings.[6]

1.6 OBJECTIVES OF THE STUDY

The Company requested ERM's services to complete the following: a) define a study area for routing the proposed transmission lines; b) collect information about routing constraints and opportunities within the study area; c) identify and compare alternative routes for the new transmission lines, and d) document these efforts in this report. More specifically, ERM's scope of work consisted of the following activities:

- Defining and describing a study area for routing the transmission lines proposed for the Project;
- Gathering and assessing information about routing constraints and opportunities to be considered as part of the study;
- Identifying and mapping routing constraints and opportunities within the study area;
- Participating in outreach efforts for the Project to gather information from stakeholders, agency staff, and the public regarding constraints to be considered as part of the routing process;

[6] *See, Application of Virginia Electric and Power Company, For approval and certification of electric transmission facilities: 230 kV Line #293 and 115 kV Line #83 Rebuild Project*, Case No. PUR-2021-00272, Final Order at 9-11 (Aug. 31, 2022) *(The Commission agreed with the Chief Hearing Examiner and declined to adopt DCR-DNH's recommendation regarding an invasive species management plan (ISMP), but directed the Company to meet with DCR-DNH and to report on the status of the meetings in the Company's next transmission certificate of public convenience and necessity (CPCN) filing)*; *see also* Report of Alexander F. Skirpan, Jr., Chief Hearing Examiner (Jun. 22, 2022) at 22 *(agreeing with the Company that, with its IVMP, the Company should not be required to undergo the additional cost of DCR-DNH's ISMP; however, recommending that the Company meet with DCR-DNH regarding its IVMP and report the results of the meeting in the next transmission CPCN filing)*.

- Identifying buildable alternative routes and/or variations for the transmission lines meeting the siting criteria provided in the Code of Virginia (Va. Code) and included in the SCC's minimum filing guidelines for transmission projects;
- If applicable, comparing the alternative routes based on an analysis of environmental impacts and use of routing opportunities; and
- Recommending a preferred route.

2. ROUTING PROCESS

The process of routing new electric transmission lines follows a sequence whereby potential route corridors are developed into potential routes which are further refined into viable alternatives. Although details may differ, the fundamental objectives of the process are the same regardless of project or location: maximize collocation with compatible linear features or land uses; avoid, minimize, or mitigate impacts to the human and natural environment; and provide regulators with viable route alternatives meeting the purpose and need of the project that are both efficient and equitable. Route viability is assessed through permitting risk, constructability, right-of-way acquisition, and cost after the least impactful alternatives are identified.

The routing process, outlined below, provides a framework for understanding the Project, how routes are identified and screened, and the selection of a preferred alternative.

2.1 DEFINING THE STUDY AREA

The first step in the routing process is defining a geographic study area based on the Company's electric transmission and service obligations specific to a project. The study area for the Project was defined to encompass its beginning and ending points (i.e., from a cut-in along the Company's existing 230 kV Edwards Ferry-Pleasant View Line (Line #203) to the proposed substation sites) and an area broad enough in between to allow for the identification of reasonable alternatives. Additionally, and to the extent practicable, the limits of the study area are defined by reference to easily distinguished landmarks, such as roads or other features. Doing so helps Dominion and ERM describe the boundaries to stakeholders, such as potentially affected landowners or county and agency staff. Section 3 of this document describes the characteristics of the Project study area in detail.

2.2 INVENTORY OF ROUTING CONSTRAINTS AND OPPORTUNITIES

The second step in the routing process involves the identification and mapping of environmental and built features within the study area. Based on extensive data collection, an inventory of routing constraints and opportunities in the study area is developed, including but not limited to:

- Locations of substations;
- Electric transmission and other utility rights-of-way;
- Residences and residential areas;
- Planned developments;
- Commonwealth, county, and private road rights-of-way;
- Public lands;
- Conservation and open space easements;
- Parks and trails;
- Wetlands and waterbodies;
- Forested land;
- Hospitals, schools, cemeteries, and convalescent centers;

- Areas of ecological significance (e.g., conservation sites and habitat for threatened and endangered species);
- Visual resources; and
- Archaeological and historic sites and other nationally or locally significant cultural resources.

2.3 IDENTIFYING POTENTIAL ROUTE CORRIDORS

The third step in the routing process is the identification of potential route corridors – swaths of the study area within which it is possible to route new transmission infrastructure – and the exclusion of areas where transmission line routing is infeasible or impracticable due to land use or other conflicts. This step is critical in larger, heavily developed or developing areas, where planned developments or protected lands, like parks, can block potential routes. The viability or feasibility of a potential route corridor is assessed by evaluating environmental impacts, compatibility with existing and future land uses, permitting risk, community input, ability to acquire new right-of-way, constructability, and cost. The route corridors identified for the Project are described in Section 4.

2.4 IDENTIFYING AND ASSESSING ROUTE VARIATIONS

After a route corridor is identified, potential route alternatives or variations within that corridor are developed using geographic information system (GIS) software. To the extent practicable, routes are identified that avoid constraints and utilize opportunities. Throughout this step, the Project team continues to collect and assess data on constraints along the routes, including input from stakeholders through community outreach. This information is used by the Project team to qualify and better understand resources that could be affected and to refine routes, where feasible, to avoid or reduce potential impacts. The routes developed for the Project are described in Section 5.2; other routes considered but rejected for the Project are described in Section 5.3.

2.5 FIELD RECONNAISSANCE AND STAKEHOLDER ENGAGEMENT

Field reconnaissance and stakeholder/public engagement activities (e.g., a project website, open houses, targeted mailings, and virtual and in-person meetings) are used to gather information, identify resources, and help inform routing and route selection. Public engagement activities for the Project are discussed in Section 5.1.

2.6 ROUTE ALTERNATIVE ANALYSIS AND ROUTE RECOMMENDATION

After gathering data and conducting stakeholder outreach, route alternatives are analyzed and compared quantitatively and qualitatively based on constraint data and community/stakeholder input. After completing this analysis, a preferred route is selected through comparison of the advantages and disadvantages of each alternative relative to SCC Guidelines. A Proposed Route and Alternative Routes, if applicable, are then provided for SCC consideration and for public notice for the Project. Conversely, routes deemed too impactful and/or infeasible or impracticable are not carried forward for notice.

3. STUDY AREA

3.1 STUDY AREA DESCRIPTION

The study area identified for the Project encompasses approximately 1.8 square miles (1,152 acres) within unincorporated areas of eastern Loudoun County, including parts of Belmont, a U.S. Census Bureau census-designated place. The limits of the study area, depicted in Figures 3.1-1 and 3.1-2, are generally defined by the following features:

- Leesburg Pike (Rt. 7) to the north;
- Belmont Ridge Road to the east;
- The Company's existing Lines #227 and #274 and the Washington and Old Dominion (W&OD) Trail to the south; and
- The Company's existing Lines #203, #2098, and #514 to the west.

Sources used by the ERM team to identify constraints and opportunities within the study area include:

- Loudoun County Geohub GIS datasets (Loudoun County 2023a; Loudoun County 2023b; Loudoun County 2023c);
- Virginia Department of Transportation (VDOT) Projects and Studies Database (VDOT 2023)
- National Conservation Easement Database (NCED 2023);
- VDCR Conservation Lands Database (VDCR 2023);
- U.S. Census Bureau American Community Survey, 5-Year Estimates (2018-2022) (U.S. Census Bureau 2022a-2022e);
- U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) mapping (USFWS 2023);
- Virginia Cultural Resources Information System (VCRIS; VDCR 2023x);
- Current aerial imagery taken in May 2023 (ESRI 2023);
- Existing utility transmission and distribution lines (Rextag 2023); and
- Proprietary facility data from the Company (Dominion 2023x), Loudoun Water (Loudoun Water 2023) and Washington Gas Company (Washington Gas 2023).

ERM researched, vetted, mapped, and incorporated constraints and opportunities identified through these sources into a GIS, where the layers were organized by resource type.

3.2 MAJOR ROUTING CONSTRAINTS AND OPPORTUNITIES

The following is a summary of the major constraints and opportunities in the study area affecting transmission line routing. Of particular note are the locations of the five planned substations to deliver service to the Customers, which are fixed. Other constraints include existing and planned developments and nearby scenic and natural resources, such as Goose Creek. Several of the features discussed below are both constraints and opportunities. Highways and roads, for example, can provide opportunities for routing new transmission infrastructure, but adjacent

development can limit the area available for a new transmission right-of-way. Routing constraints and opportunities are shown on Figure 3.2.

- The Company's Future Aspen-Golden Lines: As discussed in Section 1.2, ERM and the Company identified Dominion's future Aspen-Golden Lines, a future 500 kV single circuit transmission line and 230 kV single circuit transmission line, as a key routing opportunity because the projects cross the same area. Collocation of the Apollo-Twin Creeks Lines with the future Aspen-Golden Lines minimizes impacts on forest and riparian resources and to Goose Creek, a state-designated scenic river. The Aspen-Golden Lines are further discussed in Section 4.1.
- Location and Energization Sequence of the Proposed Substations: The Project substations must be connected by new transmission lines in this order: Twin Creeks, Sycolin Creek, Starlight, Lunar, and Apollo. All five substations would be within the data center campuses on sites identified by the Customers. As a result, any route identified for the Project must consider the location of the proposed substations.
- Existing Transmission Lines: There are multiple existing transmission line corridors in the study area, including the Company's existing Lines #227 and #274 to the south and Lines #203, #2098, and #514 to the west. The Commission requires that existing transmission lines be considered as routing opportunities when planning new transmission lines. While it is often beneficial to build new transmission lines adjacent to existing corridors to minimize impacts, the existing lines in the study area parallel recreational and cultural resources (the W&OD Trail) and industrial developments, such as quarries, where space for a new transmission line is limited or not available.
- Washington and Old Dominion Trail: The W&OD Trail is located along (and under) existing Dominion transmission lines (as noted above) and bisects the southern extent of the study area. The resource is a former railroad turned multi-use recreational trail owned and maintained by NOVA Parks.
- State Route 7: Rt. 7, a potential routing opportunity, comprises the approximate northern boundary of the study area. There are constraints proximate to the highway, including existing electric transmission lines to the west, that limit route options to Rt. 7 and for feasibly connecting the five substations. Moreover, there is inadequate space available for routing new transmission lines within a 100-foot-wide right-of-way along the highway due to the presence of existing residential areas, such as Lansdowne, and planned developments, including Campus C.
- Belmont Ridge Road: Route 659 (or Belmont Ridge Road), a VDOT minor arterial roadway, is along the eastern boundary of the study area. West of the roadway are an existing commercial and industrial development (a quarry) and planned data center campuses on currently undeveloped, forested land. East of the roadway are the existing residential communities of Belmont Country Club, Chase at Belmont Country Club, and Alexandra's Grove at Belmont.
- Goose Creek Scenic River: Goose Creek, a state-designated scenic river extending from Fauquier County to Loudoun County and the Potomac River, bisects the study area from the

W&OD Trail to Rt. 7 for about 1.5 miles. Goose Creek and its riparian corridors are a notable natural and recreational resource.

- Sycolin Creek: Sycolin Creek bisects the study area to the west and is a tributary to Goose Creek.
- Scenic Creek Valley Buffer: Loudoun County designated a 300-foot-wide buffer off Goose Creek and a 100-foot-wide buffer off Sycolin Creek to promote and maintain vegetation along state-designated scenic rivers and other waterbodies. New transmission lines crossing the creek would require tree clearing within the right-of-way and introduce structures and conductors to the viewshed from the creek. This is a key reason that Dominion's future Aspen-Golden Lines were identified as a routing opportunity for the Project – doing so ensures one new crossing, rather than two of the creek.
- Substations: To meet the need of the Project, five substations are needed to provide service to the Customers, who provided the location of the delivery points to Dominion: these locations are fixed. With multiple delivery points to consider, the routing team evaluated practicable routes that could feasibly connect the substations while also considering impacts on resources.
- Planned Developments: There are multiple planned developments within in the study area, in particular Campuses A, B, and C. The routing team solicited input from and coordinated with the Customers to develop routes across the campuses that avoid conflicts with planned structures.
- Public Lands: Loudoun Water purchased an approximately 19-acre parcel from NOVA Parks for construction of the planned Milestone Reservoir Pump Station. The parcel, which adjoins the south side of Sycolin Creek, is bound by existing Company transmission lines (Lines #227 and #274) and the W&OD Trail. Crossings of public lands can be constraints to routing a transmission line because the approval from the land managing entity for the transmission line is required and because these lands sometimes protect natural or cultural resources for the benefit of the public such that the use of these lands could be incompatible with transmission infrastructure.
- Existing and Planned Utilities: Loudoun Water provides drinking water and wastewater services to eastern Loudoun County through its Central System. In developing routes for the Project, the routing team considered potential impacts on existing and proposed Loudoun Water facilities, but also assessed Loudoun Water's existing and planned utility infrastructure as a potential routing opportunity. Where feasible, siting a transmission line right-of-way adjacent to or overlapping with other utilities can be a tool for minimizing the impacts of a project.
- Industrial Areas: There are office and industrial zoning districts throughout the study area, including Goose Creek Industrial off Durham Court and Cochran Mill Road. Adjacent to heavy industrial developed areas, the Goose Creek Industrial Park is south of a Luck Stone quarry and east of the proposed Twin Creeks Substation. The park includes multiple industrial and manufacturing businesses and consists of office buildings and parking and storage areas. Electric transmission lines are compatible with commercial and industrial development.
- Residential Areas: While the study area is predominantly industrial and commercial, it contains some residential subdivisions and residences throughout. To the north, the Goose Creek Golf

Club is located along Cochran Mill Road with property adjoining the west side of Goose Creek. Belmont residential areas are found east of Belmont Ridge Road, which connects to Rt. 7. The Lansdowne residential subdivision is located on the northside of Rt. 7, but outside the study area. New transmission lines are routed to avoid residential areas and residences where practicable.

4. ROUTE CORRIDORS

ERM developed four potential corridors for routing the Apollo-Twin Creeks Lines, referred to as the Aspen-Golden Lines Corridor (which includes the Company's future Aspen-Golden Lines), the Belmont Ridge Road Corridor, the W&OD Trail Corridor (which includes the Company's existing rights-of-way for Lines #227 and #274), and the Crosstrail Boulevard (which includes the Company's existing rights-of-way for Lines #203, #2098, and #514). The corridors were developed for their potential to avoid and mitigate impacts to routing constraints (including residential areas and natural resource constraints) while leveraging routing opportunities (such as linear rights-of-way or compatible land uses). The route corridors were studied to determine the feasibility of locating a new, predominantly 100-foot-wide, right-of-way able to accommodate the 230 kV transmission lines needed for the Apollo-Twin Creeks Lines. The areas encompassing these corridors can be referenced in Figure 3.1-1 and 3.1-2.

4.1 ASPEN-GOLDEN LINES CORRIDOR

4.1.1 CORRIDOR DESCRIPTION

ERM and the Company developed a routing corridor that utilizes the future Aspen-Golden Lines as an opportunity. For the Aspen-Golden Project, the Company proposes to construct two new 500-230 kV substations (Aspen and Golden Substations); a new 500 kV single circuit transmission line, referred to as the Aspen-Goose Creek Line (#5002); a new loop of Lines #2081 and #2150 into the proposed Golden Substation (the Lines #2081/#2150 Loop); and a new 500 kV single circuit transmission line (#5001) and 230 kV single circuit transmission line (#2333), referred to as the future Aspen-Golden Lines. This future project crosses the study area for the Apollo-Twin Creeks Lines.

4.1.2 CORRIDOR ASSESSMENT AND FEASIBILITY CONCLUSION

The Aspen-Golden Project was filed with the SCC on March 7, 2024 (SCC Case No. PUR-2024-00032). The environmental routing study provided with that filing includes a feasibility assessment of the area crossed by the Aspen-Golden Lines. Given the proximity of the two projects, the fact that both projects need to cross Goose Creek, and the availability of sufficient space, ERM and the Company developed a corridor for the Apollo-Twin Creeks Lines collocated with, or parallel and adjacent to, the Aspen-Golden Lines. Doing so minimizes the cumulative impacts of the projects to the environment, particularly Goose Creek, as well as the planned data center developments.

4.2 BELMONT RIDGE ROAD CORRIDOR

4.2.1 CORRIDOR DESCRIPTION

An approximately 1.4-mile-long segment of Belmont Ridge Road (a minor arterial roadway) follows the eastern boundary of the study area from the existing road crossing of the Company's Lines #227 and #274 to the intersection with Rt. 7. Based on feedback from Loudoun County's Board of Supervisors, this potential route corridor was identified as an option that locates the Apollo-Twin Creeks Lines parallel to the road and away from Goose Creek.

4.2.2 CORRIDOR ASSESSMENT AND FEASIBILITY CONCLUSION

This corridor was shared at the Project open houses in June and November 2023 (see Section 5.1). Locating the Apollo-Twin Creeks Lines along Belmont Ridge Road does not provide a feasible route to connect the proposed Sycolin Creek, Starlight, Lunar, and Apollo Substations on Campuses B and C. The four substation sites, which are fixed, are set back about 0.2 mile from Belmont Ridge Road. Additionally, Belmont Ridge Road separates existing residential development to the east (Belmont Country Club and Alexandra's Grove at Belmont) and existing and planned commercial and industrial development (including the planned data center campuses) to the west. Based on discussions with Customer B, locating the Apollo-Twin Creeks Lines right-of-way alongside the road would require shifting the data center building footprints closer to Goose Creek and impacting their ability to provide a transitional open space buffer along the creek. For these reasons, ERM and the Company concluded it was impractical to use the Belmont Ridge Road Corridor for routing the Apollo-Twin Creeks Lines.

4.3 WASHINGTON & OLD DOMINION TRAIL CORRIDOR

4.3.1 CORRIDOR DESCRIPTION

An approximately 1.6-mile-long segment of Dominion's existing overhead 230 kV Lines #227 and #274 follow the W&OD Trail, a former railroad turned multi-use recreational trail owned and maintained by NOVA Parks. Lines #227 and #274 are within a 100-foot-wide right-of-way directly overhead and parallel to the trail. ERM and the Company considered a routing corridor for the Apollo-Twin Creeks Lines adjacent to the trail. The corridor extends approximately 1.2 miles southeast from the proposed Aspen Substation site near Dominion's existing 500 kV Line #558 on the west side of Cochran Mill Road to Belmont Ridge Road. On the west side of Goose Creek, the corridor passes between a quarry to the south and a Loudoun Water parcel to the north. On the east side of the creek, the corridor passes between a Luck Stone quarry pit to the south and a former quarry, now a reservoir, to the north. The quarry and reservoir are separated by a narrow swath of land (about 200-feet-wide at its narrowest point) with the existing transmission line and trail running through the middle. The property owned by Loudoun Water is the site of the future Milestone Reservoir Pump Station (see Section 6.3.6) but currently is undeveloped and wooded with hiking and mountain bike trails. Prior to reaching Belmont Ridge Road, a greenfield route would need to extend north from the W&OD Trail Corridor to interconnect the proposed Project substations.

4.3.2 CORRIDOR ASSESSMENT AND FEASIBILITY CONCLUSION

The W&OD Trail Corridor meets SCC Guideline #1, which prioritizes the use of existing transmission rights-of-way when routing new lines. Despite the advantage of collocation, which would include 25 feet of overlap between the existing and new rights-of-way, the following disadvantages were identified for this option:

- There is insufficient space along the trail and existing transmission lines to expand the width of the corridor by 75 feet given the adjacent quarries and Loudoun Water-owned land (which also contains a planned future development).

- There is a Virginia Outdoors Foundation (VOF) conservation easement along the corridor that exacerbates the space constraints along corridor.
- Even if there were no space constraints, construction of the Apollo-Twin Creeks Lines adjacent to the W&OD Trail would require trail closures during construction and tree clearing along the trail.
- The corridor would require right-of-way acquisition and approval from NOVA Parks.
- The corridor does not provide a reasonably direct path towards the required delivery points for the Project.

For these reasons, ERM and the Company concluded it is infeasible to use the W&OD Trail Corridor for routing the Apollo-Twin Creeks Lines.

4.4 CROSSTRAIL BOULEVARD CORRIDOR

4.4.1 CORRIDOR DESCRIPTION

An approximately 1.2-mile-mile long segment of Crosstrail Boulevard forms the approximate western boundary of the study area. The Company's existing transmission Lines #203, #2098, and #514 are adjacent and parallel to this segment of road from approximately the intersection of Crosstrail Boulevard and Samuels Mill Court northeast to the intersection of Crosstrail Boulevard and Rt. 7. The Crosstrail Boulevard Corridor begins north of Dominion's existing Pleasant View 500 kV Substation, which is surrounded by other substations and heavy industrial uses. From here, the corridor heads north/northeast along Crosstrail Boulevard and the existing transmission lines, crossing Tuscarora Creek and Russell Branch Parkway, then continues to the intersection with Rt. 7. This segment of the corridor crosses areas currently under development with data centers and the Village at Leesburg commercial area to the north. To the south are Dominion's existing transmission lines and an approximately 140-acre active Luck Stone quarry parcel. Upon or prior to reaching Rt. 7, a greenfield route would need to extend east and southeast from the Crosstrail Boulevard Corridor to interconnect the proposed Project substations.

4.4.2 CORRIDOR ASSESSMENT AND FEASIBILITY CONCLUSION

The Crosstrail Boulevard Corridor provides a potential opportunity to locate the new transmission line adjacent to an existing corridor where other overhead transmission lines are present. Despite the potential advantages of collocation, the corridor cannot accommodate additional right-of-way for the Apollo-Twin Creeks Lines for the following reasons:

- There is insufficient space along the road due to the existing quarry and associated facilities and planned future developments, notably data centers.
- Routing the Apollo-Twin Creeks Lines adjacent to Crosstrail Boulevard would require overlapping the new transmission right-of-way with VDOT's existing right-of-way, which would require approval from VDOT. In addition, new transmission lines overlapping with Crosstrail Boulevard would increase impacts to VDOT roadways and rights-of-way relative to other feasible alternatives. Due to the potential for operational and maintenance impacts both to the transmission infrastructure and the road, Dominion prefers to minimize overlap with VDOT rights-of-way.

- Due to the overlap with VDOT right-of-way, traffic impacts during construction and maintenance activities, possibly including lane closures, would be required. Where feasible, minimizing overlap with VDOT right-of-way is preferred to mitigate potential impacts to roads and traffic.
- Crosstrail Boulevard travels in a direction (northeast) that would result in a substantially longer transmission line to reach the five substations. The Apollo-Twin Creeks Lines would have to turn south and southeast and pass adjacent to a residential area (Goose Creek Club) and park (Keep Loudoun Beautiful Park), east of Cochran Mill Road.
- This option would require a crossing of the Goose Creek Scenic River along a different corridor than the future Aspen-Golden Lines, meaning the two projects would each create a new corridor across the creek rather than using a common crossing.
- This corridor does not provide a reasonable and practicable location to connect the substations and results in additional impacts.

5. APOLLO-TWIN CREEKS LINES

ERM developed one overhead route proposed for notice on the Project. This route, referred to as the proposed Apollo-Twin Creeks Lines (Route 1), is described in Section 5.2 and evaluated in detail in Chapters 6 and 7. Route 1 is depicted in the aerial and topographic based maps provided as Figure 5.2-1 and 5.2-2. ERM developed and assessed three overhead route variations (referred to as the Sycolin Creek, Cochran Mill Road North, and Lunar to Apollo East route variations) which ERM and the Company rejected for further review. Descriptions of the route variations, and the reasons for rejecting them, are provided in Section 5.3. The route variations are depicted on Figures 5.3.1 (Sycolin Creek Variation), 5.3.2 (Cochran Mill Road North Variation) and 5.3.3 (Lunar to Apollo East Variation). Lastly, ERM and the Company assessed and rejected a conceptual underground solution for the Project, as discussed in Section 5.3.4.

5.1 STAKEHOLDER ENGAGEMENT

ERM conducted field reviews of the Project and supported Dominion's outreach to agencies and stakeholders to assist with route evaluation. As of February 2024, the Company has held dozens of individual meetings seeking stakeholder input, including with landowners, businesses, and agencies. In particular, the Company conducted outreach to Loudoun County, the Customers, Loudoun Water, and Luck Stone, the mining company. Dominion additionally engaged a stakeholder group with an interest in electric transmission line projects within all of Loudoun County called the Loudoun Reliability Engagement Group (LREG) to provide information and solicit feedback on projects, including the Project. The Company held a virtual and an in-person Project community meeting in June 2023 (in conjunction with community meetings for the Aspen-Golden Project) and a second in-person community meeting in November 2023 to present information on the Project and gather feedback. The Company's application describes the stakeholder engagement process in further detail.

5.2 ROUTE 1

From the cut-in location, the Proposed Route (Route 1) initially heads south for about 0.2 mile generally following the property line of an existing Luck Stone quarry and existing Loudoun Water utility lines to connect with the first substation, the proposed Twin Creeks Substation associated with Campus A. The substation site is within a parcel on the north side of Cochran Mill Road and south of a Luck Stone quarry. Route 1 then continues southeast for about 0.2 mile along a property boundary to a point just north of Cochran Mill Road, where the route intersects and begins to parallel the Company's future Aspen-Golden Lines. From here, Route 1 crosses Cochran Mill Road and continues southeast across Customer A's parcels for about 0.4 mile. The route crosses Goose Creek collocated with the future Aspen-Golden Lines at a spot just north of a former quarry (now a reservoir), about 0.2 mile northeast of the Company's existing Lines #227 and #274. Still collocated with the future Aspen-Golden Lines, Route 1 continues south across the Milestone Reservoir property for 0.1 mile, then turns northeast. Route 1 then connects to the proposed Sycolin Creek Substation and continues northeast across Customer B's parcels for about 0.3 mile to the south side of the proposed Starlight Substation. From there, Route 1 of the Apollo-Twin Creeks Lines splits from the future Aspen-Golden Lines and continues for 0.2 mile before entering the proposed Starlight Substation, while the Aspen-Golden Lines turn east along the

north side of the substation. Route 1 then heads north for about 0.4 mile across Customer C's parcel, connecting to the proposed Lunar Substation and terminating at the proposed Apollo Substation south of Rt. 7 and west of Belmont Ridge Road.

Route 1 measures 1.9 miles in length, including the portions of the line extending through the five proposed substation sites. Route 1 is shown on Figure 5.2-1 and 5.2-2.

5.3 ROUTE VARIATIONS REJECTED FROM FURTHER CONSIDERATION

In developing Route 1, ERM identified and assessed several route variations for the Apollo-Twin Creeks Lines that subsequently were eliminated from further consideration (see Figures 5.3.1 to 5.3.3). Descriptions of these route variations and the rationale for both considering and eliminating the variations are provided below.

As mentioned in Section 4.1, the Company preferred developing a routing corridor that utilizes a collocation with the future Aspen-Golden Lines as both projects need to cross Goose Creek. The route variations for the Apollo-Twin Creeks Lines were developed by reviewing the availability of sufficient space to collocate the right-of-way with the future Aspen-Golden Lines given the constraints in the area, including existing and planned developments. As such, maximizing the collocation opportunity further minimizes the cumulative impacts of the projects to the environment, particularly Goose Creek, as well as the planned data center developments. The sections below discuss the development of these variations as they relate to rejected collocation corridors with the future Aspen-Golden Lines.

5.3.1 SYCOLIN CREEK VARIATION

The Sycolin Creek Variation was developed based on discussions with Customer A to minimize impacts to Campus A. In discussions with Customer A, a route alignment collocated with the future Aspen-Golden Lines that utilized a crossing along the southwestern side of Campus A would minimize impacts to Customer A's planned data center building footprints and instead utilize areas planned for water and sewer infrastructure closer to Sycolin Creek.

The variation deviates from Route 1 just east of the proposed Twin Creeks Substation site (Figure 5.3.1). Whereas Route 1 heads southeast across Customer A properties, the variation instead heads south for about 0.2 mile, crossing Cochran Mill Road, parts of Campus A, and Sycolin Creek. The variation begins to collocate with the future Aspen-Golden Lines and crosses the northern portions of a Loudoun Water-owned property and another parcel associated with Campus A for about 0.4 mile. The collocated projects cross Goose Creek at a common crossing at a spot just north of a former quarry, similar to Route 1. The variation continues for about 0.2 mile then turns east onto Campus B to continue in the same alignment as Route 1. The Sycolin Creek Variation measures approximately 0.8 mile in length.

The Sycolin Creek Variation would be parallel and adjacent to the south side the future Aspen-Golden Lines for approximately 0.6 mile (see Figure 5.3.1), with the variation passing within 500 feet of the W&OD Trail and on Loudoun Water-owned property. The adjacent rights-of-way for the two projects generally follow Sycolin Creek along the property line between a Loudoun Water-owned property (which is the site of the proposed Milestone Reservoir Pump Station) to the south,

and Campus A to the north. With this variation, the collocated rights-of-way cross Goose Creek in a common crossing, but cross Sycolin Creek four times.

As the Sycolin Creek Variation was studied in detail and discussed with the affected landowners, the following issues were identified:

- Public Land Crossing: This route variation crosses approximately 0.2 mile of land owned by Loudoun Water, a public entity. Staff from Loudoun Water expressed concern that the new transmission line could impact plans to construct and access the proposed Milestone Reservoir Pump Station. Additionally, the right-of-way for the variation would require tree clearing in areas that Loudoun Water and the previous owner of the property, NOVA Parks, agreed to keep forested for conservation and recreational purposes near the W&OD Trail. A right-of-way crossing the property requires approval from Loudoun Water's Board of Directors; without their permission this route variation is not viable.
- Loudoun Water Setback Requests: In an email dated August 16, 2023 (see Appendix E), Loudoun Water requested various setbacks from their existing and planned utility infrastructure on the proposed Milestone Reservoir Pump Station parcel and adjacent parcels as it relates to utility infrastructure that would serve the proposed data center development on Campus A. The setbacks also included height clearances that would need to be maintained over a planned future bridge across Sycolin Creek in this area. Upon review of these requirements, the Company's engineering team concluded that the Project could not reasonably comply with the setback and clearance requirements with the location of this route variation.
- Environmental Impacts to Sycolin Creek: The route variation requires four overhead crossings of Sycolin Creek within an approximately 0.4 mile segment of its alignment. The route variation additionally would require tree clearing along both sides of Sycolin Creek for over 0.3 mile of shoreline, impacting its associated Scenic Creek Valley Buffer.
- Overall Project Schedule Risk: As a result of the above, there are potential right-of-way and permitting risks that could impact the Project's schedule and Dominion's ability to meet the in-service date needs of the Customers. For example, there is a likelihood that a U.S. Army Corps of Engineers (USACE) Individual Permit, rather than a General Permit, would be needed for the additional wetland and waterbody impacts along Sycolin Creek, which could extend the permitting schedule and impact the ability to construct the Sycolin Creek Variation.

For all these reasons, ERM and the Company rejected the Sycolin Creek Variation from further consideration as a route for the Apollo-Twin Creeks Lines.

5.3.2 COCHRAN MILL ROAD NORTH VARIATION

The Cochran Mill Road North Variation was developed based on discussions with Customer A to minimize impacts to Campus A and parallel Loudoun County's planned road extension of Gloucester Parkway. In discussions with Customer A, a route alignment collocating along the corridor of the planned road reservation, located on the eastern extents of Campus A, would minimize impacts to their developable areas on Campus A.

The variation deviates from Route 1 just east of the proposed Twin Creeks Substation site (Figure 5.3.2). Whereas Route 1 heads south from this point to cross a Campus A parcel, the variation

instead turns and heads east/northeast for about 0.2 mile, passing through the Goose Creek Industrial Park, located north of Cochran Mill Road. It next follows Durham Court for about 0.2 mile, turning to the southeast and heading towards Cochran Mill Road. The route variation then crosses Cochran Mill Road and continues southeast for about 0.3 mile along the west side of the planned extension of Gloucester Parkway and a potential corridor for the future Aspen-Golden Lines. The variation crosses Goose Creek approximately 0.2 mile east of the Route 1 crossing. The route variation then turns and heads west for about 0.1 mile to its terminus at an intersection with Route 1 at the proposed Sycolin Creek Substation. The Cochran Mill Road North Variation measures approximately 0.8 mile long.

As the Cochran Mill Road North Variation was studied in detail and discussed with the affected landowners, the following issues were identified:

- Impacts to Goose Creek Industrial Park: The Cochran Mill Road North Variation would impact four additional industrial business properties and require the removal of a business building to accommodate the 100-foot-wide right-of-way along Durham Court and avoid placing transmission structures in the roadway.
- Impacts to Gloucester Parkway Road Extension: The Gloucester Parkway road extension is a 90-foot-wide dedication within the Loudoun County Countywide Transportation Plan (CTP) for a planned road extension and a bridge from Belmont Ridge Road, northwest across Goose Creek, and continuing northwest past Cochran Mill Road. In order to avoid Campus C building layouts, this variation requires overlapping the planned road right-of-way with the collocated transmission corridor and thus results in a constraint for future construction of the road.
- Impact to Historic Cooke's Mill Ruins: While a collocated crossing of Goose Creek can be achieved with the Cochran Mill Road North Variation, the location of Cooke's Mill Ruins historical site would be more impacted than the proposed Goose Creek crossing of Route 1. Approximately 200 feet to the north, both transmission lines would result in visual impacts to the historical ruins.
- Reduced Collocation Length with Future Aspen-Golden Lines: This route variation provides a collocation opportunity for about 0.3 mile, which is approximately 0.3 mile less than Route 1 in this location. In accordance with SCC Guidelines, collocating the rights-of-way would reduce overall visual and environmental impacts. The constraints described above along Cochran Mill Road and the Goose Creek Industrial Park minimize the opportunity for collocation.

For these reasons, the Cochran Mill Road North Variation was rejected from further consideration.

5.3.3 LUNAR TO APOLLO EAST VARIATION

The Lunar to Apollo East Variation was developed as a potential option to avoid Loudoun Water's planned Russell Branch Pump Station, which is located between the proposed Lunar and Apollo Substations, on Campus C (see Figure 5.3.3). East of the Starlight Substation, the variation heads north for about 0.5 mile, crossing the east side of the proposed Apollo and Lunar Substations whereas Route 1 crosses to the west. The variation continues to the south side of Rt. 7 then turns northwest for about 0.1 mile to connect the proposed Apollo Substation from the north. The Lunar to Apollo East Variation measures approximately 0.6 mile.

As the Lunar to Apollo East Variation was studied in detail and discussed with the affected landowner, the following issues were identified:

- Coordination with Campus C: The variation between the proposed Lunar and Apollo Substation sites would position the transmission line closer to the planned Campus C building layouts, and is not preferred by Customer C.
- Impacts to the Planned Russell Branch Pump Station: Because of space constraints on the parcel, the route variation would be adjacent to Loudoun Water's planned Russell Branch Pump Station, parallel a future utility line, and cross the planned access road to the pump station. Given the setback and clearance requirements provided by Loudoun Water, height clearances could not reasonably be met at the crossing of the pump station's access road.

For these reasons, the Lunar to Apollo East Variation was rejected from further consideration.

5.3.4 UNDERGROUND FEASIBILITY

While an all-underground route solution for the Apollo-Twin Creeks Lines could mitigate the visual impacts of an overhead line, the following issues were identified:

- Transition Stations and/or Additional Land: Five substations are required for the Project. For an underground solution, either transition stations or additional land at the proposed substations would be needed to connect the underground lines to the substations.
- Open Trench Construction Impacts: Relative to an overhead route, an underground route typically causes greater permanent impacts to wetlands due to the introduction of permanent fill (engineered fill added to duct banks to protect underground lines and diffuse heat) into wetlands. The fill in the duct bank is impervious and can cause changes in subsurface hydrology. While overhead lines typically require wider rights-of-way, and therefore can result in more wetland conversions due to tree clearing (e.g., converting forested wetland to emergent wetland in the maintained right-of-way), fill impacts on wetlands from underground duct bank construction occurs along the entire wetland crossing length, whereas overhead lines wetland fill is typically limited to structure foundations within wetlands.
- Goose Creek Impacts: An underground solution would require a horizontal directional drill (HDD), a trenchless installation method, to install the transmission line beneath Goose Creek. The HDD would require a wider permanent right-of-way than a typical open trench installation because the transmission line circuits need to be split into multiple drills. An HDD additionally requires workspace and the entry and exit sites to operate and store equipment. With the planned data center developments and other constraints along the creek, there is insufficient space for a wider right-of-way corridor and for staging and operating HDD equipment.
- Impacts to Construction Schedule and In-Service Dates: The Project is needed to provide service to three Customers via five substations by the requested in-service dates for each Customer. The construction and material orders for an underground solution would impact, and likely prevent, the Company's ability to meet the schedule.

For these reasons, an underground solution for the Project was rejected from further consideration.

6. RESOURCES AND IMPACTS

After defining the study area, ERM developed a list of features to consider and assess as part of the routing process and provide a basis for comparing potential routes (Table 6-1). These include constraints (e.g., land uses, planned developments, and biological resources) and opportunities (e.g., existing transmission lines, roads, and other linear features). ERM inventoried existing conditions, constraints, and opportunities using information from publicly available GIS and other databases; agency websites; published documents, such as county or municipal land use plans; communication with agency and county staff, stakeholders, and elected officials; and field reconnaissance. In 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.

TABLE 6-1 FEATURES CONSIDERED FOR ROUTING

Feature Type	Description
Existing Corridors	
Existing electric facilities	Transmission or distribution lines and substations
Other utilities	Pipelines
Transportation infrastructure	Highways, roads, railroads, and related corridors
Land Uses	
Land ownership	• Federal, state, and local lands • Private lands
Land uses and cover types	• Cover types (e.g., forested, agricultural, developed, open) • Subdivisions and residential areas • Residential areas and residences • Churches, schools, and cemeteries
Recreational areas	• Federal, state, county, or municipal parks or other managed recreation areas • Golf courses • Interpreted historic sites • Trails (e.g., for biking, hiking, birding, or wildlife viewing)
Land use planning and zoning	• Zoning districts • County Comprehensive Plan and related planning documents
Planned developments	• Planned, proposed, or conceptual residential, commercial, or industrial developments
Conservation lands and easements	• VDCR conservation lands and easements • VOF easements • Loudoun County conservation easements • Wetland mitigation banks • Other conservation lands
Transportation	• Road and railroad crossings • Public and private airport facilities

Feature Type	Description
Natural Resources	
Surface waters	• Wetlands • Waterbodies
Protected or managed areas	• Resource protection areas • Conservation sites • Wildlife management areas • Ecological cores
Protected species	• Natural heritage resources • Threatened and endangered species • Bald eagles
Vegetation	• Vegetation characteristics • Forested land
Visual Resources	
Visual resources	• Viewsheds to and from visually sensitive areas • Scenic rivers and byways
Cultural Resources	
Cultural resources	• Archaeological sites • Historical or architectural sites and districts • NRHP-listed and -eligible properties • Battlefields • VDHR easements • Locally significant resources
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

NRHP = National Register of Historic Places; VDCR = Virginia Department of Conservation and Recreation; VDHR = Virginia Department of Historic Resources; VOF = Virginia Outdoors Foundation

The potential environmental impacts of Route 1, inclusive of the five proposed substations (Twin Creeks, Sycolin Creek, Starlight, Lunar, and Apollo), are quantified in Appendix H. As there are no alternatives to assess and compare, the following subsections provide an analysis of the Project's potential impacts on the affected environment.

6.1 ROUTE LENGTH AND CONSTRUCTION FOOTPRINT

Route 1 is approximately 1.9 miles long and the area within what would be its right-of-way would encompass approximately 18.7 acres. The proposed Twin Creeks Substation site occupies approximately 4.7 acres on property associated with Customer A. The proposed Sycolin Creek and Starlight substation sites encompass about 4.7 acres and 4.5 acres, respectively, on property associated with Customer B. The proposed Lunar and Apollo substation sites occupy 4.0 acres and

5.0 acres, respectively, on property associated with Customer C. Combined, the footprint for the Project facilities encompasses 41.6 acres.

6.2 ROUTING OPPORTUNITIES

In accordance with Guideline #1 of the Commission's Guidelines for Transmission Line Applications Filed Under Title 56 of the Code of Virginia (specifically that existing rights-of-way should be given priority when adding additional facilities), ERM assessed opportunities for routing the Apollo-Twin Creeks Lines along existing rights-of-way (see Section 4). The Company and ERM assessed the practicability of collocating the proposed Apollo-Twin Creeks Lines along other existing utilities and road corridors in the study area. However, the majority of the existing corridors proximate to the Project do not make logical or practical sense as the orientation of the routing opportunities relative to the proposed substation sites and/or the presence of constraints, such as natural resources or planned developments, limit the space available for new facilities.

As discussed in Section 4.1, the Apollo-Twin Creeks Lines would be adjacent to the Company's future Aspen-Golden Lines for approximately 0.9 mile (or 48 percent of the route), including the crossing of Goose Creek, which is a state-designated scenic river. There are also a number of existing and planned Loudoun Water utilities within in the study area. Where practicable, Route 1 is adjacent to these facilities. In addition to collocating with the future Aspen-Golden Lines, Route 1 collocates, or is adjacent to, other existing and planned water and sewer lines. At the cut-in location along existing Line #203, Route 1 is adjacent to, or collocates with, an existing Loudoun Water line for approximately 0.2 mile to the proposed Twin Creeks Substation. On Campus B between the proposed Sycolin Creek and Starlight Substations, Route 1 follows the north side of a proposed sewer line for approximately 0.4 mile.

Routing opportunities for Route 1 are depicted in Figure 6.2.

6.3 LAND USE

6.3.1 LAND OWNERSHIP AND PUBLIC LANDS

6.3.1.1 EXISTING CONDITIONS

ERM reviewed information about land ownership in the study area using publicly available GIS databases and digital parcel data obtained from Loudoun County (Loudoun County 2023a). The data indicates that most of the parcels within the study area are privately owned (see Figure 6.3.1). Land uses on these parcels include, but are not limited to, storage facilities, towing and hauling businesses, construction companies, proposed data centers sites, substations, and industrial material facilities including for concrete and asphalt. Route 1 crosses 14 private parcels in total, with about 77 percent of the route within properties associated with Campuses A, B, or C. The five proposed substations are entirely within Customer-owned properties.

Public lands within the study area include parcels maintained by or in partnership with Loudoun County, such as Loudoun Water, as well as public road rights-of-way. Public roads in the study area include Rt. 7, Belmont Ridge Road, Cochran Mill Road, and Crosstrail Boulevard, which are each maintained by VDOT. There are also sections of roadways within the study area maintained

by the Town of Leesburg, private HOAs, and developers who will transfer maintenance responsibilities to either VDOT or HOAs in the future.

No public lands are crossed by Route 1 or within the proposed substation sites. Thus, with the exception of road rights-of-way, the Project would not impact public lands.

Federal Lands

There are no federally owned lands within 0.25 mile of Route 1 and the associated substations. The nearest federal-owned property is a radar tower maintained by the Federal Aviation Administration (FAA) associated with the Leesburg Executive Airport (Mapcarta 2023). This federal land is outside the study area approximately 0.3 mile northwest of Route 1.

State Lands

There are no state-owned lands within 0.25 mile of Route 1 and the associated substations. The closest state-owned land is a VDOT Loudoun Maintenance Office, located more than 1.0 mile northwest of Route 1 and outside the study area.

Local Lands

There are several county-owned properties within 0.25 mile of Route 1, including land owned by the Loudoun County Board of Supervisors (BOS), Loudoun County Public Schools, Loudoun Water, and NOVA Parks. The subsections below describe these lands and their uses and identify the distance and direction of each property from the Project.

Loudoun County Board of Supervisors

The Loudoun County BOS owns and manages a park – the Keep Loudoun Beautiful Park – at 43055 Golf Club Road in Leesburg. The park, which encompasses about 3.4 aces, is south of Rt. 7 and west of Goose Creek. Recreational resources within the park include a boat launch along the creek, picnic tables, fishing access, parking, and woodland areas (Loudoun County 2023b). Route 1 is approximately 0.2 mile southeast from the proposed Apollo Substation.

Loudoun County School Board

The Loudoun County School Board owns and manages a public school – Seldens Landing Elementary School north of Rt. 7 and outside the study area. The school's athletic fields face toward Rt. 7 and the proposed Campus C and Apollo Substation and Project impacts are limited to potential views.

Loudoun Water

ERM identified two[7] existing Loudoun Water facilities on easements within 0.25 mile of Route 1 (Loudoun County 2023g and National Water Quality Monitoring Council 2023). Descriptions of these existing facilities are provided in Table 6-2, which also identifies the distance and direction of each facility from Route 1. Both facilities are within 500 feet of Route 1. ERM additionally identified four planned Loudoun Water facilities within 0.25-mile of Route 1 to be built on Loudoun

[7] For this study, Goose Creek Dike, which consists of structures on either side of Goose Creek at the crossing, is counted as a single resource.

County-owned property or maintained as an easement. These planned future developments are discussed in Section 6.3.6.

TABLE 6-2 EXISTING LOUDOUN WATER FACILITIES WITHIN 0.25-MILE OF PROJECT

Facility	Description	Location
Goose Creek Dike	Goose Creek Dike is within the Goose Creek riparian corridor on the east side of the creek, in the area generally south of Cochran Mill Road, west of Belmont Ridge Road, and north of the W&OD Trail. The dike is designed to prevent flooding and limit erosion along the waterway.	Route 1 passes adjacent to the Goose Creek Dike at the crossing of Goose Creek.
Goose Creek Industrial Park Wastewater Treatment Plant (WWTP)	Goose Creek Industrial Park WWTP is within the Goose Creek riparian corridor, south of Cochran Mill Road, west of the creek, and north of the W&OD Trail. The site contains a wastewater lagoon. The WWTP is set to be decommissioned and replaced by the Goose Creek Sewage Pump Station planned development (see Table 6-9).	South of the crossing of Cochran Mill Road, Route 1 crosses the parcel containing the WWTP, but passes about 130 feet of the facility.

WWTP = wastewater treatment plant; W&OD = Washington & Old Dominion

NOVA Parks

NOVA Parks, an interjurisdictional organization comprised of three counties (Arlington, Loudoun, and Fairfax) and three cities (Alexandria, Falls Church, and Fairfax), owns and operates over 12,000 acres of the northern Virginia countryside. The organization owns and maintains a 45-mile-long paved trail between Shirlington and Purcellville and an adjacent, 32-mile-long gravel trail for horseback riding (the W&OD Trail) (NOVA Parks 2024). The trail passes along the southern study area boundary coming within about 0.2 mile south of Route 1 at the crossing of Goose Creek. Additional discussion of this resource is provided in Sections 6.5 and Section 6.6.

6.3.1.2 IMPACT ASSESSMENT

Route 1 does not cross federal-, state-, or Loudoun County-owned lands. As indicated above, the route is in proximity to existing Loudoun Water facilities in two locations. The Company coordinated closely with Loudoun Water throughout the routing process to ensure Route 1 would minimize impacts to facility operations. Based on discussions with Loudoun Water, construction and operation of the new transmission lines along Route 1 should not impact Loudoun Water operations as the route avoids a direct crossing of the Goose Creek Industrial Park WWTP (which will be decommissioned). At the Goose Creek Dike, a potential zone of embankment with slope stability concerns is located approximately 100 feet south of the closest Route 1 structure on the east side of Goose Creek. Due to the distance of this structure from Route 1, Dominion engineering concluded that construction and operation of the new transmission lines would not likely impact or be impacted by this zone of embankment. Additional information regarding the Goose Creek Dike is provided in Section 6.8.1.

6.3.2 LAND USE AND LAND COVER

Land use and land cover types within the study area were classified using aerial photo interpretation to identify the most current uses for a given area, supported by review of local and state-wide datasets (ESRI 2023).

ERM characterized land use and land cover into the following five main categories[8]:

- Developed lands: These are areas characterized by medium- to high-density constructed buildings, such as certain residential subdivisions and commercial areas, as well as impervious surfaces. Additional information on residences and residential areas near Route 1 is provided in Section 6.3.4, while information on non-residential buildings is provided in Section 6.3.5.
- 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, open space recreational facilities. Additional information on recreation areas near the routes, such as parks, is provided in Section 6.3.8.
- Forested lands: These are areas where land cover consists of natural or maintained woody vegetation. Additional information on forested lands near Route 1 is provided in Section 6.4.4.
- Agricultural lands: These are areas used for commercial farming (e.g., commercial row crops or specialized agricultural activities) or grazing.
- Open water: These are open water features, including rivers, streams, lakes, canals, waterways, reservoirs, and ponds. Additional information on open water features near the routes is provided in Section 6.4.1.

Of note, no agricultural lands are crossed by Route 1 or within the five proposed substations.

Land use and land cover types within what would be the right-of-way for Route 1 and within the associated substation sites is summarized in Appendix H. Figure 6.3.2 depicts existing land use and land types in the study area.

6.3.2.1 IMPACT ASSESSMENT

Developed lands within the study area are largely associated with industrial and commercial uses and include the Leesburg Luck Stone plant facilities, Goose Creek Industrial Park off Cochran Mill Road, and existing Company substations south of Crosstrail Boulevard. The developed lands also include two areas characterized by low density rural residential uses within the Goose Creek Club residential community, located on the west side of Goose Creek, and two private residences along Goose Creek. Route 1 and the five substations encompass a combined total of approximately 1.6 acres of developed lands, including lands at the proposed cut-in location with Line #203, the Cochran Mill Road crossing, and the developed area east of Goose Creek.

Open spaces within the study area include the former Goose Creek Golf Course (adjacent to the Goose Creek Club residential community) and clearings near commercial businesses along

[8] For purposes of land use / land cover, wetland areas have been classified as open space, forested land, or open water. Wetlands near the routes are discussed separately in Section 6.4.1.2.

Crosstrail Boulevard and Cochran Mill Road. The open spaces are found in the north-central portion of the study area (south of Rt. 7, west of Goose Creek, and northeast of Cochran Mill Road) with additional areas along existing Company transmission lines and Cochran Mill Road. Route 1 and the five substations encompass a combined total of approximately 2.3 acres of open space lands, including areas near the cut-in location, adjacent to a Luck Stone quarry, and Cochran Mill Road, where Campus A is proposed.

Open water features include Goose Creek and Tuscarora Creek as well as pooled water related to the Loudoun Water Quarry A (see Section 6.3.6) on a Luck Stone property. The orientation of Goose Creek within the study area is north/south with Tuscarora Creek running east/west connecting to Goose Creek and passing north of the Goose Creek Club residential community. Route 1 crosses Goose Creek once near Loudoun Water Quarry A where the alignment is parallel and adjacent to the Company's future Aspen-Golden Lines to minimize crossings of the river (see Figures 5.2-1 and 5.2-2). Route 1 and the five substations encompass a combined total of approximately 0.3 acre of open water.

The largest continuous stretch of forested land is situated in the eastern portion of the study area, south of Rt. 7, east of Goose Creek, and west of Belmont Ridge Road. Other forested lands can be found on the west side of Goose Creek and south of Cochran Mill Road. The majority of the areas classified as forested include the Loudoun Water-owned property containing the planned Milestone Reservoir Pump Station (see Section 6.3.6) and the properties for Campuses A, B, and C (see Section 6.3.6). While the majority of Route 1 crosses forested lands (approximately 79 percent of the route length), most of these areas are within the planned data center campuses where forested vegetation will be clear for those developments regardless of the Project.

6.3.3 LAND USE PLANNING AND ZONING

6.3.3.1 LOUDOUN COUNTY GENERAL PLAN 2019

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 considers existing and future land uses, anticipates development trends, and makes recommendations for guiding long-term development decisions within a city or county. 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 (Section 15.2-2230).

The 2019 Loudoun County General Plan (the 2019 Plan or Plan) guides the County's land use policy and legislative actions, including objectives for natural resource management, accessible housing, cultural heritage protection, and economic development. With the involvement of over 3,000 public officials, private citizens, and different stakeholders, the Plan was adopted in 2019 and most recently amended through February 2023. Loudoun County emphasizes the need to balance land uses between commercial, industrial, residential, and recreational growth, while addressing existing land constraints. The Plan provides future land use recommendations used to guide zoning decisions and direct capital projects.

Loudoun County implements the Plan goals and objectives through the designation of "policy areas", which are further divided into "place types". Policy areas, which broadly define land planning objectives for a geographically defined region, are based on the size and configuration of

buildings, land uses, availability and purpose of open spaces, and special amenities (Loudoun County 2023d). Table 6-3 lists the policy areas within 0.25 mile of the Project, describes the land use objectives of the policy area (based on the 2019 Plan), and indicates if the area is crossed by the Project. Policy areas are not addressed further in this report but are described here to characterize current land use planning in the study area and provide context for a discussion of zoning in Section 6.3.3.3.

TABLE 6-3 POLICY AREAS WITHIN 0.25 MILE OF PROJECT

Policy Area	Description	Project Component
Leesburg JLMA	Towns, operating as independent incorporated entities; combines agricultural tradition with cultural and economic growth; encompasses the majority of western Loudoun County	Crossed by Route 1 inclusive of the Twin Creeks Substation for approximately 0.8 mile
Suburban	Contains a combination of self-sustaining residential, commercial, and employment uses which promote community and a high standard of living; incorporates public services and facilities	Crossed by Route 1 inclusive of the Sycolin Creek, Starlight, Lunar, and Apollo Substations for approximately 1.1 miles
Transitional	Features open spaces visually distinct from surrounding development; incorporates public recreation, residential development, and clusters of economic activity	Not crossed; approximately 200 feet west of Route 1 and northwest of the Goose Creek crossing

JLMA = Joint Land Management Area

Place types, which characterize permitted land uses within a specific area, are determined by existing and proposed land uses and the size and density of development as well as the policy area they occupy (Loudoun County 2023d). Table 6-4 lists the place types within 0.25 mile of the Project, describes permitted uses within each area, and indicates if the area is crossed by the Project. Place types are described here to demonstrate land use compatibility in relation to zoning and are not analyzed further in this report.

TABLE 6-4 PLACE TYPES WITHIN 0.25 MILE OF PROJECT

Place Type	Description	Project Component
Leesburg JLMA Employment	Core uses include light production, research and development, warehousing, contractor with outdoor storage, fleet and equipment sales and service, and flex space. Complementary uses include offices, retail and service commercial, and data centers. Conditional uses for the place type include institutional, civic/cultural/community space, public facilities, special activities, and parks and recreation.	Crossed by Route 1 inclusive of the Twin Creeks Substation for approximately 0.7 mile between the proposed substation and Goose Creek

Place Type	Description	Project Component
Leesburg JLMA Industry/Mineral Extraction	Core uses include general and heavy manufacturing and assembly, warehousing, contractor with outdoor storage, data centers, fleet and equipment sales and service, outdoor storage, public utilities, and quarry. Complementary uses include retail and service commercial, flex space, light production, and research and development. Conditional uses of the place type include offices, public facilities, special activities, and parks and recreation.	Crossed by Route 1 for approximately 0.1 mile on a Luck Stone quarry south of Crosstrail Boulevard and north of Cochran Mill Road
Suburban Industrial/Mineral Extraction	Core uses include general and heavy manufacturing and assembly, warehousing, contractor with outdoor storage, data centers, fleet and equipment sales and service, research and development, outdoor storage, public utilities, quarry, and outdoor manufacturing. Complementary uses include retail and service commercial, flex space, and light production. Conditional uses of the place type include offices, public facilities, special activities, and parks and recreation.	Crossed by Route 1 for approximately 0.3 mile between Goose Creek and Goose Glen Lane
Suburban Employment	Core uses include light production, offices, research and development, contractor with outdoor storage, and flex space. Complementary uses include retail and service commercial. Conditional uses of the place type include institutional, civic/cultural/community space, public facilities, special activities, parks and recreation, data centers, and warehousing.	Crossed by Route 1 inclusive of the Sycolin Creek and Starlight Substations for approximately 0.4 mile east of Goose Creek and west of Belmont Ridge Road
Suburban Mixed Use	Core uses include retail and service commercial, office, entertainment commercial, multi-family residential, institutional, and hotel. Complementary uses include small-lot single family residential attached, active adult retirement communities, civic/cultural/community space, and accessory residential units. Conditional uses include small-lot single family residential detached, public facilities, conference center, special activities, and parks and recreation.	Crossed by Route 1 inclusive of the Apollo and Lunar Substations for approximately 0.4 mile south of Rt. 7, east of Goose Creek, and west of Belmont Ridge Road
Leesburg JLMA Residential Neighborhood	Core uses include single family attached and detached dwellings. Complementary uses include accessory residential units, agriculture, equine facilities, and rural economic activities. Conditional uses of the place type include	Not crossed; approximately 0.2 mile northwest of Apollo Substation

Place Type	Description	Project Component
	civic/cultural/community facilities, public facilities, and parks and recreation.	
Transition Industrial/Mineral Extraction	Core uses include general manufacturing and assembly, data centers, research and development, outdoor storage, public facilities, and quarry. Complementary uses include offices, outdoor manufacturing, and retail and service commercial (ancillary retail). Conditional uses of the place type include special activities and parks and recreation.	Not crossed; approximately 200 feet west of Route 1 northwest of the Goose Creek crossing
Suburban Neighborhood	Core uses include single family detached residential, single family attached residential, and civic/cultural/community space. Complementary uses include retail and service commercial, active adult retirement communities, multi-family residential, and accessory residential units. Conditional uses of the place type include office, public facilities, special activities, and parks and recreation.	Not crossed; approximately 0.1 mile north of Apollo Substation and 0.2 mile east of the Sycolin Creek and Starlight Substations

JLMA = Joint Land Management Area

6.3.3.2 2019 COUNTYWIDE TRANSPORTATION PLAN

The land use planning policies and objectives in the Plan are closely coordinated with the CTP, whose purpose is to anticipate and coordinate land use development and transportation improvement needs through 2040. Dominion and ERM met with Loudoun County Department of Transportation and Capital Infrastructure (DTCI) staff in February 2023 to discuss the new CTP and the Project. DTCI staff did not identify any potential conflicts between the Project and new or planned road infrastructure at that time.

6.3.3.3 LOUDOUN COUNTY ZONING ORDINANCE

Local governments use zoning to regulate land use and implement the objectives of the comprehensive plan. A zoning ordinance regulates orderly and efficient development by separating incompatible land uses and establishing development standards. A zoning ordinance may be modified by the local governing bodies or through public petitions to change zoning designations or approve new uses. Under Virginia law, public utilities planning to construct any transmission line of 138 kV may either obtain a CPCN from the SCC or obtain the applicable local zoning ordinance approvals. The SCC's issuance of a CPCN preempts local zoning requirements (Section 56-265.2).

In 2019, Loudoun County initiated a rewrite of the 1993 Revised Zoning Ordinance to support the land use planning objectives of the 2019 Plan. In December 2023, the BOS repealed the 1993 Revised Zoning Ordinance and the adopted the 2023 Zoning Ordinance (Loudoun County 2023f). Although the transmission line component of the Project is exempt from local zoning regulations, substations and other facilities are subject to local land use approvals and screening standards, including buffers and landscaping. The 2023 Zoning Ordinance included changes related to data

center and industrial uses, including redefining which zoning districts allow data centers as a use-by-right versus zoning districts where data centers require BOS approval. Zoning districts with by-right (entitled) data center use, and other industrial uses, are relevant to the Project because they provide a local land use context for assessing the compatibility of new transmission lines with the underlying zoning. Within the study area, the Project is most compatible with zoning districts that support industrial uses and less compatible with those supporting residential uses.

The Zoning Ordinance establishes Zoning Overlay Districts, which establish additional resource-specific land use regulations appliable to defined areas (Loudoun County 2023f). Three zoning overlay districts are crossed by the Project: the Airport Impact Overlay District (AIOD), Floodplain Overlay District, and Quarry Notification Overlay District. The AIOD is discussed in Section 6.3.11. The Floodplain Overlay District and Quarry Notification Overlay District are not relevant to the Project.

6.3.3.4 IMPACT ASSESSMENT

Transmission lines and associated facilities on or crossing industrial zoning districts are generally less impactful to a community than those on or crossing residential zoning districts. Figure 6.3.3 shows the zoning districts within 0.25 mile and Table 6-5 lists and describes zoning districts that are crossed by or within 0.25 mile of the Project as detailed in Loudoun County's 2023 Zoning Ordinance. The impact assessment following the table quantifies crossings of zoning districts to show the relative compatibility of the Project with planned land use and current zoning.

TABLE 6-5 ZONING DISTRICTS WITHIN 0.25 MILE OF THE PROJECT

Zoning District	Description and Allowed Uses	Project Component
Agriculture/Residential-3 (A-3)	Legacy zoning district. Agriculture, farm operations, rural home businesses, and low-density residential development.	Crossed by Route 1 between the proposed Sycolin and Apollo Substations
General Industrial (GI)	Provides for industrial uses incompatible with residential uses.	Crossed by Route 1 between Cochran Mill Road and Goose Creek
Mineral Resource/Heavy Industry (MRHI)	Mineral extraction and industrial activities incompatible with residential uses.	Crossed by Route 1 from the cut-in location to Cochran Mill Road, and between the Goose Creek and Sycolin Creek Substations
JLMA-3	Mix of residential and non-residential uses, provides for a combination of low density rural residential uses with limited agricultural businesses in a rural setting.	Crossed by Route 1 at the Goose Creek crossing
Industrial Park (IP)	Office, light production, flex space, and warehouse uses. Limited retail. Buildings make up the predominant feature.	Not crossed; less than 0.1 mile west of the proposed Starlight Substation

Zoning District	Description and Allowed Uses	Project Component
JLMA-20	Legacy zoning district. Provides for uses compatible with Leesburg Executive Airport, future airport expansion, agricultural activities, and home-based business.	Not crossed; approximately 0.2 mile southwest of Route 1 and the Twin Creeks Substation between Crosstrail Boulevard and Cochran Mill Road
Office Park (OP)	Employment uses, locations for administrative, business, and professional offices, research and development, supporting commercial and institutional uses and facilities, limited first floor retail.	Not crossed by; approximately 0.1 mile west of Route 1 and the Lunar and Apollo Substations between Cochran Mill Road and Goose Creek
Planned Development Housing (PDH)-3	Legacy zoning district. Residential and some complimentary non-residential uses. Three dwelling units per acre.	Not crossed; approximately 0.1 mile north of the Apollo Substation
PDH-4	Legacy zoning district. Residential dwelling types in a neighborhood setting and some non-residential uses. Four dwelling units per acre.	Not crossed; multiple locations within 0.25 mile of the Project
PDH-6	Legacy zoning district. Residential dwellings in a neighborhood setting and some non-residential uses. Six dwelling units per acre.	Not crossed; approximately 0.2 mile west of Route 1 and the Lunar and Apollo Substations between Cochran Mill Road and Goose Creek

A-3 = Agriculture/Residential-3; GI = General Industrial; IP = Industrial Park; JLMA = Joint Land Management Area; MRHI = Mineral Resource/Heavy Industry; OP = Office Park; PDH = Planned Development Housing

Table 6-6 lists the crossing length and area encompassed by what would be the right-of-way for Route 1 across the affected zoning districts. In addition to Route 1, the area includes the proposed substations. The route alignment generally avoids less compatible land uses and zoning districts (residential and mixed-use) by maximizing opportunities to cross the MRHI and GI zoning districts. These crossings constitute approximately 53 percent of the route length and 41 percent of the area that would be encompassed by Route 1, inclusive of the five proposed substations.

TABLE 6-6 ZONING DISTRICTS CROSSED BY THE PROJECT

Zoning District	Length (miles) (Percent of Total)	Right-of-Way (acres) (Percent of Total)
A-3	0.9 (47%)	23.7 (58%)
MRHI	0.7 (37%)	12.5 (30%)

Zoning District	Length (miles) (Percent of Total)	Right-of-Way (acres) (Percent of Total)
GI	0.3 (16%)	4.6 (11%)
JLMA-3	< 0.1 (1%)	0.2 (1%)

A-3 = Agriculture/Residential-3; GI = General Industrial; JLMA = Joint Land Management Area; MRHI = Mineral Resource/Heavy Industry

6.3.4 RESIDENTIAL AREAS AND RESIDENCES

ERM identified residences (multi-family dwellings and/or single-family dwellings) and accessory buildings (e.g., sheds, garages, barns, and similar structures on residential or agricultural parcels) within 500 feet of the route centerline through review of various digital datasets, maps, and recent (2023) aerial photography. Table 6-7 lists the number of dwellings by type within these tiers for Route 1, inclusive of the five proposed substations. The locations of the existing residential areas within 0.25 mile of Route 1 are depicted in Figure 6.3.4.

The majority of buildings along Route 1 are commercial structures or non-residential buildings on privately-owned parcels. While Route 1 crosses Agricultural/Residential zoned properties on the east side of Goose Creek (see Section 6.3.3.3), these areas are planned for data center development (Campuses B and C).

TABLE 6-7 RESIDENCES AND ACCESSORY BUILDINGS WITHIN 100 FEET, 250 FEET, AND 500 FEET OF ROUTE 1 [a]

Structure Type	Structures within 60 feet of Right-of-Way	Structures within 100 Feet of Centerline	Structures within 250 Feet of Centerline	Structures within 500 Feet of Centerline
Accessory Building [b, c]	0	0	3	3
Single-Family Dwelling [c]	0	0	1	1
Multi-Family Dwelling	0	0	0	0

[a] *Includes the footprints of the five proposed substations (Twin Creeks, Sycolin Creek, Starlight, Lunar and Apollo)*
[b] *Includes sheds, garages, barns, and similar structures on residential parcels.*
[c] *It is the Company's understanding that there are three single-family dwellings on Customer B's properties that the Customers will address prior to construction of the Project.*

A description of each residential association and/or community is provided below.

- Goose Creek Club: This subdivision is a mixed-used residential area currently under development. While residences exist in this community, there is a site plan for additional residences, which has been approved by Loudoun County. The community is not crossed by Route 1. The nearest residences in the community are approximately 0.2 mile west of Route 1 and the proposed Apollo Substation on the opposite side of Goose Creek.

- Belmont Country Club: Located outside the study area, this residential subdivision consists of a mixed-use residential country club, containing 2,157 homes and an 18-hole golf course. The subdivision is east of Belmont Ridge Road approximately 0.2 mile to the west.
- Lansdowne: Located outside the study area, this subdivision consists of a residential, recreational, and retail mixed-use area with neighborhoods containing 2,155 homes. The Lansdowne community, which is managed by Lansdowne on the Potomac HOA, is situated on the north side of Rt. 7. The subdivision is approximately 0.1 mile north of the proposed Apollo Substation.
- Tuscarora Crossing: Located outside the study area, this future residential subdivision is an approved mixed-use development currently under construction. The development is approximately 0.1 mile north of Route 1 with existing overhead transmission lines and Crosstrail Boulevard in the area in between.

6.3.4.1 IMPACT ASSESSMENT

Based on current (2023) aerial imagery and Loudoun County building data (Loudoun County 2023a), there is one single-family dwelling with three associated accessory buildings within 250 feet of the Route 1 centerline and the proposed Sycolin Creek Substation in the area east of Goose Creek. Given the proximity of the route to this residence, visual impacts are anticipated due to clearing of the right-of-way and the introduction of the proposed transmission infrastructure, including the proposed substation on Campus B. ERM and the Company aligned and designed Route 1 to minimize visual impacts to the extent practicable but there are other constraints near Goose Creek, including existing and planned utility development associated with the Milestone Reservoir, the proposed substation locations, and the future Gloucester Parkway road extension, that limit the space available for the Project. The Route 1 alignment parallels and is adjacent to Dominion's future Aspen-Golden Lines, resulting in one new proposed crossing of Goose Creek rather than two (as shown in Figures 5.2-1 and 5.2-2).

Route 1 could cause visual impacts on residential subdivisions greater than 500 feet from Route 1, but the proposed transmission lines and structures associated with the Project would be cohesive with the visual character of the planned data center developments and other industrial operations within the study area.

Visual impacts are addressed in Section 6.5.

6.3.5 COMMERCIAL/INDUSTRIAL AREAS AND BUILDINGS

Commercial and industrial areas and buildings are present throughout the study area, including but not limited to, quarries, planned/under construction data centers, office buildings, utility infrastructure, and warehouses. As discussed in Section 6.3.3.3, zoning districts considered commercial or industrial include Mineral Resource/Heavy Industry, General Industry, Industrial Park, Office Park, and Mixed-use Business. In accordance with SCC Guidelines, crossing these commercial and industrial areas is preferred to crossing residential areas as it minimizes potential conflicts with existing and planned land uses.

Several non-residential areas and structures exist within the study area, including Luck Stone quarries and related facilities and industrial business parks that provide services such as construction materials and equipment, masonry, towing and trucking, landscaping, storage, and

the manufacture of concrete, pavement, and asphalt. As discussed in Section 6.3.1, Loudoun Water operates a dike and a WWTP within the study area and is expected to construct an additional sewage pumping station and reservoir.

ERM identified commercial and non-residential buildings within 500 feet of Route 1, inclusive of the five proposed substations, through a review of county data, U.S. Geological Survey (USGS) topographic quadrangles (USGS 2022), and current (2023) digital aerial photography. Commercial and non-residential buildings located within 500 feet of Route 1, inclusive of the proposed substations, are depicted on Figure 6.3.5, and the number of structures in each tier is provided in Table 6-8.

In addition to the buildings listed in the table, there are structures on properties owned by Customer A and Customer B within 500 feet of the Route 1 centerline based on current (2023) aerial imagery. These structures will be removed prior to construction of the Apollo-Twin Creeks Lines as part of the planned data center campus developments. As such, buildings located on Customer A and B are not included in the associated impacts to Route 1 and the five proposed substations. Therefore, the Project would have no impact on these buildings.

TABLE 6-8 COMMERCIAL AND NON-RESIDENTIAL BUILDINGS WITHIN RIGHT-OF-WAY AND 500 FEET OF ROUTE 1[a]

Structure Type	Structures within Right-of-Way	Structures within 100 Feet of Centerline	Structures within 250 Feet of Centerline	Structures within 500 Feet of Centerline
Non-Residential Structures	1[b]	2	6	13

[a] *Includes the footprints of the five proposed substations (Twin Creeks, Sycolin Creek, Starlight, Lunar and Apollo)*

[b] *There is a 31-foot by 19-foot steel picnic structure on a Luck Stone property that will have to be either demolished or relocated to construct the Apollo-Twin Creeks Lines along Route 1. The Company is coordinating with Luck Stone pertaining to the steel picnic structure.*

6.3.5.1 IMPACT ASSESSMENT

Based on current (2023) aerial imagery, there are 13 non-residential buildings within 500 feet of Route 1, inclusive of the five proposed substations. These buildings, which primarily are located near the cut-in location on Line #203 and around Cochran Mill Road, are associated with businesses such as masonry, hauling, towing, asphalt, storage, concrete, and construction. While there is the potential for temporary impacts to commercial building due to construction noise or traffic, the use of the buildings would not be permanently impacted by the Project. In the event there are temporary access impacts to commercial businesses, Dominion would coordinate directly with individual property owners.

One existing non-residential structure was identified within the right-of-way of Route 1. This structure is a 31-foot by 19-foot steel picnic structure (metal roof with no walls) approximately 80 feet east of Goose Creek on a Luck Stone property. Due to nearby constraints, including the existing Milestone Reservoir, a dike, and an existing residence, the Route 1 right-of-way would cross over the picnic structure. The Company solicited input from Luck Stone on Route 1, which

collocates with the future Aspen-Golden Lines on that property. Through conversations with Luck Stone, the Company learned the picnic structure is for private use by Luck Stone staff and provides access to Goose Creek. The Company is conducting ongoing conversations with Luck Stone pertaining to the relocation of the steel picnic structure.

6.3.6 PLANNED DEVELOPMENTS

ERM obtained information on planned developments through publicly available data on Loudoun County websites and consultations with County planning officials and other stakeholders.[9] In most cases, information on planned developments was found on the Loudoun County Land Management, Applications, Research, and Coordination (LandMARC) website or provided by Loudoun County Planning Department staff (Loudoun County 2023g).

Approximately 0.9 mile of Route 1 is parallel and adjacent to the Company's proposed future Aspen-Golden Lines, as discussed in Section 5.2. Other than providing a common alignment for each project's transmission lines, the future Aspen-Golden Project would not impact the Project and vice versa.

Table 6-9 lists the planned developments crossed by or within 0.25 mile of Route 1, and documents type of development, status, and location relative to the Project for each one. Figure 6.3.6 depicts the planned developments within 0.25 mile of Route 1.

Information on future road expansion projects is provided in Section 6.3.10.

TABLE 6-9 PLANNED DEVELOPMENTS WITHIN 0.25 MILE OF PROJECT

Development Name	Development Type	Status	Distance to Project
Data Center Campus A	Data centers, warehouses	STPL-2022-0040 proposed; site plan in review	Crossed by Route 1 in an area encompassing the proposed Twin Creeks Substation site and properties south of Cochran Mill Road and west of Goose Creek
Data Center Campus B	Data centers	LEGI-2023-0048 proposed; zoning map amendment, special exceptions, and zoning modification in review	Crossed by Route 1 in an area encompassing the proposed Sycolin Creek and Starlight Substation sites east of Goose Creek and west of Belmont Ridge Road
Data Center Campus C	Data centers	Modified process site plan STMP-2022-0016 approved; site under construction	Crossed by Route 1 on properties encompassing the proposed Lunar and Apollo Substation sites east of Goose Creek, west of Belmont Ridge Road, and south of Rt. 7
Goose Creek Club II	Residential development	LEGI-2023-0023 proposed; zoning map amendment and	Not crossed by Route 1; approximately 0.2 mile west of Route 1 and the proposed Starlight, Lunar and Apollo

[9] Planned developments are publicly known projects that have been submitted to or are intended to be submitted to the Loudoun County Planning Department for approval and projects for which construction is not complete as of March 2024.

Development Name	Development Type	Status	Distance to Project
		zoning modifications in review	Substations in the area west of Goose Creek
Goose Creek Sewage Pump Station	Sewage pump station	Site plan STPL-2022-0001 approved; site under construction	Not crossed by Route 1; less than 0.1 mile south of Route 1, about 0.1 mile south of Cochran Mill Road and west of Goose Creek
Loudoun County Asphalt	Asphalt facility	EPLAN-2023-0099 proposed; site plan amendment in review	Not crossed by Route 1; less than 0.1 mile west of Route 1 and the proposed Twin Creeks Substation site; adjacent to the Company's existing Pleasant View Substation
Loudoun Water Milestone Reservoir	Raw water pump station	STPL-2022-0037 proposed; site plan in review	Not crossed by Route 1; approximately 0.1 mile south of Cochran Mill Road and west of Goose Creek.
Loudoun Water Quarry A	Water pump station and reservoir	STPL-2019-0027 proposed; site plan in review	Crossed by Route 1 east of Goose Creek and west of Belmont Ridge Road
Loudoun Water Russell Branch Pump Station	Sewage pump station	SPAM-2023-0028 proposed; site plan amendment in review	Not crossed by Route 1; approximately 60 feet from the Route 1 centerline east of Goose Creek between the proposed Lunar and Apollo Substations
Luck Stone Leesburg Plant	Mineral extraction	LEGI-2023-0084 proposed; zoning map amendment, zoning concept plan amendment, and special exception in review	Not crossed by Route 1; approximately 0.2 mile southeast of Route 1 on the south side of the W&OD Trail
Sheetz Crosstrail	Gas station	STPL-2023-0040 proposed; site plan in review	No crossed by Route 1; approximately 0.1 mile northwest of Route 1 near the intersection of Crosstrail Boulevard and Samuels Mill Road
Tuscarora Crossing – Landbay 1 Phase 1	Residential development	Construction plans and profiles CPAP-2021-0008 approved; site under construction	Not crossed by Route 1; approximately 0.2 mile northwest of Route 1 near the intersection of Crosstrail Boulevard and W&OD Trail
Tuscarora Crossing – Landbay 1 Phase 1A	Residential development	CPAP-2023-0002 proposed; construction plans and profiles in review	Not crossed by Route 1; approximately 0.2 mile northwest of Route 1 near the intersection of Crosstrail Boulevard and W&OD Trail
Tuscarora Crossing – Landbay 1 Phase 2	Residential development	STPL-2021-0021 proposed; site plan in review	Not crossed by Route 1; approximately 0.2 mile northwest of Route 1 near the intersection of Crosstrail Boulevard and W&OD Trail
Tuscarora Crossing –	Residential development	STPL-2020-0051 proposed; site plan in review, and	Not crossed by Route 1; approximately 0.2 mile northwest of Route 1 near the

Development Name	Development Type	Status	Distance to Project
Landbay 6 Phase 1		construction plans and profiles CPAP-2021-0008 approved; site under construction	intersection of Crosstrail Boulevard and W&OD Trail

W&OD = Washington & Old Dominion

6.3.6.1 IMPACT ASSESSMENT

Depending on when they are built, planned developments within 0.25 mile of the Project could experience temporary impacts during the construction period (e.g., noise, dust, or traffic) or visual impacts during operations. The severity of visual impacts would depend on factors such as surrounding tree cover, landscaping, orientation of the development towards/away from transmission infrastructure, and topography. Visual impacts also would depend on the development type and the visual sensitivity of the development and its occupants or users. For example, a residential development implies future tenants or homeowners who constitute a sensitive user group compared to data center developments and its employees. Visual impacts are discussed in Section 6.5. The following discussion, organized alphabetically, addresses the potential impacts of installation and operation of the proposed transmission line along Route 1, inclusive of the associated substations, to those planned developments that would (or could) be crossed by the Project.

Data Center Campus A

In September 2022, Twin Creeks Development, LLC submitted a site plan for Campus A, consisting of three data center buildings and two warehouse buildings on approximately 112.6-acres spanning nine parcels of undeveloped and industrial land (STPL-2022-0040). Outside the undeveloped land, current land uses include concrete, equipment, and material storage facilities. The planned development is on the south side of Cochran Mill Road, except for an area of about 15 acres on the north side of the road designated for a future substation that would serve the data center (Twin Creeks Substation). The site plan includes a 121,000 square foot warehouse, a 160,549 square foot warehouse, and three data centers (181,755 square feet, 177,325 square feet, and 170,500 square feet, respectively). The three data center buildings are on 60.1 acres subject to a zoning approval granted in 2020 (ZMAP-2018-0009). The Campus A site plan is under review as of February 2024.

Throughout the routing process, the Company and ERM coordinated with Customer A on its Campus A site plan to ensure impacts to planned warehouse and data center buildings, as shown on their current site plan to the county, would be minimized. Also, in coordination with Customer A, the Company reviewed route variations (see Section 5.3) that would minimize impacts to planned Loudoun Water facilities on Campus A. Route 1 would cross the Twin Creeks Substation parcel associated with Campus A, cross Cochran Mill Road, then head southeast through the planned campus towards Goose Creek. Altogether, Route 1 crosses the planned development for approximately 0.6 mile, intersecting parking areas, utility areas, and private roads. Impacts to the development are further minimized by collocating Route 1 with the future Aspen-Golden Lines for approximately 0.4 mile on the development. Based on the ongoing coordination with Customer A, no impacts to the Campus A buildings from installation of the transmission line along Route 1 or construction of the Sycolin Creek Substation are anticipated.

Data Center Campus B

In October 2022, Loudoun GC LLC (the local affiliate of Sentinel Data Centers) submitted a Legislative Land Development Application request to Loudoun County for a data center campus on an approximately 114.5-acre site of undeveloped land (LEGI-2023-0048). The Concept

Development Plan shows a 4,854,958 square foot buildable area, possible substation site, setbacks from Belmont Ridge Road, a 500-foot buffer from Goose Creek, and possible future road right-of-way for extensions of Gloucester Parkway and Russell Branch Parkway. Included in the Legislative Land Development Application are the following petitions:

- a zoning map amendment to rezone 84.5-acres from A-3 and General Industry to Industrial Park (ZMAP-2022-0021);
- a special exception to increase floor-area-ratio in the Industrial Park zoning district to 1.0 (SPEX-2022-0042);
- a minor special exception to allow for increased data center development potential on the property (SPMI-2023-0013); and
- a zoning modification to reduce required setbacks along Gloucester Parkway and Russell Branch Parkway (ZMOD-2022-0077).

The Campus B Legislative Land Development Application is in review as of February 2024.

Throughout the routing process, Dominion and ERM coordinated with Customer B on its Campus B layout to identify a route that avoids impacts to the development, minimizes impacts to Goose Creek, and collocates with the future Aspen-Golden Lines. Route 1 crosses the western portion of Campus B to connect the proposed Sycolin Creek Substation and then continues 0.2 mile north to connect the proposed Starlight Substation. Altogether, Route 1 crosses the development for approximately 0.5 mile.

Impacts to the planned Campus B development are minimized by collocating Route 1 with the proposed future Aspen-Golden Lines for approximately 0.3 mile. Within this area, Route 1 and the proposed future Aspen-Golden Lines cross 0.1 mile (encompassing what would be 0.9 acre of right-of-way) of a proffered transitional open space buffer proposed on Campus B. Where Route 1 collocates with the future Aspen-Golden Lines, the Company and Customer B are coordinating to have compatible native plantings for the transmission line easements within this buffer area. This would minimize impacts to the overall Scenic Creek Valley Buffer, located on Campus B along Goose Creek. Campus B's Transitional Open Space Buffer is discussed in more detail in Section 6.3.8. Based on the ongoing coordination between Dominion and Customer B, no impacts to Campus B buildings as a result of Route 1 are anticipated (see Appendix E).

Data Center Campus C

In August 2022, the Data Center Campus C developer submitted a modified process site plan application for a data center complex on a 134.40-acre parcel of undeveloped land (STMP-2022-0016). The planned future land use of the site includes the proposed data center campus and Loudoun Water's Russell Branch Pump Station (SPAM-2023-0028). The site plan proposes the development of up to 2.3 million square feet of floor area split between four buildings (two two-story buildings and two three-story buildings), utilities, and parking lot improvements. Because the data center is a by-right use, no zoning application was required prior to seeking site plan approval from the County, and portions of Campus C are under construction based on current (2023) aerial imagery. The Campus C site application subsequently was approved in May 2023. Clearing and grading of much of the site was complete as of January 2024.

In January 2024, an engineering plan revision application was submitted to Loudoun County for revised storm management facilities, truck entry, and retaining wall infrastructure (EPLAN-2024-0004). The revised engineering plan does not move any of the footprints of the data centers from the approved site plan application. EPLAN-2024-0004 is in review as of February 2024.

Dominion and ERM coordinated with Customer C on their Campus C layout to identify a route that avoids impacts to the development and minimizes impacts to Goose Creek and the Scenic Creek Valley Buffer. Route 1 crosses the western portion of the parcel to connect the proposed Lunar Substation before terminating at the proposed Apollo Substation. Altogether, Route 1 crosses the planned development for approximately 0.4 mile. Based on the site plan, Route 1 avoids the proposed data center buildings and Loudoun Water's proposed pump station, which would be between the proposed substation sites.

Loudoun Water Quarry A

In June 2019, Loudoun Water submitted a site plan approval request to Loudoun County for a water storage facility and associated infrastructure on a 67.5-acre parcel of developed land, including for use of Quarry A at the Luck Stone Leesburg Plant (STPL-2019-0027). The site plan proposes to establish a water storage reservoir capable of holding one billion gallons of water that would be withdrawn for treatment at an offsite water treatment plant. Additional project improvements include a pump station with a 300-foot deep, 25-foot diameter pump shaft, raw water transmission mains, stormwater facilities, and water and sewer connections (Loudoun Water 2023a). Prior to site plan approval, Loudoun Water was required to apply for zoning applications to permit the future use of a quarry for public utility water storage. The Loudoun Water Quarry A site plan is in review as of February 2024.

Route 1 crosses Goose Creek and is sited on the northern side of the Quarry A parcel for about 0.2 mile. According to the site plan, no planned improvements would be within the area crossed by Route 1. As further discussed in Section 6.8.1, an embankment referred to as the Goose Creek Dike is located between Goose Creek and the water reservoir, along the northwestern portion of the Quarry A site. Route 1 intentionally bypasses Goose Creek Dike and places structures near the tops of the bluffs on either side of Goose Creek. Impacts are further minimized by collocating Route 1 with the future Aspen-Golden Lines.

Loudoun Water Russell Branch Pump Station

In April 2023, Loudoun Water submitted a site plan amendment application to Loudoun County for a pump station and access road on a portion of two parcels of undeveloped land encompassing approximately 242.4-acres (SPAM-2023-0028). The pump station project is expected to occupy an area shared by Campus C and an additional planned data center campus outside of the study area. The site plan proposes the development of about 2,773 square feet of structures inclusive of a pump station and emergency storage tank, as well as an access road and related utilities to create an underground connection with an existing offsite sewer pumping station across Belmont Ridge Road. Because the pump station would be a permitted use, no zoning application was required prior to Loudoun Water seeking site plan approval. The site plan amendment application seeks to reduce the scope of a site plan previously approved by the county in 2019 (STPL-2018-

0008). The Loudoun Water Russell Branch Pump Station site plan amendment is in review as of February 2024.

Route 1 crosses about 0.4 mile of the Campus C parcel encompassing the planned pump station, which as noted above would be between the proposed Lunar and Apollo Substations. Dominion and ERM coordinated with Loudoun Water to determine a feasible route alignment that minimizes impacts to their planned pump station on Campus C. Route 1 bypasses the planned pump station to the west (and was preferred to a route variation that considers bypassing the pump station to the east; see Section 5.3). While Route 1 will be adjacent to the planned development, there is no direct overlap of the Route 1 right-of-way with the proposed facilities such that the Project would not impact construction and operation of the planned pump station.

Luck Stone Leesburg Plant

In July 2023, Luck Stone Corporation and Luck Towers LLC, submitted a Legislative Land Development application to Loudoun County to amend permitted uses and consolidate proffers within the Luck Stone Leesburg Plant. The development would occupy a group of eight parcels encompassing approximately 779-acre of developed and undeveloped land (LEGI-2023-0084). The development would occupy a group of eight parcels encompassing approximately 779 acres of developed and undeveloped land (LEGI-2023-0084). Current land uses include operation of Luck Stone Leesburg Plant mining facilities. Future shared uses within the affected parcels include the proposed Loudoun Water Quarry A site and future data center development per the Luck Stone Cochran Mill application. The zoning application proposes to revise and consolidate proffers associated with ZCPA-2023-0002, ZMAP-1999-0004, and ZMAP-1990-0009, to amend the mining limits of Quarry B to include land underneath the current processing plant, and to permit utilization of Stonewater Lane to ship mined aggregates at the time Quarry B is closed, expected in approximately 25 years. Included in the Legislative Land Development Application are the following petitions:

- a zoning map amendment to rezone all impacted parcels to the Mineral Resource-Heavy Industry zoning district (ZMAP-2023-0010),
- a zoning concept plan amendment to amend permitted uses and consolidate previous proffered conditions (ZCPA-2023-0001), and
- a special exception to permit stone quarrying within Quarry B (SPEX-2023-0002).

The Luck Stone Leesburg application is in review as of February 2024.

The Legislative Land Development application and Concept Development plan show Quarry A as being included in the zoning application but notes that the parcel has been approved to include the Loudoun Water Quarry A water storage facility and is no longer used for active mining (SPEX-2009-0020). What would be the right-of-way for Route 1 crosses into the affected parcel for 0.2 mile, as is the case for Quarry A; however, the route does not cross any of the parcels with expanded mining operations. Installation of the transmission lines along Route 1 would neither prevent the development potential of the parcels nor create physical impacts to the affected site for future Luck Stone Leesburg Plant mining, storage, and data center development.

6.3.7 CONSERVATION EASEMENTS AND LANDS

Land conservation preserves Virginia's heritage, provides recreational opportunities, and improves water and habitat quality and overall quality of life. In addition to managing lands under its jurisdiction, the VDCR helps landowners, land trusts, and localities by serving as a clearinghouse and keeping an inventory of protected lands. The agency also helps by identifying important open space and lands rich with plant and animal diversity. The VDCR provides grants and information on conservation easements and other land protection tools.

ERM used the VDCR's Managed Conservation Lands Database (VDCR 2024c) to identify easement types and individual easements within the study area. Those easements within 0.25 mile of Route 1 and the proposed substations are depicted on Figure 6.3.7 and described in the subsection below. No Virginia Natural Area Preserves are present in the study area.

Dominion understands that properties are placed under easements throughout the year, and additional easements could be identified in the study area as the Project moves forward. Dominion will continue to consult with the various land managing entities and conservation agencies for the study area regarding potential new easements along the routes.

6.3.7.1 IMPACT ASSESSMENT

Virginia Outdoors Foundation

The VOF, which was created under the Virginia Open-Space Land Act, leads the Commonwealth in land conservation, protecting over 850,000 acres (VOF n.d.). 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 open space easements, which 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.

There is one VOF easement within 0.25 mile of the proposed Project on several Luck Stone-owned properties encompassing forested land on either side of Goose Creek as well as existing quarry facilities. The VOF easement is approximately 0.2 mile from the Route 1 centerline at the Goose Creek crossing near the Company's existing Lines #227 and #274. The Project would have no impact on the vegetation and other resources within this easement or on their preservation in perpetuity. There are no crossings of VOF easements along the route.

Scenic Creek Valley Buffer

Loudoun County recognizes that forests along waterways (i.e., riparian buffers) naturally provide protection from degradation by filtering stormwater runoff, decreasing streambank erosion, reducing the impact of floodwaters, providing shade for organisms, and creating habitat (Loudoun County n.d.). Based on the Revised Loudoun County Zoning Ordinance, the Scenic Creek Valley Buffer prevents the construction of new structures within 300 feet of the Scenic River-designated portions of Goose Creek and within 100 feet of all other creeks and streams. Within the study area, the Scenic Creek Valley Buffer designation runs along Goose Creek beginning on the south side of Rt. 7 and extending south for approximately 1.4 miles and along the confluence of Goose and Sycolin Creeks.

Route 1 crosses the Scenic Creek Valley Buffer for approximately 0.2 mile over Sycolin Creek and Goose Creek. The right-of-way for Route 1 would encompass approximately 2.6 acres within the buffer. At the crossing location, Route 1 avoids public land (Loudoun Water) and minimizes impacts to other constraints in the area, including planned developments, an existing residence, and a dike. To mitigate impacts to Goose Creek, ERM and the Company aligned and designed Route 1 to cross the stream at a perpendicular angle parallel and adjacent to Dominion's future Aspen-Golden Lines, as depicted in Figure 3.2. This results in one crossing of Goose Creek rather than two.

6.3.8 RECREATIONAL RESOURCES

ERM obtained information on recreational resources through digital data sets and maps, recent digital aerial photography, publicly available information on county websites, and consultation with county officials and other stakeholders. Unless otherwise noted, information on existing recreational resources were found on the Loudoun County Parks, Recreation, and Community Service website (Loudoun County 2023h), and planned recreational resources were found on the Loudoun County LandMARC website (Loudoun County 2023g). Table 6-10 lists the recreational resources crossed by or within 0.25 mile of the Project, and documents the type of resource, status, and distance and direction from Project facilities for each. Figure 6.3.8 depicts recreational resources within 0.25 mile of the Project.

The existing and planned recreational resources along Route 1, described below, are found within a distinct part of the Project study area: the Goose Creek riparian corridor. Within Goose Creek, residents can hike, boat, picnic, play sports, and fish.

TABLE 6-10 RECREATIONAL RESOURCES WITHIN 0.25 MILE OF PROJECT

Recreational Resource	Recreational Type	Status	Distance to Project
Data Center Campus A Proffers	Shared-use asphalt trail, two natural surface trails	STPL-2022-0040 proposed; Twin Creeks Development LLC's site plan application is in review	Crossed by Route 1 south of Cochran Mill Road
Data Center Campus B Proffers	Bike racks, two natural surface trails, boat launch	LEGI-2023-0048 proposed; Loudoun GC LLC's zoning applications are in review	Crossed by Route 1 between the Sycolin Creek and Starlight Substation sites
Goose Creek Scenic River	River	Active; maintained via partnership with Virginia, Loudoun County, advisory committees, and landowners (Goose Creek Association 2024)	Crossed by Route 1 in its approach to the proposed Sycolin Creek Substation site
Loudoun County Linear Parks and Trails System	Interconnected multi-use trail system	Countywide Plan Linear Parks and Trails System adopted by Loudoun County in July 2021; owned and maintained through public-	Crossed by Route 1 at Goose Creek

Recreational Resource	Recreational Type	Status	Distance to Project
		private partnership (Loudoun County 2021)	
Keep Loudoun Beautiful Park	Neighborhood Park along Goose Creek with a boat launch, fishing, picnic area, and parking	Active; owned by Loudoun County Board of Supervisors and maintained by Loudoun County Parks, Recreation, and Community Services	Not crossed; approximately 0.2-mile northwest of the Apollo Substation site
W&OD Trail	Shared-use asphalt trail (with adjacent gravel equestrian trail)	Active: owned and maintained by NOVA Parks (NOVA Parks 2024)	Not crossed; approximately 0.2 mile southwest of Route 1 at Goose Creek

W&OD = Washington & Old Dominion

6.3.8.1 IMPACT ASSESSMENT

Data Center Campus A

Campus A is planned to be built on the west side of the Goose Creek riparian corridor, east of the W&OD Trail, and along Cochran Mill Road. The site contains approximately 112.6 acres of industrial land, inclusive of an existing Loudoun Water temporary sewage treatment plant and other planned Loudoun Water developments. As discussed in Section 6.3.6, Twin Creeks Development, LLC, submitted a site plan application for approval of a data center and warehouse development with recreational proffered commitments (STPL-2022-0040, in review as of February 2024). On the south side of Cochran Mill Road, the proffers include a 10-foot-wide shared-use asphalt trail, two natural surface trails, and a 225-foot-wide open space easement along the Goose Creek Valley buffer.

Route 1 crosses the planned development for about 0.6 mile adjacent to the Company's proposed future Aspen-Golden Lines. Route 1 crosses the planned development for about 0.6 mile adjacent to the Company's future Aspen-Golden Lines. In this area, the route crosses Cochran Mill Road, which already creates a linear clearing through the development. Additional industrial uses within the vicinity include mineral extraction, wastewater treatment, and pavement manufacturing.

Route 1 would create a new, 100-foot-wide right-of-way within a cleared corridor through a currently undeveloped, but partially open space, segment of the Goose Creek riparian corridor. The new transmission line would not affect the recreational development of pathways and open spaces, while impacts on the setting would be mitigated through the route's proximity to Campus A and other industrial uses within the area. Though construction noise could temporarily disturb some recreational activity if the trails are in use prior to transmission line construction, these impacts would be temporary, limited to the period of construction in the immediate vicinity of the property. Overall, Route 1 would not prevent the development or use of Campus A's proffered recreational facilities.

Data Center Campus B

Campus B is expected to be built north of the W&OD Trail, south of Rt. 7, east of Goose Creek, and west of Belmont Ridge Road. The site contains approximately 114.5-acres of forested, undeveloped land. Loudoun GC, LLC, applied for zoning application approval for a data center development with recreational proffered requirements (LEGI-2023-0048, in review as of February 2024). The proffers include bike racks, pedestrian pathways and sidewalks around the parking lots, an earthen trail along Goose Creek, an earthen trail from Belmont Ridge Road to Goose Creek, a new non-motorized boat launch into the creek, and a 200-foot open space easement along Goose Creek.

Route 1 crosses about 0.5 mile of the planned development, a segment which also includes the proposed Sycolin Creek and Starlight Substations. The Company coordinated with Customer B to identify a feasible alignment for Route 1 on Campus B, which crosses part of the open space proffer and preservation areas along the Goose Creek riparian corridor (Loudoun County's 300-foot Scenic Creek Valley Buffer and the proffered 200-foot Transitional Open Space Buffer). On Campus B, the Route 1 alignment is parallel and adjacent to the proposed future Aspen-Golden Lines within the proffered Transitional Open Space buffer (encompassing approximately 0.8 acre). On Campus B, the Route 1 alignment is parallel and adjacent to the future Aspen-Golden Lines within the proffered Transitional Open Space buffer (encompassing approximately 0.8 acre). This alignment minimizes impacts to the overall Scenic Creek Valley Buffer, resulting in one new crossing rather than two. Where Route 1 collocates with the future Aspen-Golden Lines, the Company and Customer B are coordinating with regard to compatible native plantings for the transmission line right-of-way within the buffer areas.

The new transmission lines would not affect development or use of the planned pathways, bike racks, and boat launch. Impacts on setting would be mitigated through the route's proximity to other industrial uses within the area and its alignment adjacent to the planned future Aspen-Golden Lines. Impacts on setting would be mitigated through the route's proximity to other industrial uses within the area and its alignment adjacent to the future Aspen-Golden Lines. Though construction noise could temporarily disturb some recreational activity, if any of the resources are open for use at that time, these impacts would be temporary, limited to the period of construction in the immediate vicinity of the development. Overall, Route 1 would not prevent the development or use of proffered recreation facilities at Campus B for walking, biking, and boating.

Goose Creek Scenic River

Goose Creek Scenic River runs through the study area from Leesburg to Ashburn, predominantly parallel and to the west of Belmont Ridge Road. Historically serving as a waterway of commerce for the shipping of grain and timber, Goose Creek flows approximately 48 miles between Loudoun County and Fauquier County and drains into the Potomac River. Adopted into the Virginia Scenic Rivers System in 1984, Goose Creek Scenic River is maintained by the Commonwealth of Virginia, Loudoun and Fauquier Counties, advisory committees, and private landowners, and managed for fishing, hiking, canoeing, and kayaking (Goose Creek Association 2024). There are several boat launches into Goose Creek, including a launch within the Keep Loudoun Beautiful Park, located within the study area near the intersection of Rt. 7 and Crosstrail Boulevard. Goose Creek Scenic

River is crossed by the Company's existing 230 kV transmission lines (Lines #227 and #274), as well as the NOVA Parks W&OD Trail.

Route 1 crosses Goose Creek at a perpendicular angle along an alignment adjacent to the future Aspen-Golden Lines within adjacent rights-of-way measuring 250-feet-wide. Route 1 crosses the creek about 0.2 mile northeast of the W&OD Trail and existing transmission lines, which already create a perpendicular, linear clearing across the creek. There are additional industrial uses within the vicinity, including mineral extraction, wastewater treatment, and pavement manufacturing.

While Route 1 and the future Aspen-Golden Lines would create a new, 250-foot-wide cleared corridor through a currently forested segment of Goose Creek, the structures would not affect the flow of Goose Creek and impacts on the setting would be mitigated through the route's proximity to the W&OD Trail, transmission lines, and industrial uses within the area. The crossing location is between two bends in the creek, which would limit the visual impact from locations on the creek both upstream and downstream of the new transmission lines. Noise during construction could temporarily disturb some recreational activity on the creek depending on season, but these impacts would be temporary, limited to the period of construction in the immediate vicinity of the creek. Installation of the transmission line along Route 1 would not prevent uses of the creek, and though it could alter viewshed conditions, the alignment adjacent to the future Aspen-Golden Lines and through a bend in the river would minimize visual effects.

Loudoun County Linear Parks and Trails System

Loudoun County's Linear Parks and Trails is a proposed network of an interconnected, multi-use trail systems along streams and natural corridors throughout the County. Within the study area, new trails are expected to be installed near Goose Creek. The Loudoun County BOS adopted the Linear Parks and Trails System Countywide Plan (in July 2021) to create a general "roadmap" for future trails to be built out in a phased development. Loudoun County's goal is to expand its existing 224 miles of trails to 509 miles throughout the County to provide citizens safe recreational opportunities and travel accessibility as well as the preservation of natural and cultural resources (Loudoun County 2021).

While the specific locations of trails are not dictated by the Linear Parks and Trails System County Plan, Route 1 is in areas where future trails may be located, including near Goose Creek. As trails are a compatible, allowable use within transmission line rights-of-way, Route 1 would not prevent the use of existing trails or the development and use of future trails. During construction, temporary impacts to users of existing trails (or any additional trails installed prior to construction of the Project) would be limited to noise and detours or closures, but these impacts would be temporary, limited to the period of active construction in the vicinity of the trails.

6.3.9 CEMETERIES, SCHOOLS, AND PLACES OF WORSHIP

ERM reviewed USGS topographic quadrangles (USGS 2022), recent digital aerial photography (ESRI 2023), County parcel data, and information from the Virginia Cultural Resource Information System (VCRIS) (Virginia Department of Historic Resources [VDHR] 2022) to identify cemeteries, schools, and/or places of worship within 0.25 mile of the Project.

No schools, cemeteries, or places of worship are located within the study area or within 0.25 mile of the Project, as depicted in Figure 6.3.9.

6.3.9.1 CEMETERIES

There are no known cemeteries within 0.25 mile of Route 1, inclusive of the proposed substations. The closest cemetery to the Project is the African American Burial Ground for the Enslaved at Belmont (Loudoun County 2022f), located approximately 0.5 mile east of Route 1 and opposite of Belmont Ridge Road. Established between 1796 and 1802, the cemetery originally contained around 80 internments, predominantly persons enslaved by the Ludwell-Lee family, the former owners of Belmont Plantation. Years of neglect and nearby construction projects resulted in the destruction of potentially half of the graves at the site. Since 2017, the cemetery had been rehabilitated and includes the Freedom Heritage Trail, a 400-foot-long trail through the burial ground. The cemetery occupies an approximately 2.7-acre parcel of forested land that is privately-owned and protected under a Loudoun County BOS easement (Find a Grave 2024). Further discussion is provided in Section 6.6, Cultural Resources.

6.3.9.2 SCHOOLS

There are no schools within 0.25 mile of Route 1, inclusive of the proposed substations. The nearest school to the Project is Seldens Landing Elementary, which is part of Loudoun County Public Schools. The elementary school offers kindergarten through fifth grade programming with specials such as physical education, music, and library services (Loudoun County Public Schools 2024). The school occupies an approximately 19.9-acre parcel of county-owned, developed land inclusive of athletic fields, a playground, and parking lots. Seldens Landing Elementary is approximately 0.3-mile northeast of Route 1 and the proposed Apollo Substation. Further discussion is provided in Section 6.5, Visual Resources.

6.3.9.3 PLACES OF WORSHIP

There are no places of worship within 0.25 mile of Route 1, inclusive of the proposed substations. The closest place of worship is Potomac Hills Presbyterian Church, which holds services at Harper Middle School, part of Loudoun County Public Schools. Established in 1990, Potomac Hills Presbyterian Church holds weekend services, Sunday School, youth groups, and women's clubs (Potomac Hills 2024). Harper Middle School occupies an approximately 35 acre parcel of county-owned, developed land inclusive of athletic fields and parking lots. The school is about 1.1 miles northwest of Route 1 and the proposed Apollo Substation. Given the distance of the church from Route 1, it would not be impacted by the Project.

6.3.10 TRANSPORTATION INFRASTRUCTURE

The road network in the study area includes a variety of existing road types ranging from principal arterials (such as Rt. 7) to minor arterials (such as Belmont Ridge Road) to minor collectors (such as Cochran Mill Road), as well as local roads. Figure 3.2 shows existing roads within the study area. In addition to the existing roads, two planned road extensions in the study area are included in the Loudoun County CTP (Loudoun County, 2023e). The two road extensions, Russell Branch Parkway and Gloucester Parkway, are shown on Figure 3.2. No existing or planned railroads are present within the study area. Airports are addressed in Section 6.3.11 of this document.

6.3.10.1 IMPACT ASSESSMENT

Route 1 crosses two existing roadways: Cochran Mill Road and Goose Glen Lane. Cochran Mill Road is a two-lane road classified in the Loudoun County CTP as a minor collector. Route 1 crosses perpendicular to Cochran Mill Road approximately 0.1 mile south of the proposed Twin Creeks Substation site, in an area where the alignment is adjacent to the future Aspen-Golden Lines. Goose Glen Lane is a one-lane private road classified in the CTP as a local road. Route 1 overlaps with Goose Glen Lane for approximately 600 feet between the proposed Sycolin Creek and Starlight substation sites. However, Goose Glen Lane provides access to two vacant residences west of Belmont Ridge Road and has been purchased by Customer B for the construction of Campus B. Goose Glen Lane moreover is planned to be removed as part of the Campus B development.

As depicted in Figure 3.2, Route 1 crosses two planned road extensions identified in the Loudoun CTP: Gloucester Parkway and Russell Branch Parkway. Both roads currently extend between Rt. 28 in the east and Belmont Ridge Road in the west, and both have dedicated right-of-way for future road extensions and bridges extending west from Belmont Ridge Road across Goose Creek. Gloucester Parkway follows Cochran Mill Road then heads west to connect with Kincaid Boulevard, and Russell Branch Parkway follows Cochran Mill Road to Crosstrail Boulevard. The dedicated future road rights-of-way are 90 feet wide for Gloucester Parkway and 120 feet for Russell Branch Parkway. The planned Gloucester Parkway road dedication is crossed once by Route 1 between the proposed Sycolin Creek and Starlight Substation sites, and the planned Russell Branch Parkway road dedication is crossed once directly north of the proposed Starlight Substation site. Both of these crossings are perpendicular to the road dedications where the alignment is adjacent to the proposed future Aspen-Golden Lines.

In addition to the crossings noted above, what would be the right-of-way for Route 1 would be adjacent to and partially overlap the right-of-way of wo existing, two-lane, local roads, though these roads are not crossed. There would be overlap along short, less than 400-foot-long segments along Durham Court, which is directly southeast of the proposed Twin Creeks Substation site in the Goose Creek Industrial Park, and Jackpit Lane, which is south of the proposed Sycolin Creek Substation site on the northeast side of the Loudoun Water Quarry A reservoir.

Temporary closures of roads and/or traffic lanes may be required during Project construction for Route 1. No long-term impacts on roads are anticipated. The Project will comply with VDOT requirements for access to the rights-of-way from public roads. At the appropriate time, the Project will obtain the necessary VDOT permits, as required, and comply with permit conditions.

6.3.11 AIRPORTS AND HELIPORTS

6.3.11.1 AIRPORT FACILITIES

Transmission line structures have the potential to affect airspace in and around airports. The following sections describe the airports in the vicinity of the study area and the airspace regulations that could impact the Project.

6.3.11.2 AIRPORTS NEAR THE PROJECT AREA

ERM reviewed the FAA's 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 nine airports, private airstrips, or heliports within 10 nautical miles of the proposed Project (see Figure 6.3.11-1). Table 6-11 lists these facilities and provides their airport identification (ID) number, distance and direction from the nearest point on Route 1 or the nearest proposed substation to the nearest runway/heliport, the type of use, and the maximum runway length (if applicable).

TABLE 6-11 AIRPORTS AND HELIPORTS LOCATED WITHIN 10 NAUTICAL MILES OF THE PROJECT

Airport/Heliport Name	FAA Identifier	Approximate Distance and Direction from Nearest Project Facility (nautical miles)	Use	Maximum Runway Length (feet)
Leesburg Executive Airport	JYO	1.4 miles southwest of Twin Creek Substation	Public	5,500
Inova Loudoun Hospital Heliport	34VA	1.4 miles east of Apollo Substation	Private	NA
Longview Heliport	6VG8	5.3 miles north of Apollo Substation	Private	NA
Goose Hunt Farm Airport	3VA5	5.5 miles southwest of Twin Creek Substation	Private	1,700
Dulles International Airport	IAD	7.6 miles southeast of Sycolin Creek Substation	Public	11,500
Stone Springs Heliport	6VG4	8.0 miles south of Sycolin Creek Substation	Private	NA
Egypt Farms Heliport	4VA0	8.8 miles southwest of Twin Creek Substation	Private	NA
Crippen's Heliport	VA54	9.1 miles southwest of Sycolin Creek Substation	Private	NA
Reston Hospital Center Heliport	43VA	9.5 miles southwest of Sycolin Creek Substation	Private	NA

FAA = Federal Aviation Administration; NA = not applicable; nm = nautical mile

6.3.11.3 FEDERAL AVIATION ADMINISTRATION REGULATIONS

The FAA is responsible for overseeing air transportation in the United States, focusing 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 (CFR), 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 available online at https://www.ecfr.gov/current/title-14/chapter-I/subchapter-E/part-77.

6.3.11.4 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. Below is a description of the civil imaginary surfaces:

- Horizontal surface: This surface is 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. The Leesburg Executive Airport is located at a surveyed elevation of 389.5 feet above mean sea level (AMSL), meaning the horizontal surface is 539.5 feet AMSL. Dulles International Airport has a surveyed elevation of 312.3 feet AMSL, placing the horizontal surface at 462.3 feet AMSL.
- Conical surface: This is 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. For the Leesburg Executive Airport and Dulles International Airport, the conical surface would extend from 539.5 feet to 739.5 feet AMSL and from 462.3 feet to 662.3 feet AMSL, respectively.
- Primary surface: This is 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. This surface is 250 feet wide for visual approach runways, 500 feet wide for runways with non-precision instrument approaches, and 1,000 feet wide for precision instrument runways. Both the Leesburg Executive Airport and Dulles International Airport have primary surfaces that are 1,000 feet wide.
- Approach surface: This is 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). For both Leesburg Executive Airport and Dulles International Airport, the inner edge of the approach surface is the same width as the primary surface (1,000 feet), 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. 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.

Figure 6.3.11-2 provides a visual representation of the imaginary surfaces for Leesburg Executive Airport.

6.3.11.5 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 6-11.

6.3.11.6 FEDERAL AVIATION ADMINISTRATION NOTICE REQUIREMENTS AND TIMING

Based on the runway categories and dimensional standards described above, a notice must be filed with the FAA in any of the following conditions:

- 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 slopes:
  - 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; or
  - 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; or
  - 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; or
- 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, to the FAA regional office with jurisdiction over the area within which the construction or alteration will be located. The form can also be 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 current plans, the proposed transmission line structures for the Project would range in height from 75 to 135 feet tall,[10] depending on structure locations. It is anticipated that cranes would be used to install the structures. Based on current plans, the Project would exceed the FAA notification thresholds described above for Leesburg Executive Airport and therefore would require notification to the FAA.

[10] This range of the structure heights is inclusive of the structures within the footprints of the Twin Creeks, Sycolin Creek, Starlight, Lunar, and Apollo Substations.

6.3.11.7 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. While Loudoun County has drafted land use restrictions for the Leesburg Executive Airport and Dulles International Airport associated with noise contour lines, the restrictions do not regulate the height of structures. Therefore, the Part 77 airspace restrictions as codified in the Va. Code apply.

6.3.11.8 LOCAL AIRPORT REGULATIONS

Va. Code Sections 15.22280, 15.22282, 15.22293, and 15.22294 give local jurisdictions the power to establish and regulate zoning districts, make airspace subject to their zoning ordinance, and establish airport safety zoning. The following is a summary of the zoning regulations applicable to the airports listed in Table 6-11.

Loudoun County has established restricted use zones to regulate the use of property in the vicinity of both the Leesburg Executive Airport and Dulles International Airport. The AIOD is a zoning overlay district administered by the Loudoun County Department of Building and Development intended 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 AIOD boundaries are based on the 60 decibels (dBs) 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 both the Leesburg Executive Airport and Dulles International Airport. The zones include all land lying beneath the approach surfaces, transitional surfaces, horizontal surfaces, and conical surfaces as they apply to these airports.

Based on mapping provided by Loudoun County, the Project is not located within either airport's AIOD.

6.3.11.9 IMPACT ASSESSMENT

ERM conducted an airport analysis to determine if any of the FAA-defined airport imaginary surfaces could be penetrated by transmission structures associated with the Project. ERM reviewed the height limitations associated with the FAA-defined imaginary surfaces for all runways at the airports. Of the 10 airports and heliports listed in Table 6-11, Leesburg Executive Airport is the only public use airport or helipad close enough to Route 1 or a substation for a transmission structure to potentially impact navigable airspace. The nearest runway associated with Dulles International Airport is approximately 7.1 miles (37,500 feet) from the Project. At this distance, the Project would not cross beneath any of the imaginary surfaces associated with the airport.

Standard GIS tools, including ESRI's ArcMap 3D and Spatial Extension software, were used to create and geo-reference the airport imaginary surfaces for Leesburg Executive Airport in space and in relation to the locations and heights of transmission structures along Route 1. Ground surface data was derived by using a USGS 10 Meter Digital Elevation Model. Height limitations for Route 1, inclusive of the proposed substations, were analyzed along with FAA Part 77 airspace surfaces.

Civil airport imaginary surfaces have been established by the FAA with relation to each airport and each runway. Imaginary surfaces were developed to prevent existing or proposed objects from extending from the ground into navigable airspace.

Leesburg Executive Airport

The Leesburg Executive Airport is the closest public airport to the Project. At the closest point, the proposed transmission lines are approximately 8,430 feet east of and perpendicular to the airport's runway 17/35. The site is at an estimated elevation of 335 feet AMSL, which is approximately 54 feet lower than the surveyed Leesburg Executive Airport elevation of 389.5 feet AMSL. Therefore, given the distance, the estimated decrease in elevation of the Project compared to the Leesburg Executive Airport, and the planned 75- to 135-foot-tall structure heights for the new transmission line, no structure associated with the Project would penetrate the restricted Part 77 airspace surfaces of the airport. Temporary construction equipment (e.g., cranes) must also be cognizant of Part 77 airspace surfaces.

6.4 NATURAL RESOURCES

6.4.1 SURFACE WATERS

ERM identified and mapped watersheds, wetlands, and waterbodies (e.g., lakes, streams, ponds, and stormwater features) within the study area using publicly available desktop sources, including:

- Recent aerial imagery, taken in spring of 2023 (Loudoun County 2023)
- Google Earth Aerial Imagery (Google LLC 2022)
- USGS 10-meter Digital Elevation Model (USGS 2022)
- ESRI World Topographic Map, multiple scales (ESRI et al. 2023)
- NWI maps from the USFWS online data mapping portal (USFWS 2021)
- The National Hydrography Dataset (NHD) Plus High Resolution (USGS 2023)
- Soils data from the U.S. Department of Agriculture-Natural Resources Conservation Service
- Soil Survey Geographic Database (USDA-NRCS 2023)

For reference, an overview map illustrating the locations of NWI-mapped wetlands, NHD-mapped waterbodies, and watershed boundaries in the study area is provided as Figure 6.4.1.

6.4.1.1 WATERSHEDS

Watersheds are used to define the geographic area within the boundaries of drainage divides throughout the country. For purposes of classifying watersheds, the United States is divided into hydrologic units in four levels—regions, subregions, accounting units, and cataloging units—which

may contain an entire or part of a watershed. Each level is identified by a hydrologic unit code (HUC). The first level of the code, the HUC 2-digit, is a major geographic area or region containing several rivers or the drainage area of a major river. Subsequent levels (the HUC 4-, HUC 6-, HUC 8-, and HUC 10-digits) encompass progressively smaller areas based on the drainage divides of lower order waterbodies.

The study area is within the following HUC areas:

- the Mid-Atlantic HUC 2-digit (02) region, which discharges into the Atlantic Ocean, Long Island Sound, and the Riviere Richelieu, a tributary of the St. Lawrence River,
- the Potomac HUC 4-digit (0207) subregion, which drains about 14,600 square miles within the Potomac River basin, including Washington D.C., Maryland, Pennsylvania, Virginia, and West Virginia,
- the Middle Potomac-Catoctin (02070008) HUC 8-digit watershed, which drains about 1,210 square miles into the Potomac River (USGS 2019), and
- the Lower Goose Creek (0207000807) HUC 10-digit watershed, which drains approximately 120-square miles into Goose Creek.

Within the study area, the Lower Goose Creek HUC 10-digit watershed contains open waterbody features that appear to be stormwater ponds and as well as USGS NHD-mapped perennial and intermittent streams. Named waterbodies within the study area include Tuscarora Creek and Sycolin Creek, as well as perennial tributaries to Goose Creek, which flows from the south to north across the study area.

6.4.1.2 WETLANDS

The identification of wetlands and wetland types within what would be the right-of-way for Route 1 (inclusive of the substation sites) is based on ERM's desktop wetland and waterbody probability analysis described in the Wetland and Waterbody Desktop Summary, attached as Appendix D. Wetlands have been classified based on the Cowardin classification system as:

- Palustrine Emergent (PEM) – wetlands characterized by erect, rooted, herbaceous hydrophytes (i.e., aquatic plants) and woody species less than 3 feet in height, excluding mosses and lichens;
- Palustrine Scrub-Shrub (PSS) – wetlands characterized by woody vegetation, excluding woody vines, approximately 3 to 20 feet in height;
- Palustrine Forested (PFO) – wetlands characterized by woody vegetation, excluding woody vines, approximately 20 feet or more in height and 3 in. or larger diameter at breast height (DBH);
- Palustrine Unconsolidated Bottom (PUB) – wetlands characterized by bottom substrate particles smaller than stones (less than 10 inches) covering greater than 25 percent of the area, with plants covering less than 30 percent of the area; and
- Riverine – wetlands within a channel, with two exceptions: (1) wetlands dominated by trees, shrubs, persistent emergent, emergent mosses, or lichens, and (2) habitats with water containing ocean-derived salts in excess of 0.5% (USFWS 2013).

Wetlands provide a wide range of ecological functions, including flood storage and groundwater recharge, nutrient and sediment capture, erosion control, filtration of pollutants from adjacent waterbodies, and diverse fish and wildlife habitat. PFO wetlands are of especially high value because of their habitat biodiversity and carbon sequestration functions, as well as their increased filtration capabilities (Wetland Forest Initiative Undated; USDA 2007).

Most wetlands within the study area are adjacent to, or contiguous with, rivers, streams, and associated tributaries regulated by the USACE and Virginia Department of Environmental Quality (VDEQ) under Sections 404 and 401 of the Clean Water Act (CWA), respectively. Generally, there are few wetlands mapped by the NWI in the study area, with most being stormwater features and riverine wetlands associated with tributaries to Goose Creek. Surface flow within these wetlands generally drains to the north within the Goose Creek watershed.

ERM did not conduct an onsite delineation of wetlands or waterbodies along Route 1; however, a field delineation was completed by Wetland Studies and Solutions Inc. in June 2022 on a parcel south of Rt. 7 and west of Belmont Ridge Road, between the proposed Starlight and Apollo Substations (between MPs 1.5 and 1.9). This field delineation of wetlands and waterbodies was approved by the USACE in an Approved Jurisdictional Determination (AJD) in August 2022 (Permit # NAO-2022-01498-RDB). The boundaries of the field delineated wetlands and waterbodies were used in the desktop wetland delineation for this area (USACE 2022).

ERM calculated acres of wetlands along Route 1 and in the substation sites based on a probability analysis (described in Appendix D), assuming the presence of wetlands in areas with high, medium-high, or medium probabilities of wetland occurrence. Table 6-12 summarizes the results of ERM's analysis.

TABLE 6-12 HIGH, MEDIUM-HIGH, AND MEDIUM PROBABILITY WETLANDS WITHIN THE PROJECT FOOTPRINT

Wetland Type [a]	**Acres**
PFO Wetlands (acres)	NA [b]
PEM Wetlands (acres)	0.3
PSS Wetlands (acres)	0.0
PUB Wetlands (acres)	0.1
Riverine Wetlands (acres)	0.6
Total (acres)	**1.0**

[a] Wetland acreages have been rounded to the tenths place; as a result, the totals may not reflect the sum.
[b] NA: Not applicable due to absence of a wetland type within the Project footprint; 0.0 indicates less than 0.05 acre of the wetland is present.

What would be the right-of-way for Route 1, inclusive of the proposed substations, encompasses approximately 1.0 acre of wetlands, including 0.3 acre of PEM, less than 0.1 acre of PSS, 0.1 acre of PUB, and 0.6 acre of riverine wetlands. Wetland locations along the route include:

- PEM wetland between MPs 0.2 and 0.3 within the proposed Twin Creeks Substation
- PEM and PUB wetlands between MPs 0.4 and 0.5
- Riverine wetlands between MPs 0.8 and 0.9 along Goose Creek
- PUB wetland at approximate MP 1.3
- PSS wetland at approximate MP 1.8

Impact Assessment

To minimize impacts on wetland areas, the Project has been designed to span or avoid wetlands, keeping transmission structures outside of wetland boundaries to the extent practicable. The majority of potential direct impacts on wetlands due to Project construction would be temporary in nature. Temporary timber matting would be used for construction equipment to travel over wetlands, as appropriate. Due to the absence of an existing right-of-way, some new access roads may be necessary along the route. If a section of line cannot be accessed from existing roads, Dominion 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 preexisting conditions.

Permanent direct impacts to wetlands would be limited to the fill of approximately 0.3 acre of PEM wetland within the footprint of the Twin Creeks Substation, placement of structures within wetlands if unavoidable, and the potential permanent conversion of less than 0.1 acre of PSS wetlands within the right-of-way to PEM type wetland, depending on vegetation type and height maintained within the right-of-way. Where tree clearing is required within the new right-of-way, PFO and PSS wetlands would be permanently converted to PSS or PEM wetland types. Forested wetlands and riparian buffers provide functions such as peak flood flow reduction, nutrient and sediment capture, filtration of pollutants to adjacent waterbodies, and habitat diversity. The conversion of forested wetlands would reduce or eliminate some of these functions. Based on the wetland desktop study and available desktop resources, there is less than 0.1 acre of PSS wetland near an intermittent tributary to Goose Creek at approximate MP 1.8 and no PFO within the Project footprint.

Where the removal of trees or shrubby vegetation occurs within wetlands, Dominion 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.

Outside of the 0.3-acre PEM wetland within the Twin Creeks Substation footprint and potential structure placements, no change in contours of wetlands and waterbodies, or redirection of the flow of water, is anticipated. The amount of spoil from foundation and structure placement would be minimal. Excess spoil in surrounding wetlands generated through foundation construction would be controlled through construction best management practices (e.g., the implementation of erosion and sediment controls).

Upon SCC approval of a route and final line engineering, Dominion will obtain the appropriate permits from the Virginia Marine Resource Commission (VMRC), USACE, and VDEQ for work within

wetlands to ensure compliance with Section 404 and 401 of the CWA and minimize potential impacts on aquatic resources within the approved transmission line corridor.

6.4.1.3 WATERBODIES

ERM identified and mapped waterbodies, including streams, rivers, and other open waterbody features (e.g., reservoirs, lakes, impoundments, ponds, and stormwater features) within the study area using the publicly available GIS databases identified above and the field delineation completed by Wetland Studies and Solutions Inc. between approximate MPs 1.5 and 1.9 of Route 1 (USACE 2022). Waterbody crossings are regulated by the VMRC, USACE, and VDEQ under Sections 404 and 401 of the CWA, the Virginia Water Protection permit program, and the Code of Virginia. No navigable waters are crossed by Route 1; therefore, no Rivers and Harbors Act Section 10 authorization from the USACE would be required for the Project.

Based on ERM's desktop wetland and waterbody analysis, there are no waterbodies within the footprints of any of the proposed substations. Route 1 has seven waterbody crossings, of which three are NHD-mapped waterbodies, including perennial Goose Creek and two, unnamed, intermittent tributaries to Goose Creek. There are four unmapped waterbodies including two open water features that appear to be stormwater detention ponds, and two unnamed, unclassified streams identified within the right-of-way using recent (2023) aerial imagery. For reference, a general location map illustrating waterbodies crossed by the route is provided in ERM's Wetland and Waterbody Desktop Summary, provided as Appendix D.

Based on ERM's desktop wetland and waterbody analysis, Route 1, inclusive of the five proposed substations, would encompass approximately 0.6 acre of riverine wetlands and 0.1 acre of PUB wetlands. Waterbody counts are shown in Table 6-13 with the locations of crossings along Route 1 summarized below:

- An open water feature between MPs 0.4 and 0.5
- Perennial Goose Creek at approximate MP 0.8 and unnamed, intermittent tributaries to Goose Creek at approximate MP 0.8 and between MPs 1.8 and 1.9
- Two unnamed, intermittent tributaries to Goose Creek at approximate MP 1.2 and 1.3
- Open water feature at approximate MP 1.3

TABLE 6-13 WATERBODIES WITHIN THE PROJECT FOOTPRINT

Waterbodies	Crossing Count
NHD-Mapped Perennial Waterbodies	1
NHD-Mapped Intermittent Waterbodies	2
Non-NHD Mapped Waterbodies [a]	4
Total	**7**

[a] Identified via current (2023) aerial imagery during desktop analysis.
NHD = National Hydrography Dataset

Impact Assessment

No waterbodies were identified within the footprints of the five proposed substation sites. Waterbodies crossed by Route 1 would be spanned, with permanent, indirect impacts to waterbodies limited to riparian buffer transition from tree cover to herbaceous vegetation within the maintained right-of-way. Tree removal adjacent to waterbodies would reduce riparian buffer functions such as stream bank stabilization and erosion control, nutrient and sediment filtration, floodwater storage and peak flow reduction, and water temperature changes due to loss of shading. The right-of-way would be maintained with a cover of herbaceous vegetation during operations, which would provide some filtration and stabilization to protect waterbodies from runoff. Based on recent (2023) aerial photography, all waterbodies crossed by Route 1 would have trees cleared adjacent to them within the right-of-way.

Where removal of trees and/or woody shrubs is required, clearing within 100 feet of a stream would be conducted by hand. Vegetation would be cut at or slightly above ground level and there would be no grubbing of stumps. Dominion would use sediment barriers (e.g. silt fence, super silt fence, or silt socks) along waterways and steep slopes during construction to protect waterways from soil erosion and sedimentation.

Temporary, minor impacts on water quality could occur during construction from disturbed soils transported by storm water entering into adjacent surface waters during rain events. Increased turbidity and localized sedimentation of stream bottoms may occur as a result of runoff. Potential impacts would be mitigated by the implementation of erosion control measures.

Waterways crossed by the Project would be maintained for proper drainage using culverts or other crossing devices in accordance with Dominion's standard policies. If a section of line cannot be accessed from existing roads, Dominion may need to install a crane mat, culvert, or temporary bridge to cross small streams. In such cases, temporary fill may be required. Fill would be placed on erosion control fabric and removed when work is completed, returning the surface to original contours.

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

6.4.2 AREAS OF ECOLOGICAL SIGNIFICANCE

ERM reviewed available ecological datasets for the area within a 100-foot buffer around Route 1, inclusive of the five proposed substations. ERM also consulted the VDCR's Natural Heritage Program (NHP) (VDCR 2024a) and requested a formal review of the Project study area from the VDCR to identify areas of ecological significance along and near Route 1, including natural area preserves, conservation sites, SCUs, ecological cores, and general location areas for natural heritage resources. These areas collectively delineate habitats containing rare, threatened, or endangered plants and animals, unique or exemplary natural communities, and/or significant geologic formations.

The VDCR responded to Dominion's request for formal review of the Project study area in a letter dated February 15, 2024 (attached as Appendix C). Based on that response and research conducted by ERM, no SCUs, natural area preserves, or state-listed insects are present along Route 1, inclusive of the five proposed substation sites, and no further discussion of these resource types is provided in this study. Areas of ecological significance that are present along Route 1 include conservation sites, ecological cores, and general location areas for natural heritage resources. Definitions of these resource types are provided below.

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 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, 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.

Ecological cores are areas of at least 100 acres of continuous interior, natural cover that provide habitat for a wide range of species, from interior-dependent forest species to habitat generalists, as well as species that use marsh, dune, and beach habitats. Interior ecological core areas begin 100 meters inside the nearest core edges and continue to the deepest parts of the ecological core. Ecological cores also provide natural and economic benefits of open space, recreation, water quality (including drinking water recharge and protection, and erosion prevention), and air quality (including carbon sequestration and oxygen production). Ecological cores are ranked from C1 to C5 (C5 being the least significant) using nine prioritization criteria, including the habitats of the natural heritage resources the cores contain.

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.

6.4.2.1 CONSERVATION SITES

Conservation sites identify a planning boundary delineating the VDCR's determinations of the land and water areas occupied by one or more natural heritage resources. VDCR conservation sites do not preclude human activities, but each conservation site is given a biodiversity significance ranking based on rarity, quality, and number of natural heritage resources it contains.

Ashburn Quarry Conservation Site

The Ashburn Quarry Conservation Site consists of approximately 280.5 acres of quarry land with a conservation rating of B5, indicating a site of general interest or open space significance. Quarries can resemble natural cliff surfaces and act as habitat for certain species. The natural heritage resource associated with this site is the Peregrine falcon (*Falco peregrinus*), which is currently state-listed as threatened and federally protected under the Migratory Bird Treaty Act, which makes it unlawful to "take, kill, possess, transport, or import migratory birds, or their eggs, parts, or nests" without a federal permit from the USFWS (16 U.S.C. §703). Intentional take is considered to be direct and affirmative purposeful actions that reduce migratory birds, their eggs, or their nests.

Peregrine falcon nests naturally are located on cliffs, bluffs, talus slopes, old tree hollows, and abandoned nests of other birds of prey. The Ashburn Quarry has created a habitat that resembles this natural environment for the species (VDCR 2024b). This site is an active quarry owned by Luck Stone Corporation called the Leesburg Plant. In 2019, a pair of nesting falcons were first observed in the quarry, where they raised four eyasses (i.e., chicks) (Booth 2020). The following year, the Center for Conservation Biology (CCB) released a report identifying breeding adults in Virginia, and the presence of the Ashburn Quarry breeding pair and four additional eyasses were confirmed in 2020 (Watts 2020). The placement of Route 1 relative to the Ashburn Quarry Conservation Site is depicted on Figure 6.4.2.

For Peregrine falcons in Virginia, nesting typically begins in March, following a period of courtship. The falcons build their nests in a depression scraped in substrate such as dirt, sand, or fine gravel. Nests can be reused multiple times over the course of many breeding seasons (VDWR 2024e). The breeding season concludes when the young leave the nests, typically in June.

Impact Assessment

East of its Goose Creek crossing, Route 1 intersects less than 0.1 mile of the northern boundary of the Ashburn Quarry Conservation Site. What would be the right-of-way for Route 1 encompasses approximately 0.3 acre of the site, consisting of mostly forest and a short segment of an access road to the quarry. None of the proposed substation sites are within the conservation site limits.

Although Route 1 crosses and the proposed Sycolin Creek Substation site is within an area identified as predicated suitable habitat (PSH) for the Peregrine falcon, no impacts are anticipated due to the minor crossing of the Ashburn Quarry Conservation Site. Route 1 avoids fragmentation of the site by crossing its northern boundary and would be collocated with the future Aspen-Golden Lines (as depicted in Figures 5.2-1 and 5.2-2) to minimize the fragmentation that would result from multiple rights-of-way in this area. Moreover, because Route 1 is on the margins of and therefore avoids the steep slopes of the quarry utilized by the Peregrine falcon, no impacts are anticipated for potential Peregrine falcon nests.

Although transmission lines have caused many migratory bird deaths – collisions may kill up to 175 million birds annually and electrocution may kill hundreds of thousands more birds annually (Manville 2005), few electrocution records exist for the Peregrine falcon. According to the data, Peregrine falcon electrocutions are rare (Avian Power Line Interaction Committee 2006).

To mitigate any impacts, VDCR recommends limiting disturbances to periods outside of the breeding season, when the Peregrine falcon is most vulnerable to human disturbance and coordinating with Virginia Department of Wildlife Resources (VDWR) to ensure compliance with the Virginia Endangered Species Act (VA ST §§ 29.1-563 – 570).

6.4.2.2 ECOLOGICAL CORES

The VDCR ranking system for the integrity of ecological cores includes the following categories:

- Rank C1—Outstanding
- Rank C2—Very High
- Rank C3—High
- Rank C4—Moderate
- Rank C5—General

Larger and more biologically diverse core areas have higher rankings. Ecological integrity is enhanced if the core is part of a larger complex of natural lands or if the core contributes to water quality enhancement. Ecological cores in the two highest categories (i.e., C1 and C2) are connected by landscape corridors creating a statewide network of natural lands.

Route 1 crosses two ecological core units, including one that also encompasses the sites of the proposed Starlight, Lunar, and Apollo Substations. For each of these cores, Table 6-14 lists the unit identification number, rank, size, and location, and provides a description of each core's condition based on ERM's observations of current (2023) aerial photography for each crossing. The core boundaries are depicted in Figure 6.4.2.

TABLE 6-14 VDCR ECOLOGICAL CORES CROSSED BY THE PROJECT

Ecological Core ID	Ecological Core Rank	Total Core Acreage	Location	Existing Condition	Project Component
30885	4-Moderate	182	East of Goose Creek, west of Belmont Ridge Road, south of Rt. 7, north of Goose Glen Lane	Historic aerial imagery indicates that the core was recently altered between June 2022 and the Spring of 2023 due to clear cutting of approximately 26.3 acres.	Crossed by Route 1 between the Starlight, Lunar, and Apollo Substation sites
31054	5-General	64	South of Cochran Mill Road, encompassing some portions of the eastern shoreline along Goose Creek, and adjacent to the northeast boundary of the W&OD Trail	Mostly forested with some open space area around Cochran Mill Road	Crossed by Route 1 south of Cochran Mill Road and west of Goose Creek

Rt. = State Route; W&OD = Washington & Old Dominion

Impact Assessment

According to the VDCR, impacts on ecological cores occur when their natural cover is partially or completely converted to developed land uses. Habitat conversion can result in changes that reduce ecosystem processes, biodiversity, population viability, and habitat quality (VDCR 2024b). Impacts on ecological cores from the Project would result from tree clearing for the new Project facilities, such as the right-of-way. Route 1 crosses one core with a VDCR ranking of C5 and another with a ranking of C4, with a combined crossing length of approximately 0.9 mile. The Starlight, Lunar and Apollo Substation sites are within the same C4 core crossed by Route 1. What would be the right-of-way for Route 1, inclusive of the substation sites, encompasses approximately 20.0 acres of land.

The Route 1 alignment is parallel and adjacent to the Company's future Aspen-Golden Lines for approximately 0.3 mile where it crosses Core ID 31054. This alignment ensures one crossing of the core rather than two. In total, the Project would occupy about 3.7 acres of the resource. Regardless, however, the condition of this core will be altered due to future planned development (specifically Campus A and Milestone Reservoir), which will remove vegetation from the core area. We additionally note that the VDCR defines ecological cores as "areas of at least 100 acres of contiguous interior, natural cover," but Core ID 31054 encompasses only 64 acres of land (VDCR 2024b).

East of Goose Creek, Route 1 crosses Core ID 30885 for approximately 0.6 mile. The proposed Starlight, Lunar, and Apollo Substation sites additionally are within the core. In total, the Project would occupy about 16.4 acres of the resource. While Route 1 bisects the resource, historical aerial imagery indicates that the core was recently altered between June 2022 and the spring of 2023 due to clear cutting of approximately 26.3 acres. Moreover, the condition of this core will be altered due to planned data center developments (Campuses B and C), which will remove vegetation from the core.

6.4.3 PROTECTED SPECIES

To protect and recover imperiled species and the ecosystems they depend on, Congress passed the federal 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 USFWS. 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 of the species, including their parts and products, unless federally permitted.

To 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 Sections 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 impacts on these species.

ERM identified protected species along and near the Project using the following sources:

- USFWS Information for Planning and Consultation System (IPaC) online system (USFWS 2024)
- VDCR NHP (VDCR 2024a)
- VDWR Wildlife Environmental Review Map Service (WERMS) (VDWR 2024a)
- Virginia Fish and Wildlife Information Service (VaFWIS) (VDWR 2024b)
- Center for Conservation Biology (CCB) Eagle Nest Locator (CCB 2022)
- VDWR Little Brown Bat and Tri-colored Bat Winter Habitat and Roost Tree Application (VDWR 2024c)
- VDWR Northern Long-Eared Bat (NLEB) Winter Habitat & Roost Tree Application (VDWR 2024d)

ERM obtained query results from the VDCR NHP, the VDWR VaFWIS, the VDWR WERMS, and the USFWS IPaC to identify federal- and state-listed species that may occur within the study area. Digital data were obtained from VDCR to identify locations within what would be the right-of-way of Route 1 and the substation footprints (along with an associated 100-foot buffer) that potentially support protected species. Query results from the VDCR include species known to occur in the area and communities known to historically or currently contain protected species (VDCR 2024b). Query results from USFWS IPaC includes species that may occur within the rights-of-way of the Route 1 and within the proposed substation sites plus the associated 100-foot buffers (USFWS 2024). Query results from VaFWIS include species known to occur or likely to occur within a 2.0-mile radius from the geographic center of the study area (VDWR 2024b). Data for species known to occur within what would be the Route 1 right-of-way, inclusive of the five proposed substations, were retrieved using queries of the VDWR WERMS.

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. VDWR's Species Observation dataset includes all verified species documentations maintained by the VDWR.

6.4.3.1 FEDERAL- AND STATE-LISTED ENDANGERED AND THREATENED SPECIES

Database queries identified two federal- and seven state-listed threatened and endangered (T&E) species within and adjacent to the study area. The federal-listed species (both of which are also state-listed) are the NLEB (*Myotis septentrionalis*) and Dwarf wedgemussel (*Alasmidonta heterodon*). There are five state-listed species identified by queries that have not been federally listed, including: the Wood turtle (Glyptemys insculpta), Peregrine falcon, Torrey's mountain mint (*Pycnanthemum torreyi*), Tricolored bat (*Perimyotis subflavus*), and Green floater (*Lasmigona subviridis*). Federal-listing of the Tricolored bat and Green floater has been proposed, but neither species has been listed. Each federal- and state-listed species was reviewed for potential of occurrence within and adjacent to Route 1, inclusive of the proposed substations. Information on the federal- and state-listed species is provided in Table 6-15.

TABLE 6-15 POTENTIALLY FEDERAL- AND STATE-LISTED SPECIES IN THE STUDY AREA

Common Name	Scientific Name	Status	Global Rank	Habitat	Source
Mammals					
NLEB	*Myotis septentrionalis*	FE, ST	G2	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.	IPaC VDWR—Winter Habitat and Roost Tree Map
Tricolored bat	*Perimyotis subflavus*	FPE, SE	G3	Typically roosts in trees near forest edges during summer. Hibernates deep in caves or mines in areas with warm, stable temperatures during winter.	IPaC VDWR—Winter Habitat and Roost Tree Map
Invertebrates					
Dwarf wedgemussel	*Alasmidonta heterodon*	FE, SE	G1	Large rivers and small streams, often burrowed into clay banks among the root systems of trees; also associated with mixed substrates of cobble, gravel, and sand.	IPaC
Green floater	*Lasmigona subviridis*	FPT, ST	G3	Small to medium streams in quiet pools and eddies with gravel and sand substrates.	IPaC VaFWIS
Reptiles					
Wood turtle	*Glyptemys insculpta*	ST	G3	Forested floodplains, fields, wet meadows, and farmland with a perennial stream nearby.	VaFWIS
Birds					
Peregrine falcon	*Falco peregrinus*	ST	G4	Nests on cliffs, bluffs, talus slopes, old tree hollows, and abandoned nests of other birds of prey.	VDCR

Common Name	Scientific Name	Status	Global Rank	Habitat	Source
Plants					
Torrey's mountain-mint	*Pycnanthemum torreyi*	ST	G2	Exposed diabase flatrock located within Triassic Basins.	VDCR

Sources: USFWS 2024; VDCR 2024a, 2024b; VDWR 2024b, 2024c, 2024d
IPaC = Information for Planning and Consultation; NLEB = northern long-eared bat; VaFWIS = Virginia Fish and Wildlife Information Service; VDCR = Virginia Department of Conservation and Recreation; VDWR = Virginia Department of Wildlife Resources

Federal/State Status:

FE	Federally listed as endangered	SE	State listed as endangered	FPE	Federally proposed as endangered
FT	Federally listed as threatened	ST	State listed as threatened	FPT	Federally proposed 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

Federal-Listed Species

Two federal-listed species and two species with a federally proposed listing, each of which are also state-listed, may potentially occur within the study area. The IPaC database identified the NLEB, Tricolored bat, and Dwarf wedgemussel, and both the VaFWIS database and IPaC database identified the Green floater.

The USFWS proposed that the Tricolored bat be listed as endangered in 2022 (USFWS 2024). The species can be found throughout the state and lives a relatively solitary life. It hibernates in caves and rock shelters in mountainous areas in the winter. This bat is one of the earliest feeders in the evenings with a diet consisting of small insects (VDWR 2024b).

Potential summer foraging habitat for NLEB and Tricolored bat includes multiple forested areas along Route 1. Review of the VDWR winter habitat and roost trees online mapping system did not show winter habitat (i.e., hibernacula) or roost trees for NLEB or Tricolored bat within what would be the Route 1 right-of-way or the proposed substation sites (VDWR 2024c, 2024d).

The Dwarf wedgemussel is described by the 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 15 feet wide, to large rivers more than 330 feet 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 2024b).

The Green floater is a species of mussel found in small creeks and streams that other mussel species do not occupy. Their habitats consist of clean, fast-flowing streams and firm rubble, gravel, and sand substrates that lack siltation (VDWR 2024b).

While all four species were identified by the various databases as having potential occurrence within the study area, the VaFWIS data show that only the Green floater has an occurrence confirmed as present within the 2.0-mile search radius due to the presence of Goose Creek within the study area. Because there have been documented occurrences of this state-listed (and proposed federally-listed) species and its habitat, Goose Creek has been classified as Threatened and Endangered Species Waters (T&E Waters). This designation classifies streams and rivers that contain documented occurrences of federal- or state-listed species and their habitat.

State-Listed Species

Seven state-listed species, including the Wood turtle, Peregrine falcon, Torrey’s mountain mint, and the four species mentioned in the previous subsection, were identified as potentially occurring within the study area. The VaFWIS and/or WERMS data show that of the seven species, only the Green floater has documented occurrences within the 2.0-mile search radius for the Project. Non-database sources have also confirmed the presence of the Peregrine falcon within the study area (Watts 2020, Booth 2020).

As mentioned in Section 6.4.2, Peregrine falcons nest on cliffs, bluffs, talus slopes, old tree hollows, and abandoned nests of other birds of prey. The existence of quarries can create nesting

habitat for the Peregrine falcon, as the quarry walls can resemble sloping cliffs (VDCR 2024b). As previously noted, the presence of Peregrine falcons within the study area was confirmed in 2019 and 2020 (Watts 2020, Booth 2020).

Torrey's mountain mint can generally be found in dry upland forests; rocky woodlands over mafic, ultramafic, or calcareous rocks; edges of sandstone glades; dry-mesic barrens; thickets; upland meadows; and powerline rights-of-way. In Virginia specifically, populations of this species are found in dry, rocky, deciduous woods, along roadsides, and in thickets near streams (NatureServe 2024).

Wood turtle habitat typically includes forested communities near streams used for hibernation. Suitable stream habitat for the Wood turtle includes well-oxygenated water free from pollutants, with streambed material composed of sand, gravel, or rock. Wood turtles are semiaquatic and leave the water in the spring to move into open grasslands, barrens, and sandy shores for nesting and foraging. While there is no confirmed documentation of the Wood turtle within the study area, according to the VaFWIS database, there is predicted aquatic habitat within and along Goose Creek, Tuscarora Creek, and Sycolin Creek, and predicted terrestrial habitat in and around the Milestone Reservoir and Luck Stone Goose Creek Plant areas.

As mentioned previously, VaFWIS confirmed the presence of the Green floater within a 2.0-mile search radius of the Project due to the presence of Goose Creek, which is classified as T&E Waters.

Impact Assessment

The seven federal-listed and/or state-listed species identified as potentially occurring within the study area are identified in Table 6-17. Potential habitat for all seven species occurs along Route 1, but the VDWR, VaFWIS, WERMS data, and non-database sources show that only the Green floater and Peregrine falcon have been confirmed within a 2.0-mile radius of the geographic center of the Project study area.

While no instream construction would be required for the Project, if shade is reduced along the streambank due to right-of-way clearing, the water temperature could increase, potentially impacting the presence of the Green floater. Coordination with the VDWR may be needed to determine if surveys and/or construction timing windows are warranted for the Project to avoid impacts on this species.

Route 1 avoids the steep slopes of the quarry in the study area utilized by the Peregrine falcon, so no impacts are anticipated for any potential Peregrine falcon nests. To mitigate additional impacts, construction activities disturbing the birds would be limited to periods outside of the breeding season, if practicable, and the Company would coordinate with VDWR to ensure compliance with the Virginia Endangered Species Act.

While no documented occurrences for the Wood turtle are noted in the study area, Route 1 spans over Goose Creek, which was identified as predicted habitat by the VaFWIS database. No instream construction activities would be required for the Project, but riparian vegetation would be cleared adjacent to Goose Creek. Coordination with the VDWR would be needed to determine if surveys and/or construction timing windows are warranted for the Project to avoid the Wood turtle.

While VDWR data show that occurrences of federal- and state-listed bats have not been confirmed within a 2.0-mile radius of the geographic center of the study area, summer foraging habitat for these species is likely present within the forested lands crossed by Route 1, inclusive of the five proposed substation sites. No impacts to these bat species are anticipated for Route 1 if trees are cleared during the winter according to VDWR time-of-year restrictions (TOYRs). As mentioned previously, the Company performed a bat survey in May 2023 near the study area, and no federal- or state-listed bat species were confirmed as present (see Appendix C). Additionally, the construction of planned developments (see Section 6.3.6), will clear up to approximately 35.4 acres of forested land within right-of-way of Route 1 and five substation footprints prior to the construction of the Project. As such, this loss of habitat will be attributed to the planned developments.

The Company is actively monitoring regulatory changes and requirements associated with the NLEB and how they could potentially impact construction timing associated with TOYRs. The USFWS has indicated that it plans to issue final NLEB guidance to replace the interim guidance, which expires on March 31, 2024. The Company actively is tracking updates from the USFWS with respect to the final guidance. Once issued, the Company plans to review and follow the final guidance to the extent it applies to the Company's projects. Until the final guidance is issued, the Company will continue following the interim guidance. For projects that may require additional coordination, the Company will coordinate with the USFWS.

The Company is also monitoring the potential for regulatory changes associated with an up-listing of the Tricolored bat. On September 14, 2022, the USFWS published the proposed rule to the Federal Register to list the Tricolored bat as endangered under the ESA. USFWS recently extended its Final Rule issuance target from September 2023 to September 2024. The Company is actively tracking this ruling and evaluating the effects of potential outcomes on Company projects' permitting, construction, and in-service dates, including electric transmission projects.

Dominion will coordinate with state and federal agencies as needed to determine if surveys, construction TOYRs, or other mitigation would be required for the Project.

6.4.3.2 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 2022), 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 are no eagle nests within the

study area, which is not within an Eagle Concentration Area. The closest eagle nest (Nest ID LD1901) is approximately 5.0 miles southeast of the study area. According to the CCB, the nest was last observed to be occupied in 2023 (CCB 2022). The next closest nest (Nest ID LD1602) is approximately 5.7 miles north of the study area.

Impact Assessment

The VDWR provides activity-specific guidelines for work within 330-foot and 660-foot buffer zones surrounding a known Bald eagle nest. If eagle nests are identified within 660 feet of the right-of-way approved by the SCC, Dominion will work with the VDWR and other appropriate jurisdictional agencies to minimize any impacts on the species.

6.4.3.3 SPECIES OF CONCERN

Rare Plant Species

Species of concern typically include rare plants and animals that are not afforded the same level of protection as federal- and state-listed T&E species. NatureServe, an international network of NHPs, assigns a global rank to species based on rarity and conservation status. Species ranked "G1" (global rank 1 / critically imperiled) or "G2" (global rank 2 / imperiled) are most at risk. Based on the VDCR's February 15, 2024 letter, several rare plant species have the potential to occur in the study area (VDCR 2024b). These species are listed in Table 6-16, which also provides the global and state rank and describes habitat for each species.

TABLE 6-16 RARE PLANT SPECIES WITH THE POTENTIAL TO OCCUR IN THE STUDY AREA

Common Name	Scientific Name	Status	Global Rank	State Rank	Habitat	Source
Plants						
Earleaf false foxglove	*Agalinis auriculata*	None	G3	S1	Exposed diabase flatrock located within Triassic Basins	VDCR
American bluehearts	*Buchnera americana*	None	G5?	S1/ S2	Exposed diabase flatrock located within Triassic Basins	VDCR
Downy phlox	*Phlox pilosa*	None	G5	S1	Exposed diabase flatrock located within Triassic Basins	VDCR
Stiff goldenrod	*Solidago rigida var. rigida*	None	G5	S2	Exposed diabase flatrock located within Triassic Basins	VDCR
Hairy hedgenettle	*Stachys arenicola*	None	G5	S1	Exposed diabase flatrock located within Triassic Basins	VDCR

Source: VDCR 2024b
VDCR = Virginia Department of Conservation and Recreation
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*

** Global ranks followed by a question mark denote inexact or uncertain ranking by the VDCR*

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*

Impact Assessment

According to the VDCR, there is potential for five rare plants and one plant state-listed as threatened (Torrey's mountain mint, see Section 6.4.3.1) to occur within the study area (VDCR 2024b). All six species are typically found within semi-open diabase glades and prairies. Diabase glades are characterized by historically fire-dominated grassland vegetation on relatively nutrient-rich soils underlain by Triassic bedrock. Diabase flatrock, a dark-colored volcanic rock, is found primarily in northern Virginia counties and is located within the geologic formation known as the Triassic Basin. Where the bedrock is exposed, a distinctive community type of drought-tolerant plants occurs. The VDCR considers diabase flatrocks to be rare natural communities threatened by earth disturbing activities. If identified, the Company will work with the appropriate regulatory agencies to minimize any impacts on listed species and/or listed habitat(s).

Route 1 (inclusive of the five proposed substations) would impact a total of 29.2 acres of diabase soils. Due to the mostly forested and developed nature along the majority of Route 1, it is unlikely that the plant species of concern identified by the VDCR are present. Habitat conversion will occur due to clearing, but the transmission line corridor would be maintained as a natural emergent/scrub shrub habitat resembling the successional conditions that allow natural communities to exist within this converted habitat regime. The permanent impacts associated with the Project would be discrete and limited to the structure foundation locations and substation footprints.

6.4.4 VEGETATION

6.4.4.1 LOCAL VEGETATION CHARACTERISTICS

The study area is situated within the Northern Piedmont physiographic province. Vegetation in this province has been altered by clearing as part of ongoing agricultural and silvicultural practices occurring since European settlement. Prior to the effects of European settlement, vegetation was influenced by the practices of Native Americans. Literature 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. Fallow farmlands 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*). Over time, early successional communities in the Northern Piedmont mature into late successional oak hickory forests (VDCR 2021).

The effects of human development activities on the landscape have resulted in a patchwork of early and late successional forests, pastures, and agricultural fields. The study area lies in a highly developed portion of Loudoun County where remnant communities of forested vegetation and open fields are commonly interspersed with developed land. As such, the vegetation in the study area is typically limited to small fragments of mixed pine (*Pinus spp*.) and hardwood forest communities, turfgrass communities associated with developed land, and forested “edge” communities that border larger forested tracts.

Impact Assessment

ERM reviewed publicly available recent (2023) 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, which would be maintained with an herbaceous cover during operations. Disturbed areas resulting from use of temporary workspace would revert to preconstruction vegetative conditions.

Forested land would be the vegetation resource primarily affected by Route 1, inclusive of the five proposed substations. The Project facilities would impact 36.8 acres of forested land and 2.3 acres of open space, as depicted in Figure 6.3.2. Of these 36.8 acres of forested land, 35.4 acres exist on land that is intended for planned developments. Where Route 1 crosses planned developments (see Section 6.3.6), up to 35.4 acres of forested land within the Route 1 right-of-way and substation footprints will be cleared prior to the construction of the Project, and the cleared land will be utilized for the Project’s right-of-way and substation footprints.

6.4.4.2 FORESTED VEGETATION

Forested vegetation within the study area is generally associated with relatively small contiguous tracts of trees found in upland and/or alluvial forests. Upland forests are composed of tree species typically found in the Northern Piedmont physiographic province, with vegetation assemblages such as pine forest and mixed hardwood forest dominated by Loblolly pine (*Pinus taeda*) species, Red maples (*Acer rubrum*), Shortleaf pine (*Pinus echinata*), Sweetgum (*Liquidambar styraciflua*), Tulip tree, American beech (*Fagus grandifolia*), hickories (*Carya spp*.), and various upland oaks

(*Quercus spp*.). Upland forest communities have usually become smaller because of historic encroachment from agricultural land use and development, and usually exist in small discontinuous tracts of woodlands or fragmented forests located between croplands, pastures, and developed areas.

Alluvial forests in the study area are found at lower topographic elevations in floodplains and drainageways associated with wetlands and waterbodies like Goose Creek. Alluvial forest composition typically includes species like Silver maple (*Acer saccharinum*), American sycamore (*Platanus occidentalis*), American elm (*Ulmus americana*), Box elder (*Acer negundo*), Hackberry (*Celtis occidentalis*), and River birch (*Betula nigra*). Floodplain sloughs and backswamps are common landforms in the Northern Piedmont region and can support a variety of water-tolerant oak species in the forest canopy, like Pin oak (*Quercus palustris*), Swamp white oak (*Quercus bicolor*), Willow oak (*Quercus phellos*), and Swamp chestnut oak (*Quercus michauxii*). Beneath the forest canopy, understory plants include a variety of shrubs and herbaceous species such as Sweet pepperbush (*Clethra alnifolia*), Northern spicebush (*Lindera benzoin*), Arrowwood (*Viburnum dentatum*), sedges (*Carex spp*.), and rushes (*Juncus spp.*).

As noted in Section 6.3.2, ERM classified land cover along Route 1, inclusive of the five proposed substation sites, using a combination of local and statewide datasets and aerial photo interpretation to identify the most current uses or cover types for a given area. Figure 6.3.2 depicts land use/land cover, including forested areas, along the Project facilities.

Forest Conservation Values

The Forest Conservation Value (FCV) model is a tool designed by the Virginia Department of Forestry to strategically identify the highest priority forestland for conservation in Virginia (VDCR 2023b). The intent is to maximize the efficiency of limited resources by focusing conservation efforts on the highest quality, most productive, and most vulnerable forestland statewide.

The FCV model identifies five conservation values:

- 5: Outstanding
- 4: Very High
- 3: High
- 2: Moderate
- 1: Average

Impact Assessment

ERM reviewed publicly available FCV model data prepared by the VDCR to assess the value of forest resources along Route 1, inclusive of the five proposed substation sites (VDCR 2023b). A majority of the forested lands within the study area are mapped as Average, and generally speaking, the habitats through which Route 1 passes are not designated as high-ranking areas for conservation planning by the VDCR. The route crosses about 1.9 miles of forested habitat ranked Average and Moderate. It does not cross habitat designated as possessing Outstanding, Very High, or High FCVs.

Construction and operation of the Apollo-Twin Creeks Lines and associated substations would impact 33.7 acres of habitat with FCV classifications, including 32.7 acres classified as Average and 1.0 acre classified as Moderate (in the area west of Goose Creek and south of Cochran Mill Road). The majority of the forested areas have undergone cycles of tree clearing based on historic imagery, and/or up to 34.5 acres of forested land within the right-of-way and substation footprints will be altered by other planned developments, including Campuses A, B, and C.

Fragmentation

According to the VDCR, loss of habitat presents the greatest risk to biodiversity (VDCR 2023a). When development alters the landscape and fragments large natural tracts of land into smaller, scattered pieces of land, the biodiversity of the area suffers. Large patches of land have more benefits than the same area of land among smaller fragmented pieces, including:

the number and diversity of species increases progressively as habitat size increases,

there is opportunity in larger patches for more habitat diversity and protection from disturbance in adjacent developed areas, and

the ecosystem services (i.e., the direct or indirect benefits to people) of larger areas are greater than smaller ones (VDCR 2023a).

The majority of the vegetation crossed by Route 1 is forest, though there are a number of other planned developments, including utilities and substations, quarries, and data center campuses (see Section 6.3.6) that will require clearing of these forested lands. ERM additionally notes that the alignment of Route 1 of the proposed Apollo-Twin Creeks Lines parallel and adjacent to the Company's future Aspen-Golden Lines would minimize fragmentation, particularly at the crossing of Goose Creek, which is forested. The collocated alignment ensures one crossing of Goose Creek rather than two.

Impact Assessment

As noted above, current forest conditions along Route 1, inclusive of the five proposed substation sites, would be impacted by several planned developments (up to 34.5 acres of forested land within the Route 1 right-of-way and substation sites), which would minimize the additional impact of the Project on forest resources. Forested areas cleared for right-of-way would be converted into a natural emergent/scrub shrub habitat resembling successional conditions that would allow for natural communities to exist within the converted habitat. Forested areas cleared for substations would be cleared of all vegetation and converted to developed land. Areas cleared for both right-of-way and substations will differ from original forested conditions and create habitat fragmentation, causing potential loss in biodiversity, less protection from developed areas, and a decrease in ecosystem services.

6.5 VISUAL RESOURCES

6.5.1 OVERVIEW

ERM conducted a visual resource assessment to characterize the existing scenic/landscape conditions and understand the potential impact from the installation of Project components along Route 1, inclusive of the five proposed substations, on these conditions. This assessment included the following activities:

- Identification of visually sensitive resources (VSRs) through the review of recent (2023) digital aerial photography;
- Site reconnaissance and local outreach;
- Definition of potential user groups (i.e., groups of people, such as residents or tourists who experience views) within the study area;
- Preparation and review of visual simulations or renderings of the proposed transmission infrastructure from key observation points (KOPs) in the study area; and
- Evaluation of the Project with respect to visual impacts.

Overall, the study area has a commercial/industrial and suburban land use character, with clusters of industrial and commercial uses, residential areas, and parks and open space, as well as related infrastructure (e.g., highways and roads, transmission, and distribution lines) to support these uses. At the time of the assessment, there were multiple sites throughout the study area that had been recently developed or were under construction. The amount of construction (both recent and ongoing) indicates a landscape that is changing, with a general shift in the overall level of development (generally from more rural to more urban). In contrast to the currently developed areas and ongoing construction, landscaped and naturally vegetated areas frame and provide visual interest to the developed elements of the landscape in the study area.

The Project would add transmission line structures along Route 1 in the study area. These would include monopoles, paired 2-pole turning structures, multiple cross arms and insulators on each pole, and overhead lines or conductors. The poles would appear as tall, vertical structures with a wider base and tapered top with smaller, thinner horizontal and diagonal lines created by the cross arms and insulators extending out from the poles (the thinner cross arms and insulators resemble a series of triangles stacked along the upper portion of transmission poles). The upper part of the poles (at the cross arms/insulators) would be connected by conductors, which would appear as long, thin horizontal or diagonal (depending on viewing perspective) lines that start high (at the appropriate level of the pole) and dip toward the ground to a low point at approximately the center point between poles.

Depending on lighting, the Project's metal transmission structures would appear as lighter to darker shades of gray, while the conductors would appear as darker gray to black against the skyline. The general form, lines, and colors of the Project's proposed structures are not uncommon in landscapes with other human modifications (e.g., buildings, travel corridors, distribution and communication poles and lines, signs, and lights), although they do contrast with natural features (e.g., trees and other vegetation, rock formations and exposed soil, rivers and other water bodies). In addition, the height of the monopoles may cause them to be the tallest

structures on the landscape (human-made or natural) and thereby highly visible in the fore-, middle, and background depending on viewing perspectives and existing foreground features (e.g., the presence of trees, buildings, or other structures that limit more distant views).

6.5.2 VISUALLY SENSITIVE RESOURCES

VSRs are defined as areas containing resources with unique scenic qualities or sensitive viewsheds and/or areas where a project's components and any associated vegetation clearing would likely contrast with the surrounding landscape. Common examples of VSRs include designated scenic resources (e.g., scenic byways, rivers, overlooks, and landscapes), residential areas, parks and other recreational sites, historic sites, conservation areas and other open spaces, natural features, cultural destinations, road corridors, and areas of high public concentration. Table 6-17 lists and describes the VSRs identified by ERM along and near Route 1, inclusive of the five proposed substation sites, while Figure 6.5.2 depicts the location of each VSR relative to the Project.

TABLE 6-17 VISUALLY SENSITIVE RESOURCES AND USER GROUPS

VSR #	VSR Name	VSR Description	Impacted User Groups
Scenic Resources			
1	Goose Creek Scenic River	48 miles of Goose Greek in Fauquier and Loudoun County were designated as a Scenic River in 1976. The river is used by recreationalists for boating and fishing and also provides drinking water to Loudoun County. Goose Creek was historically used to transport grain and other goods.	Residents and recreationists (e.g., boaters, anglers, photographers, birdwatchers, and other nature appreciators)
Recreational Resources			
2	W&OD Trail	Former railroad between Shirlington and Purcellville, Virginia, converted to a paved trail for non-motorized use and parallel unpaved trail for horseback riding.	Local residents, recreationists/tourists (e.g., bicyclists, pedestrians, horseback riders)
3	Seldens Landing Elementary School	Loudoun County public elementary school for kindergarten through 5th grade, with associated athletic fields. The school is on the north side of Rt. 7, west of Belmont Ridge Road, accessed from Coton Commons Drive.	Local residents, workers (school employees), and recreationists (e.g., organized sports participants and spectators)
4	Belmont Country Club	Private country club with an 18-hole golf course, tennis courts, fitness center, event space, and other amenities. The country club and associated gated community is accessed via Russell Branch Parkway, south of Rt. 7, or at several intersections along Gloucester Parkway, east of Belmont Ridge Road.	Local residents, workers, recreationists (e.g., golfers, tennis players, swimmers), and tourists
5	Keep Loudoun Beautiful Park	Loudoun County Park on the north side of Golf Club Road with Rt. 7 to the north, Goose Creek to the east, and Tuscarora Creek to the south. Provides picnic areas and water access for boating and fishing.	Local residents and recreationists
Historic Resources			
6	Cooke's Mill (Ruins)	Historic structure at a former mill site along Goose Creek. The access road for this location is along Cochran Mill Road.	Recreationists
7	African American Burial Ground for the Enslaved at Belmont	Historic and active burial ground for formerly enslaved people of Loudoun County area plantations and their	Local residents and tourists

VSR #	VSR Name	VSR Description	Impacted User Groups
		descendants. Accessed via Freedom Trail Road, southeast of the intersection of Rt.7/Rt. 659 (Belmont Ridge Road).	
Road Corridors			
8	Crosstrail Boulevard	Four lane divided road with occasional turning lanes and at-grade intersections.	Local residents, workers, and commuters
9	Cochran Mill Road	Two lane divided road with occasional turning lanes and at-grade intersections. The roadway carries an AADT of 1,000 vehicles where the Project corridor crosses the roadway. North of the Project crossing, the AADT increases to 4,100.	Local residents, workers, and commuters
10	Belmont Ridge Road (Rt. 659)	Four lane divided road with occasional turning lanes and at-grade intersections. The roadway carries an AADT of 8,800 vehicles south of Gloucester Parkway and 9,300 vehicles north of Gloucester Parkway.	Local residents, workers, and commuters
11	Leesburg Pike (Rt. 7)	Six-lane divided highway with a mix of at-grade intersections and grade-separated interchanges. Major thoroughfare for Loudoun County and all of northern Virginia. The roadway carries an AADT of 121,000 vehicles west of Belmont Ridge Road.	Local residents, workers, commuters, and through-travelers
Areas of High Public Concentration			
12	Belmont CDP	Population of 9,888	Residents, workers, commuters, and through-travelers
13	Town of Leesburg	Population of 48,974	Residents, workers, commuters, and through-travelers
14	Lansdowne CDP	Population of 12,840	Residents, workers, and commuters

Sources: U.S. Census Bureau 2023 (population data); VDOT 2023 (AADT data)

AADT = annual average daily traffic; CDP = Census Designated Place; Rt. = Virginia State Route; VSR = visually sensitive resource; W&OD = Washington & Old Dominion

6.5.3 KEY OBSERVATION POINTS

In addition to considering the existing landscape characteristics across broader geographic areas (i.e., VSRs), ERM visual resource specialists also chose eight specific KOPs to document point-specific existing conditions and anticipated changes to these conditions from the Project (Table 6-18). These KOPs are representative of the VSRs and user groups in the study area and were used both to document existing visual conditions and create photographic simulations of what the Project would look like from these locations. Not every VSR has a corresponding KOP; rather, the KOPs represent typical viewpoints in the study area from which Project infrastructure would be visible. Figure 6.5.3 shows the locations and viewing directions the KOPs identified for the Project.

TABLE 6-18 KEY OBSERVATION POINTS

KOP #	Location	Reason for Inclusion	Project Component Represented
1	View looking northeast from a community parking lot off Cochran Mill Road	Example of the proposed right-of-way (with clearing) through a suburban wooded landscape. Affected user groups include local residents, workers, and recreationists. Representative of suburban views along a natural area.	Route 1 Lunar Substation
2	View looking west from Belmont Ridge Road	Example of the proposed right-of-way and substation through a suburban landscape. Affected user groups include local residents, workers, and commuters. Representative of suburban views along a busy state route for both drivers and pedestrians.	Route 1 Lunar Substation
3	View looking east from W&OD Trail and Cochran Mill Road intersection	Example of the proposed right-of-way and planned pump stations within a mixed suburban/industrial area. Affected user groups include recreationists and tourists. Representative of the W&OD Trail VSR.	Route 1
4	View looking northeast from W&OD Trail northwest of Cochran Mill Road	Example of proposed right-of-way and substation within mixed industrial/utility area. Affected user groups include recreationists and tourists. Representative of the W&OD Trail VSR.	Route 1 Twin Creeks Substation
5	View looking east from Cooke's Mill Ruins along the west bank of Goose Creek	Example of proposed right-of-way and substation in a suburban wooded landscape. Affected users are recreationists and tourists. Representative of Cooke's Mill Ruins VSR and Goose Creek Scenic River VSR.	Route 1 Starlight Substation
6	View looking southeast from east bank of Goose Creek	Example of proposed right-of-way and substation in a suburban wooded landscape. Affected users are recreationists and residents. Representative of Goose Creek Scenic River VSR	Route 1 Sycolin Creek Substation

KOP #	Location	Reason for Inclusion	Project Component Represented
7	View looking southeast from west bank of Goose Creek	Example of proposed right-of-way and substation in a suburban wooded landscape. Affected users are recreationists and residents. Representative of Goose Creek Scenic River VSR	Route 1 Sycolin Creek Substation
8	View looking west from Freedom Trail Road and Belmont Ridge Road	Example of proposed substation and right-of-way in a suburban wooded landscape. Affected user groups include local residents, commuters, tourists, and recreationists. Also representative of the African American Burial Ground for the Enslaved at Belmont VSR	Route 1 Lunar Substation

KOP = key observation point; VSR = visually sensitive resource; W&OD = Washington & Old Dominion

Descriptions of the existing visual conditions and the anticipated changes to these conditions are provided below for each KOP. Photographs of existing conditions, as well as visual simulations of the proposed Project infrastructure from each KOP are provided in Appendix F.

6.5.3.1 KOP 1

Existing Conditions

KOP 1 faces northeast from a parking lot for a public park (recreational field and basketball court) along Cochran Mill Road. The existing view from this site is primarily a naturally vegetated area with a mix of deciduous and coniferous trees as well as other ground cover. The vegetation transitions from a maintained lawn around the parking lot perimeter to a buffer area with a mix of ground cover and trees to a more densely forested area parallel to Goose Creek, a designated Virginia Scenic River. Other than the parking lot and maintained lawn areas in the immediate foreground, there is little to no other development visible from this KOP. The primary user group at KOP 1 is recreationists, although area residents or workers in the small neighborhood to the north of this park (Goose Creek Club) could have similar views. These user groups could have a moderate sensitivity to visual changes from this KOP. While recreationists may be more sensitive to new visual intrusions on a landscape, the primary sports-related uses at this park draw views in the opposite direction of the Project. The KOP is representative of static views.

Visual Simulation

Upper portions of the proposed Apollo Substation, transmission structures, and associated conductors would be visible above the treeline bordering Goose Creek from KOP 1 (Appendix F). Viewers at this KOP would see the upper portion of the proposed Apollo Substation structures, the upper portions of the transmission structures, and associated conductors running north/northwest towards the proposed Apollo Substation. This would increase the level of visible development from this site and would contrast with the primarily natural-appearing landscape. Specifically, the proposed monopole structures would add substantially taller vertical lines to the existing landscape and introduce new horizontal lines where most elements are aligned vertically. The

mature trees bordering Goose Creek would screen the fence line and lower portions of buildings at the Lunar Substation. Overall, the addition of the Project would add new industrial features to the landscape resulting in a moderate to high impact on the visual conditions as viewed from KOP 1.

6.5.3.2 KOP 2

Existing Conditions

KOP 2 faces west from a paved pedestrian path on the east side of Belmont Ridge Road, located near the intersection with Freedom Trail Road. The roadway has a linear metal guard rail bordering the west side of the roadway. The roadway slopes downhill to the south (left), and uphill to the north (right) to cross over Rt. 7. Looking towards the roadway at this KOP, dense woodland borders the west side of the roadway as the road slopes downhill. The mature trees on the west side of the roadway are below-grade so only the crowns of the trees are visible, which opens views to the west allowing for further views of rolling hills. User groups at this KOP are likely to have a low to moderate sensitivity to visual change. User groups include viewers in moving vehicles and users of pedestrian paths along the roadway. Viewers in moving vehicles would most likely be focused on the roadway/travelling at higher speeds, and thus would have a lower sensitivity than pedestrians at the KOP, which is primarily representative of dynamic views.

Visual Simulation / Rendering

Due to topography, views of the proposed Lunar Substation, transmission structures, and associated conductors are largely obscured, with only the top of the transmission structures and associated conductors visible to the southwest between the mature trees bordering Belmont Ridge Road to the west, and the Lunar Substation structures visible between the tree crowns to the west. Structures associated with Campus C and the planned Russell Branch Pump Station would be visible between the KOP and the Project features. As a result, the Project would marginally increase the extent of industrial features visible from Belmont Ridge Road, although these facilities would be difficult to distinguish from the planned industrial developments in the area. The addition of the Project would therefore have a negligible to minor impact on the proposed visual conditions of the landscape as viewed from KOP 2.

6.5.3.3 KOP 3

Existing Conditions

KOP 3 faces east from the intersection of the W&OD Trail and Cochran Mill Road. There is a moderate amount of existing development visible from this KOP, including the W&OD Trail, an overhead Dominion transmission line (Line #274) with lattice structures along the northern side of the trail, overhead distribution lines that parallel and cross Cochran Mill Road, and a private materials yard partially screened by a fence and vegetation. Evergreen and deciduous trees, shrubs, and other vegetation partially screen the industrial facilities from users on the W&OD Trail. The height and density of foreground vegetation and structures limit most views from this KOP, although some middleground and background views are possible through the vegetation looking east along the W&OD Trail. The primary user groups at this KOP are trail users, motorists and other travelers along Cochran Mill Road, and workers at the nearby industrial facilities. Given the existing level of development and other infrastructure visible from this KOP, these user groups are

anticipated to have a moderate sensitivity to visual change. The KOP is representative of both dynamic and static views.

Visual Simulation

From this KOP, the proposed Twin Creeks Substation, transmission structures, and associated conductors would be partially visible through the screening vegetation along the northern side of the W&OD Trail, in particular when the deciduous trees have lost their leaves for the season. User groups at this KOP would see the monopole structures (an addition of vertical lines on the landscape) and associated conductors (an addition of horizontal lines above existing trees and buildings), although these new structures are generally compatible with the existing development and infrastructure visible from the KOP. While not visible in the simulation, travelers along Cochran Mill Road would have unobscured views of the proposed transmission line for less than 0.5 mile when traveling north along Cochran Mill Road from this KOP. The industrial uses visible in the simulation would be removed and replaced with structures associated with Campus C (see Section 6.3.5). As a result, Project infrastructure would be viewed in the context of industrial uses. The removal of vegetation and the installation of the proposed transmission line would constitute a moderate degree of change along the western side of Cochran Mill Road; however, the proposed transmission lines would generally be visually consistent with the existing and planned industrial uses along this portion of the road. Overall, the addition of the Project would add structures to the landscape, but this change would have a minor impact on the visual conditions of the landscape as viewed from KOP 3.

6.5.3.4 KOP 4

Existing Conditions

KOP 4 is situated northwest of Cochran Mill Road facing northeast from the W&OD Trail towards Dominion's existing Pleasant View Substation. The existing substation borders the northeast side of the trail and dominates the industrial and commercial views. The substation structures, transmission structures, and associated conductors (Lines #203 and #227) are heavily skylined due to the trail located below the grade of the substation and surrounding area. There is a small, vegetated berm adjacent to the trail that obscures the bases of the nearest existing transmission structures and the lower portions of the Pleasant View Substation structures. The primary user groups at this KOP are trail users and would have a moderate sensitivity to visual changes from this KOP. While recreationists may be more sensitive to new visual intrusions on a landscape, the heavy industrial/utility presence bordering the trail would reduce sensitivity to additional transmission structures. The KOP is representative of static views.

Visual Simulation

From this KOP, the proposed transmission structures and associated conductors are skylined and partially visible to the west of the existing Pleasant View Substation, behind the existing structures for Lines #203 and #227. The proposed Apollo-Twin Creeks Lines structures blend with the existing industrial views, and do not change the existing vegetation in the immediate area. The existing Pleasant View Substation obscures views of the Project, including the proposed Twin Creeks Substation, to the east (although views of Project may be available from adjacent

segments of the W&OD Trail). Overall, the addition of the Project would add structures to the landscape, but this change would have a negligible to minor impact on the visual conditions of the landscape from KOP 4.

6.5.3.5 KOP 5

Existing Conditions

KOP 5 faces east from the west bank of Goose Creek near the Cooke's Mill ruins. The immediate foreground consists of a sandy shoreline, flowing water of Goose Creek, and the branches of several small trees. The eastern shore has some rocks and sandy soil visible at the water's edge and slopes upward to a dense line of shrubs and mature trees. Visibility beyond the far shore of the creek and up the creek bluff is minimal. This KOP is representative of static and dynamic views from tourists or recreationists along the shore or paddling Goose Creek. These user groups would have a moderate to high sensitivity to visual changes from this KOP.

Visual Simulation

No Project features are visible from this KOP due to the existing vegetation screening. Due to the lack of Project visibility, there would be no change on the visual conditions of the landscape by the Project from KOP 5.

6.5.3.6 KOP 6

Existing Conditions

KOP 6 faces southeast from the east bank of Goose Creek, looking uphill towards a residence that is partially obscured by dense vegetation. The slope angles to the south and includes a mixture of dense shrubs and mature trees which quickly transitions to an open grassy lawn. A dense line of mature trees obscures views beyond the grassy lawn. An outbuilding is visible at the eastern edge of the lawn in front of the mature trees and a portion of the main residence is visible at the top of the slope to the west. This KOP is representative of static views from residents or dynamic views for recreationists on the water such as paddlers. These user groups would have a moderate to high sensitivity to visual changes from this KOP.

Visual Simulation

From this KOP, the proposed transmission structures and associated conductors are partially visible and skylined to the east, above the residence (which will be removed prior to the construction of the Apollo-Twin Creeks Lines as part of the planned Campus B) and several of the mature trees. The future Aspen-Golden Lines (if approved by the SCC) would also be visible from this KOP location. Both projects, which are proposed to be collocated and parallel to each other at this location, will introduce industrial components to a predominately natural view. Overall, the addition of the Project would add structures to the landscape, but this change would have a minor impact on the visual conditions from KOP 6.

6.5.3.7 KOP 7

Existing Conditions

KOP 7 faces southeast from the west bank of Goose Creek near the site of the Cooke's Mill Ruins, looking across the creek to the opposite shore. The immediate foreground is dominated by a mature tree with overhanging branches and leaves. A band of rocks and large stones crosses the creek bed to the east bank, creating small riffles in low-water conditions typical of late August. The east bank is vegetated with grasses and shrubs leading up a gentle slope to dense bands of mature trees. A residence on the east bank (the same residence visible from KOP 6), is partially obscured by the mature trees and shrubs at the edge of the grassy slope from the creek bank. This KOP is representative of static views from residents or dynamic views from recreationists on the water. These user groups would have a moderate to high sensitivity to visual changes from this KOP.

Visual Simulation

From this KOP, the proposed transmission structures and associated conductors are partially visible and skylined to the east, above the residence (which will be removed prior to the construction of the Apollo-Twin Creeks Lines as part of the planned Campus B) where there is a break in the treeline. The future Aspen-Golden Lines (if approved by the SCC) would also be visible from this location. Both projects, which are proposed to be collocated and parallel to each other at this location, will introduce industrial components to the predominately natural view. Overall, the addition of the Project would add structures to the landscape, but this change would have a minor impact on the visual conditions from KOP 7.

6.5.3.8 KOP 8

Existing Conditions

KOP 8 faces west from Belmont Ridge Road and Freedom Trail Road, near the entrance to the African American Burial Ground for the Enslaved at Belmont. The road and the grassy slope between Freedom Trail Road and Belmont Ridge Road are in the immediate foreground of the view. A chain link fence and distribution line with poles on the west side of the roadway (running north/south) add horizontal and vertical features to the view. The grassy fill slope along Belmont Ridge Road obscures views beyond the roadway to the west. To the southwest, mature trees obscure views on both sides of Belmont Ridge Road. This KOP is representative of static views from tourists and recreationists. These user groups would have a minor to moderate sensitivity to visual changes from this KOP.

Visual Simulation

From this KOP, the proposed transmission structures and associated conductors between the proposed Lunar and Apollo Substations would be skylined, but minimally visible above the dense woodland and berm along the western side of Belmont Ridge Road. The structures would generally blend in with the existing vertical pattern of the treeline but may stand out at certain times of day due to their color and as well as the visibility of the conductors. The proposed Lunar Substation would be obscured by the dense woodland to the west of Belmont Ridge Road. The future Aspen-Golden Lines (if approved by the SCC) transmission structures and associated conductors cross

Belmont Ridge Road within the view and would be significantly more prominent than (and in front of) the Project's features, which are setback from Belmont Ridge Road and closer to Goose Creek. Overall, the addition of the Project would add structures to the landscape, but this change would have a negligible to minor impact on the visual conditions from KOP 8.

6.5.4 VISUAL IMPACT ASSESSMENT FOR VISUALLY SENSITIVE RESOURCES

The degree to which overhead transmission lines influence and are visible on a landscape depends on a number of factors, including (but not limited to) structure height, existing landscape features (e.g., topography, vegetation, human-made development, etc.), and distances from the viewer. The specific combination of these factors changes from location to location, contributing to a range of potential influences and impacts across the study area. The anticipated impacts from the Project to the visual resource conditions in each VSR are described in Table 6-19. This table also indicates a potential impact rating (major, moderate, minor, or negligible) for each VSR.

TABLE 6-19 SUMMARY OF ANTICIPATED IMPACTS BY VISUALLY SENSITIVE RESOURCE AND KEY OBSERVATION POINT

VSR #	VSR Name	KOP #	Project Location	Description of Impact	Potential Impact Rating/ Visual Sensitivity
Scenic Resources					
1	Goose Creek Scenic River	5, 6, 7	Route 1 crosses the river about 0.2 mile northeast of the point where the W&OD Trail crosses Goose Creek.	Mature trees line both sides of the creek, which would need to be cleared within the right-of-way. The proposed monopole structures would add substantially taller vertical lines to the existing landscape and introduce new horizontal lines where most elements are aligned vertically. The proposed data centers along Goose Creek (Campuses A, B, and C) would open views that do not currently exist, making Project structures (transmission structures, conductors, and substations) visible in the context of the new data center. The simulations from KOPs 5, 6, and 7 do not show the proposed Apollo-Twin Creeks Lines crossing of the river, where visual impacts would be stronger than those depicted.	Impact: Moderate to High Visual sensitivity is moderate to high due to recreational use and the State Scenic River designation.
Recreational Resources					
2	W&OD Trail	3, 4	Route 1 and the proposed Twin Creeks Substation are about 0.2 mile northeast of the trail.	The area contains a mixture of industrial uses and mature forest that will require vegetation clearing. Upper portions of transmission and substation structures and associated conductors would be visible above the treeline from the trail. Construction of Campus A would open views that do not currently exist, making Project structures (transmission structures, conductors, and substations) visible in the context of the new data center.	Impact: Moderate Visual sensitivity is moderate due to the recreational use and historic nature of the trail.

VSR #	VSR Name	KOP #	Project Location	Description of Impact	Potential Impact Rating/ Visual Sensitivity
3	Seldens Landing Elementary School	NA	The proposed Apollo Substation site is about 0.2 mile southwest of the school sports fields, about 200 feet southwest of Rt. 7, and about 0.4 mile west of the Rt. 7/Belmont Ridge Road interchange.	Due to vegetation bordering both sides of Rt. 7, only the upper portions of the substation structures, transmission structures, and associated conductors could be visible above the treeline. The new infrastructure could be viewed in the context of additional industrial development in southern views from the VSR.	Impact: Low to Moderate Visual sensitivity is low due to the typical activities at the site (student drop-off/pick-up; athletic and recreation events; views from the school building).
4	Belmont Country Club	NA	Route 1 runs about 0.2 mile west from the Belmont Country Club residences located east of Belmont Ridge Road. The Project crosses through a landscape that is currently forested but will be converted to future data centers developments (Campus B). The proposed Sycolin Creek Substation site is approximately 1,000 feet southwest of the intersection of Belmont Ridge Road and Goose Glen Lane. The proposed Starlight Substation site is at the northern side of Goose Glen Lane, about 1,000 feet northwest of Belmont Ridge Road.	The Project is on the west side of Belmont Ridge Road, where vegetation clearing has taken place for Campus C, open views in that area. Along Goose Creek, transmission structures and associated conductors could be visible above the treeline. The new transmission infrastructure could be viewed in the context of the new industrial development.	Impact: Low Visual sensitivity is moderate due to the residential use of the area.
5	Keep Loudoun Beautiful Park	NA	The proposed Apollo Substation site is about 1,000 feet southeast of the park's Creekside access on the west side of Goose Creek; about 200 feet south of Rt. 7; and 300 feet east of Goose Creek. The transmission corridor runs north to the proposed Apollo Substation site from the proposed Lunar Substation site.	The Project is on the east side of Goose Creek crossing dense forest that would require clearing. The installation of the proposed Lunar and Apollo substations along with planned industrial developments (data centers and a pump station) would open views of the proposed substations, transmission structures, and associated conductors above the treeline.	Impact: Low to Moderate Visual sensitivity is low to moderate due to the recreational use of the area and the introduction of industrial structures above a natural landscape.

VSR #	VSR Name	KOP #	Project Location	Description of Impact	Potential Impact Rating/ Visual Sensitivity
Historic Resources					
6	Cooke's Mill Ruins	5	The proposed Sycolin Creek Substation site is about 0.2 mile southeast of the ruins and about 0.2 mile northwest of the Belmont Ridge Road/Gloucester Parkway intersection. The proposed Starlight Substation site is about 900 feet east of the ruins and 0.3 mile west of the Belmont Ridge Road/Freedom Trail Road intersection. The proposed Lunar Substation site is about 0.3 mile northeast of the ruins, and 0.3 mile northwest of the Belmont Ridge Road/Freedom Trail Road intersection, about 500 feet north of the proposed Starlight Substation site. Route 1 passes about 0.1 mile west of the ruins about where the route crosses Goose Creek and passes about 0.1 mile east of the ruins where the route crosses Goose Glen Lane.	Mature trees line both sides of the creek along which the ruins are found. The proposed industrial developments (data centers) along Goose Creek could open views that do not currently exist, making the Project potentially visible in the context of the natural landscape. However, KOP 5 shows intervening vegetation and mature trees along both sides of the creek hiding any potential view.	Impact: Minor Visual sensitivity is minor due to vegetation screening.
7	African American Burial Ground for the Enslaved at Belmont	8	Route 1 and the proposed Apollo and Lunar Substation sites are approximately 0.5 mile west of the cemetery, which sits at the southeast corner of Belmont Ridge Road and the on-ramp to Rt. 7. Route 1 runs north-south between the proposed Lunar and Apollo Substation sites, about 300 feet east of Goose Creek. The proposed Apollo Substation site is about 200 feet south of Rt. 7 and 0.4 mile west of the Rt. 7/Belmont Ridge Road interchange. The proposed Lunar Substation site is approximately 0.3 mile to the northwest of the Belmont Ridge Road/Freedom Trail Road	Route 1 would require vegetation clearing for its right-of-way and add additional transmission structures and associated conductors above the landscape to the west of Belmont Ridge Road. The proposed Lunar Substation in addition to planned industrial development (data centers and the Russell Branch Pump Station) would introduce additional industrial features and require vegetation clearing. These changes would not be visible from within the VSR due to topography, but would be partially visible outside the entrance to the VSR (see Appendix G).	Impact: Negligible to Minor Visual sensitivity is negligible to minor due to the historic nature of the site and intervening topography and planned developments.

VSR #	VSR Name	KOP #	Project Location	Description of Impact	Potential Impact Rating/ Visual Sensitivity
			intersection, about 500 feet north of the proposed Starlight Substation site.		
Road Corridors					
8	Crosstrail Boulevard	NA	For Route 1, the proposed cut-in location off existing Line #203 is about 0.3 mile to the northeast of the overpass for Crosstrail Boulevard where it crosses the W&OD Trail.	Dense forest covers the area to the east of existing overhead transmission corridors and a quarry in which additional vegetation clearing would be required for the new right-of-way. The Project would add additional transmission structures and associated conductors to the existing corridor. Route 1 does not cross Crosstrail Boulevard.	Impact: Low Visual sensitivity is low because viewers would predominately be in vehicles traveling along the roadway.
9	Cochran Mill Road	3	Route 1 crosses Cochran Mill Road about 100 feet southwest of the southern intersection of Cochran Mill Road and Durham Court. The proposed Twin Creeks Substation site is on the north side of Cochran Mill Road about 800 feet west of the southern intersection of Cochran Mill Road and Durham Court.	Route 1 would require vegetation clearing through dense forested areas and introduce additional transmission structures and associated conductors to the roadway. The proposed Twin Creeks Substation would add industrial structures and fencing to an already industrial portion of the roadway. Additional industrial projects in the area (data centers) would open views from the VSR. The proposed substation structures, transmission structures, and associated conductors would be viewed in the context of the planned industrial development, including where the Project's conductors cross Cochran Mill Road (not visible from KOP 3).	Impact: Low to Moderate Visual sensitivity is low because viewers would predominately be in vehicles traveling along the roadway.
10	Belmont Ridge Road (Rt. 659)	2	The Sycolin Creek Substation is about 0.2 mile to the northwest of the Belmont Ridge Road/Gloucester Parkway intersection. The proposed Starlight Substation site is about 0.3	Route 1 does not cross Belmont Ridge Road, which has dense forest on both sides of the roadway though some vegetation clearing has occurred near the Rt. 7 intersection.	Impact: Low to Moderate Visual sensitivity is low to moderate because most viewers would be in

VSR #	VSR Name	KOP #	Project Location	Description of Impact	Potential Impact Rating/ Visual Sensitivity
			mile west of Belmont Ridge Road/Freedom Trail Road intersection. The proposed Lunar Substation site is about 0.3 mile northwest of the Belmont Ridge Road/Freedom Trail Road intersection, about 500 feet north of the proposed Starlight Substation site. Route 1 extends northeast for about 1 mile through the substation sites listed above.	Route 1 would require additional vegetation clearing near Goose Creek and introduce new, tall, vertical structures with horizontal conductors. Planned industrial developments (Campuses B and C) in the area would open views that do not currently exist. The transmission structures and associated conductors would be visible above the treeline but would be viewed in the context of the new industrial development.	vehicles traveling along the roadway, although there are wide multi-use paths that parallel both sides of the road for pedestrian traffic.
11	Leesburg Pike (Rt. 7)	NA	The proposed Apollo Substation site is south of Rt. 7, about 0.4 mile west of the Rt. 7/Belmont Ridge Road interchange within a densely forested area on the east side of Goose Creek.	Route 1 does not cross Rt. 7. The proposed Apollo Substation structures, transmission structures, and associated conductors would be partially visible above screening vegetation between the roadway and Project. Additional industrial projects (data centers) would also be visible, increasing human-built views south of the roadway west of Belmont Ridge Road.	Impact: Low Visual sensitivity is low as viewers would predominately be in vehicles traveling along the roadway parallel to the Project.
Areas of High Public Concentration					
12	Belmont CDP	2, 8	The Project crosses dense woodland west of the Belmont CDP. See the Belmont Ridge Road VSR description.	Due to the installation of additional industrial projects (i.e., data centers) that would open views in the area, the Project would be visible on the western side of the CDP above the treeline. Transmission structures and associated conductors installed along Route 1 would be visible above the treeline but would be viewed in the context of the new industrial development.	Impact: Moderate Visual sensitivity is moderate to high due to the high volume of residences.
13	Town of Leesburg	NA	The Project is located near but outside of the town limits.	While the Project is near Leesburg town limits, views of Project	Impact: Negligible

VSR #	VSR Name	KOP #	Project Location	Description of Impact	Potential Impact Rating/ Visual Sensitivity
				infrastructure from within the Town would be unlikely due to intervening topography and vegetation. Therefore, visual impacts would be minimal	Visual sensitivity is moderate due to the high volume of residences north of Rt. 7 and west of Goose Creek.
14	Lansdowne CDP	NA	See the Seldens Landing Elementary School VSR description. Residents bordering the north side of Rt. 7 would potentially have similar views.	Due to vegetation bordering both sides of Rt. 7, only the upper portions of the proposed substation structures, transmission structures, and associated conductors for Route 1 would be visible above the treeline from the VSR. The new transmission infrastructure would be viewed in the context of the additional industrial projects' development.	Impact: Low to Moderate Visual sensitivity is low to moderate due to the residential areas along Rt. 7.

CDP = Census Designated Place; NA = not applicable; Rt. = Virginia State Route; VSR = visually sensitive resource; KOP = key observation point

6.5.5 IMPACT ASSESSMENT CONCLUSION

The western portion of the Project would be highly visible where Route 1 crosses Cochran Mill Road and the proposed Twin Creeks Substation, which is situated on the northside of the roadway. Installation of the transmission infrastructure along Route 1 would introduce structures and associated conductors to the views along that portion of the roadway. The Project would be visually consistent with the existing human-built industrial modifications along Cochran Mill Road, though the prominence of the substation and structures crossing the roadway would dominate views at close range.

The eastern portion of the Project does not border or cross a roadway, but several planned industrial developments (such as the Campuses) would be constructed along the western side of Belmont Ridge Road, thereby opening views towards and the increasing the visibility of the Project. The new transmission infrastructure; however, would be viewed within the context of the ongoing industrial development of the area. The Project would also be viewed within the context of the Company's future Aspen-Golden Lines (if approved by the SCC) as the Project would share a collocated alignment with these lines for much of its route (about 48%).

6.6 CULTURAL RESOURCES

ERM conducted a pre-application analysis (the analysis) of potential impacts on known cultural resources along and near the proposed Project under consideration in accordance with the VDHR's *Guidelines for Assessing Impacts of Proposed Electric Transmission Lines and Associated Facilities on Historic Resources in the Commonwealth of Virginia* (Guidelines) (VDHR 2008). For Route 1, the analysis identified and considered previously recorded resources within the following study tiers as specified in the Guidelines:

- National Historic Landmarks (NHLs) within a 1.5-mile radius of the route centerline;
- NRHP-listed properties, NHLs, battlefields, and historic landscapes within a 1.0-mile radius of the route centerline;
- NRHP-eligible and NRHP-listed properties, NHLs, battlefields, and historic landscapes within a 0.5mile radius of the route centerline; and
- All of the above qualifying resources and archaeological sites within what would be right-of-way for Route 1.

These study tiers additionally encompassed the proposed Twin Creeks, Sycolin Creek, Starlight, Lunar, and Apollo Substation sites, which are along Route 1.

Data on previously recorded cultural resources within each study tier was obtained from the Virginia Cultural Resources Information System (VCRIS). ERM additionally collected information from the Loudoun County Preservation Society (2023), Loudoun County Heritage Commission (2023), Loudoun County Preservation and Conservation Commission (2023), and Loudoun County African-American Historic Architectural Resources Survey (2004) to find locally significant resources within a 1.0-mile radius of Route 1 and the proposed substation sites.

Many of the previously recorded aboveground cultural resources in the vicinity of the route have not been assessed for NRHP eligibility and, therefore, are not included in the analysis per the

Guidelines. These resources should be considered potentially eligible for listing in the NRHP until they are assessed, and a determination of eligibility made by the VDHR. Additionally, there may be unreported historic and archaeological resources that could be affected by construction or operation of the Project. Any such resources would be addressed during an intensive cultural resources survey to be conducted along the route certificated by the SCC in a subsequent phase of investigation to support permitting of the Project.

Along with the records review, ERM conducted field assessments of the considered architectural resources and historic districts for the Project in accordance with the Guidelines. Digital photographs were taken of each architectural resource with views toward the applicable transmission line route and/or other facility. Photo simulations were prepared to assess potential visual effects on the considered resources within the tiered study area. For the previously recorded archaeological sites under consideration, aerial photographs were examined to assess the current land condition and spatial relationship between the sites and any existing or planned transmission lines. The results of these assessments are presented in Sections 6.6.1 and 6.6.2.

As enumerated in more detail below, ERM identified four previously recorded archaeological sites within what would be the Route 1 right-of-way, of which three sites are not eligible for listing in the NRHP and one site has not been evaluated to determine its eligibility for listing in the NRHP. With regard to historic architectural resources, ERM identified six previously recorded sites and/or districts within the study tiers described above. Of these, one is an NHL, one is listed in the NRHP, one is eligible for listing in the NRHP, one is potentially eligible for listing in the NRHP, and two have not been evaluated to determine their eligibility for listing in the NRHP but are considered locally significant for purposes of this report.

6.6.1 ARCHAEOLOGICAL SITES AND FINDINGS

Crossings of archaeological sites were considered a constraint in this study due to the potential for an electric transmission line project to impact archaeological deposits in these areas (e.g., due to transmission structure placement, tree clearing, or heavy equipment usage within a site). The known archaeological sites in what would be the Route 1 right-of-way and associated substation sites are listed and described in Table 6-20. A confident and complete assessment of the integrity of each site would require archaeological field investigations, which as noted, would be completed in a subsequent phase of studies for the Project along the route certificated by the SCC.

Information on the sites that would be impacted by the Project, such as the eligibility of each site for listing in the NRHP and an assessment of each site's condition based on desktop review, are provided in Table 6-20. The sites are described in the subsections below. A confident evaluation of the nature of archaeological deposits at each site and impacts from prior land use activities would require a field survey to verify the desktop analysis. An assessment of potential impacts on the sites is provided below.

TABLE 6-20 ARCHAEOLOGICAL SITES WITHIN THE RIGHT-OF-WAY FOR THE PROJECT

Site Number	Description	NRHP Status
44LD1999	Single dwelling (Reconstruction and Growth, World War I to World War II)	Not Eligible
44LD2001	Temporary camp (Pre-Contact) and artifact scatter (Early National Period, Antebellum Period, Civil War, Reconstruction and Growth, World War I to World War II, The New Dominion, Post Cold War)	Not Eligible
44LD2002	Temporary camp (Pre-Contact)	Not Eligible
44LD2012	Artifact scatter (The New Dominion, Post Cold War)	Unevaluated

NRHP = National Register of Historic Places

6.6.1.1 IMPACT ASSESSMENT

Site 44LD1999 is a domestic artifact scatter associated with a single dwelling dating from the Reconstruction and Growth to World War II periods. The site was identified in 2022 by Thunderbird Archeology, a division of Wetland Studies and Solutions, Inc., during a Phase I survey. Based on the results of the survey, the site was determined not eligible for listing in the NRHP. The current site setting appears to be undisturbed, based on a review of recent aerial photographs.

Site 44LD2001 is a multicomponent site consisting of a Pre-Contact temporary encampment and a historic artifact scatter from an undetermined cultural period. The site was identified in 2022 by Thunderbird Archeology. Portions of the site have been disturbed by historic-era plowing, likely affecting the site's integrity. The site was determined not eligible for listing in the NRHP as a result Thunderbird Archeology's survey.

Site 44LD2002 is interpreted as small lithic scatter representing a short-term temporary camp during an unknown period prior to European contact. The site was originally identified in a 2022 during a Phase I survey conducted by Thunderbird Archeology. As a result of the survey, the site was assessed as not eligible for listing on the NRHP. The current site setting appears to be undisturbed, based on a review of recent aerial photographs.

Site 44LD2012 consists of a historic artifact scatter dating from the Post Cold War to the New Dominion cultural periods. The site is interpreted as a refuse area associated with a nearby mid-twentieth century dwelling. In their 2022 survey, Thunderbird Archeology determined that up to a quarter of the site had been destroyed, though the site was not evaluated to determine its eligibility for listing in the NRHP. Based on the nature of the site and amount of disturbance that has occurred due to development, it is unlikely that intact cultural components are present.

6.6.2 ABOVEGROUND HISTORIC RESOURCES AND FINDINGS

Installation of transmission infrastructure along Route 1, inclusive of the proposed substations, has the potential to affect several historic architectural sites and districts. This section of the report presents information on known aboveground cultural resources in the vicinity of Route 1 using the VDHR's tiered study area model described above. The locations of resources relevant to the route are depicted on Figure 6.6.1. Individual descriptions of the resources are provided in ERM's analysis, which is attached as Appendix G. A summary of the number of resources that would be impacted and the degree of impact on these resources for the Project is presented in Table 6-21. Based on desktop analysis and visual simulations prepared, Route 1 passes near six historic resources meeting the VDHR criteria for inclusion in the study.

TABLE 6-21 ABOVEGROUND HISTORIC RESOURCES IN VDHR TIERS FOR THE PROJECT

Buffer (mile)	Resource Category	Resource Number	Description	Impact
1.0 to 1.5	National Historic Landmark	253-5182 [5]	Ball's Bluff Battlefield & National Cemetery Historic District Boundary Increase	None
0.5 to 1.0	National Register Properties (Listed)	053-0106 [2, 3, 4, 5]	Belmont Manor	None
	Battlefields (Potentially Eligible)	053-5058 [5]	Ball's Bluff Battlefield	None
0.0 to 0.5	Locally Significant	053-0336 [2, 3, 4]	Cooke's Mill	Minimal
		053-6238 [2, 3, 4, 5]	African American Burial Ground for the Enslaved at Belmont	Minimal
	National Register – Eligible	053-0276 [1, 2]	Washington and Old Dominion Railroad Historic District	Minimal
0.0 (Within ROW)	National Register – Eligible	-	-	-

[1] Resource is within the designated tiers for the proposed Twin Creeks Substation
[2] Resource is within the designated tiers for the proposed Sycolin Creek Substation
[3] Resource is within the designated tiers for the proposed Starlight Substation
[4] Resource is within the designated tiers for the proposed Lunar Substation
[5] Resource is within the designated tiers for the proposed Apollo Substation
ROW= right-of-way

6.6.2.1 IMPACT ASSESSMENT

Information on the six resources meeting the VDHR criteria for inclusion in the study is provided in Table 6-21. ERM conducted a field reconnaissance at each of these resources to assess conditions and take photographs to support the preparation of simulations to assist with the

impact assessment. Based on our study, we conclude that construction and operation of the proposed transmission infrastructure along this route would have no impact on three resources (053-0106, 053-5058, and 253-5182) and a minimal impact on three resources (053-0276, 053-0336, and 053-6238).

There would be no visibility of Project infrastructure along Route 1 due to intervening vegetation, infrastructure, and distance from the following resources:

- Belmont Manor (053-0106), which lies about 0.8 mile east of Route 1, 0.8 mile to the southeast of the proposed Starlight Substation, 0.9 mile to the east of the proposed Sycolin Substation, 1.0 mile to the southeast of the proposed Lunar Substation, and 1.0 mile to the southeast of the proposed Apollo Substation.
- Ball's Bluff Battlefield (053-5058), which lies about 0.9 mile north of Route 1 and the proposed Apollo Substation.
- Ball's Bluff Battlefield & National Cemetery Historic District Boundary Increase (253-5182), which lies about 1.4 miles north-northeast of Route 1 and the proposed Apollo Substation.

Consequently, construction and operation of the Apollo-Twin Creeks Lines along Route 1 would have no impact on these resources.

The Washington and Old Dominion Railroad Historic District (053-0276) is approximately 0.2 mile to the southwest of Route 1 at the Goose Creek crossing, about 0.2 mile southwest of the proposed Twin Creeks Substation, and about 0.3 mile to the southwest of the proposed Sycolin Creek Substation. The surrounding area is wooded and contains existing Dominion substations and transmission Lines #203/#2098. The district itself shares a right-of-way with Dominion's existing Line #227/274. Only four transmission structures associated with Route 1 would be minimally visible where the route connects to Dominion's existing Line #203/2098, but the Project would not be visible from other vantage points.

It is important to note that Dominion's existing lines are already a conspicuous element in the district's viewshed, as they share the district's right-of-way. In addition, multiple existing Dominion substations are visible and directly adjacent to the district. Although the district's historic landscape has been severely altered by comparable infrastructure, because the installation of transmission infrastructure along Route 1 would be visible, it constitutes a change. Thus, ERM recommends that Route 1 would have a Minimal Impact on 053-0276.

In addition to the Apollo-Twin Creeks Project, the Company's future Aspen-Golden Lines will be located adjacent to the Apollo-Twin Creeks Lines in this area, and once built, also would be minimally visible from various locations in the district when looking to the west. The impact from the Aspen-Golden Project is discussed in a separate report (Derrick et al. 2024), but in terms of its relevance for assessing impacts from the Apollo-Twin Creeks Project, the Aspen-Golden Project would not alter the viewshed of 053-0276 in a way that would increase the visibility of Route 1.

Cooke's Mill (053-0336) is approximately 0.07 mile northwest of Route 1 along Goose Creek, 0.12 mile west of the proposed Starlight Substation, 0.12 mile north of the proposed Sycolin Creek Substation, 0.31 mile southwest of the proposed Lunar Substation, and 0.60 mile southeast of the

proposed Twin Creeks Substation. The area between the resource and Route 1 includes one residential property surrounded by dense vegetation consisting of mature trees.

Only one transmission line structure and associated conductors from Route 1 would be visible from the eastern portion of 053-0336 through a clearing in the trees. All other areas of the resource would have no visibility towards the route due to intervening vegetation. Because discrete locations within the resource would have limited views towards Route 1, installation of the transmission line would add modern elements to the historic viewshed. Thus, ERM recommends there would be a Minimal Impact to the resource from Route 1. The Company's future Aspen-Golden Lines, once built, would also be minimally visible from the eastern portion of Cooke's Mill. Three of the future Aspen-Golden Lines transmission structures and associated conductors would be visible from the site.

The African American Burial Ground for the Enslaved at Belmont (053-6238) is approximately 0.46 mile east of Route 1 (east of Belmont Ridge Road and south of Rt. 7), 0.44 mile southeast of the proposed Apollo Substation, 0.44 mile east of the proposed Lunar Substation, 0.48 mile northeast of the proposed Starlight Substation, and 0.79 mile northeast of the proposed Sycolin Creek Substation. No transmission structures would be visible from inside of the resource boundary due to dense vegetation. All other areas within the cemetery trail and inside the forested area containing the cemetery would have no view of Route 1. Only the tip of one transmission structure would be visible from the entrance of the cemetery (about 235 feet outside of the VDHR boundary) where it is closest to the route. One area on Freedom Trail Road (about 100 feet outside of the VDHR boundary) would have an unobstructed sight line to the Company's future Aspen-Golden Project due to its location outside of the historic forested area. However, the proposed Starlight Substation and the tips of two of the Route 1's structures would be visible from this location as well. The proposed Starlight Substation would appear in the distance.

Views from outside of the resource boundary, which would include new transmission infrastructure, would quickly be screened upon entering the wooded interior of the resource. The area surrounding the resource has already lost its historic feeling as a result of the construction of divided highways to the north and west. The transmission line would constitute one more element of modern infrastructure within an altered landscape. The future Aspen-Golden Project, discussed in a separate report (Derrick et al 2024), would also be more prominent in the landscape. Although the historic section of the cemetery would have no view to the route, the cemetery entrance and areas outside of its tree line would have some visibility Route 1 and proposed substation. Thus, ERM recommends that there would be a Minimal Impact on this resource from Route 1 and the proposed Starlight Substation.

6.6.3 SUMMARY OF EXISTING DATA COLLECTED UNDER SECTION 106 OR 110 OF THE NATIONAL HISTORIC PRESERVATION ACT

Portions of Route 1 and the Sycolin Creek, Starlight, Lunar, and Apollo Substations have been previously surveyed for cultural resources. Eight previous cultural resource surveys intersect parts of the proposed Project. Information on these previous surveys—including VDHR survey number, report title, report authors, and report date—is provided in Table 6-22. The extent of the previous survey coverage is depicted in Attachment 2 within the analysis (Appendix G).

TABLE 6-22 CULTURAL RESOURCE SURVEYS COVERING PORTIONS OF THE PROJECT

VDHR Survey #	Title	Author(s)	Date
LD-065	Phase I Archaeological Survey of the Proposed Loudoun County Power Plant, Leesburg, Virginia	Jill Chappell	1991
LD-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	Douglas C. McLearen, Kimberly S. Zawacki, Matthew R. Laird, James G. Harrison III	1999
LD-140	Historical and Archaeological Survey of the Lansdowne Tract, Loudoun County, Virginia	Eugene M. Scheel	1991
LD-199	Archaeological Survey of Route 659, Belmont Ridge Road Improvements, Loudoun County, Virginia	Barbara Shaffer, Lily Richards, Richard White, Brenda Carr-Weller	2007
LD-290	Phase I Archeological Investigations of the Loudoun Water Proposed Pump Station and Water Transmission Line, Loudoun County, Virginia	Kimberly Snyder, David Carroll	2010
LD-320	Cultural Resources Survey of the Proposed Routes 7 and 659 Project, Loudoun County, Virginia	Elizabeth Monroe, Meg Malvasi	2010
LD-416	Phase IA and I Archeological Investigations of the +/- 106.56 Acre Goose Creek Golf Course Property, Loudoun County, Virginia	John Mullen, Edward Johnson, Kristen Deily	2008
LD-614	Phase I Cultural Resources Investigation, 19509 Belmont Ridge Road, Loudoun County, Virginia	David Carroll, Elizabeth Johnson, Daniel Baicy	2022

VDHR = Virginia Department of Historical Resources

6.7 ENVIRONMENTAL JUSTICE

The purpose of conducting an environmental justice (EJ) desktop review is to determine if construction or operation of the Apollo-Twin Creeks Lines and the Twin Creeks, Sycolin Creek, Starlight, Lunar, and Apollo Substations could result in disproportionate and adverse environmental impacts on populations of color (inclusive of linguistically isolated communities) or low-income populations (collectively, EJ populations). This review is consistent with federal and state guidance and statutes and aligns with Dominion's Environmental Justice Policy.

According to USEPA guidance (USEPA 2016a), EJ analyses must address disproportionately high or adverse impacts on EJ populations in the following circumstances:

When populations of color (i.e., those which are non-white or white with Hispanic ethnicity) represent over 50 percent of the population of an affected area; or

When either the percentage of populations of color or the percentage low-income populations in an affected area are "meaningfully greater" than the corresponding percentages in a "reference population".

Low-income populations are those that fall within the annual statistical poverty thresholds from the U.S. Bureau of the Census, Population Reports, Series P-60 on Income and Poverty (USEPA 2016b). Reference populations are defined as the population of a larger area in which the affected population resides (e.g., a county, state, or region depending on the geographic extent of the analysis area).

The Commonwealth of Virginia's General Assembly adopted the Virginia Environmental Justice Act (VEJA) in July 2021 (Va. Code § 2.2-234 through 2.2-235). The VEJA defines "Environmental Justice" and "Environmental Justice Community" as follows (Va. Code § 2.2-234):

"Environmental Justice" means the fair treatment and meaningful involvement of every person, regardless of race, color, national origin, income, faith, or disability, regarding the development, implementation, or enforcement of any environmental law, regulation, or policy. For purposes of this definition:

- "Fair treatment" means the equitable consideration of all people whereby no group of people bears a disproportionate share of any negative environmental consequence resulting from an industrial, governmental, or commercial operation, program, or policy.
- "Meaningful involvement" means that (i) affected and vulnerable community residents have access and opportunities to participate in the full cycle of the decision-making process about a proposed activity that will affect their environment or health, and (ii) decision makers will seek out and consider such participation, allowing the views and perspectives of community residents to shape and influence the decision.

"Environmental Justice Community" means any low-income community, population of color, or community of color. For purposes of this definition:

- "Low-income community" means any census block group (CBG) in which 30 percent or more of the population is composed of people with low income.

- “Population of color" means a population of individuals who identify as belonging to one or more of the following groups: “Black, African American, Asian, Pacific Islander, Native American, other non-white race, mixed race, Hispanic, Latino, or linguistically isolated”.
- "Community of color" means any geographically distinct area where the population of color, expressed as a percentage of the total population of such area, is higher than the population of color in the Commonwealth expressed as a percentage of the total population of the Commonwealth. If a community of color is composed primarily of one of the groups listed in the definition of "population of color", however, the percentage population of that group in the Commonwealth is used instead of the percentage population of color.

ERM used the CBG as the primary geographic unit for the EJ analysis because it is the smallest area for which U.S. Census Bureau demographic data is available, providing information at a sub-county level. Demographic and socioeconomic data for CBGs within 1-mile of Route 1 or the substation sites (defined here as the analysis area) are depicted on Figure 6.7.1.

While the Commonwealth of Virginia is the reference population for this analysis, data for Loudoun County was also considered in the review to assess regional demographic variations. Demographic data for the Commonwealth were compared with individual CBGs to help identify the presence of potential EJ populations. For example, CBGs where the population of color exceeds the percentage of population of color in Virginia as a whole (40 percent) were identified as potential EJ populations. The most current U.S. Census Bureau American Community Survey, 5 Year Estimates (2018-2022) were used to collect demographic data for the Commonwealth, Loudoun County, and CBGs within the study area (U.S. Census Bureau 2022a, 2022b, 2022c, 2022d, 2022e).

The USEPA’s definition of a population of color is analogous to Virginia’s definition (provided above) but does not include populations with language barriers. However, the U.S. Census Bureau American Community Survey has a separate table for limited English-speaking households in which all members over age 14 speak a language other than English and also speak English less than very well.

Virginia’s criteria for an identified “population of color” and what constitutes an EJ population have a lower threshold and are more inclusive than that suggested in federal guidance. Therefore, the Commonwealth’s criteria are used to identify CBGs that contain populations of color for this study. The same approach is used to identify limited English speakers, which is included in the state’s definition for a population of color, although considered separately in federal guidance.

Federal guidelines recommend using an appropriate poverty threshold and comparing the analysis area with a reference population to identify low-income populations. Virginia defines a “low-income community” 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” (Va. Code § 2.2-234). For this review, a low-income community is considered present when the low-income population percentage in the CBG exceeds 30 percent.

This EJ analysis also assesses the potential for other socioeconomic indicators to identify areas that may have higher environmental burdens and vulnerable populations when considered in combination with demographic and socioeconomic information meeting the EJ criteria and definition under the VEJA. These other indicators include education attainment (the percent of people over age 25 in a CBG with less than a high school education) and age-based vulnerabilities (i.e., the percent of people in a CBG under age 5 or over age 64). There is no equivalent VEJA definition for these groups, so age-based communities (or education-vulnerable communities) are identified using the federal guidance of a meaningfully greater threshold. A CBG is considered to contain a potential age-based vulnerable community (or community with low education attainment) when the percentage of the population either below age 5 or above age 64 (or with less than a high school education) exceeds twice the corresponding state averages.

6.7.1 ENVIRONMENTAL JUSTICE DESKTOP RESULTS

Sixteen CBGs are within 1 mile of Route 1, inclusive of the five proposed substations. Each of these 16 CBGs contain populations of color including one that also meets the low-income population threshold. None of the CBGs contain populations under age 5, over age 64, or with less than high school education exceed the meaningful thresholds (Table 6-23, Figure 6.7.1 in Appendix A).

6.7.1.1 LOW-INCOME POPULATIONS

No CBGs with low-income populations are crossed by Route 1.

6.7.1.2 POPULATIONS OF COLOR

Two CBGs with populations of color are crossed by Route 1.

6.7.1.3 OTHER SENSITIVE POPULATIONS

There are no CBGs with populations under age 5, over age 64, or with less than a high school education crossed by Route 1.

TABLE 6-23 DEMOGRAPHIC AND SOCIOECONOMIC INDICATORS IN THE 1-MILE ENVIRONMETAL JUSTICE ANALYSIS AREA

State/County Census Block Group (Census Tract, Block Group)	Population	Total Populations of Color (%) [a]	White, non-Hispanic (%)	Black or African American (%)	American Indian and Alaska Native (%)	Asian (%)	Pacific Islander (%)	Some Other Race Alone (%)	Two or More Races (%)	Hispanic or Latino (%)	Low-Income Population [b] (%)	Limited English Speaking Household [c] (%)	Population with Less than High School Education [d] (%)	Population Under Age 5 [e] (%)	Population Over Age 64 e (%)
VIRGINIA	8,624,511	40	60	19	0.1	7	0.1	0.5	4	10	24	3	9	6	16
Loudoun County	420,773	53	53	7	0.2	21	<0.1	1	4	14	9	4	6	7	10
511076105062 (CT 6105.06, BG 2)	1,892	61	39	9	<0.1	27	<0.1	<0.1	1	23	11	<0.1	8	6	6
511076105063 (CT 6105.06, BG 3)	967	32	68	9	1	9	<0.1	<0.1	3	11	23	<0.1	3	1	3
511076105073 (CT 6105.07, BG 3)	1,798	28	72	5	<0.1	11	<0.1	<0.1	<0.1	11	6	<0.1	2	1	9
511076105074 (CT 6105.07, BG 4)	1,490	40	60	11	<0.1	24	<0.1	<0.1	2	2	11	<0.1	5	6	8
511076106041 (CT 6106.04, BG 1)	1,287	32	68	4	<0.1	12	<0.1	<0.1	2	14	7	<0.1	<0.1	9	9
511076106043 (CT 6106.04, BG 3)	1,361	16	84	1	<0.1	1	<0.1	<0.1	4	9	2	4	<0.1	3	1
511076106044 (CT 6106.04, BG 4)	1,913	46	54	20	<0.1	3	<0.1	<0.1	9	14	3	<0.1	7	1	7
511076110041 (CT 6110.04, BG 1)	4,752	49	51	12	<0.1	21	<0.1	1	8	7	7	1	4	6	3
511076110042 (CT 6110.04, BG 2)	1,163	32	68	1	<0.1	22	<0.1	<0.1	6	3	1	3	0	3	10
511076110091 (CT 6110.09, BG 1)	1,932	36	64	4	<0.1	19	<0.1	<0.1	<0.1	12	1	<0.1	2	4	8
511076110092 (CT 6110.09, BG 2)	2,001	27	73	4	1	9	<0.1	<0.1	5	8	9	3	2	4	4
511076110093	1,737	44	56	11	<0.1	19	<0.1	2	3	9	3	<0.1	2	2	11

State/County Census Block Group (Census Tract, Block Group)	Population	Total Populations of Color (%) [a]	White, non-Hispanic (%)	Black or African American (%)	American Indian and Alaska Native (%)	Asian (%)	Pacific Islander (%)	Some Other Race Alone (%)	Two or More Races (%)	Hispanic or Latino (%)	Low-Income Population [b] (%)	Limited English Speaking Household [c] (%)	Population with Less than High School Education [d] (%)	Population Under Age 5 [e] (%)	Population Over Age 64 e (%)
(CT 6110.09, BG 3)															
511076110111 (CT 6110.11, BG 1)	2,570	40	60	7	<0.1	20	<0.1	<0.1	5	8	5	1	2	6	4
511076110112 (CT 6110.11, BG 2)	1,207	41	59	24	<0.1	3	<0.1	<0.1	1	13	33	12	4	12	4
511076110121 (CT 6110.12, BG 1)	1,702	61	39	0	<0.1	50	<0.1	<0.1	7	3	8	8	4	4	2
511076110122 (CT 6110.12, BG 2)	2,876	33	67	2	<0.1	15	<0.1	<0.1	3	12	5	<0.1	2	7	11

Source: U.S. Census Bureau (2022). American Community Survey, 5 Year Estimates (2018-2022), Tables B03002, C17002, C16002, B15002, B01001.

[a] U.S. Census Bureau American Community Survey 5 Year Estimates (2018-2022), Table B03002.

[b] U.S. Census Bureau American Community Survey 5 Year Estimates (2018-2022), Table C17002.

[c] U.S. Census Bureau American Community Survey 5 Year Estimates (2018-2022), Table C16002.

[d] U.S. Census Bureau American Community Survey 5 Year Estimates (2018-2022), Table B15002.

[e] U.S. Census Bureau American Community Survey 5 Year Estimates (2018-2022), Table B01001.

Bold font indicates a CBG crossed by the Project.

Gray shaded cells include reference population.

Blue shaded cells indicate populations of color, including communities of color composed primarily of one of the groups listed in the VEJA definition of "population of color" or the analysis area has a greater percentage of a community of color than the state as a whole.

Green shaded cells indicate low-income populations.

Yellow shaded cells indicate populations with limited English-speaking households.

6.7.2 ENVIRONMENTAL JUSTICE ASSESSMENT

The EJ desktop review analysis area (i.e., the area within 1 mile of Route 1) is broad, extending beyond the areas where Project impacts on EJ populations are anticipated. The desktop review results suggest that construction and operation of the Project transmission line and substations could potentially affect EJ communities in the 1-mile analysis area, which includes 16 CBGs.

Based on the EJ criteria thresholds for race, ethnicity, and income identified in Section 6.7, potential EJ communities were identified in all of the CBGs within the analysis area, two of which are crossed by Route 1 (511076105063 and 511076110121). Fifteen CBGs contain populations of color and one of these contains both a low-income population and a population of color (including residents with language barriers). None of the CBGs exceed the age or educational thresholds for EJ communities.

CBG 511076110121, which is crossed by Route 1, contains populations of color. The nearest existing residence to Route 1 in this CBG is within 250 feet of the alignment east of Goose Creek. The Company did not identify any residences that would have to be demolished or relocated to construct the proposed Project along Route 1. It is the Company's understanding that there are several buildings on Customer B's properties (which are within CBG 511076110121) that the Customer will address prior to construction of the Project.

Route 1 also crosses CBG 511076105063, which contains populations of color; however, the nearest residential community within this CBG is about 0.2 mile west of Route 1.

As part of the regulatory review process, Dominion will complete an evaluation of potential environmental, cultural, and historical impacts of the Project. Dominion will continue to engage with local and state agencies to complete these evaluations and mitigate any impacts from construction. In addition, Dominion will obtain all required environmental permits and comply with applicable permit conditions. Dominion anticipates that environmental impacts generally will be mitigated through design and construction best practices.

In assessing whether a community would bear a disproportionate impact of the Project, ERM considered temporary construction impacts, visual impacts, property devaluation, and health impacts related to electric and magnetic fields as discussed in the sections below.

6.7.2.1 CONSTRUCTION ACTIVITIES

Impacts associated with Project construction are considered temporary, lasting less than a year. Construction activity and crews would be present at a particular location during daytime hours for a few to several days at a time, but on multiple occasions throughout the construction period between initial right-of-way clearing and final restoration.

Various regulations, industry standards, and construction best management practices (BMPs) would guide construction and restoration of the right-of-way. The short-term impacts associated with construction may include equipment noise, dust, potential changes in traffic patterns, and general ground disturbance.

Noise is generally defined as unwanted sound. The primary noise receptors in the study area would be commercial and industrial properties and scattered residences. During construction,

temporary, localized noise from heavy equipment and increased vehicle traffic is expected to occur during daytime hours. Exceedances of daytime noise limits are not expected; if they occur, the exceedances would be temporary.

During construction, Dominion would minimize ground-disturbing activities to the extent practicable. Following construction, Dominion would remove construction-related equipment and debris from the right-of-way and restore the land within the right-of-way as closely as possible to preconstruction conditions (other than maintaining the right-of-way with an herbaceous cover).

6.7.2.2 VISUAL IMPACTS

The Company used the routing process as a tool for minimizing visual impacts by identifying route alternatives that are most harmonious with the landscape. Mitigation measures include avoiding unique viewsheds, placing structures to take advantage of natural screening (e.g., tall trees), and avoiding the placement of structures directly in front of residences. ERM used the Company's future Aspen-Golden Lines as a routing opportunity to limit the number of new transmission corridors crossing the area, which is developing.

ERM evaluated existing visual conditions by identifying visually sensitive areas, describing the landscape and viewer types (e.g., local residents, recreational users, workers, and motorists), identifying eight KOPs (see Section 6.5.3), and preparing photo simulations to represent landscapes, sensitive areas, and viewer types.

Route 1 crosses CBG 511076110121, which contains populations of color. The majority of residential communities within this CBG are approximately 0.3 mile east of the Project on the east side of Belmont Ridge Road. However, in this CBG, there is one residence in the viewshed of Route 1 located approximately 145 feet northeast of the route east of the Goose Creek crossing and near the proposed Sycolin Creek Substation. The residence is located on a property zoned industrial for a self-storage business, which operates adjacent to Belmont Ridge Road. An in-person meeting was held with the residential property owner in July 2023 to discuss the Project and solicit feedback. At that time, no concerns were raised by the landowner regarding visual impacts. The residence was included in the invitations sent for Project open houses, but no additional feedback from the landowner was provided.

Route 1 also crosses CBG 511076105063, which contains populations of color. The nearest residential community in this CBG, Goose Creek Club, is about 0.2 mile west of Route 1 and the proposed Lunar and Apollo Substation sites. As discussed in Section 6.5.3, portions of the Project would be visible to this residential community; however, the addition of the Project would add new industrial features to the landscape with other planned industrial development (Campus C).

6.7.2.3 PROPERTY VALUES

Affected communities and landowners often express concern that the presence of transmission lines in the viewshed of homes could adversely affect aesthetics, resulting in the reduction of property values and deterring potential buyers. Indirect impacts on property values caused by direct visual impacts from 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 primarily are affected by factors unrelated to the presence of a transmission line. Other factors have been shown through research to have greater influence on the value of residential property than the presence of a transmission line, such as location, type, and condition of improvements to the property; neighborhood; and local real estate market conditions (Jackson and Pitts 2010; Anderson et al. 2017). There is one residence within 500 feet of Route 1 as the route primarily crosses commercial/industrial areas and open and wooded areas planned for several data center campuses.

6.7.2.4 HEALTH IMPACTS

The conclusions of multidisciplinary scientific review panels assembled by national and international scientific agencies during the past three decades are the foundation of Dominion's opinion that no adverse health impacts are anticipated to result from the operation of the transmission infrastructure. The general scientific consensus of agencies that have reviewed this research, relying on generally accepted scientific methods, is that common sources of electromagnetic fields (EMFs) in the environment, including from transmission lines and other parts of the electric system, appliances, etc., are not a cause of any adverse health impacts.

Research on EMF and human health varies widely in approach. Some studies evaluate the impacts of high, short-term EMF exposures not typically found in people's day-to-day lives on biological responses, while others evaluate the impacts of common, lower EMF exposures found throughout communities. Studies also have evaluated the possibility of impacts (e.g., cancer, neurodegenerative diseases, and reproductive impacts) of long-term exposure. Altogether, this research includes well over 100 epidemiologic studies of people in their natural environment, and many more laboratory studies of animals (in vivo) and isolated cells and tissues (in vitro). Standard scientific procedures, such as weight-of-evidence methods, were used by the expert panels assembled by agencies to identify, review, and summarize the results of this large and diverse research.

The reviews of EMF-related biological and health research have been conducted by numerous scientific and health agencies, including, for example, the European Health Risk Assessment Network on Electromagnetic Fields Exposure, the International Commission on Non-Ionizing Radiation Protection, the World Health Organization, the Institute of Electrical and Electronics Engineers International Committee on Electromagnetic Safety, the Scientific Committee on Emerging and Newly Identified Health Risks of the European Commission, and the Swedish Radiation Safety Authority (formerly the Swedish Radiation Protection Authority; WHO 2007; SCENIHR 2009, 2015; ICNIRP 2010; SSM 2015, 2016, 2018, 2019, 2020, 2021, 2022; ICES 2019). The general scientific consensus of the agencies that have reviewed this research, relying on generally accepted scientific methods, is that the scientific evidence does not confirm that common sources of EMF in the environment, including transmission lines and other parts of the electric system, appliances, etc., are a cause of any adverse health impacts.

The route was designed to be as far from dwellings and other sensitive receptors as possible within EJ communities. The desktop review suggests that EJ populations within 1 mile of the

routes would not bear disproportionate impacts associated with construction, property values, visual, and health--related impacts of the Project.

6.8 GEOLOGICAL RESOURCES

The study area is within the Piedmont geologic province, which lies between the mountainous Blue Ridge province to the west and the terraced slopes of the Coastal Plain province to the east. The Piedmont province is characterized by rolling topography, thick soils, and heavily weathered bedrock primarily caused by the region's humid climate. The geologic terranes of the province are relatively complex where many of the rock units are separated by faults and contain various igneous and metamorphic histories. Based on review of the Geologic Map of Virginia, the Project is within a Mesozoic basin situated between the Blue Ridge and Western Piedmont-Potomac Terranes (William and Mary Department of Geology 2024). The entirety of Route 1, inclusive of the proposed substation sites, crosses through Jurassic-age intrusive igneous mafic bedrock (diabase) (William and Mary Department of Geology 2022; USGS 2005).

6.8.1 MINERAL RESOURCES

ERM reviewed publicly available Virginia Energy datasets (2024), USGS topographic quadrangles, and recent (2023) digital aerial photographs to identify mineral resources in the study area. There are two active mineral resource sites within approximately 0.25 mile of Route 1, inclusive of the five proposed substation sites. The closest active permitted mining site, the Goose Creek Plant site, is on Cochran Mill Road adjacent to the Route 1 centerline at the road crossing. The closest inactive mineral occurrence is a diabase prospect belonging to Quarry A (Milestone Reservoir), an abandoned quarry approximately 100 feet southwest of the Route 1 centerline, east of the Goose Creek crossing. According to Loudoun Water, adjacent to this quarry is an area commonly referred to as the Goose Creek Dike which contains a zone of potential embankment with slope stability issues.. This zone received a factor of safety (FS) rating below the USACE's Levee Design requirement for long-term stability of 1.5 (Arcadis 2022). Route 1 intentionally bypasses Goose Creek Dike and places structures near the tops of the bluffs on either side of Goose Creek.

6.8.1.1 IMPACT ASSESSMENT

As noted above, ERM identified two active mineral resource sites within approximately 0.25 mile of Route 1. The Goose Creek Plant and the Leesburg Plant sites are approximately 300 feet north and 0.25 mile south of Route 1, respectively. Construction and operation of the Project would not impact site operations at these plants.

A potential zone of embankment with slope stability concerns is located approximately 100 feet south of the closest Route 1 structure on the east side of Goose Creek. Due to the distance of this structure from Route 1, Dominion engineering concluded that construction and operation of the new transmission lines would not likely impact or be impacted by this zone of embankment. By placing structures at high points, Dominion engineering found that the conductors can safely span over Goose Creek and the adjacent steep banks. The Company will continue to coordinate with Loudoun Water, which operates Goose Creek Dike, regarding the embankment, and work with Loudoun Water on a plan to minimize clearing within the right-of-way near the dike in the segment of Route 1 spanning Goose Creek to avoid exacerbating slope stability issues.

7. CONCLUSION

As discussed in Section 4, ERM developed four potential corridors for routing the Apollo-Twin Creeks Lines: the Aspen-Golden Lines, Belmont Ridge Road, W&OD Trail, and Crosstrail Boulevard Corridors. Each corridor was investigated as a potential means of avoiding or minimizing impacts to routing constraints while leveraging routing opportunities. Three of the four corridors – Belmont Ridge Road, W&OD Trail, and Crosstrail Boulevard – were rejected as infeasible or impractical mainly due to space limitations associated with other constraints. The Aspen-Golden Lines Corridor provided an option for routing the new transmission lines for the Project adjacent to another proposed transmission line project across Goose Creek and the planned Campus A, B, and C data center developments. Doing so allows for a single crossing of Goose Creek, which is a state-designated scenic river, and minimizes impacts on developable space within the planned developments.

Routing the proposed Apollo-Twin Creeks Lines within the corridor was an iterative process whereby conceptual route segments were continuously studied and refined based on stakeholder input, including from developers; impact assessment; and engineering review. Of particular note are the locations of the five planned substations to deliver service to the Customers, which are fixed points. Through its outreach to stakeholders, including landowners and developers, the Company learned of additional planned developments in the area, including but not limited to, utility developments and other industrial uses (see Section 6.3.6).

Within the corridor, ERM identified and assessed a single route option (Route 1) for the proposed Apollo-Twin Creeks Lines which collocates with the Company's future Aspen-Golden Lines for approximately 0.9 mile, or about 48 percent of its length. Three overhead route variations and the feasibility of constructing the Project underground were also investigated, but these options were rejected for further consideration on the Project mainly due to space limitations, engineering constraints, and/or poor alignment relative to the Project's required delivery points (see Section 5.3). The Route 1 alignment maximizes crossings of the Customers' properties, with at least 77 percent of its total length on Campuses A, B, and C. Additionally, of the 14 parcels crossed by the route, 9 (64 percent) are owned by Customers A, B, and C.

The Route 1 alignment considered input from affected landowners and other stakeholders, particularly the data center developers, to determine a feasible path for the transmission lines across Goose Creek and through the planned developments adjacent to the future Aspen-Golden Lines. Customer A plans to construct a data center complex on its properties south of Cochran Mill Road, requiring service to the proposed Twin Creeks Substation. Based on the latest Campus A preliminary site design, the Route 1 alignment, which was developed in coordination with Customer A, minimizes impacts to the planned building footprints by spanning parking areas, utility areas, and private roads within a right-of-way collocated with the future Aspen-Golden Lines.

Customer B plans to construct a data center complex on its properties east of Goose Creek and along Belmont Ridge Road, requiring service to the Sycolin Creek and Starlight Substations. Based on Campus B's preliminary site design, Route 1 would not impact the planned building footprints, instead crossing an open space proffer and preservation areas within and along the

Goose Creek riparian corridor (including Loudoun County's 300-foot Scenic Creek Valley Buffer and Customer B's proffered 200-foot Transitional Open Space Buffer). Route 1 crosses Customer B's proffered Transitional Open Space buffer (impacting approximately 0.8 acre) adjacent to the future Aspen-Golden Lines to minimize impact to the overall Scenic Creek Valley Buffer. Additionally, the Company and Customer B are coordinating to have compatible native plantings for the transmission line easements within the buffer areas.

Customer C plans to construct a data center complex on their properties west of Belmont Ridge Road and south of Rt. 7, requiring service to the Lunar and Apollo Substations. The Company solicited feedback on the approximately 0.4-mile-long segment of Route 1 that crosses Customer C's property. Given the location of Goose Creek, Scenic Creek Valley Buffer, and the proposed Loudoun Water Russell Branch Sewage Pumping Station, the Company and Customer C determined that the Route 1 alignment minimizes impacts to the extent practicable and avoids buildings associated with Campus C.

Dominion also coordinated with Luck Stone Corporation, which operates the Goose Creek Plant off Cochran Mill Road and owns a previously mined quarry east of Goose Creek that is undergoing conversion to a reservoir to serve Loudoun Water's planned Milestone Reservoir Pump Station. Dominion and ERM consulted with Luck Stone to identify routes that minimize impacts to its existing and planned operations. North of the proposed Twin Creeks Substation site and on the Goose Creek Plant property, Route 1 follows the western property boundary, to the extent possible, to minimize impacts to an existing berm used to mitigate impacts resulting from quarry operations. On the Milestone Reservoir site, Route 1 crosses Goose Creek in a right-of-way adjacent to the future Aspen-Golden Lines to the east of an existing dike, in place to mitigate potential subsurface constraints in the area.

Dominion coordinated with Loudoun Water to solicit feedback on its proposed facility construction and expansion plans in the study area. Loudoun Water has plans to convert its existing wastewater treatment plant to a sewage pump station (the planned Goose Creek Sewage Station) on the property associated with Campus A. West and adjacent to Campus A, Loudoun Water purchased property from NOVA Parks to construct the Milestone Reservoir Pump Station site. Dominion also coordinated with Loudoun Water on its proposed pump station facility on the Campus C properties (the planned Russell Branch Sewage Pumping Station). Route 1 deviates west of the planned Russell Branch Sewage Pumping Station facility to avoid impacts for construction and future operation of the facility. Based on a review of Loudoun Water's preliminary site designs, Route 1 would not impact the planned building footprints or identified future expansion areas provided by Loudoun Water. Route 1 also avoids crossing Loudoun Water-owned property and accommodates the setback specifications provided by Loudoun Water, to the extent practicable, to minimize impacts to their existing and proposed facilities.

In conclusion, the Company's most important factor guiding routing was consistency with SCC Guideline #1, specifically (1) that existing rights-of-way should be given priority as the locations for additions to existing transmission facilities; (2) that the joint use of existing rights-of-way by different kinds of utility services should be considered, and (3) that rights-of-way should be selected with the purpose of minimizing conflict between the rights-of-way and present and prospective uses of the land on which they will be located. Route 1 provides an opportunity to

collocate with the future Aspen-Golden Lines (SCC Case No. PUR-2024-00032) for 0.9 mile of the 1.9-mile-long route. Additionally, Route 1 collocates with existing and proposed water and sewer lines for 0.2 and 0.4 mile, respectively. Approximately 79 percent of Route 1 collocates is parallel to other utility rights-of-way, including the Company's future corridor.

For all the reasons above, ERM and Dominion conclude that Route 1 reasonably minimizes adverse impacts to the greatest extent reasonably practicable on the scenic assets, historic resources, and environment of the area concerned, as well as on cultural resources and planned developments in the Project area.

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APPENDIX A FIGURES

W&OD Trail
Crosstrail Boulevard
514
2093
203
State Route 7
APOLLO SUB
LUNAR SUB
PLEASANT VIEW 500 SUB
TWIN CREEKS SUB
GOOSE CREEK SUB
PLEASANT VIEW SUB
Cochran Mill Road
STARLIGHT SUB
ASPEN SUB
SYCOLIN CREEK
GOOSE CREEK
SYCOLIN CREEK SUB
Belmont Ridge Road
536 2130
227
274
221
GOCHRAN MILL DP
N
W
E
S
0 500 1,000
Feet

Project Location

Existing Substation
Proposed Substation
Proposed Apollo-Twin Creeks Lines (Route 1)
Proposed Substation Boundary
Existing Substation Boundary
Existing Dominion Transmission Lines
Study Area
Washington & Old Dominion Trail

Future Aspen-Golden Project

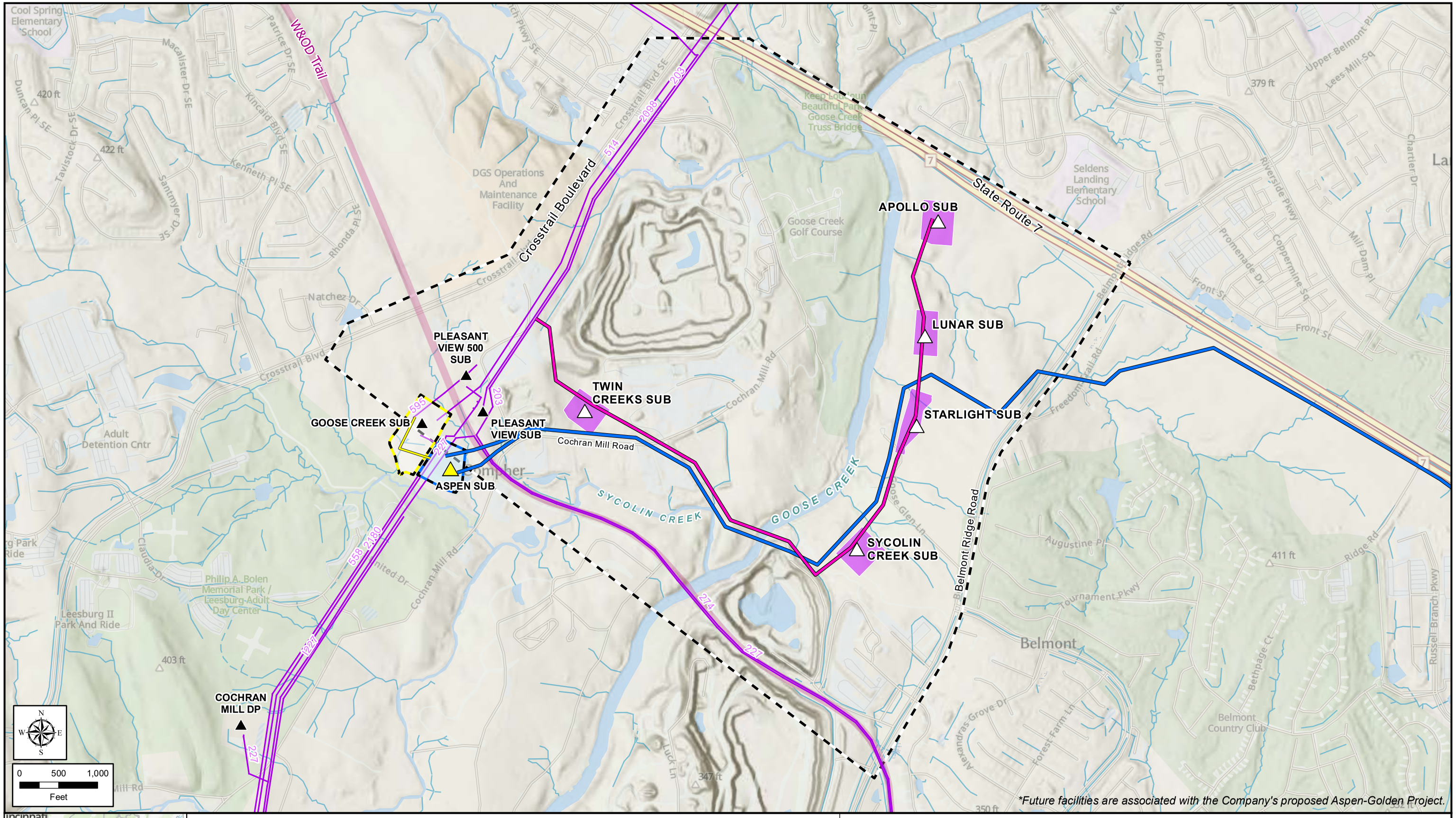
Future Aspen Substation*
Future Aspen–Golden Lines Proposed Route*
Future Aspen-Goose Creek Line*
Future Substation Boundary*

*Future facilities are associated with the Company's proposed Aspen-Golden Project.

Figure 3.1-1
Study Area Overview (Aerial)
230 kV Apollo-Twin Creeks Lines, Twin Creeks, Sycolin Creek, Starlight, Lunar, and Apollo Substations
Dominion Energy Virginia
Loudoun County, Virginia

ERM

Dominion Energy

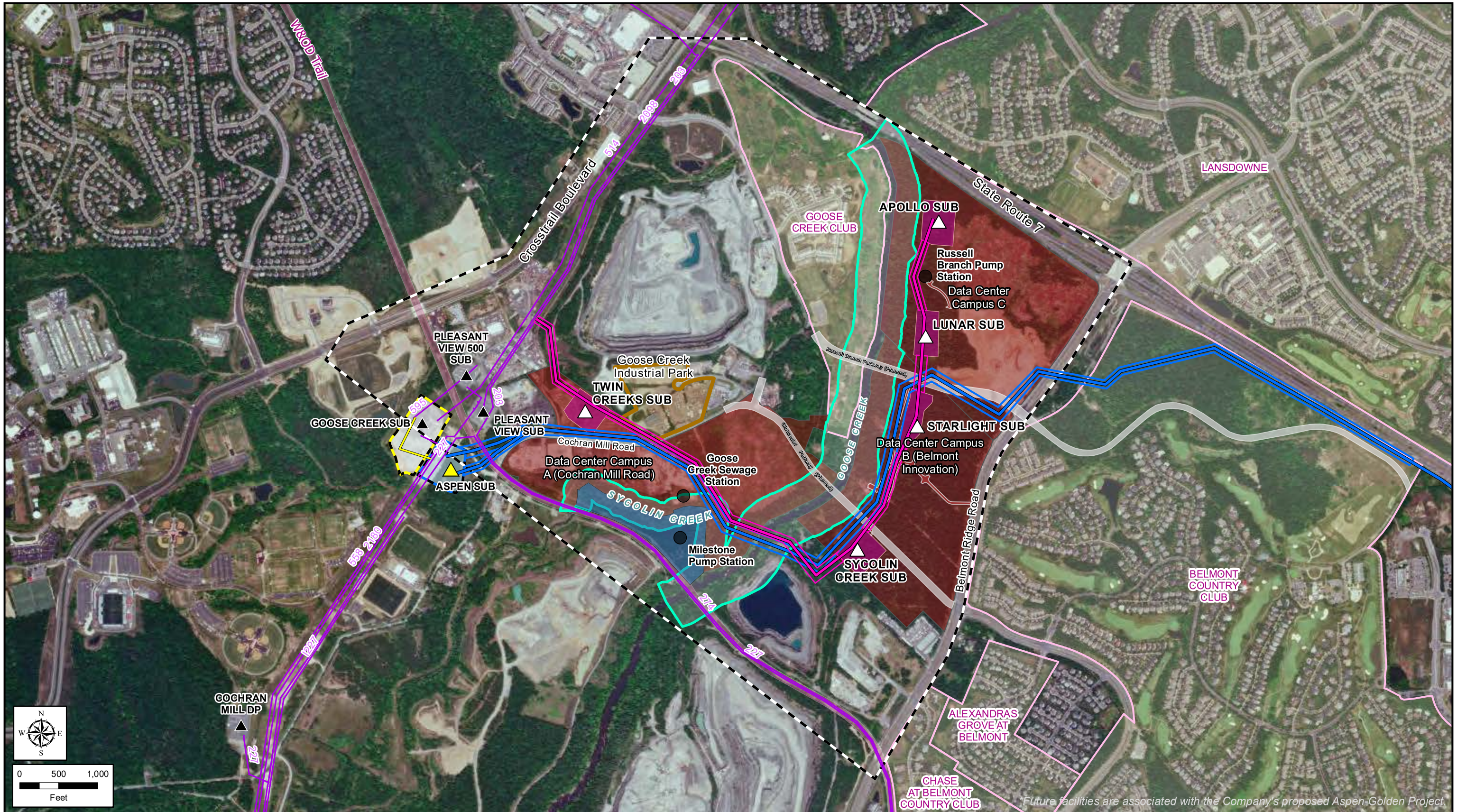


*Future facilities are associated with the Company's proposed Aspen-Golden Project.

Figure 3.1-2
Study Area Overview (Topo)
230 kV Apollo-Twin Creeks Lines, Twin Creeks, Sycolin Creek, Starlight, Lunar, and Apollo Substations
Dominion Energy Virginia
Loudoun County, Virginia

ERM

Dominion Energy

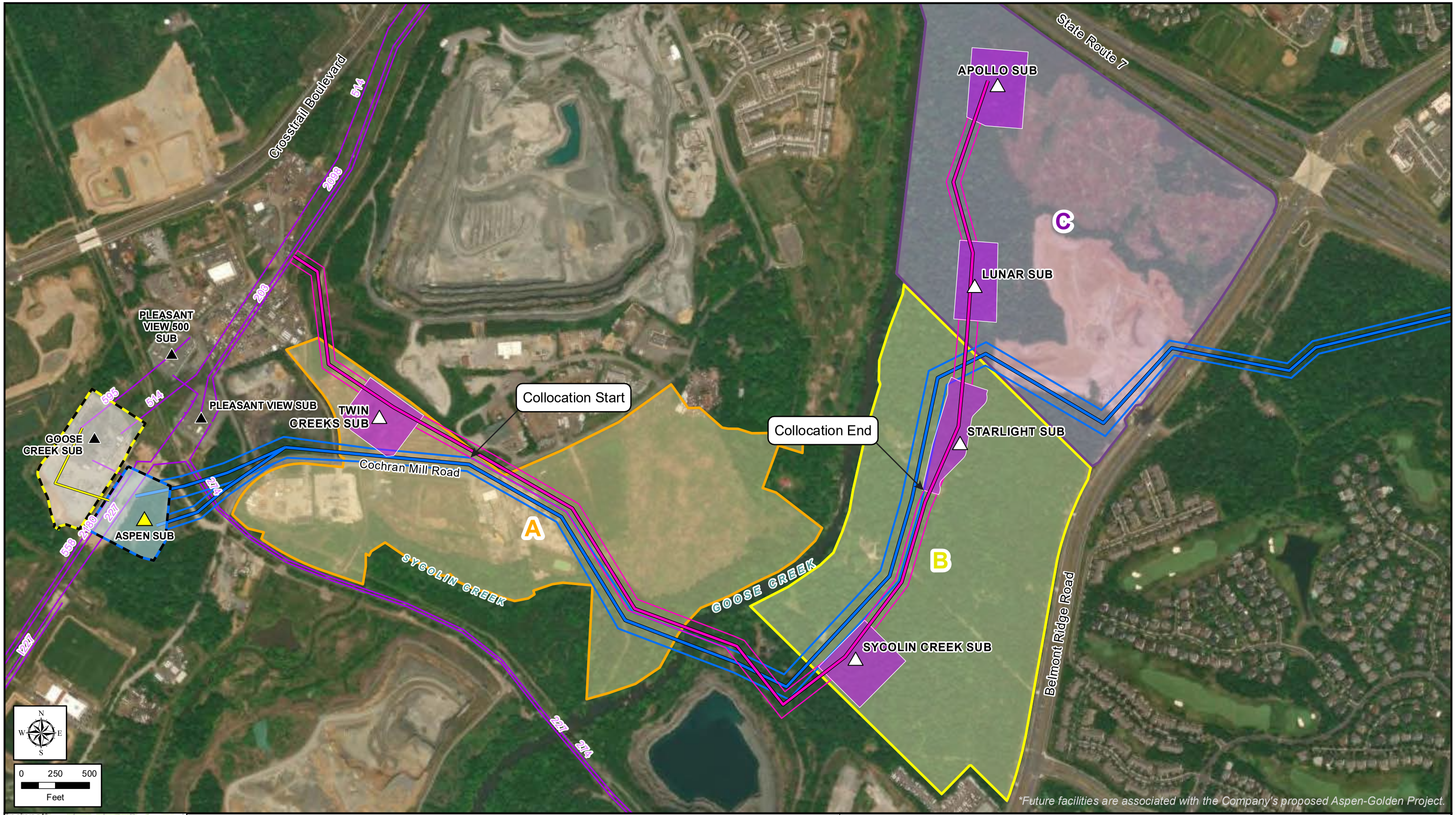


*Future facilities are associated with the Company's proposed Aspen-Golden Project.

Figure 3.2
Routing Constraints and Opportunities
230 kV Apollo-Twin Creeks Lines, Twin Creeks, Sycolin Creek, Starlight, Lunar, and Apollo Substations
Dominion Energy Virginia
Loudoun County, Virginia

ERM

Dominion Energy



- Existing Substation
- Proposed Substation
- Proposed Apollo–Twin Creeks Lines (Route 1)
- Proposed Substation Boundary
- Existing Substation Boundary
- Existing Dominion Transmission Lines

Future Aspen-Golden Project

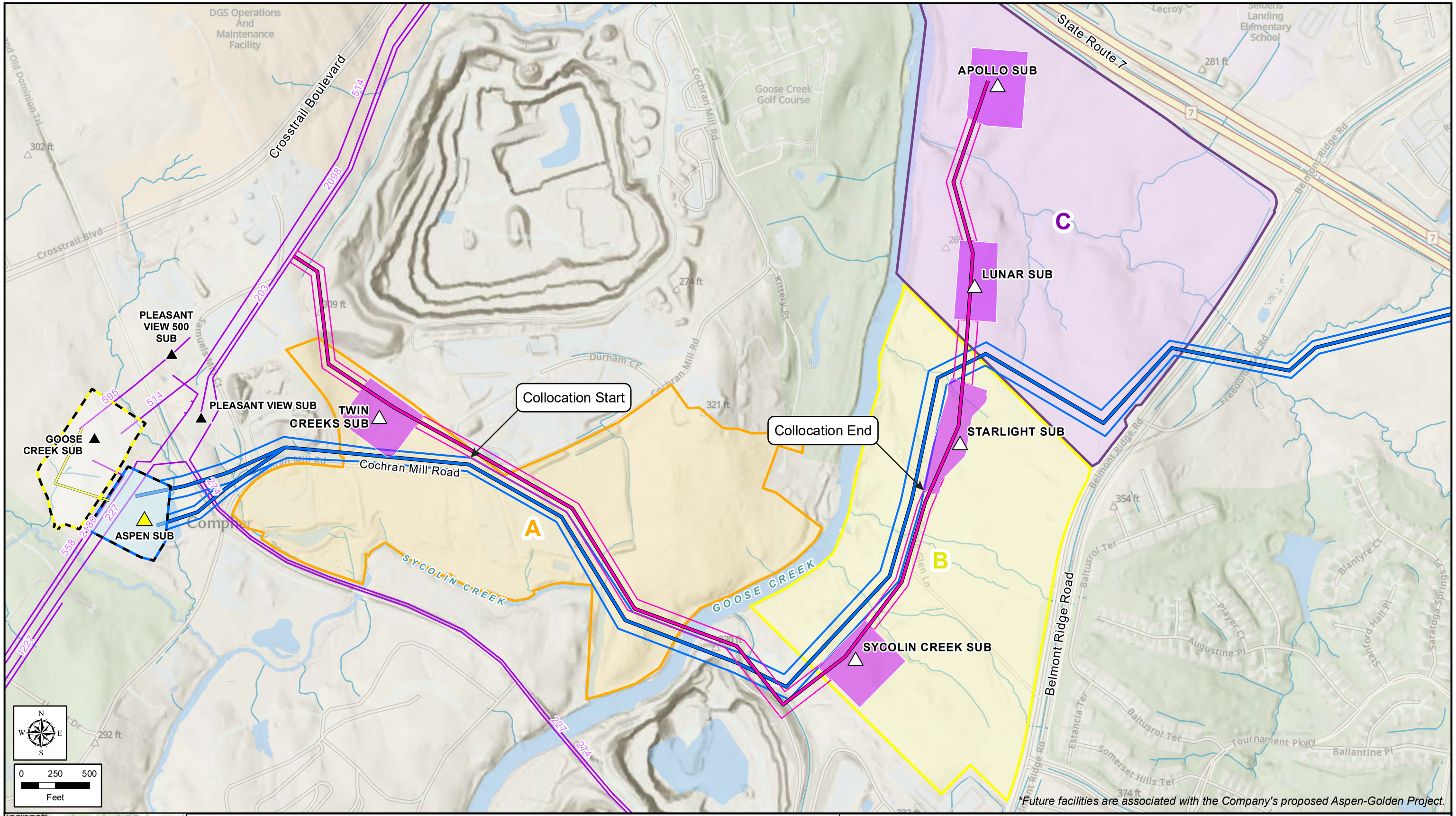
- Future Aspen Substation*
- Future Aspen-Golden Lines Proposed Route*
- Future Aspen-Goose Creek Line*
- Future Substation Boundary*

- Customer A Properties
- Customer B Properties
- Customer C Properties

Figure 5.2-1
Route 1 Aerial Overview
230 kV Apollo-Twin Creeks Lines, Twin Creeks, Sycolin Creek, Starlight, Lunar, and Apollo Substations
Dominion Energy Virginia
Loudoun County, Virginia

ERM

Dominion Energy



*Future facilities are associated with the Company's proposed Aspen-Golden Project.

Figure 5.2-2
Route 1 Topographic Overview
230 kV Apollo-Twin Creeks Lines, Twin Creeks, Sycolin Creek, Starlight, Lunar, and Apollo Substations
Dominion Energy Virginia
Loudoun County, Virginia

ERM

Dominion Energy

* Future facilities were considered for the Company's proposed Aspen-Golden Project

Figure 5.3.1
Route Variations Rejected: Sycolin Creek Variation
230 kV Apollo-Twin Creeks Lines, Twin Creeks, Sycolin Creek, Starlight, Lunar, and Apollo Substations
Dominion Energy Virginia
Loudoun County, Virginia

ERM

Dominion Energy

- Existing Substation
- Proposed Substation
- Proposed Apollo-Twin Creeks Lines (Route 1)
- Apollo-Twin Creeks Route Variation (Rejected)
- Future Aspen-Golden Lines Proposed Route*
- Aspen-Golden Lines (Rejected Variation)
- Existing Dominion Transmission Line
- Proposed Substation Boundary

Existing and Planned Development

- Planned Utility Development
- Residence in Study Area
- Goose Creek Industrial Park
- Planned Road Extension (Loudoun County DTCI)
- Future Public Road Dedication
- Data Center
- Commercial Building located within Right-of-Way

Public Lands

- Loudoun Water Property

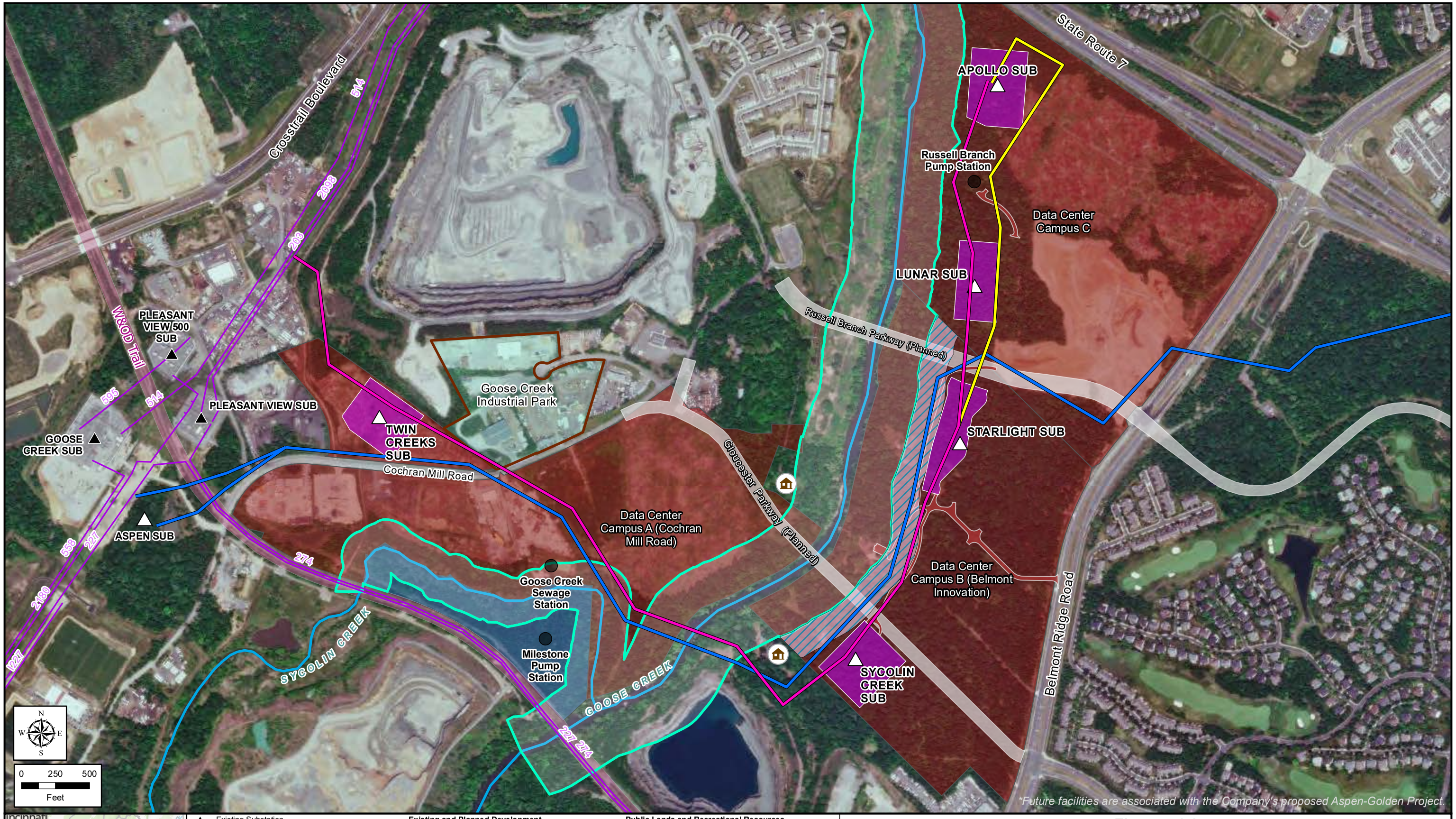
Recreational Resources

- Washington & Old Dominion Trail
- Virginia Scenic River
- Cooke's Mill

Figure 5.3.2
Route Variations Rejected: Cochran Mill Road North Variation
230 kV Apollo-Twin Creeks Lines, Twin Creeks, Sycolin Creek, Starlight, Lunar, and Apollo Substations
Dominion Energy Virginia
Loudoun County, Virginia

ERM

Dominion Energy

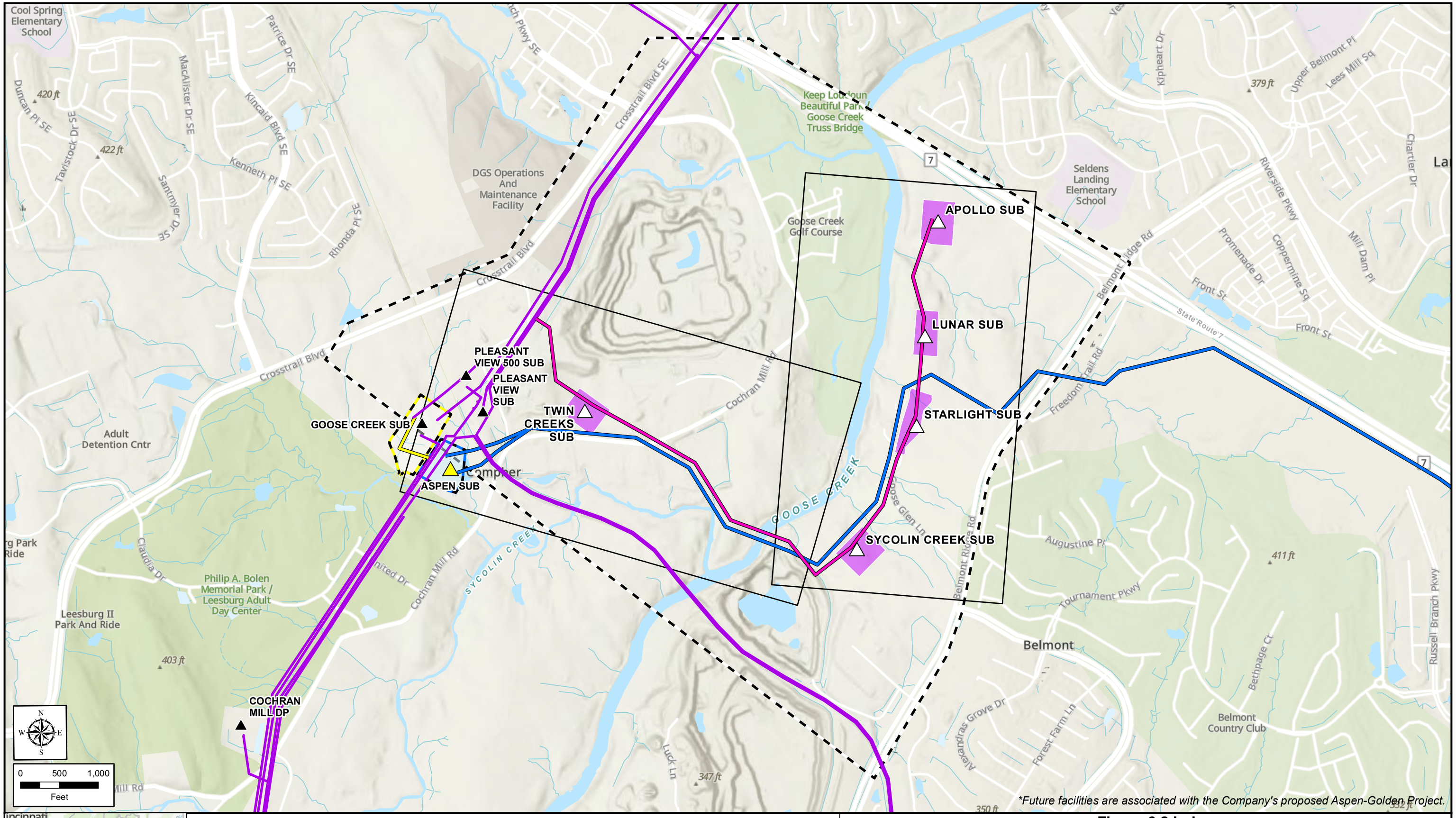


*Future facilities are associated with the Company's proposed Aspen-Golden Project.

Figure 5.3.3
Route Variations Rejected: Lunar to Apollo East Variation
230 kV Apollo-Twin Creeks Lines, Twin Creeks, Sycolin Creek, Starlight, Lunar, and Apollo Substations
Dominion Energy Virginia
Loudoun County, Virginia

ERM

Dominion Energy

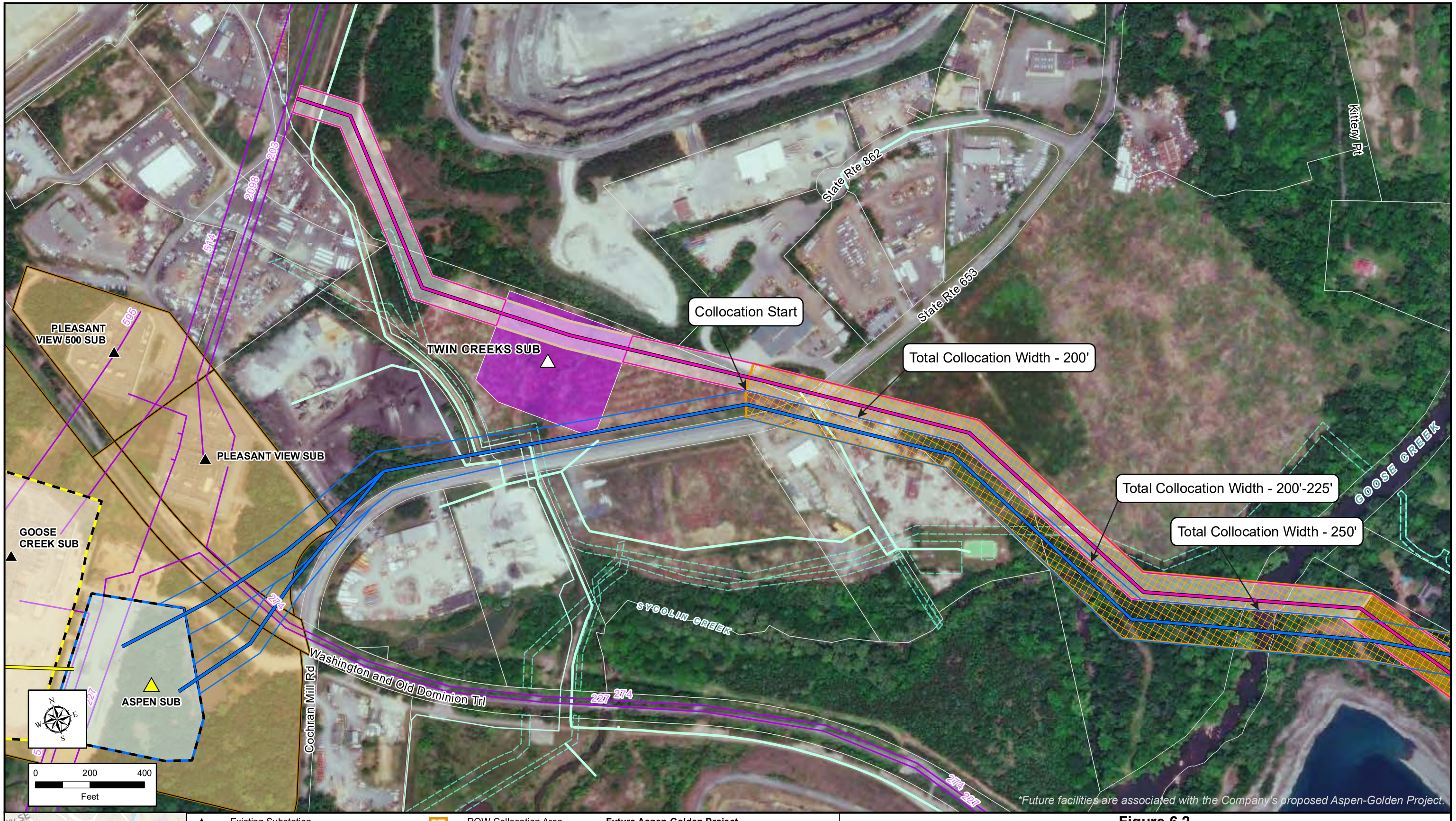


*Future facilities are associated with the Company's proposed Aspen-Golden Project.

Figure 6.2 Index
Routing Opportunities
230 kV Apollo-Twin Creeks Lines, Twin Creeks, Sycolin Creek, Starlight, Lunar, and Apollo Substations
Dominion Energy Virginia
Loudoun County, Virginia

ERM

Dominion Energy



Existing Substation
Proposed Substation
Proposed Apollo-Twin Creeks Lines (Route 1)
Proposed Substation Boundary
Existing Substation Boundary
Existing Dominion Transmission Lines
Parcels

ROW Collocation Area
Dominion Property
Existing Loudoun Water Lines
Proposed Loudoun Water Lines

New Apollo-Twin Creeks Easements

100' Right-of-Way
140' Right-of-Way

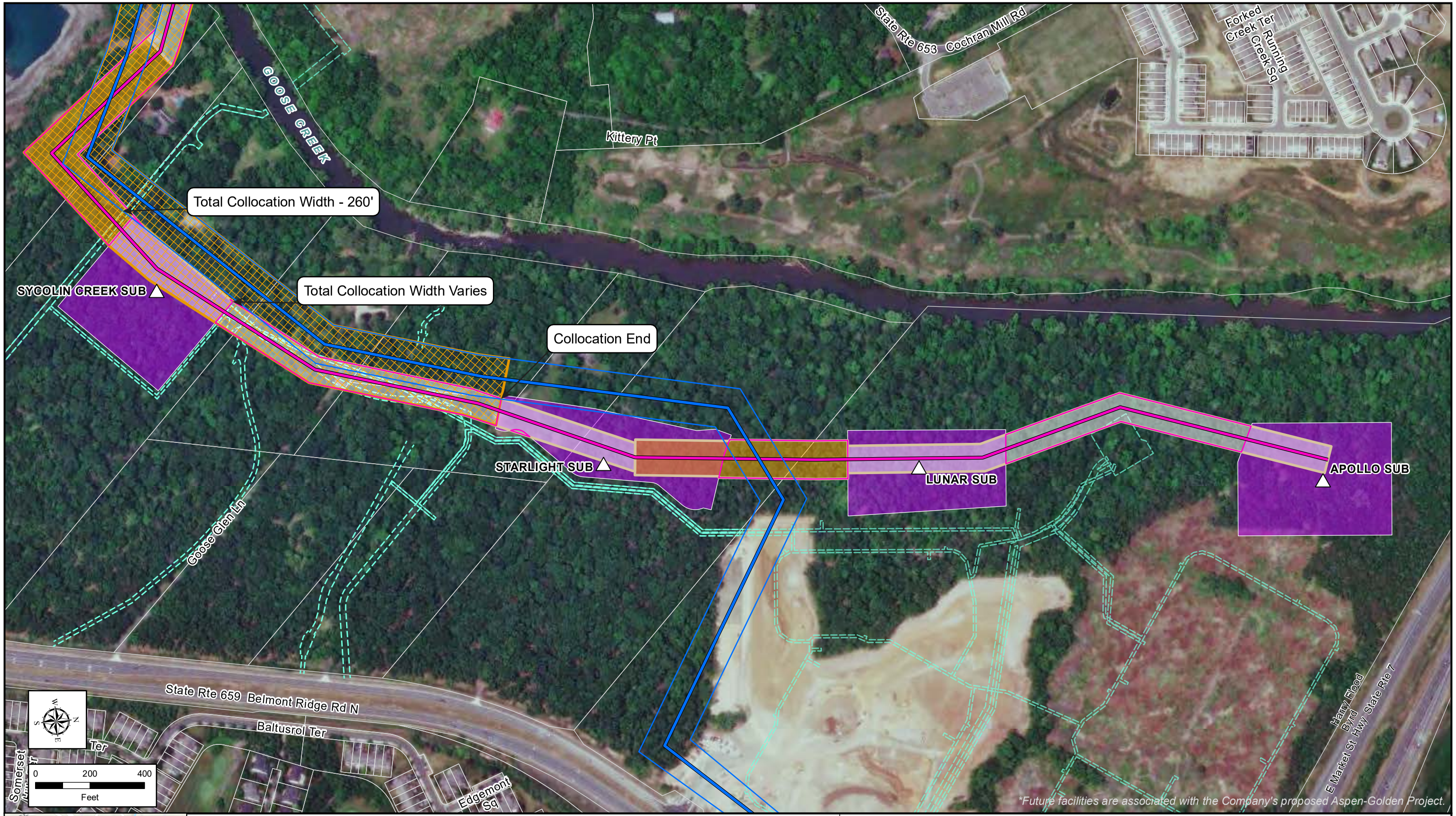
Future Aspen-Golden Project

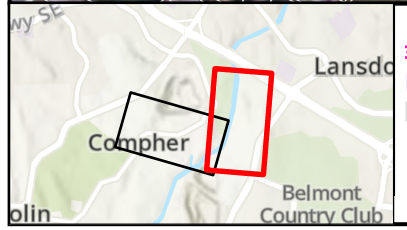
Future Aspen Substation*
Future Aspen-Golden Lines Proposed Route*
Future Aspen-Goose Creek Line*
Future Substation Boundary*

Figure 6.2
Routing Opportunities
230 kV Apollo-Twin Creeks Lines, Twin Creeks, Sycolin Creek, Starlight, Lunar, and Apollo Substations
Dominion Energy Virginia
Loudoun County, Virginia

ERM

Dominion Energy





- Proposed Substation
- Proposed Apollo-Twin Creeks Lines (Route 1)
- Proposed Substation Boundary
- Parcels
- ROW Collocation Area
- Existing Loudoun Water Lines
- Proposed Loudoun Water Lines

New Apollo-Twin Creeks Easements

- 100' Right-of-Way
- 140' Right-of-Way

Future Aspen-Golden Project

- Future Aspen-Golden Lines Proposed Route*

Figure 6.2
Routing Opportunities
230 kV Apollo-Twin Creeks Lines, Twin Creeks, Sycolin Creek, Starlight, Lunar, and Apollo Substations
Dominion Energy Virginia
Loudoun County, Virginia

ERM

Dominion Energy

W&OD Trail
Keep Loudoun Beautiful Park
Radio Tower (Leesburg Executive Airport)
Crosstrail Boulevard
514
2093
2093
State Route 7
Seldons Landing Elementary School
APOLLO SUB
LUNAR SUB
STARLIGHT SUB
GOOSE CREEK
PLEASANT VIEW 500 SUB
TWIN CREEKS SUB
PLEASANT VIEW SUB
GOOSE CREEK SUB
Cochran Mill Road
595
2093
2211
SYCOLIN CREEK
SYCOLIN CREEK SUB
Belmont Ridge Road
593 2100
2214
2211
2211
COCHRAN MILL DP
2211
N
W
E
S
0 500 1,000
Feet

Project Location
Cincinnati
Washington
Richmond
Virginia
Raleigh

- Existing Substation
- Proposed Substation
- Proposed Apollo-Twin Creeks Lines (Route 1)
- Proposed Substation Boundary
- Existing Dominion Transmission Lines
- Study Area
- Washington & Old Dominion Trail
- Seldens Landing Elementary School
- Goose Creek Industrial WWTP (to be decommissioned)
- Loudoun Water Goose Creek Dike Extent
- Loudoun Water Goose Creek Dike
- 0.25 Mile Buffer

Land Ownership
- Federal Land
- State Land
- Local Land

Figure 6.3.1
Land Ownership and Public Lands within 0.25 mile
230 kV Apollo-Twin Creeks Lines, Twin Creeks, Sycolin Creek, Starlight, Lunar, and Apollo Substations
Dominion Energy Virginia
Loudoun County, Virginia

ERM
Dominion Energy

Figure 6.3.2
Existing Land Use and Land Cover
230 kV Apollo-Twin Creeks Lines, Twin Creeks, Sycolin Creek, Starlight, Lunar, and Apollo Substations
Dominion Energy Virginia
Loudoun County, Virginia

ERM

Dominion Energy

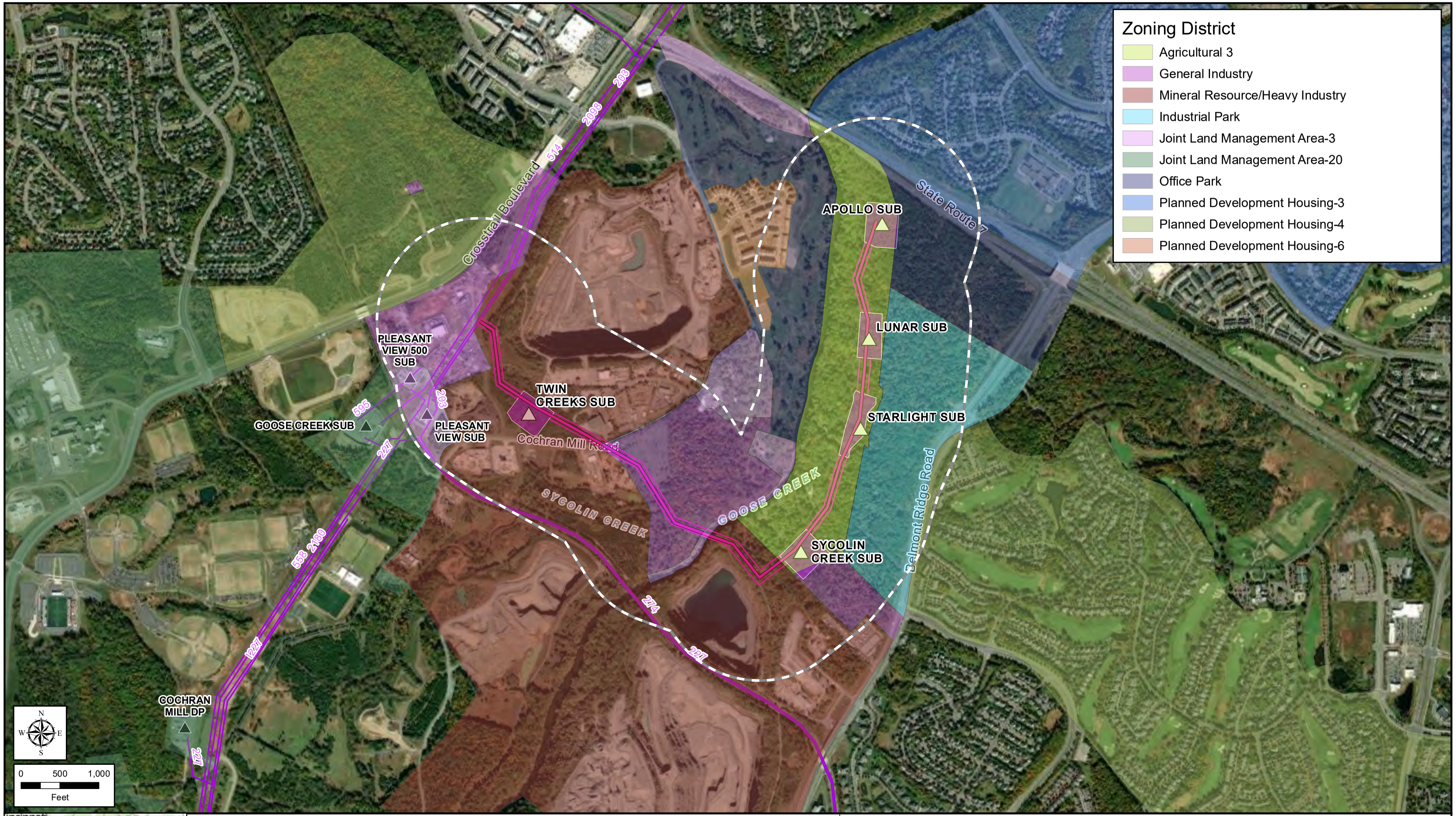


Figure 6.3.3
Land Use Planning and Zoning within 0.25 mile
230 kV Apollo-Twin Creeks Lines, Twin Creeks, Sycolin Creek, Starlight, Lunar, and Apollo Substations
Dominion Energy Virginia
Loudoun County, Virginia

ERM

Dominion Energy

TUSCARORA CROSSING
Crosstrail Boulevard
514
2093
203
GOOSE CREEK CLUB
APOLLO SUB
State Route 7
LANSDOWNE
LUNAR SUB
GOOSE CREEK
PLEASANT VIEW 500 SUB
TWIN CREEKS SUB
GOOSE CREEK SUB
536
203
PLEASANT VIEW SUB
Cochran Mill Road
STARLIGHT SUB
2211
SYCOLIN CREEK
Belmont Ridge Road
SYCOLIN CREEK SUB
558 2100
2214
2221
BELMONT COUNTRY CLUB
1227
COCHRAN MILL DP
2271
ALEXANDRAS GROVE AT BELMONT
CHASE AT BELMONT COUNTRY CLUB
N
W
E
S
0 500 1,000
Feet

Project Location

- Existing Substation
- Proposed Substation
- Proposed Apollo-Twin Creeks Lines (Route 1)
- Proposed Substation Boundary
- Existing Dominion Transmission Lines
- Study Area
- Residential Subdivisions

Residential Structures within 500 feet

- Single-Family Detached
- Miscellaneous

Figure 6.3.4
Residential Areas and Residences
230 kV Apollo-Twin Creeks Lines, Twin Creeks, Sycolin Creek, Starlight, Lunar, and Apollo Substations
Dominion Energy Virginia
Loudoun County, Virginia

ERM

Dominion Energy

Figure 6.3.5
Commercial/Industrial Areas and Buildings
230 kV Apollo-Twin Creeks Lines, Twin Creeks, Sycolin Creek, Starlight, Lunar, and Apollo Substations
Dominion Energy Virginia
Loudoun County, Virginia

ERM

Dominion Energy

Tuscarora Crossing
Crosstrail Boulevard
514
2093
203
Goose Creek Club II
APOLLO SUB
State Route 7
Russel Branch Pump Station
Sheetz Crosstrail
LUNAR SUB
Data Center Campus C
PLEASANT VIEW 500 SUB
595
2093
203
PLEASANT VIEW SUB
GOOSE CREEK SUB
274
221
Loudoun County Asphalt
TWIN CREEKS SUB
STARLIGHT SUB
Cochran Mill Road
Data Center Campus A (Cochran Mill Road)
Goose Creek Sewage Pump Station
SYCOLIN CREEK
GOOSE CREEK
Loudoun Water Milestone Reservoir
SYCOLIN CREEK SUB
Data Center Campus B (Belmont Innovation)
Luck Stone Cochran Mill
2160
553
1227
Luck Stone Leesburg Plant
227
274
Loudoun Water Quarry A and Luck Stone Leesburg Plant
Belmont Ridge Road
N
W
E
S
0
500
1,000
Feet

Cincinnati
Project Location
Virginia
Richmond
Raleigh

- Existing Substation
- Proposed Substation
- Proposed Apollo-Twin Creeks Lines (Route 1)
- Proposed Substation Boundary
- Existing Dominion Transmission Lines

Planned Development
- Data Center
- Planned Development - Residential
- Commmercial
- Industrial
- Loudoun Water

- Study Area
- 0.25 Mile Buffer

Figure 6.3.6
Planned Developments within 0.25 mile
230 kV Apollo-Twin Creeks Lines, Twin Creeks, Sycolin Creek, Starlight, Lunar, and Apollo Substations
Dominion Energy Virginia
Loudoun County, Virginia

ERM
Dominion Energy

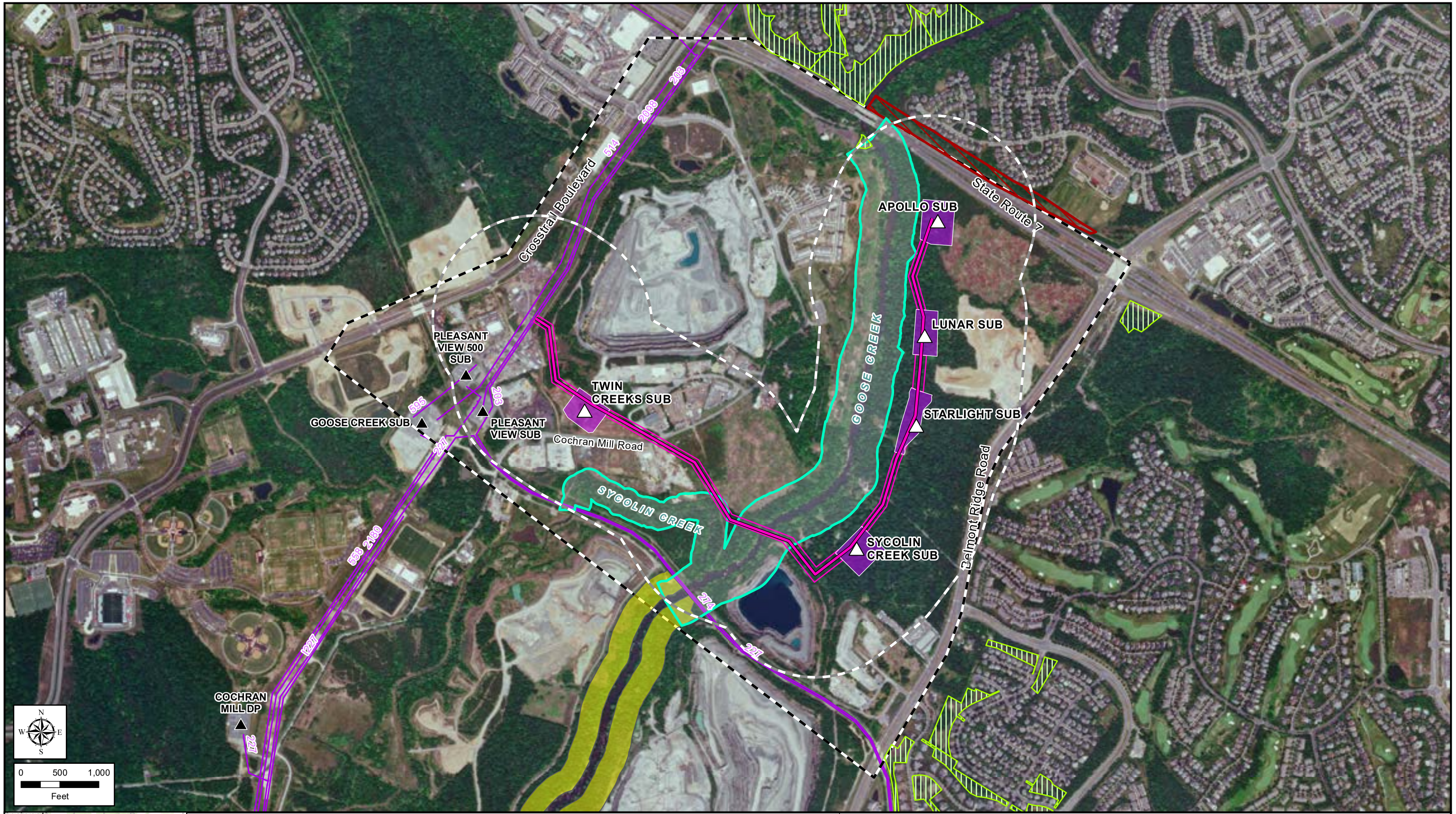
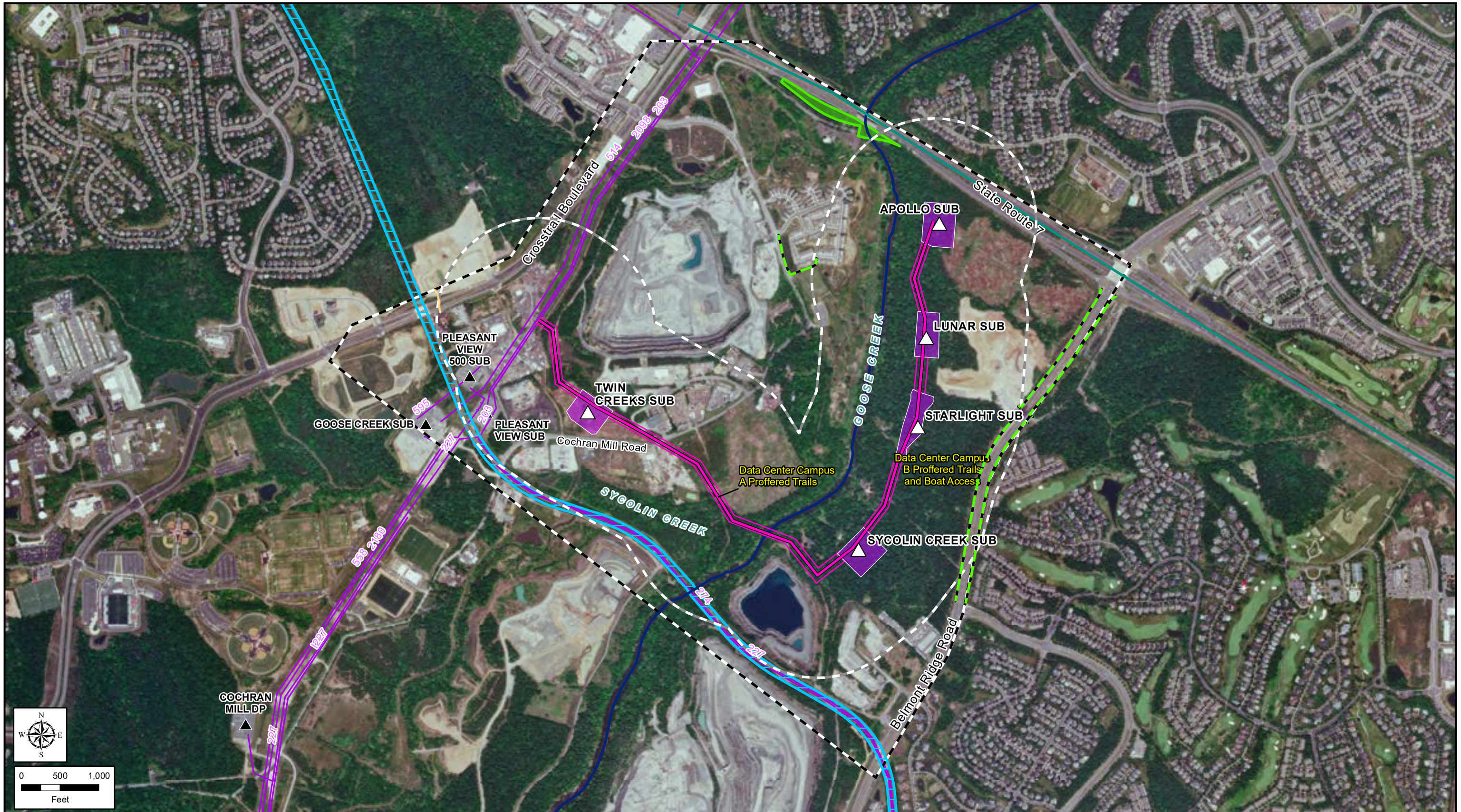
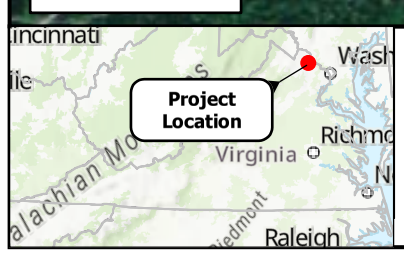


Figure 6.3.7
Conservation Easements and Lands within 0.25 mile
230 kV Apollo-Twin Creeks Lines, Twin Creeks, Sycolin Creek, Starlight, Lunar, and Apollo Substations
Dominion Energy Virginia
Loudoun County, Virginia

ERM

Dominion Energy





- Existing Substation
- Proposed Substation
- Proposed Apollo-Twin Creeks Lines (Route 1)
- Proposed Substation Boundary
- Existing Dominion Transmission Lines
- Goose Creek Scenic River
- Shared Use Path (Paved Trail)
- Dirt/Gravel Trail
- DGIF Birding Wildlife Trails
- Park
- NOVA Parks - W&OD Trail
- Study Area
- 0.25 Mile Buffer

Figure 6.3.8
Recreational Resources within 0.25 mile
230 kV Apollo-Twin Creeks Lines, Twin Creeks, Sycolin Creek, Starlight, Lunar, and Apollo Substations
Dominion Energy Virginia
Loudoun County, Virginia

ERM

Dominion Energy

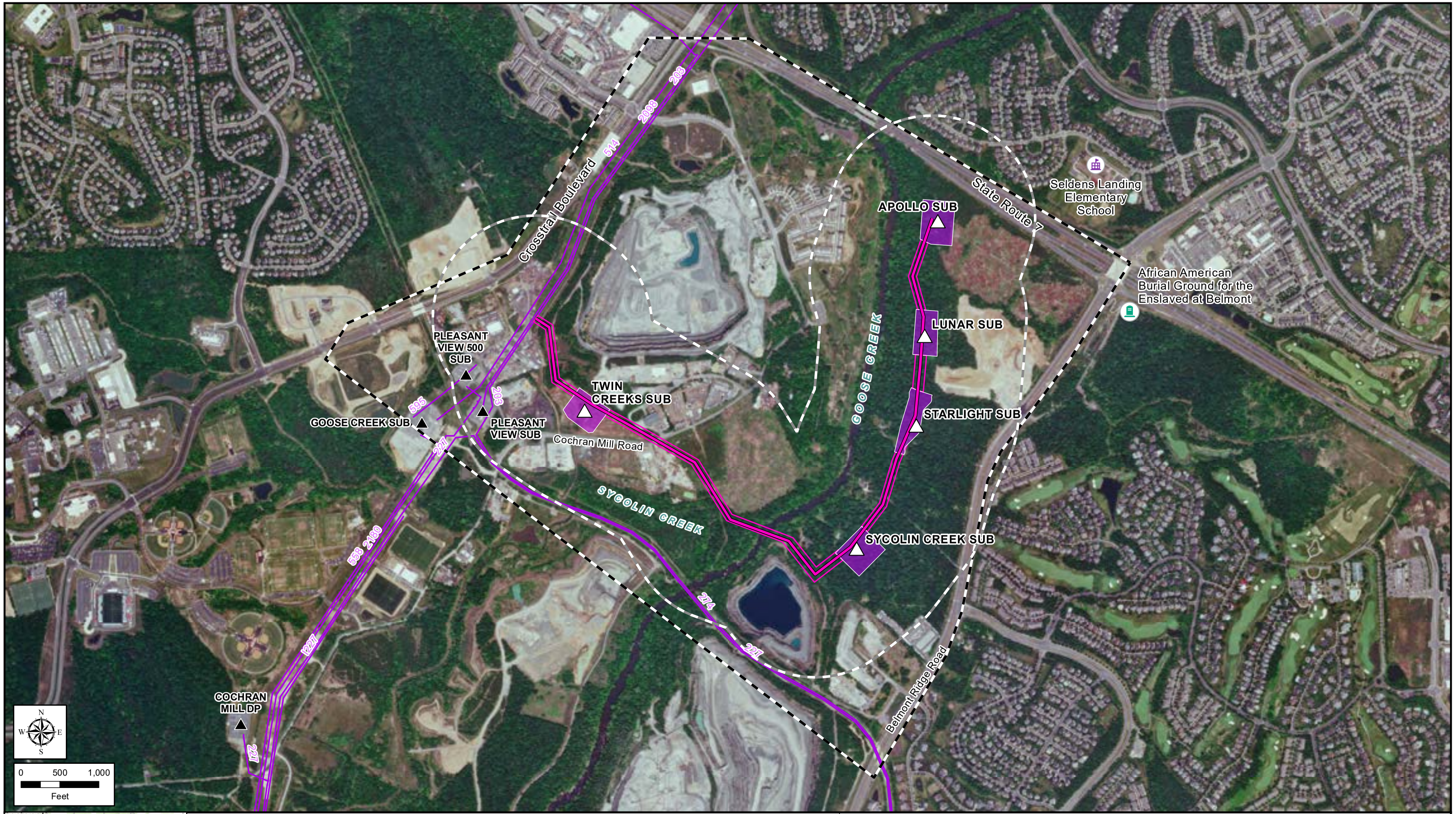


Figure 6.3.9
Cemeteries, Schools, and Places of Worship within 0.25 mile
230 kV Apollo-Twin Creeks Lines, Twin Creeks, Sycolin Creek, Starlight, Lunar, and Apollo Substations
Dominion Energy Virginia
Loudoun County, Virginia

ERM

Dominion Energy

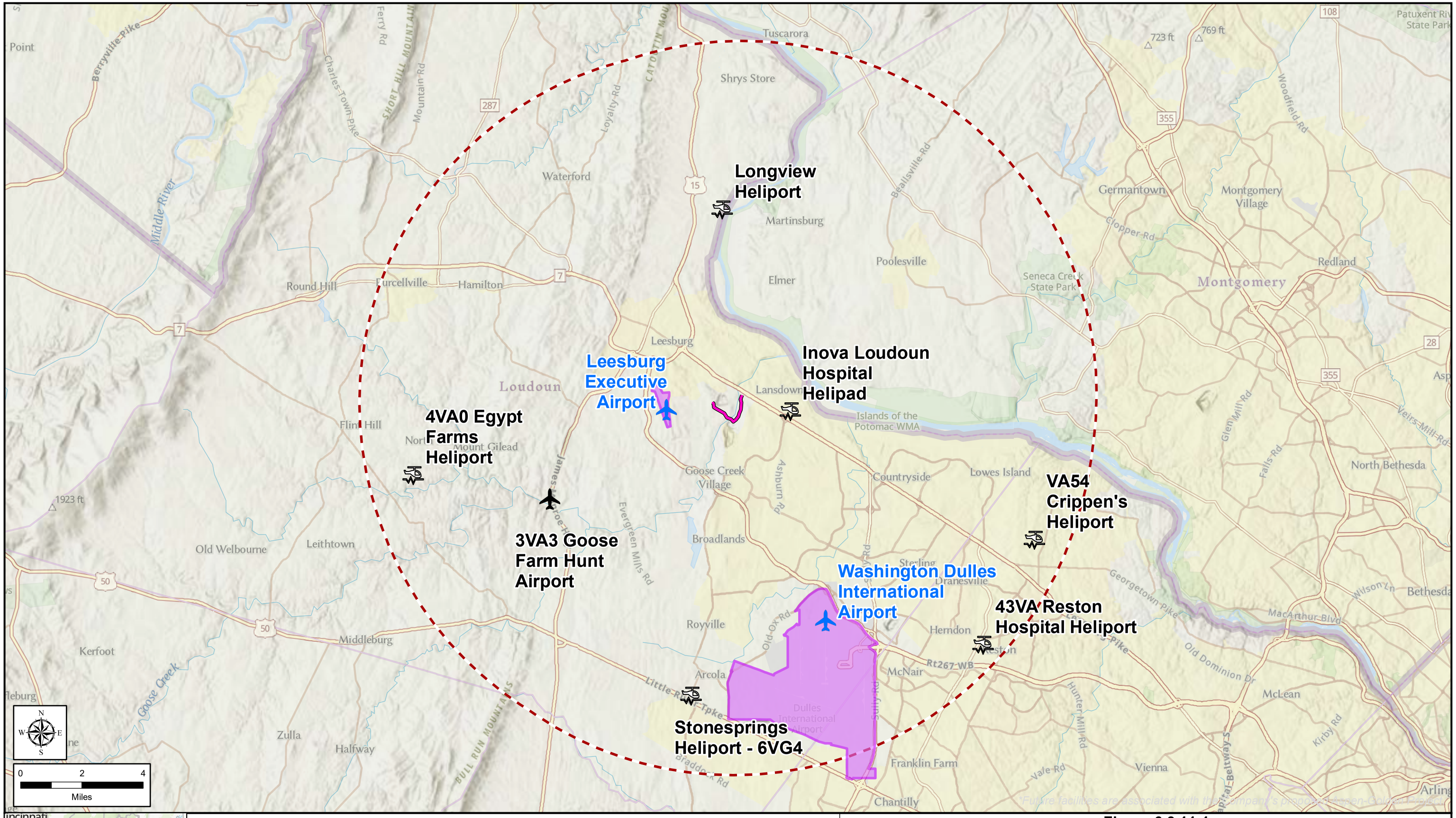


Figure 6.3.11-1
Airports and Heliports within 10 nautical miles of the Project
230 kV Apollo-Twin Creeks Lines, Twin Creeks, Sycolin Creek, Starlight, Lunar, and Apollo Substations
Dominion Energy Virginia
Loudoun County, Virginia

ERM

Dominion Energy

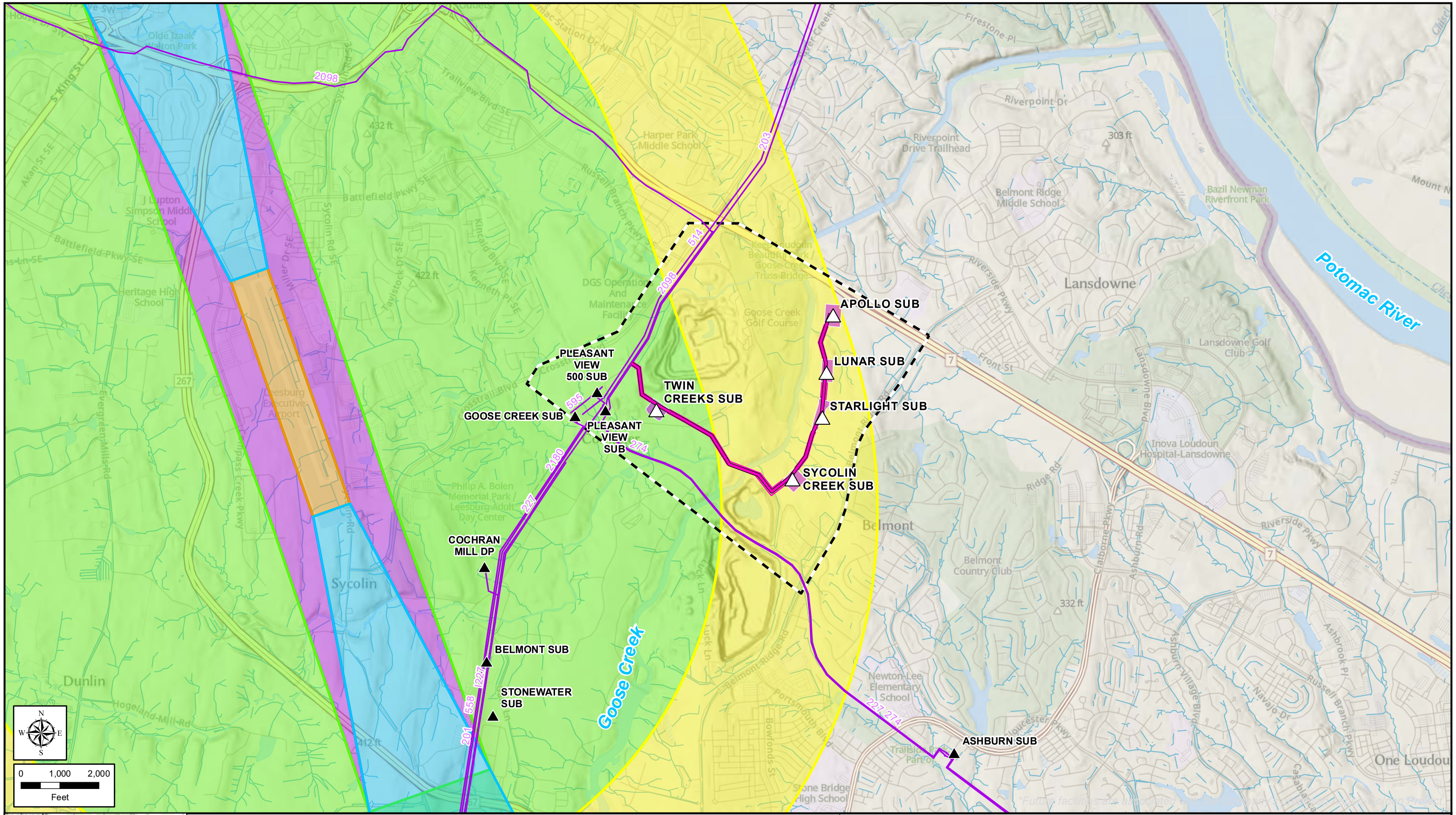


Figure 6.3.11-2
Civil Airport Imaginary Surfaces for Leesburg Executive Airport
230 kV Apollo-Twin Creeks Lines, Twin Creeks, Sycolin Creek, Starlight, Lunar, and Apollo Substations
Dominion Energy Virginia
Loudoun County, Virginia

ERM

Dominion Energy

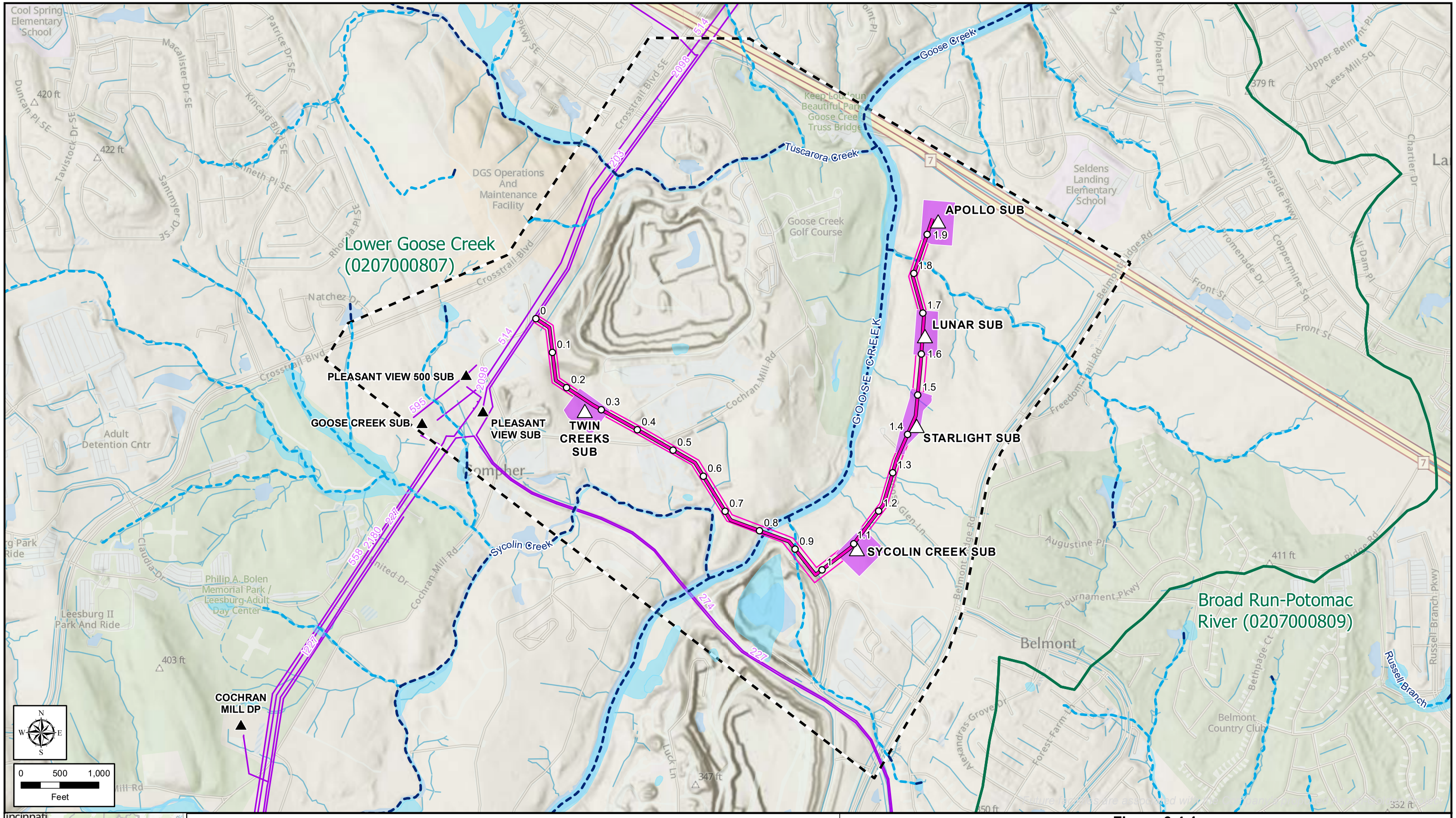


Figure 6.4.1
NWI Wetlands, NHD Waterbodies, and HUC 10 Watersheds
230 kV Apollo-Twin Creeks Lines, Twin Creeks, Sycolin Creek, Starlight, Lunar, and Apollo Substations
Dominion Energy Virginia
Loudoun County, Virginia

ERM

Dominion Energy

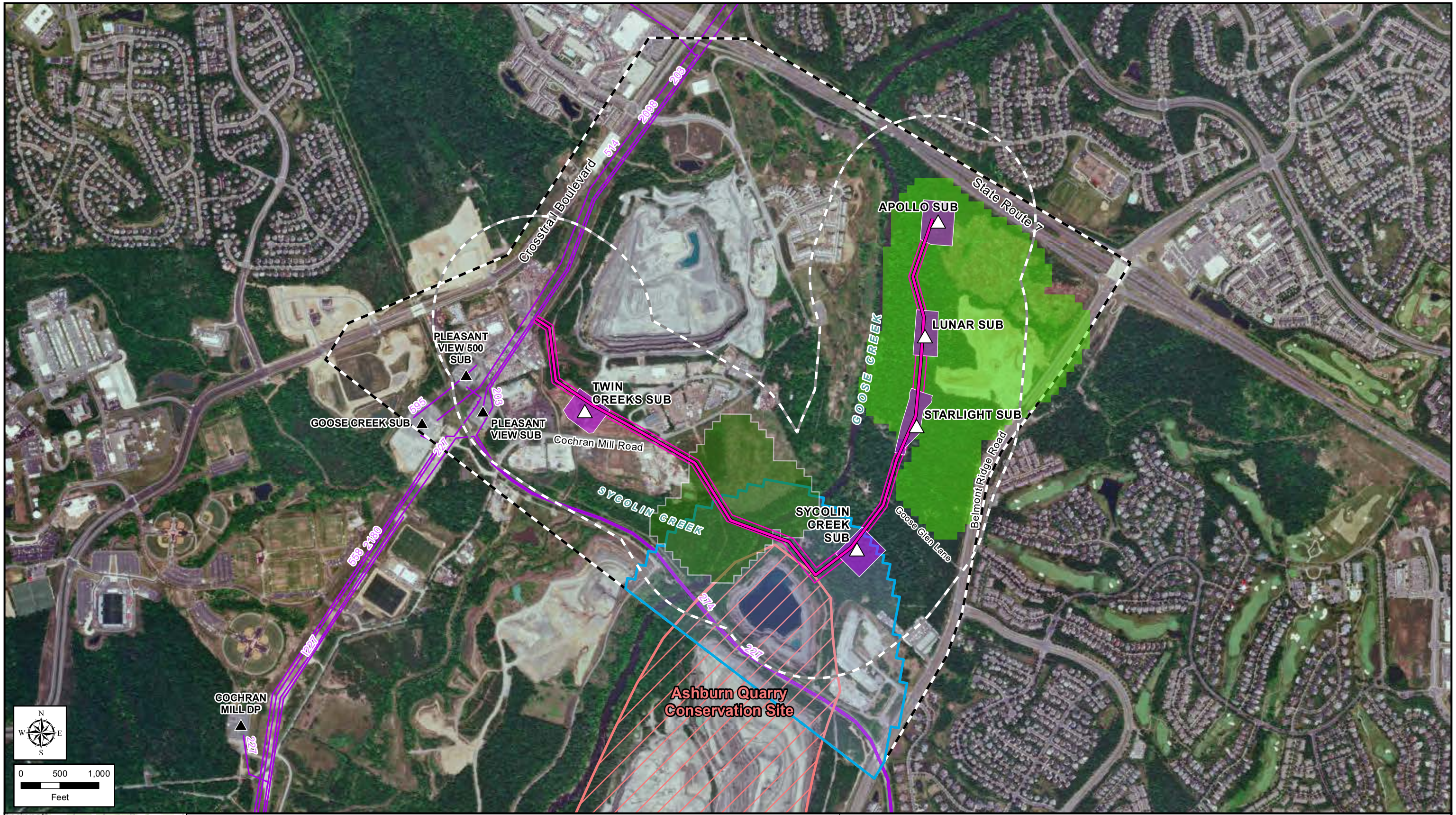


Figure 6.4.2
VDCR Areas of Ecological Significance
230 kV Apollo-Twin Creeks Lines, Twin Creeks, Sycolin Creek, Starlight, Lunar, and Apollo Substations
Dominion Energy Virginia
Loudoun County, Virginia

ERM

Dominion Energy

VSR Number	VSR Name
1	Goose Creek Scenic River
2	Washington and Old Dominion Trail
3	Seldens Landing Elementary School
4	Belmont Country Club
5	Keep Loudoun Beautiful Park
6	Cooke's Mill (Ruins)
7	African American Burial Ground for the Enslaved at Belmont
8	Crosstrail Boulevard
9	Cochran Mill Road
10	Belmont Ridge Road (Route 659)
11	Leesburg Pike (State Route 7)
12	Belmont CDP
13	Town of Leesburg
14	Lansdowne CDP

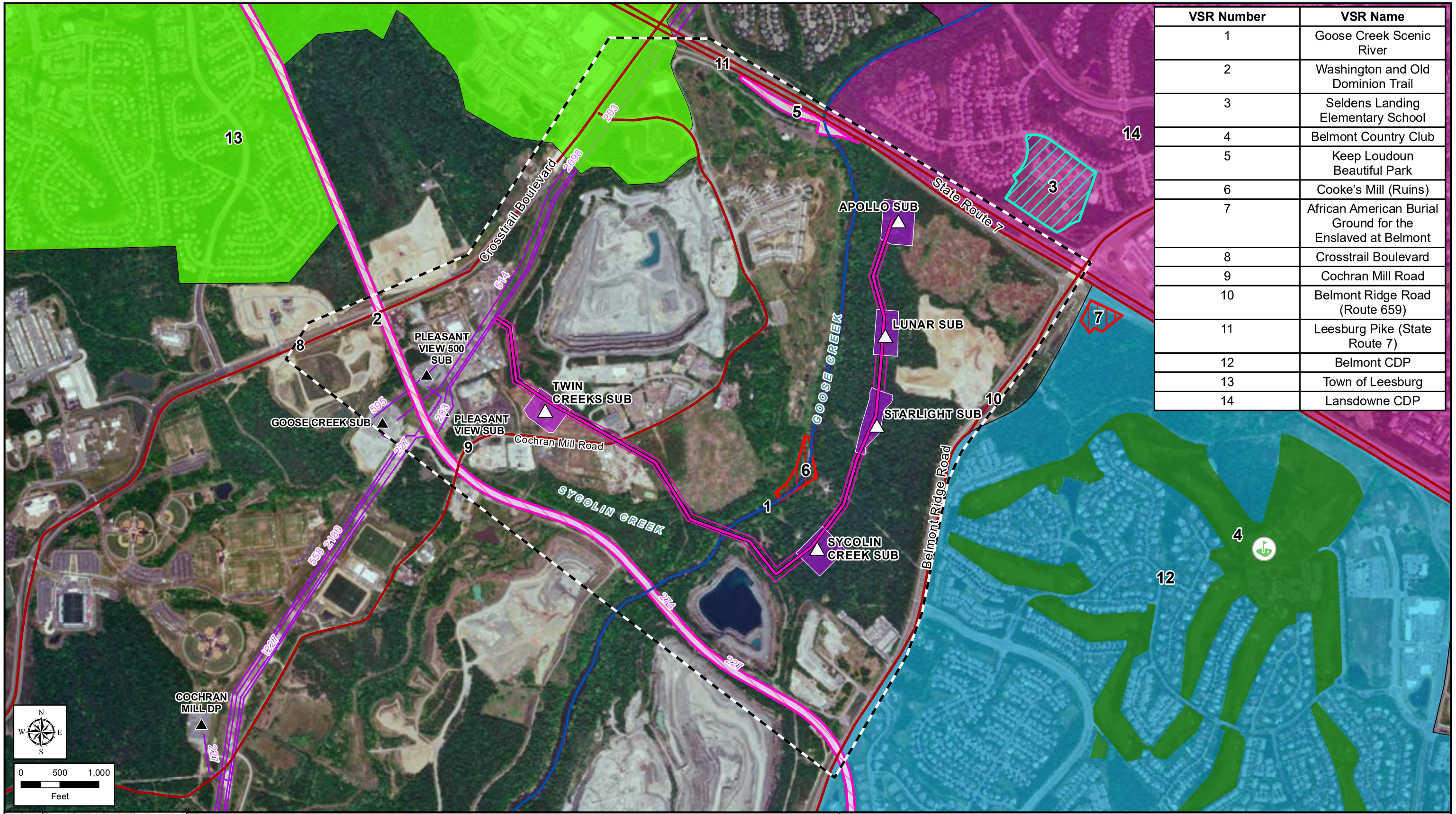


Figure 6.5.2
Visually Sensitive Resources
230 kV Apollo-Twin Creeks Lines, Twin Creeks, Sycolin Creek, Starlight, Lunar, and Apollo Substations
Dominion Energy Virginia
Loudoun County, Virginia

ERM

Dominion Energy

Crosstrail Boulevard
State Route 7
Belmont Ridge Road
Cochran Mill Road
GOOSE CREEK
SYCOLIN CREEK
APOLLO SUB
LUNAR SUB
STARLIGHT SUB
SYCOLIN CREEK SUB
TWIN CREEKS SUB
PLEASANT VIEW 500 SUB
PLEASANT VIEW SUB
GOOSE CREEK SUB
COCHRAN MILL DP
595
2093
514
203
2211
2100
2214
1
2
3
4
5
6
7
8
N
S
E
W
0 500 1,000
Feet
Project Location
Existing Substation
Proposed Substation
Proposed Apollo-Twin Creeks Lines (Route 1)
Proposed Substation Boundary
Existing Dominion Transmission Lines
Study Area
Key Observation Point (KOP)
KOP View Direction

Figure 6.5.3
Key Observation Points
230 kV Apollo-Twin Creeks Lines, Twin Creeks, Sycolin Creek, Starlight, Lunar, and Apollo Substations
Dominion Energy Virginia
Loudoun County, Virginia

ERM
Dominion Energy

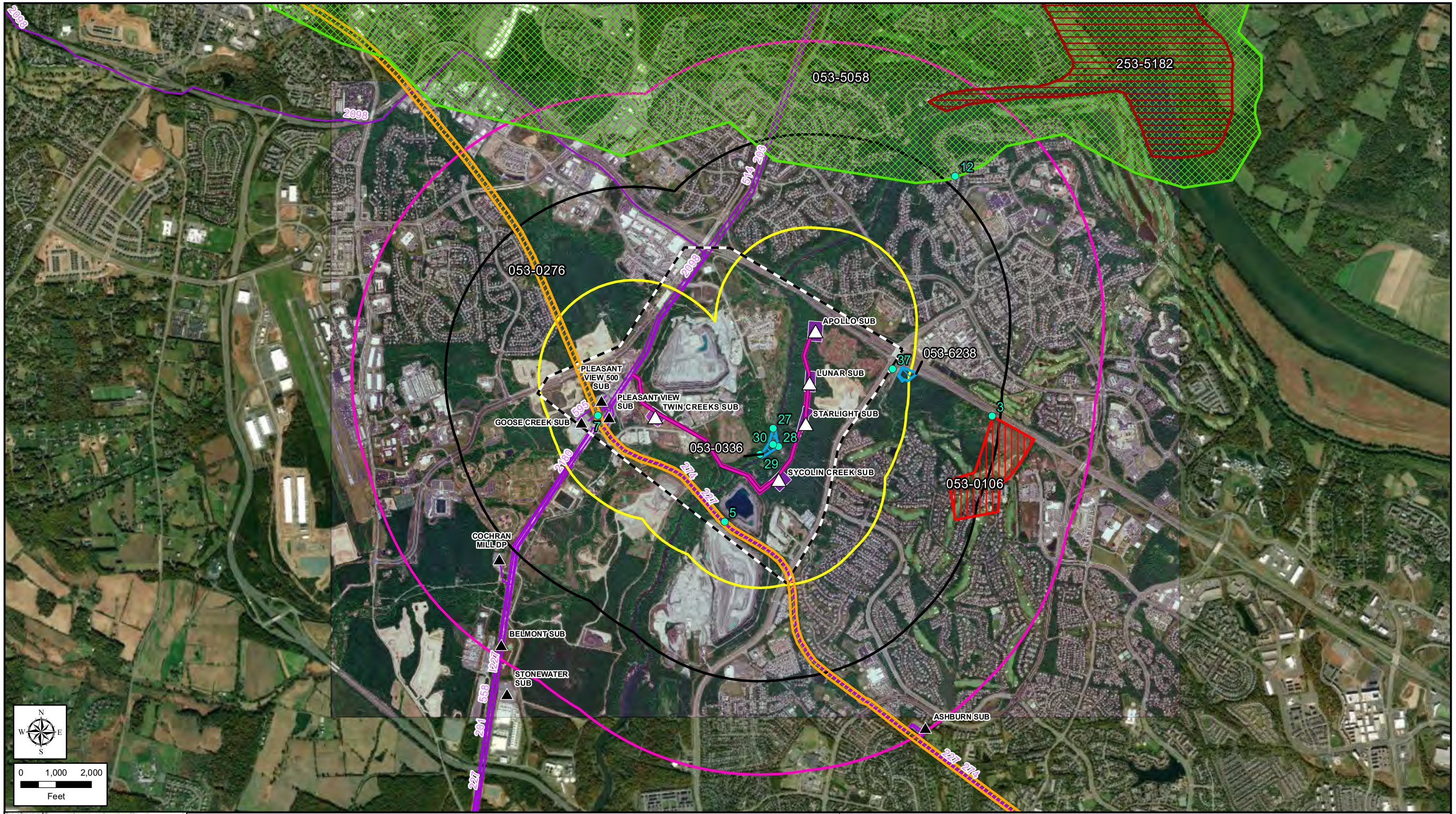


Figure 6.6.1
Aboveground Historic Resources and Architectural Sites
230 kV Apollo-Twin Creeks Lines, Twin Creeks, Sycolin Creek, Starlight, Lunar, and Apollo Substations
Dominion Energy Virginia
Loudoun County, Virginia

ERM

Dominion Energy

Dominion Energy

Figure 6.7.1

Demographic and Socioeconomic Indicators in the Study Area

230 kV Apollo-Twin Creeks Lines, Twin Creeks, Sycolin Creek, Starlight, Lunar, and Apollo Substations

Dominion Energy Virginia
Loudoun County, VA

511076106041 (CT 6106.04, BG 1)
511076106043 (CT 6106.04, BG 3)
511076106044 (CT 6106.04, BG 4)
511076105062 (CT 6105.06, BG 2)
511076105063 (CT 6105.06, BG 3)
511076105073 (CT 6105.07, BG 3)
511076105074 (CT 6105.07, BG 4)
511076110091 (CT 6110.09, BG 1)
511076110092 (CT 6110.09, BG 2)
511076110093 (CT 6110.09, BG 3)
511076110111 (CT 6110.11, BG 1)
511076110112 (CT 6110.11, BG 2)
511076110121 (CT 6110.12, BG 1)
511076110122 (CT 6110.12, BG 2)
511076110041 (CT 6110.04, BG 1)
511076110042 (CT 6110.04, BG 2)

APOLLO SUB
LUNAR SUB
STARLIGHT SUB
SYCOLIN CREEK SUB
TWIN CREEKS SUB
PLEASANT VIEW 500 SUB
PLEASANT VIEW SUB
GOOSE CREEK SUB
COCHRAN MILL DP
BELMONT SUB
STONEWATER SUB

African American Burial Ground for the Enslaved at Belmont

Lansdowne
Belmont
Sycolin
Leesburg Executive Airport
Goose Creek Golf Course
DGS Operations And Maintenance Facility
Philip A. Bolen Memorial Park / Loudoun Adult Day Center
Belmont Country Club
Harper Park Middle School
Belmont Ridge Middle Sch
Riverpoint Drive Trailhead
Inova Loudoun Hospital-Lansdo
Newton-Lee Elementary Schoo

Russell Branch Pkwy SE
Crosstrail Blvd
Cochran Mill Rd
Battlefield Pkwy
Sycolin Rd SE
Kincaid Blvd SE
Belmont Ridge Rd
Riverpoint Dr
Gloucester Pkwy
Claiborne Pkwy
641
643

- Burial Grounds and Cemeteries
- Study Area
- Existing Substation
- Proposed Substation
- Proposed Substation Footprint
- Existing Dominion Transmission Line
- 1-Mile Buffer of Project Impacts
- Proposed Apollo-Twin Creeks Lines (Route 1)
- Census Block Group Boundary
- Limited English Speaking Household
- Population of Color
- Population of Color and Low-income Population

0 1,000 2,000
Feet

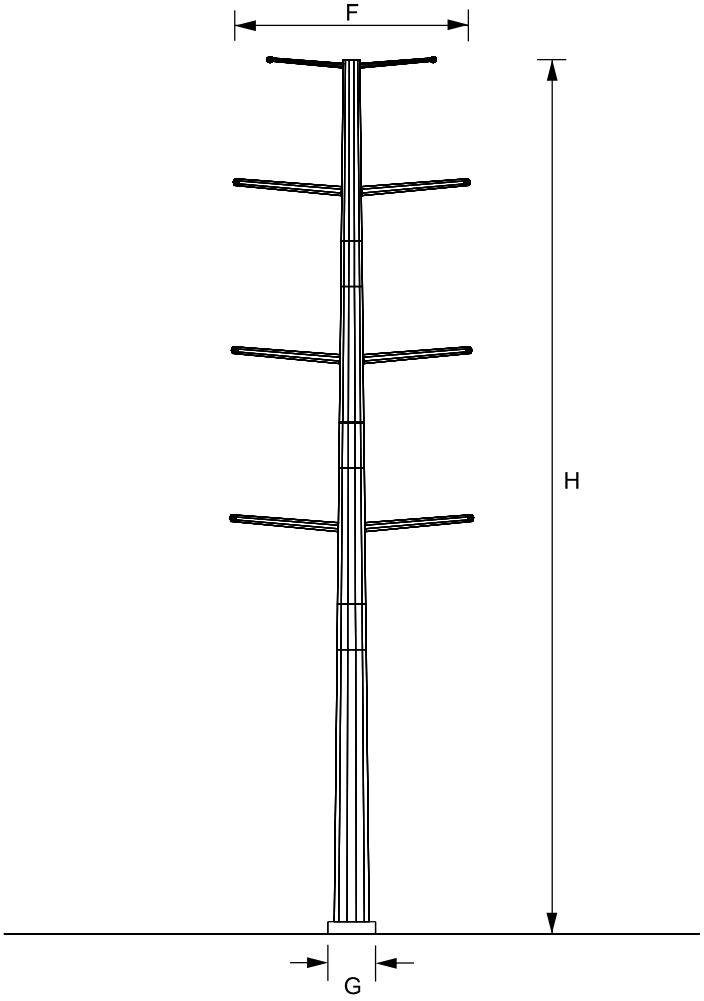
1:21,000

ERM

N W E S

Loudoun
Fauquier
Fairfax

APPENDIX B STRUCTURAL DRAWINGS



TYPICAL DC ENGINEERED MONOPOLE DOUBLE DEADEND STRUCTURE

A. STRUCTURE MAPPING	SEE ATTACHMENT II.B.3.d
B. RATIONALE FOR STRUCTURE TYPE:	MORE COMPACT STRUCTURES FOR DOUBLE CIRCUIT CONFIGURATION
C. LENGTH OF R/W (STRUCTURE QTY):	1.9 MILES (9)
D. STRUCTURE MATERIAL:	DULLED GALVANIZED STEEL
RATIONALE FOR STRUCTURE MATERIAL:	DULLED GALVANIZED STEEL TO MINIMIZE VISUAL IMPACT BY REDUCING THE GLARE ON THE NEW STRUCTURES
E. FOUNDATION MATERIAL: AVERAGE FOUNDATION REVEAL:	CONCRETE SEE NOTE 1
F. AVERAGE WIDTH AT CROSSARM:	26'
G. AVERAGE WIDTH AT BASE:	9' DIAMETER FOUNDATION - SEE NOTE 2
H. MINIMUM STRUCTURE HEIGHT: MAXIMUM STRUCTURE HEIGHT: AVERAGE STRUCTURE HEIGHT:	110' 135' 121'
I. AVERAGE SPAN LENGTH:	*630' - SEE NOTE 3*
J. MINIMUM CONDUCTOR-TO-GROUND:	22.5' (AT MAXIMUM OPERATING TEMPERATURE)

NOTES:
1. MINIMUM FOUNDATION REVEAL SHALL BE 1.5', MAX REVEAL IS SUBJECT TO FINAL DESIGN
2. FINAL FOUNDATION DIAMETER SHALL BE BASED ON GEOTECHNICAL FINDINGS DURING FINAL DESIGN
3. SPAN LENGTHS ARE INCLUSIVE OF THE ROW LENGTH LISTED IN LINE (C)
4. INFORMATION ON DRAWING IS PRELIMINARY AND SUBJECT TO CHANGE DURING FINAL ENGINEERING

THE INFORMATION CONTAINED ON THIS DRAWING IS CONSIDERED PRELIMINARY IN NATURE AND IS SUBJECT TO CHANGE BASED ON FINAL DESIGN

Dominion Energy
10900 Nuckols Road
Glen Allen, VA 23060

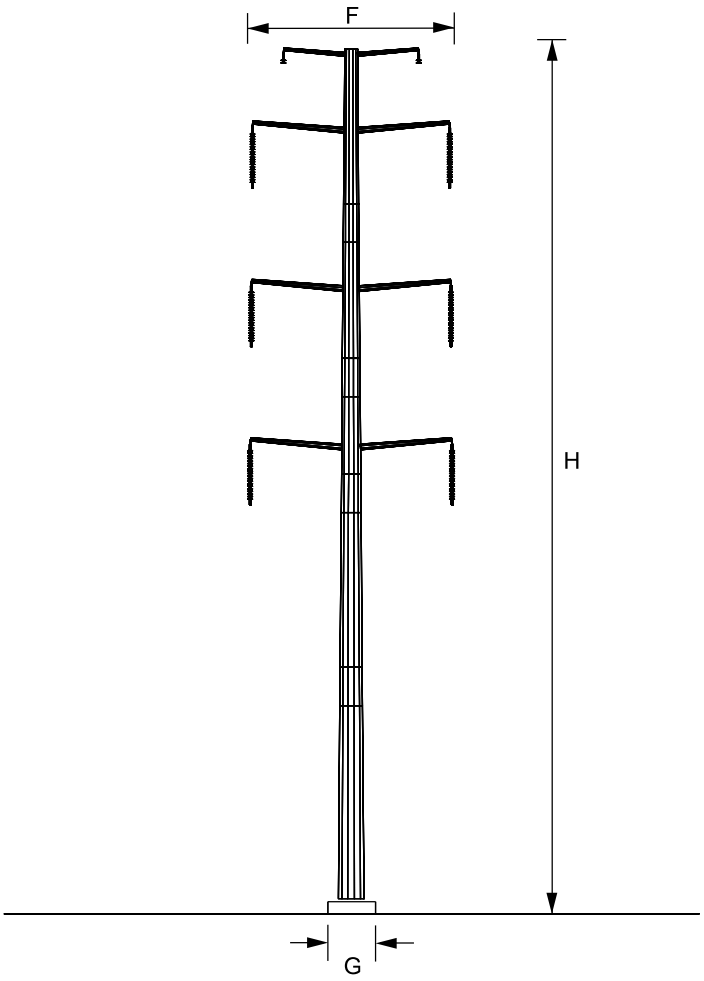
STRUCTURE: 203/2 (2320/5), 203/1C (2320/4), 203/1A (2320/2), 2316/2 (2317/2), 2316/3 (2317/3), 2316/4 (2317/4), 2334/2 (2335/2), 2334/3 (2335/3), 2342/2 (2343/2)

TYPICAL DC ENGINEERED MONOPOLE DOUBLE DEADEND STRUCTURE

ATTACHMENT NO.

II.B.3.a

DRAWN BY: SLS



TYPICAL DC ENGINEERED MONOPOLE SUSPENSION STRUCTURE

A. STRUCTURE MAPPING	SEE ATTACHMENT II.B.3.d
B. RATIONALE FOR STRUCTURE TYPE:	MORE COMPACT STRUCTURES FOR DOUBLE CIRCUIT CONFIGURATION
C. LENGTH OF R/W (STRUCTURE QTY):	1.9 MILES (1)
D. STRUCTURE MATERIAL:	DULLED GALVANIZED STEEL
RATIONALE FOR STRUCTURE MATERIAL:	DULLED GALVANIZED STEEL TO MINIMIZE VISUAL IMPACT BY REDUCING THE GLARE ON THE NEW STRUCTURES
E. FOUNDATION MATERIAL: AVERAGE FOUNDATION REVEAL:	CONCRETE SEE NOTE 1
F. AVERAGE WIDTH AT CROSSARM:	26'
G. AVERAGE WIDTH AT BASE:	6' DIAMETER FOUNDATION - SEE NOTE 2
H. MINIMUM STRUCTURE HEIGHT : MAXIMUM STRUCTURE HEIGHT : AVERAGE STRUCTURE HEIGHT :	110' 110' 110'
I. AVERAGE SPAN LENGTH:	*630' - SEE NOTE 3*
J. MINIMUM CONDUCTOR-TO-GROUND:	22.5' (AT MAXIMUM OPERATING TEMPERATURE)

NOTES:
1. MINIMUM FOUNDATION REVEAL SHALL BE 1.5', MAX REVEAL IS SUBJECT TO FINAL DESIGN
2. FINAL FOUNDATION DIAMETER SHALL BE BASED ON GEOTECHNICAL FINDINGS DURING FINAL DESIGN
3. SPAN LENGTHS ARE INCLUSIVE OF THE ROW LENGTH LISTED IN LINE (C)
4. INFORMATION ON DRAWING IS PRELIMINARY AND SUBJECT TO CHANGE DURING FINAL ENGINEERING

THE INFORMATION CONTAINED ON THIS DRAWING IS CONSIDERED PRELIMINARY IN NATURE AND IS SUBJECT TO CHANGE BASED ON FINAL DESIGN

Dominion Energy
Dominion Energy
10900 Nuckols Road
Glen Allen, VA 23060

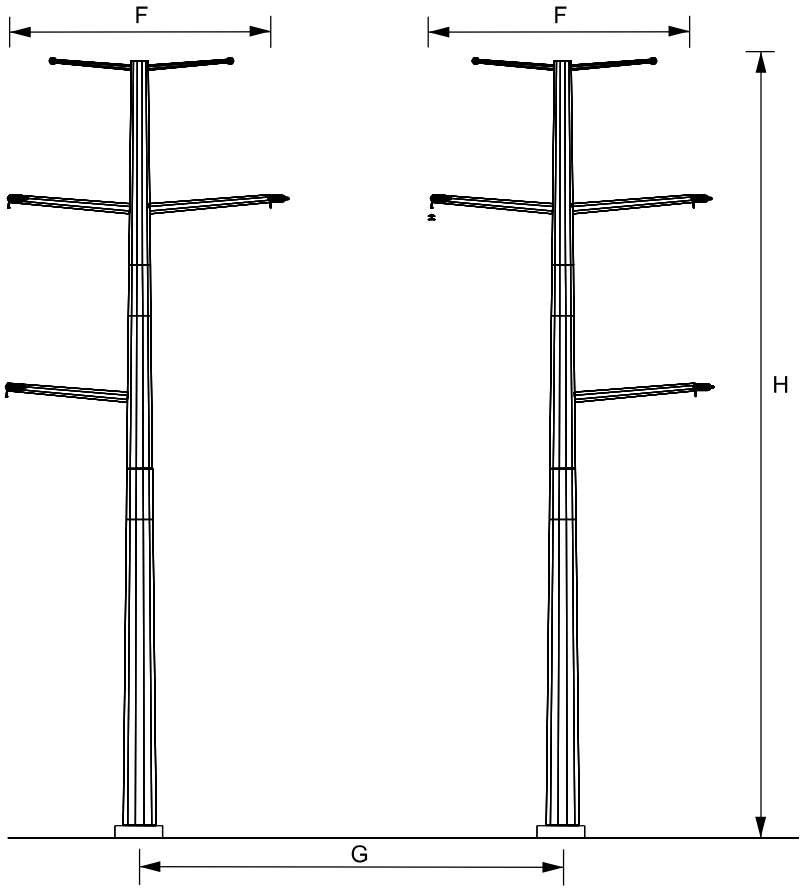
STRUCTURE: 203/1B (2320/3)

TYPICAL DC ENGINEERED MONOPOLE SUSPENSION STRUCTURE

ATTACHMENT NO.

II.B.3.b

DRAWN BY: SLS



TYPICAL DC ENGINEERED 2-POLE DOUBLE DEADEND STRUCTURE

A. STRUCTURE MAPPING	SEE ATTACHMENT II.B.3.d
B. RATIONALE FOR STRUCTURE TYPE:	SHORTER STRUCTURES FOR DOUBLE CIRCUIT CONFIGURATION NEEDED FOR CROSSING UNDER TRANSMISSION LINE.
C. LENGTH OF R/W (STRUCTURE QTY):	1.9 MILES (3)
D. STRUCTURE MATERIAL:	DULLED GALVANIZED STEEL
RATIONALE FOR STRUCTURE MATERIAL:	DULLED GALVANIZED STEEL TO MINIMIZE VISUAL IMPACT BY REDUCING THE GLARE ON THE NEW STRUCTURES
E. FOUNDATION MATERIAL: AVERAGE FOUNDATION REVEAL:	CONCRETE SEE NOTE 1
F. AVERAGE WIDTH AT CROSSARM:	26'
G. AVERAGE WIDTH AT BASE:	41.5' POLE SPACING, 7' DIAMETER FOUNDATION - SEE NOTE 2
H. MINIMUM STRUCTURE HEIGHT : MAXIMUM STRUCTURE HEIGHT : AVERAGE STRUCTURE HEIGHT :	85' 90' 88'
I. AVERAGE SPAN LENGTH:	*630' - SEE NOTE 3*
J. MINIMUM CONDUCTOR-TO-GROUND:	22.5' (AT MAXIMUM OPERATING TEMPERATURE)

NOTES:
1. MINIMUM FOUNDATION REVEAL SHALL BE 1.5', MAX REVEAL IS SUBJECT TO FINAL DESIGN
2. FINAL FOUNDATION DIAMETER SHALL BE BASED ON GEOTECHNICAL FINDINGS DURING FINAL DESIGN
3. SPAN LENGTHS ARE INCLUSIVE OF THE ROW LENGTH LISTED IN LINE (C)
4. INFORMATION ON DRAWING IS PRELIMINARY AND SUBJECT TO CHANGE DURING FINAL ENGINEERING

THE INFORMATION CONTAINED ON THIS DRAWING IS CONSIDERED PRELIMINARY IN NATURE AND IS SUBJECT TO CHANGE BASED ON FINAL DESIGN

Dominion Energy
Dominion Energy
10900 Nuckols Road
Glen Allen, VA 23060

STRUCTURE: 2316/5 (2317/5), 2316/6 (2317/6), 2340/2 (2341/2)

TYPICAL DC ENGINEERED 2-POLE DOUBLE DEADEND STRUCTURE

ATTACHMENT NO.

II.B.3.c

DRAWN BY: SLS

APPENDIX C VDCR CORRESPONDENCE AND FEDERAL- AND STATE-LISTED SPECIES INFORMATION

COMMONWEALTH of VIRGINIA
DEPARTMENT OF CONSERVATION AND RECREATION

February 15, 2024

Briana Cooney
Environmental Resource Management
222 South 9th Street, Suite 2900
Minneapolis, MN 55402

Re: 0655669, Twin Creeks to Apollo

Dear Ms. Cooney:

The Department of Conservation and Recreation's Division of Natural Heritage (DCR) has searched its Biotics Data System for occurrences of natural heritage resources from the area outlined on the submitted map. Natural heritage resources are defined as the habitat of rare, threatened, or endangered plant and animal species, unique or exemplary natural communities, and significant geologic formations.

According to the information in our files, the Ashburn Quarry Conservation Site is located within the project area, including a 100-foot buffer. Conservation sites are tools for representing key areas of the landscape that warrant further review for possible conservation action because of the natural heritage resources and habitat they support. Conservation sites are polygons built around one or more rare plant, animal, or natural community designed to include the element and, where possible, its associated habitat, and buffer or other adjacent land thought necessary for the element's conservation. Conservation sites are given a biodiversity significance ranking (B-rank) based on the rarity, quality, and number of element occurrences they contain; on a scale of 1-5, 1 being most significant. The Ashburn Quarry Conservation Site has been assigned a B-rank of B5, which represents a site of general interest/open space significance. The natural heritage resource associated with this site is:

Falco peregrinus	Peregrine Falcon	G4/S1B, S2N/NL/LT

The Peregrine Falcon nests on cliffs, bluffs, talus slopes, old tree hollows, and abandoned nests of other birds of prey (Byrd, 1991). The adult Peregrine Falcon has long and pointed wings, a dark blue or slate back, black on its head and cheeks and white on its throat and sides of its neck. Their belly is barred white and blackish brown, and its long, narrow tail is blue-grey with rounded narrow black bands and a white tipped end (Byrd, 1991). The Peregrine Falcon declined dramatically worldwide as a result of pesticide use in the mid-1900's and was once extirpated from east of the Mississippi, including Virginia (CCB, 2006). Once nesting took place in mountainous areas with sheer cliffs (CCB, 2006); currently, nesting pairs in Virginia predominately use artificial structures such as tall buildings, bridge supports, and towers primarily in the coastal plain (Byrd, 1991; CCB, 2006). Intensive reintroduction efforts have been applied in Virginia since the 1970s, and currently the population in Virginia still warrants protection and management.

Threats to the Peregrine falcon include continued exposure to pesticides and human disruption of nesting attempts (Byrd, 1991). Please note that this species is currently classified as threatened by the Virginia Department of Wildlife Resources (VDWR).

Due to the legal status of Peregrine falcon, DCR recommends coordination with Virginia's regulatory authority for the management and protection of this species, the VDWR, to ensure compliance with the Virginia Endangered Species Act **(**VA ST §§ 29.1-563 – 570).

Additionally, according to the diabase screening layer and a review by a DCR biologist, several rare plants which are typically associated with prairie vegetation and inhabit semi-open diabase glades in Virginia, may occur at this location if suitable habitat is present. Diabase glades are characterized by historically fire-dominated grassland vegetation on relatively nutrient-rich soils underlain by Triassic bedrock. Diabase flatrock, a hard, dark-colored volcanic rock, is found primarily in northern Virginia counties and is located within the geologic formation known as the Triassic Basin. Where the bedrock is exposed, a distinctive community type of drought-tolerant plants occurs. Diabase flatrocks are extremely rare natural communities that are threatened by activities such as quarrying and road construction (Rawinski, 1995).

In Northern Virginia, diabase supports occurrences of several global and state rare plant species: Earleaf False foxglove (*Agalinis auriculata*, G3/S1/NL/NL), American bluehearts (*Buchnera americana*, G5?/S1S2/NL/NL), Downy phlox (*Phlox pilosa*, G5/S1/NL/NL), Torrey's Mountain-mint (*Pycnanthemum torreyi*, G2/S2/SOC/LT), Stiff goldenrod (*Solidago rigida var. rigida*, G5T5/S2/NL/NL), and Hairy hedgenettle (*Stachys arenicola*, G4?/S1/NL/NL). Please note that Torrey's Mountain-mint is listed as threatened by the Virginia Department of Agriculture and Consumer Services (VDACS). Torrey's Mountain-mint is also listed as a Species of Concern (SOC) by United States Fish and Wildlife Service (USFWS); however, this is not a legal designation.

Due to the potential for this site to support populations of natural heritage resources, DCR recommends an inventory for rare plants associated with diabase soils in the study area. With the survey results we can more accurately evaluate potential impacts to natural heritage resources and offer specific protection recommendations for minimizing impacts to the documented resources.

DCR-Division of Natural Heritage biologists are qualified to conduct inventories for rare, threatened, and endangered species. Please contact Anne Chazal, Natural Heritage Chief Biologist, at anne.chazal@dcr.virginia.gov or 804-786-9014 to discuss availability and rates for field work.

Under a Memorandum of Agreement established between the Virginia Department of Agriculture and Consumer Services (VDACS) and the DCR, DCR represents VDACS in comments regarding potential impacts on state-listed threatened and endangered plant and insect species. Survey results should be coordinated with DCR-DNH. Upon review of the results, if it is determined the species is present, and there is a likelihood of a negative impact on the species, DCR-DNH will recommend coordination with VDACS to ensure compliance with Virginia's Endangered Plant and Insect Species Act.

The proposed project will also impact multiple Ecological Cores **(C4 and C5)** as identified in the Virginia Natural Landscape Assessment (https://www.dcr.virginia.gov/natural-heritage/vaconvisvnla). Mapped cores in the project area can be viewed via the Virginia Natural Heritage Data Explorer, available here: http://vanhde.org/content/map.

Ecological Cores are areas of at least 100 acres of continuous interior, natural cover that provide habitat for a wide range of species, from interior-dependent forest species to habitat generalists, as well as species that utilize marsh, dune, and beach habitats. Interior core areas begin 100 meters inside core edges and continue to the deepest parts of cores. Cores also provide the natural, economic, and quality of life benefits of open space, recreation, thermal moderation, water quality (including drinking water recharge and protection, and erosion prevention), and air quality (including sequestration of carbon, absorption of gaseous pollutants, and production of oxygen). Cores are ranked from C1 to C5 (C5 being the least significant) using nine prioritization criteria, including the habitats of natural heritage resources they contain.

Impacts to cores occur when their natural cover is partially or completely converted permanently to developed land uses. Habitat conversion to development causes reductions in ecosystem processes, native biodiversity, and habitat quality due to habitat loss; less viable plant and animal populations; increased predation; and increased introduction and establishment of invasive species.

DCR recommends avoidance of impacts to cores. When avoidance cannot be achieved, DCR recommends minimizing the area of impacts overall and concentrating the impacted area at the edges of cores, so that the most interior remains intact.

Furthermore, DCR recommends the development and implementation of an invasive species plan to be included as part of the maintenance practices for the right-of-way (ROW). The invasive species plan should include an invasive species inventory for the project area based on the current DCR Invasive Species List (http://www.dcr.virginia.gov/natural-heritage/document/nh-invasive-plant-list-2014.pdf) and methods for treating the invasives. DCR also recommends the ROW restoration and maintenance practices planned include appropriate revegetation using native species in a mix of grasses and forbs, robust monitoring and an adaptive management plan to provide guidance if initial revegetation efforts are unsuccessful or if invasive species outbreaks occur.

There are no State Natural Area Preserves under DCR's jurisdiction in the project vicinity. Please note this project is within Goose Creek, which has been designated as a scenic river in the state of Virginia. More information about scenic rivers can be found here: https://www.dcr.virginia.gov/recreational-planning/srmain.

New and updated information is continually added to Biotics. Please re-submit a completed order form and project map for an update on this natural heritage information if the scope of the project changes and/or six months has passed before it is utilized.

A fee of $500.00 has been assessed for the service of providing this information. Please find attached an invoice for that amount. Please return one copy of the invoice along with your remittance made payable to the Treasurer of Virginia, DCR Finance, 600 East Main Street, 24th Floor, Richmond, VA 23219. Payment is due within thirty days of the invoice date. Please note late payment may result in the suspension of project review service for future projects.

The Virginia Department of Wildlife Resources (VDWR) maintains a database of wildlife locations, including threatened and endangered species, trout streams, and anadromous fish waters that may contain information not documented in this letter. Their database may be accessed https://services.dwr.virginia.gov/fwis/ or contact Amy Martin at 804-367-2211 or amy.martin@dwr.virginia.gov. According to the information currently in our files, Goose Creek, which has been designated by the VDWR as a "Threatened and Endangered Species Water" for the Green Floater (*Lasmigona subviridis*) is within the submitted project boundary including a 100-foot buffer. Therefore, DCR recommends coordination with Virginia's regulatory authority for the management and protection of this species, the VDWR, to ensure compliance with the Virginia Endangered Species Act **(**VA ST §§ 29.1-563 – 570).

Should you have any questions or concerns, feel free to contact me at 804-371-2708. Thank you for the opportunity to comment on this project.

Sincerely,

S. René Hypes
Natural Heritage Project Review Coordinator

Cc: Amy Martin, VDWR

Literature Cited

Byrd, M.A. 1991. Peregrine Falcon. In Virginia's Endangered Species: Proceedings of a Symposium. K. Terwilliger ed. The McDonald and Woodward Publishing Company, Blacksburg, Virginia. p. 499-501.

Rawinski, T.J. 1995. Natural communities and ecosystems: Conservation priorities for the future. Unpublished report for DCR-DNH.

Watts, B. D. 2006. An investigation of cliffs and cliff-nesting birds in the southern Appalachians with an emphasis on the Peregrine Falcon. Center for Conservation Biology Technical Report Series, CCBTR-06-14. College of William and Mary, Williamsburg, VA. 43 pp.

VaFWIS Search Report Compiled on 1/19/2024, 1:48:42 PM

Help

Known or likely to occur within a **2 mile radius around point 39.0766380 -77.5172168** in **107 Loudoun County, VA**

View Map of Site Location

490 Known or Likely Species ordered by Status Concern for Conservation (displaying first 28) (28 species with Status* or Tier I** or Tier II**)

BOVA Code	Status*	Tier**	Common Name	Scientific Name	Confirmed	Database(s)
050022	FEST	Ia	Bat, northern long-eared	Myotis septentrionalis		BOVA
060003	FESE	Ia	Wedgemussel, dwarf	Alasmidonta heterodon		BOVA
060029	FTST	IIa	Lance, yellow	Elliptio lanceolata		BOVA,HU6
050020	SE	Ia	Bat, little brown	Myotis lucifugus		BOVA
050027	FPSE	Ia	Bat, tri-colored	Perimyotis subflavus		BOVA
060006	SE	Ib	Floater, brook	Alasmidonta varicosa		BOVA
030062	ST	Ia	Turtle, wood	Glyptemys insculpta	Potential	BOVA,Habitat,HU6
040096	ST	Ia	Falcon, peregrine	Falco peregrinus		BOVA
040293	ST	Ia	Shrike, loggerhead	Lanius ludovicianus		BOVA,HU6
040379	ST	Ia	Sparrow, Henslow's	Centronyx henslowii		BOVA
060081	ST	IIa	Floater, green	Lasmigona subviridis	Yes	BOVA,TEWaters,Habitat,HU6
040292	ST		Shrike, migrant loggerhead	Lanius ludovicianus migrans		BOVA
100079	FC	IIIa	Butterfly, monarch	Danaus plexippus		BOVA
030063	CC	IIIa	Turtle, spotted	Clemmys guttata		BOVA
030012	CC	IVa	Rattlesnake, timber	Crotalus horridus		BOVA,HU6
040092		Ia	Eagle, golden	Aquila chrysaetos		BOVA
040040		Ia	Ibis, glossy	Plegadis falcinellus		HU6
040306		Ia	Warbler, golden-winged	Vermivora chrysoptera		BOVA
100248		Ia	Fritillary, regal	Speyeria idalia idalia		BOVA,HU6

040213		Ic	Owl, northern saw-whet	Aegolius acadicus		BOVA,HU6
040052		IIa	Duck, American black	Anas rubripes		BOVA,HU6
040036		IIa	Night-heron, yellow-crowned	Nyctanassa violacea violacea		BOVA
040320		IIa	Warbler, cerulean	Setophaga cerulea		BOVA,HU6
040140		IIa	Woodcock, American	Scolopax minor		BOVA,HU6
060071		IIa	Lampmussel, yellow	Lampsilis cariosa		BOVA,HU6
040203		IIb	Cuckoo, black-billed	Coccyzus erythropthalmus		BOVA
040105		IIb	Rail, king	Rallus elegans		BOVA
100166		IIc	Skipper, Dotted	Hesperia attalus slossonae		BOVA,HU6

To view **All 490 species** View 490

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

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

View Map of All Query Results from All Observation Tables

Bat Colonies or Hibernacula: **Not Known**

Anadromous Fish Use Streams

N/A

Impediments to Fish Passage (1 records)

View Map of All Fish Impediments

ID	Name	River	View Map
1216	GOOSE CREEK DAM	GOOSE CREEK	Yes

Colonial Water Bird Survey

N/A

Threatened and Endangered Waters (13 Reaches)

View Map of All Threatened and Endangered Waters

Stream Name	T&E Waters Species						View Map
	Highest TE*	BOVA Code, Status*, Tier**, Common & Scientific Name					
Goose Creek (018820)	ST	060081	ST	IIa	Floater, green	Lasmigona subviridis	Yes
Goose Creek (023631)	ST	060081	ST	IIa	Floater, green	Lasmigona subviridis	Yes
Goose Creek (025464)	ST	060081	ST	IIa	Floater, green	Lasmigona subviridis	Yes
Goose Creek (026509)	ST	060081	ST	IIa	Floater, green	Lasmigona subviridis	Yes
Goose Creek (026550)	ST	060081	ST	IIa	Floater, green	Lasmigona subviridis	Yes
Goose Creek (028649)	ST	060081	ST	IIa	Floater, green	Lasmigona subviridis	Yes
Goose Creek (031573)	ST	060081	ST	IIa	Floater, green	Lasmigona subviridis	Yes
Goose Creek (032031)	ST	060081	ST	IIa	Floater, green	Lasmigona subviridis	Yes
Goose Creek (032084)	ST	060081	ST	IIa	Floater, green	Lasmigona subviridis	Yes
Goose Creek (034352)	ST	060081	ST	IIa	Floater, green	Lasmigona subviridis	Yes
Goose Creek (035653)	ST	060081	ST	IIa	Floater, green	Lasmigona subviridis	Yes
Goose Creek (036348)	ST	060081	ST	IIa	Floater, green	Lasmigona subviridis	Yes
Goose Creek (040279)	ST	060081	ST	IIa	Floater, green	Lasmigona subviridis	Yes

Managed Trout Streams

N/A

Bald Eagle Concentration Areas and Roosts

N/A

Bald Eagle Nests

N/A

Species Observations (29 records - displaying first 20)

View Map of All Query Results
Species Observations

obsID	class	Date Observed	Observer	N Species			View Map
				Different Species	Highest TE*	Highest Tier**	
633212	SppObs	Jun 17 2015	Rick Browder; Gabriel Darkwah	3		III	Yes
607875	SppObs	Jul 22 2009	Richard; Browder	7		III	Yes
308382	SppObs	Jun 2 2004	Alex Barron	4		III	Yes
67870	SppObs	Aug 7 2001	Rick Browder (Principle Permittee)	6		III	Yes
55952	SppObs	Oct 3 1998	PAUL ANGERMEIER (PRINCIPAL PERMITTEE), KEVIN R. GOODWIN, (COLLECTOR), VA COOPERATIVE FISH AND WILDLIFE UNIT	23		III	Yes
11559	SppObs	Oct 6 1989	ANGERMEIER ET AL	21		III	Yes
332215	SppObs	Jan 1 1956	VPI-VA. TECH	7		III	Yes
60818	SppObs	Oct 18 1964	HIGHTON, RICHARD, MADISON, DALE	1		IV	Yes
17019	SppObs	Jan 1 1900		1		IV	Yes
614305	SppObs	Jul 5 2008	William ; Robertson	1			Yes
614302	SppObs	Jun 28 2008	William ; Robertson	1			Yes
425207	SppObs	Aug 24 2005	VCU - INSTAR	5			Yes
67876	SppObs	Aug 7 2001	Rick Browder (Principle Permittee)	3			Yes
300635	SppObs	Jun 18 2001	ROGER B. CLAPP	1			Yes
300232	SppObs	May 15 2001	Mark F. Causey, Ken H. Bass, Liam J. McGranaghan	1			Yes
58864	SppObs	Apr 29 1998	Roger B. Clapp (PRINCIPLE PERMITTEE), MILENSKI, SCHMIDT, USGS/PWRC	1			Yes

			NATIONAL MUSEUM OF NATURAL HISTORY				
54543	SppObs	May 3 1997	R. B. CLAPP	1			Yes
51006	SppObs	Apr 19 1997	Mike Mulligan, Chesapeake Bay Foundation	4			Yes
16388	SppObs	Nov 24 1974	N & M BURKHEAD & M. T. MASNIK	13			Yes
334699	SppObs	Jan 1 1974	NMB-BURKHEAD	13			Yes

Displayed 20 Species Observations

Selected 29 Observations View all 29 Species Observations

Habitat Predicted for Aquatic WAP Tier I & II Species (6 Reaches)

View Map Combined Reaches from Below of Habitat Predicted for WAP Tier I & II Aquatic Species

Stream Name	Tier Species						View Map
	Highest TE*	BOVA Code, Status*, Tier**, Common & Scientific Name					
Cattail Branch (20700081)	ST	030062	ST	Ia	Turtle, wood	Glyptemys insculpta	Yes
Goose Creek (20700081)	ST	060081	ST	IIa	Floater, green	Lasmigona subviridis	Yes
Russell Branch (20700081)	ST	030062	ST	Ia	Turtle, wood	Glyptemys insculpta	Yes
Sycolin Creek (20700081)	ST	030062	ST	Ia	Turtle, wood	Glyptemys insculpta	Yes
tributary (20700081)	ST	030062	ST	Ia	Turtle, wood	Glyptemys insculpta	Yes
Tuscarora Creek (20700081)	ST	030062	ST	Ia	Turtle, wood	Glyptemys insculpta	Yes
Tuscarora Creek (20700081)	ST	030062	ST	Ia	Turtle, wood	Glyptemys insculpta	Yes

Habitat Predicted for Terrestrial WAP Tier I & II Species

N/A

Virginia Breeding Bird Atlas Blocks (3 records)

View Map of All Query Results
Virginia Breeding Bird Atlas Blocks

BBA ID	Atlas Quadrangle Block Name	Breeding Bird Atlas Species			View Map
		Different Species	Highest TE*	Highest Tier**	

50214	Leesburg, CE	63		III	Yes
50212	Leesburg, NE	58		III	Yes
51213	Sterling, CW	64		III	Yes

Public Holdings:

N/A

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

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

USGS 7.5' Quadrangles:
Leesburg
Sterling

USGS NRCS Watersheds in Virginia:

N/A

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

HU6 Code	USGS 6th Order Hydrologic Unit	Different Species	Highest TE	Highest Tier
PL14	Goose Creek-Big Branch	59	FTST	I
PL15	Sycolin Creek	54	ST	I
PL16	Goose Creek-Cattail Branch	56	ST	I
PL19	Broad Run-Beaverdam Run	53	ST	I
PL20	Potomac River-Selden Island	47	ST	I

Compiled on 1/19/2024, 1:48:42 PM I1624671.0 report=all searchType= R dist= 3218 poi= 39.0766380 -77.5172168

PixelSize=64; Anadromous=0.017811; BBA=0.032485; BECAR=0.018136; Bats=0.017657; Buffer=0.060058; County=0.053099; HU6=0.041941; Impediments=0.019094; Init=0.090675; PublicLands=0.018781; Quad=0.023573; SppObs=0.212325; TEWaters=0.027668; TierReaches=0.045013; TierTerrestrial=0.024624; Total=0.856555; Tracking_BOVA=0.170815; Trout=0.019146; huva=0.020431

VAFWIS - Department of Wildlife Resources

39.07663 -77.51721
is the Search Point
Submit Cancel

Search Point
- **Change** to "clicked" map point
- **Fixed** at 39.07663 -77.51721

Show Position Rings
Yes No
1/2 mile and 1/8 mile at the **Search Point**

Show Search Area
Yes No
2 Search distance miles radius

Search Point is at map center

Base Map Choices
Topography

Map Overlay Choices
Current List: Position, Search

Map Overlay Legend
Position Rings 1/2 mile and 1/8 mile at the Search Point
2 mile radius Search Area

back Refresh Browser Page
Map Click Pan Id M
Map Scale In Zoom Out
Screen Size Small Size Big
Help

Point of Search 39.07663 -77.51721
Map Location 39.07663 -77.51721

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

Base Map source: Topographic maps from TOPO! copyright 2006 (see National Geographic Maps for details)

Map projection is UTM Zone 18 NAD 1983 with left 278253 and top 4332297. Pixel size is 8 meters . Coordinates displayed are decimal Degrees North and West. Map is currently displayed as 1000 columns by 1000 rows for a total of 1000000 pixles. The map display represents 8000 meters east to west by 8000 meters north to south for a total of 64.0 square kilometers. The map display represents 26251 feet east to west by 26251 feet north to south for a total of 24.7 square miles.

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

map assembled 2024-01-19 13:47:24 (qa/qc March 21, 2016 12:20 - tn=1624671 dist=3218 I)
$poi=39.0766380 -77.5172169

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Virginia Ecological Services Field Office
6669 Short Lane
Gloucester, VA 23061-4410
Phone: (804) 693-6694 Fax: (804) 693-9032

In Reply Refer To:
Project Code: 2024-0037412
Project Name: Twin Creeks to Apollo

January 17, 2024

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

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed, and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

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

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological

evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

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

Migratory Birds: In addition to responsibilities to protect threatened and endangered species under the Endangered Species Act (ESA), there are additional responsibilities under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) to protect native birds from project-related impacts. Any activity, intentional or unintentional, resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the U.S. Fish and Wildlife Service (50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)). For more information regarding these Acts, see Migratory Bird Permit | What We Do | U.S. Fish & Wildlife Service (fws.gov).

The MBTA has no provision for allowing take of migratory birds that may be unintentionally killed or injured by otherwise lawful activities. It is the responsibility of the project proponent to comply with these Acts by identifying potential impacts to migratory birds and eagles within applicable NEPA documents (when there is a federal nexus) or a Bird/Eagle Conservation Plan (when there is no federal nexus). Proponents should implement conservation measures to avoid or minimize the production of project-related stressors or minimize the exposure of birds and their resources to the project-related stressors. For more information on avian stressors and recommended conservation measures, see https://www.fws.gov/library/collections/threats-birds.

In addition to MBTA and BGEPA, Executive Order 13186: *Responsibilities of Federal Agencies to Protect Migratory Birds*, obligates all Federal agencies that engage in or authorize activities that might affect migratory birds, to minimize those effects and encourage conservation measures that will improve bird populations. Executive Order 13186 provides for the protection of both migratory birds and migratory bird habitat. For information regarding the implementation of Executive Order 13186, please visit https://www.fws.gov/partner/council-conservation-migratory-birds.

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

Attachment(s):

- Official Species List

OFFICIAL SPECIES LIST

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

This species list is provided by:

Virginia Ecological Services Field Office
6669 Short Lane
Gloucester, VA 23061-4410
(804) 693-6694

PROJECT SUMMARY

Project Code: 2024-0037412
Project Name: Twin Creeks to Apollo
Project Type: Transmission Line - New Constr - Above Ground
Project Description: This request is a part of a pre-permitting effort to determine feasibility of overhead powerline routes.

Project Location:

The approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@39.0758122,-77.51825748166914,14z

Counties: Loudoun County, Virginia

ENDANGERED SPECIES ACT SPECIES

There is a total of 5 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

---

1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

MAMMALS

NAME	STATUS
Northern Long-eared Bat *Myotis septentrionalis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Endangered
Tricolored Bat *Perimyotis subflavus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/10515	Proposed Endangered

CLAMS

NAME	STATUS
Dwarf Wedgemussel *Alasmidonta heterodon* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/784	Endangered
Green Floater *Lasmigona subviridis* There is **proposed** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/7541	Proposed Threatened

INSECTS

NAME	STATUS
Monarch Butterfly *Danaus plexippus*	Candidate

No critical habitat has been designated for this species.
Species profile: https://ecos.fws.gov/ecp/species/9743

CRITICAL HABITATS

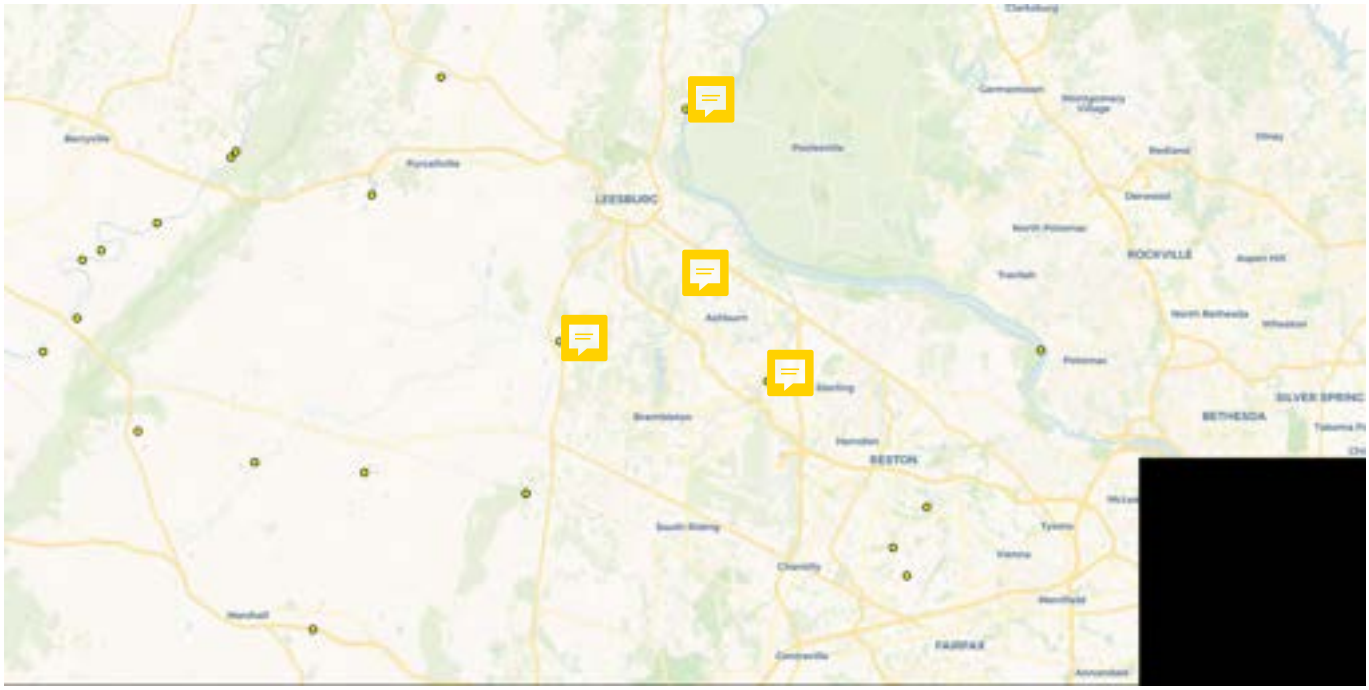
THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

YOU ARE STILL REQUIRED TO DETERMINE IF YOUR PROJECT(S) MAY HAVE EFFECTS ON ALL ABOVE LISTED SPECIES.

IPAC USER CONTACT INFORMATION

Agency:	Environmental Resources Management
Name:	Briana Cooney
Address:	222 South 9th Street
Address Line 2:	Suite 2900
City:	Minneapolis
State:	MN
Zip:	55402
Email	briana.cooney@erm.com
Phone:	6123477114

CCB Mapping Portal



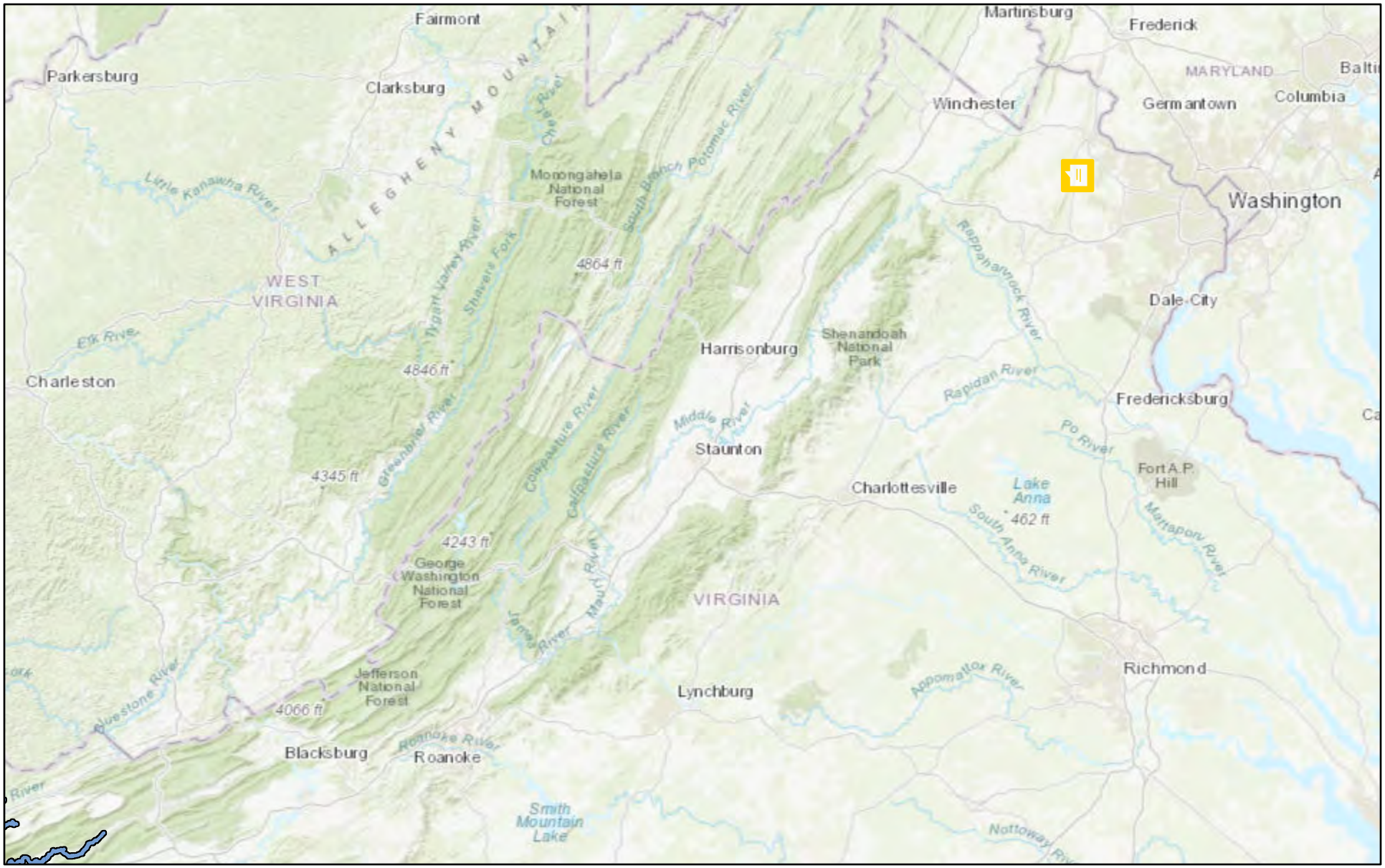
Layers: VA Eagle Nest Locator

Map Center [longitude, latitude]: [-77.53669738769531, 39.0738441478418]

Map Link:
https://ccbbirds.org/maps/#layer=VA+Eagle+Nest+Locator&zoom=11&lat=39.0738441478418&lng=-77.53669738769531&legend=legend_tab_7c321b7e-e523-11e4-aaa0-0e0c41326911&base=Street+Map+%28OSM%2FCarto%29

Report Generated On: 01/17/2024

Critical Habitat - Twin Creeks to Apollo



January 17, 2024

Virginia Critical Habitat (published)

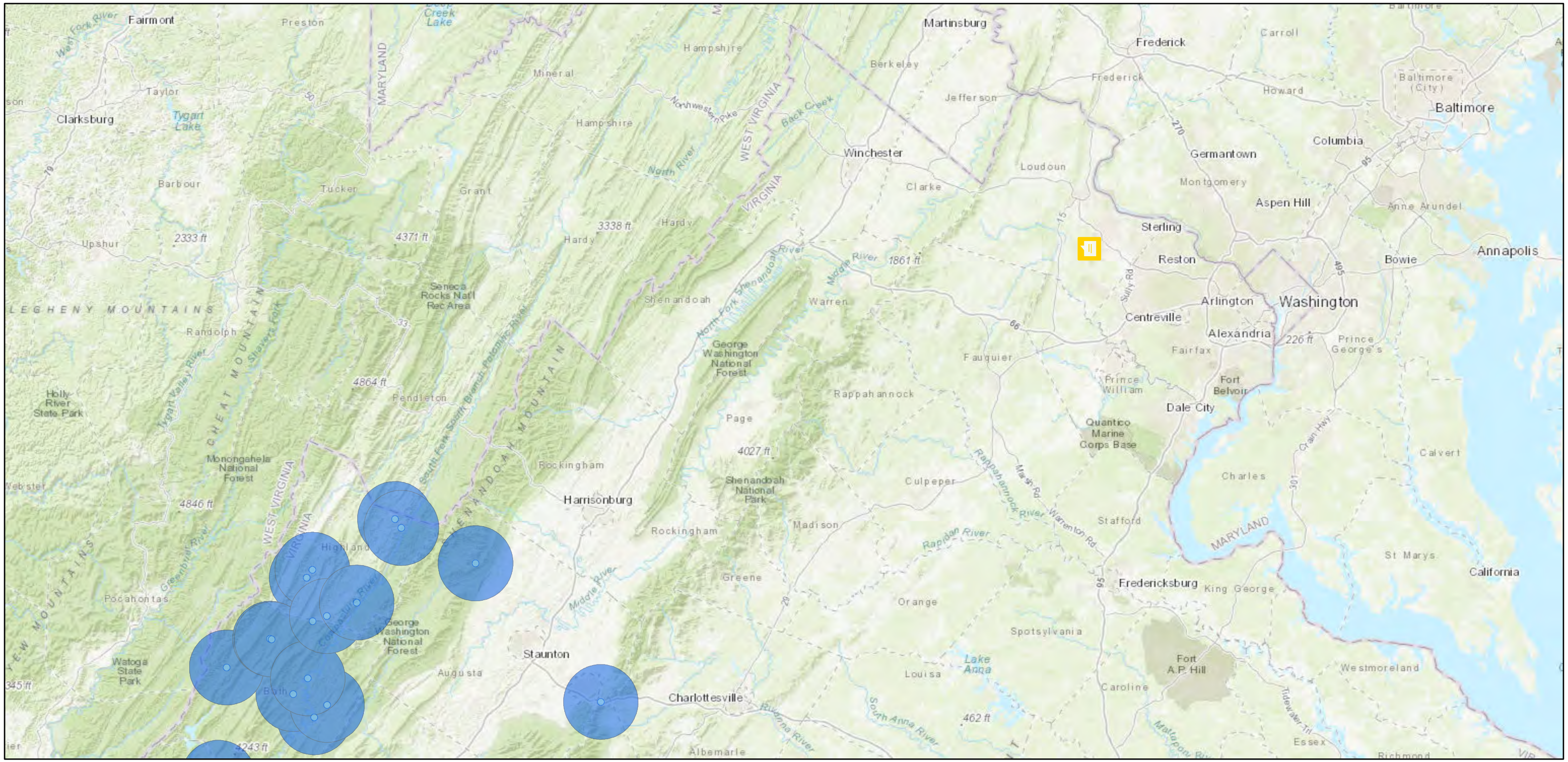
1:2,311,162

0 15 30 60 mi

0 20 40 80 km

Esri, HERE, Garmin, FAO, USGS, EPA, NPS

MYLU-PESU Locations and Roost Trees - Twin Creeks to Apollo



1/17/2024

Tri-colored and Little Brown Hibernaculum Half Mile Buffer

Tri-colored and Little Brown Hibernaculum 5.5 Mile Buffer

1:1,155,581

0 10 20 40 mi

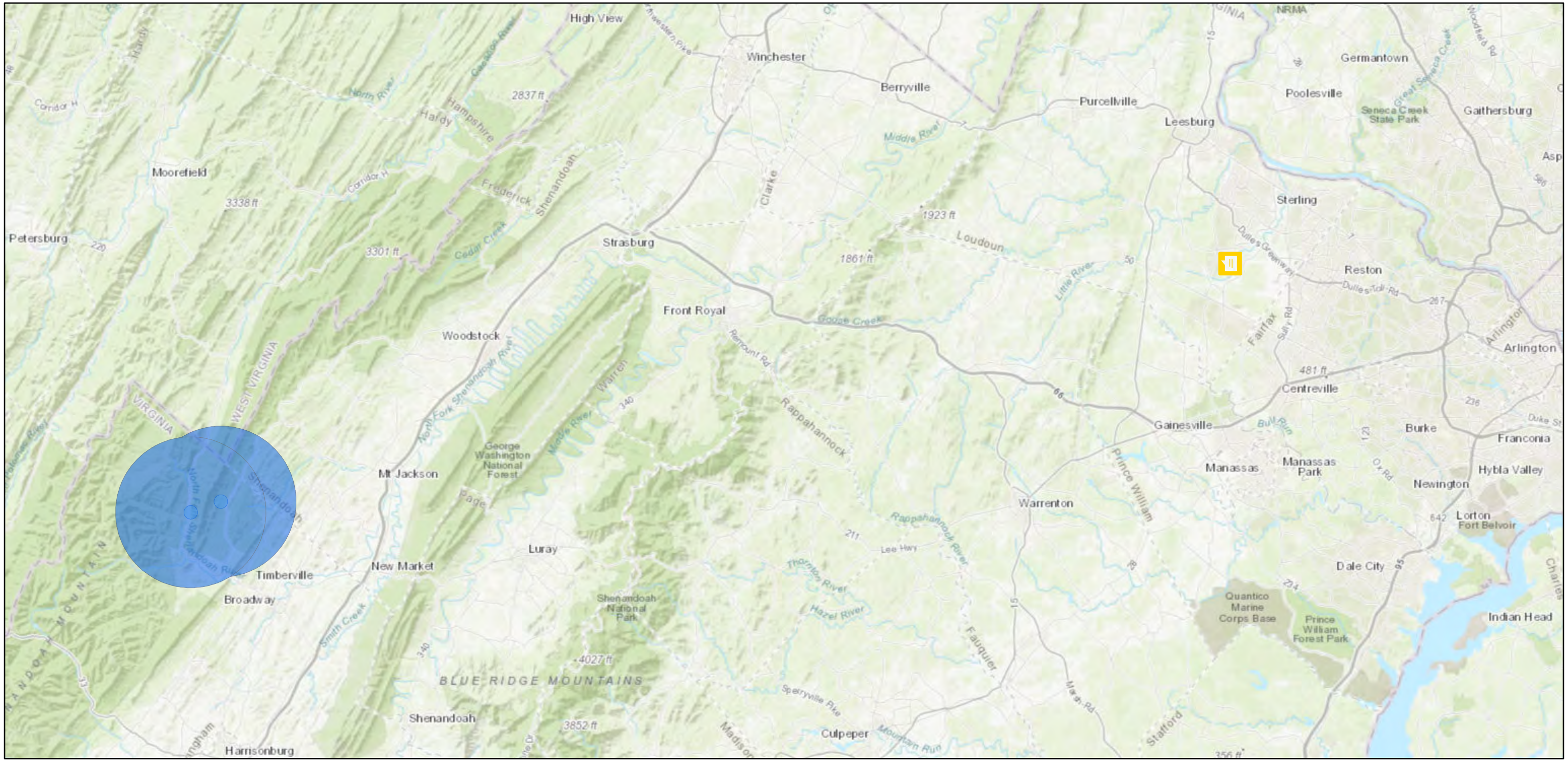
0 15 30 60 km

Esri, HERE, Garmin, FAO, USGS, NGA, EPA, NPS

Dept. Game and Inland Fisheries

Esri, HERE, Garmin, FAO, USGS, NGA, EPA, NPS |

NLEB Locations and Roost Trees - Twin Creeks to Apollo



1/17/2024

NLEB Hibernaculum 5.5 Mile Buffer

NLEB Hibernaculum Half Mile Buffer

1:577,791

0 5 10 20 mi

0 5 10 20 km

Esri, HERE, Garmin, USGS, NGA, EPA, USDA, NPS

VA Dept. Game & Inland Fisheries

Esri, HERE, Garmin, USGS, NGA, EPA, USDA, NPS |

APPENDIX D WETLAND AND WATERBODY DESKTOP SUMMARY

222 South 9th Street
Suite 2900
Minneapolis, Minnesota 55402

T +0 804 253 1090
F +0 804 253 1091

erm.com

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

DATE
27 March 2024

SUBJECT
Apollo-Twin Creeks 230 kV Electric Transmission Project Wetland and Waterbody Desktop Summary

REFERENCE
0655669

Dear Ms. Rayfield:

Environmental Resources Management (ERM), on behalf of Virginia Electric and Power Company (Dominion Energy Virginia, Dominion, or the Company), conducted a desktop wetland and waterbody review of publicly available information for the proposed overhead 230 kilovolt (kV) double circuit Apollo-Twin Creeks Lines, Twin Creeks Substation, Sycolin Creek Substation, Starlight Substation, Lunar Substation, and Apollo Substation (Apollo-Twin Creeks 230 kV Electric Transmission Project, or Project) in Loudoun County, Virginia. This delineation was done using desktop resources and methodology. A field delineation is required to verify the accuracy and extent of aquatic resource boundaries. The Project Route is shown in Attachment 1, with identified wetland boundaries shown in Attachment 2.

Dominion Energy Virginia is filing an application with the State Corporation Commission (SCC) to:

- Construct five new 230-34.5 kV substations in Loudoun County, Virginia, on property to be obtained by the Company (referred to as the Twin Creeks Substation, Sycolin Creek Substation, Starlight Substation, Lunar Substation, and Apollo Substation).
- Construct a new double circuit overhead 230 kV transmission line in entirely new right-of-way[1] by cutting the Company's existing 230 kV Edwards Ferry-Pleasant

[1] On March 7, 2024, the Company filed an application for SCC approval of new single circuit 500 kV and 230 kV electric transmission lines located in a new right-of-way varying between 100 and 150 feet in width and extending for approximately 9.4 miles (the future Aspen-Golden Lines)

View Line #203 at Structure #203/2 (collectively, the Apollo-Twin Creeks Lines). From the cut-in location within the existing right-of-way, the Apollo-Twin Creeks Lines will extend approximately 1.9 miles within a predominantly 100-foot-wide right-of-way,[2] interconnecting the proposed Twin Creeks, Sycolin Creek, Starlight, and Lunar Substations and terminating at the proposed Apollo Substation.

The Project is needed to provide service requested by three data center customers (individually, Customers A, B and C; collectively, the Customers) and to maintain and improve reliable electric service consistent with North American Electric Reliability Corporation Standards to customers in the eastern Leesburg area in Loudoun County. The Company considered the facilities required to construct and operate the Project, the amount of new rights-of-way that will be required, amount of existing development in each area, potential for environmental impacts on communities, and the relative cost of the Project.

The purpose of this desktop analysis is to identify and evaluate potential impacts of the Project on aquatic resources (streams, creeks, runs, and open water features) in the area. In accordance with Virginia Department of Environmental Quality (DEQ) and the SCC's Memorandum of Agreement, the evaluation was conducted using various data sets

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between a new 500-230 kV Aspen Substation and a new 500-230 kV Golden Substation, as well as an approximately 0.2-mile line between the new 500-230 kV Aspen Substation and the existing 500 kV Goose Creek Substation, all located in Loudoun County, Virginia (collectively, the Aspen-Golden Project). *See Application of Virginia Electric and Power Company for approval and certification of electric transmission facilities: 500-230 kV Aspen Substation, 500 kV Aspen-Goose Creek Line #5002, 500 kV and 230 kV Aspen-Golden Lines #5001 and #2333, 500-230 kV Golden Substation and Lines# 2081/#2150 Loop*, Case No. PUR-2024-00032 (filed March 7, 2024) (referred to herein as the Aspen-Golden Application). For approximately 0.9 mile of the 9.4-mile proposed route of the future Aspen-Golden Lines, the Company noted as part of the Aspen-Golden Application that it would need additional right-of-way with varying widths between 100 and 140 feet to accommodate construction of two new 230 kV double circuit lines—namely, the Apollo-Twin Creeks Lines (as defined herein but referred to in the Aspen-Golden Application as the future Twin Creeks Lines). As noted in the Aspen-Golden Application, the Company understood that it could not condemn for more than what was needed for the Aspen-Golden Project until such time as the Company sought approval of this instant Project, as defined herein, consistent with the Commission's approach in recent proceedings. *See* the Aspen-Golden Application, Appendix at n. 6. The Company is now seeking such approval in this Application and is filing contemporaneous with the filing of this Application a motion to consolidate these two cases for purposes of judicial economy. A map depicting the total right-of-way where the Apollo-Twin Creeks Lines are proposed for collocation with the future Aspen-Golden Lines, which ranges from a total of 200 to 260 feet, is provided in Attachment II.A.6 of the Appendix. As clarification, the Company notes that the use of "collocation" in this context indicates where the rights-of-way are adjacent to and/or overlap one another as depicted in Attachment II.A.2 of the Appendix.

[2] Notably, there are two segments of the proposed Apollo-Twin Creeks Lines where the right-of-way is 140 feet in width. The first is an approximately 0.2-mile segment where the proposed Apollo-Twin Creeks Lines expand to a 140-foot-wide right-of-way in order to feasibly cross under the future Aspen-Golden Lines and enter the proposed Sycolin Creek Substation. The second is an approximately 0.1-mile segment where the proposed Apollo-Twin Creeks Lines leave the proposed Starlight Substation and cross under the future Aspen-Golden Lines, which requires the structure configuration to switch from double circuit monopoles (vertical) to 2-pole structures (delta) and then back to double circuit monopoles (vertical) for the remainder of the route.

that may indicate wetland location and type. This report is being submitted to the DEQ as part of the DEQ Wetland Impacts Consultation.

PROJECT STUDY AREA AND POTENTIAL ROUTE

The study area encompasses approximately 1.9 square miles (1,152 acres) entirely in Loudoun County. The study area includes portions of the U.S. Census Bureau census-designated places of Belmont, and there are no incorporated cities within the study area. The limits of the study area are depicted in Attachment A and are generally defined by the following features:

The limits of the study area are generally defined by the following features:

- Leesburg Pike (Rt. 7) to the north;
- Belmont Ridge Road to the east;
- Beaumeade-Belmont Line #227 and Beaumeade-Pleasant View Line #274 and the Washington and Old Dominion Trail to the south; and
- the Company's existing Edwards Ferry-Pleasant View Line #203, Hamilton-Pleasant View Line #2098, and Doubs-Goose Creek #514 to the west.

Dominion identified one viable overhead route alternative for the Apollo-Twin Creeks Lines, described below.

ROUTE 1

From the cut-in location, the Proposed Route (Route 1) initially heads south for about 0.2 mile generally following the property line of an existing Luck Stone quarry and existing Loudoun Water utility lines to connect with the first substation, the proposed Twin Creeks Substation associated with Campus A. The site for the substation is within a parcel on the north side of Cochran Mill Road and south of a Luck Stone quarry. Route 1 then continues southeast for about 0.2 mile along a property boundary to a point just north of Cochran Mill Road, where the route intersects and begins to parallel the Company's future Aspen-Golden Lines. From here, Route 1 crosses Cochran Mill Road and continues southeast across the Customer A parcels for about 0.4 mile. The route crosses Goose Creek collocated with the future Aspen-Golden Lines at a spot just north of a former quarry (now a reservoir), about 0.2 mile northeast of the Company's existing Lines #227 and #274. Still collocated with the future Aspen-Golden Lines, Route 1 continues south on the former quarry property for 0.1 mile then turns northeast. The route connects to the proposed Sycolin Creek Substation and continues northeast across Customer B's parcels for about 0.3 mile to the south side of the proposed Starlight Substation. From there, Route 1 of the Apollo-Twin Creeks Lines splits from the future Aspen-Golden-Lines for 0.2 mile before entering the proposed Starlight Substation, while the future Aspen-Golden Lines continue east along the north side of the substation. Route 1 then heads north for about 0.4 mile across the

Customer C parcel connecting to the proposed Lunar Substation and terminating at the proposed Apollo Substation south of Rt. 7 and west of Belmont Ridge Road.

Route 1 measures approximately 1.9 miles in length and encompasses approximately 18.7 acres. Combined with the proposed substations, the Project facilities encompass approximately 41.6 acres.

PROPOSED SUBSTATIONS

TWIN CREEKS SUBSTATION

The proposed Twin Creeks Substation is located north of Cochran Mill Road, approximately 0.7 mile south of the intersection of Cochran Mill Road and Crosstrail Boulevard. The substation footprint occupies approximately 4.7 acres, which consists entirely of forested land cover. The Company's existing 230 kV and 500 kV electrical substations and other existing industrial and mining lands surround the proposed Twin Creeks Substation.

SYCOLIN CREEK AND STARLIGHT SUBSTATIONS

The proposed Sycolin Creek and Starlight Substations are located on the properties associated with Campus B (the Belmont Innovation Campus). The future substations are located east of Goose Creek and approximately 0.2 mile west from the frontage of Belmont Ridge Road. To the south, the Sycolin Creek Substation footprint occupies approximately 4.7 acres of which the entire area consists of forested land cover. To the north, the Starlight Substation footprint occupies approximately 4.5 acres of which about 90 percent is forested and 10 percent is developed.

LUNAR AND APOLLO SUBSTATIONS

The proposed Lunar and Apollo Substations are located east of Goose Creek and approximately 200 feet to the south of Route 7. To the south, the Lunar Substation footprint occupies approximately 4.0 acres of which is entirely forested. To the north, the Apollo Substation footprint occupies approximately 5.0 acres of which is entirely forested.

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:

- USA National Agricultural Imagery Program (NAIP) Natural Color Images, Virginia, 1-meter pixel resolution (NAIP 2023)
- USA NAIP Imagery: Color Infrared NAIP Infrared Images, Virginia, 1-meter pixel resolution (NAIP 2023a)

- USGS 10-meter Digital Elevation Model (USGS 2022)
- Current aerial imagery, taken in spring of 2023 (Loudoun County 2023)
- Historic aerial imagery (Google LLC 2022)
- ESRI World Topographic Map, multiple scales (ESRI et al. 2023)
- U.S. Fish and Wildlife Service (USFWS) National Wetland Inventory (NWI) mapping (USFWS 2023)
- U.S. Department of Agriculture-Natural Resources Conservation Service (USDA-NRCS) Soil Survey Geographic (SSURGO) database (USDA-NRCS 2023)
- USGS National Hydrography Dataset (NHD) Plus High Resolution (USGS 2023)

NATURAL COLOR AND INFRARED AERIAL PHOTOGRAPHY

Recent (2023) natural color aerial photography was used to provide a visual overview of the Project area and to assist in evaluating current conditions. 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.

TOPOGRAPHIC MAPS

Recent ESRI world topographic maps show the topography of the area as well as other important landscape features such as forest cover, development, buildings, agricultural areas, streams, lakes, and wetlands (USGS 2022; ESRI et al., 2023).

USFWS NATIONAL WETLAND INVENTORY MAPPING

NWI maps provide the boundaries and classifications of potential wetland areas as mapped by the USFWS (USFWS 2023). NWI data is 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, where 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. To acknowledge ERM's adjustment of NWI classifications where appropriate, all wetland types referenced in this assessment are referred to as assigned wetland cover types regardless of whether the cover type was modified from the NWI classification.

USDA-NRCS SOILS DATA

Soils in the study area were identified and assessed using the SSURGO database, which is a digital version of the original county soil surveys (USDA-NRCS 2023). 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 NATIONAL HYDROGRAPHY DATASET

The National Hydrography Dataset (NHD) dataset contains features such as lakes, ponds, streams, rivers, and canals (USGS 2023). The waterbodies mapped by the NHD appeared generally consistent with those visible on the USGS maps and aerial photography.

PROBABILITY ANALYSIS

ERM used a stepwise process to identify probable wetland areas along the route segments, as follows:

1. Infrared and natural color aerial photography was used in conjunction with 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, with wetlands classified based on the Cowardin classification system described below:

- Palustrine Emergent (PEM) – wetlands characterized by erect, rooted, herbaceous hydrophytes (i.e., aquatic plants) and woody species less than 3 feet in height, excluding mosses and lichens;
- Palustrine Scrub-Shrub (PSS) – wetlands characterized by woody vegetation, excluding woody vines, approximately 3 to 20 feet in height;
- Palustrine Forested (PFO) – wetlands characterized by woody vegetation, excluding woody vines, approximately 20 feet or more in height and 3 inches or larger diameter at breast height;
- Palustrine Unconsolidated Bottom (PUB) – wetlands characterized by bottom substrate particles smaller than stones (less than 10 inches) covering greater than 25 percent of the area, with plants covering less than 30 percent of the area; and
- Riverine – wetlands within a channel, with two exceptions: (1) wetlands dominated by trees, shrubs, persistent emergent, emergent mosses, or lichens, and (2) habitats with water containing ocean-derived salts in excess of 0.5%. (USFWS 2013).

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, medium-high and high probability categories 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 route. Attachment 2 depicts two map sets: one which interprets the wetland cover types and one with the probabilities displayed on color base map images.

FIELD DELINEATIONS COMPLETED WITHIN THE PROPOSED ROUTE

As noted above, ERM did not conduct an onsite delineation of wetlands or waterbodies along Route 1; however, a field delineation was completed by Wetland Studies and Solutions Inc. in June 2022 on a parcel south of Rt. 7 and west of Belmont Ridge Road, between the proposed Starlight and Apollo Substations (between mileposts 1.5 and 1.9). This field delineation of wetlands and waterbodies was approved by the U.S. Army Corps of Engineers (USACE) in an Approved Jurisdictional Determination (AJD) in August 2022 (Permit # NAO-2022-01498-RDB). This field delineation (USACE 2022) was used to outline boundaries of potential wetlands in this area in lieu of the wetland desktop delineation method. The field delineated boundaries in these locations are incorporated into the wetland and waterbody probability table below.

RESULTS

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

Table 2: Summary of the Probabilities of Wetland and Waterbody Occurrence along Route 1 and the Proposed Substations [a,b]

Probability	Total within right-of-way (acres) [c]	Wetland and Waterbody type (acres)				
		PEM Emergent	PFO Forested	PSS Scrub-shrub	PUB Freshwater pond	Riverine Stream
Route 1						
High	NA	NA	NA	NA	NA	NA
Medium/High	0.6	0.3	NA	NA	NA	0.3
Medium	0.4	NA	NA	0.0	0.1	0.3
Medium/Low	0.1	NA	NA	NA	NA	0.1
Low	NA	NA	NA	NA	NA	NA
Very Low	NA	NA	NA	NA	NA	NA

NA: Not applicable due to absence of wetland or waterbody type within the Project footprint; 0.0 indicates less than 0.05 acre of the wetland is present.

a Numbers in this table have been rounded for presentation purposes; as a result, the totals may not equal the sum due to rounding.

b Any wetlands or waterbodies within the proposed Twin Creeks, Sycolin Creek, Starlight, Lunar, and Apollo Substations footprints are included within Route 1.

c Total acres may not total the sum of wetland and waterbody types because 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.

WETLAND CROSSINGS

ROUTE 1 AND PROPOSED SUBSTATIONS

The length of the corridor of Route 1 is approximately 1.9 miles and encompasses a total of approximately 41.6 acres (including the 4.7-acre Twin Creeks, 4.7-acre Sycolin Creek, 4.5-acre Starlight, 4.0-acre Lunar, and 5.0-acre Apollo Substation footprints). Based on the methodology discussed above, the right-of-way footprint will encompass approximately 2.4% percent (1.0 acre) of land with a medium or higher probability of containing wetlands and waterbodies.

WATERBODY CROSSINGS

ERM identified and mapped waterbodies in the study area using similar publicly available GIS databases as those used to identify and map wetlands. Route 1 and the Proposed Substations cross perennial and intermittent waterbodies (rivers, streams, tributaries, and open water features). According to the USACE documentation, no waters considered navigable under Section 10 of the Rivers and Harbors Act are crossed by Route 1 for the Project.

ROUTE 1

Based on ERM's desktop wetland and waterbody analysis, there are no waterbodies within the footprints of any of the proposed substations. Route 1 has seven waterbody crossings, of which three are NHD-mapped waterbodies, including perennial Goose Creek and two, unnamed, intermittent tributaries to Goose Creek. There are four unmapped waterbodies including two open water features that appear to be stormwater detention ponds, and two unnamed, unclassified streams identified within the right-of-way using recent (2023) aerial imagery. Based on ERM's desktop wetland and waterbody analysis, the Route 1 right-of-way would encompass approximately 0.6 acre of riverine wetlands and 0.1 acre of PUB wetlands.

PROJECT IMPACTS

Avoiding or minimizing new impacts on wetlands and streams was among the criteria used in developing routes for the Project. To minimize impacts on wetland areas, the transmission line has been designed to span or avoid wetlands where possible, keeping transmission structures outside of wetlands to the extent practicable. Permanent direct impacts to wetlands would be limited to the fill of approximately 0.3 acre of PEM wetland within the footprint of the Twin Creeks Substation, placement of structures within wetlands if unavoidable, and the potential permanent conversion of less than 0.1 acre of PSS wetlands within the right-of-way to PEM wetland type, depending on vegetation type and height maintained within the right-of-way.

There would be no change in contours of wetlands and waterbodies, or redirection of the flow of water, and the amount of spoil from foundations and structure placement would be minimal. Excess soil in wetlands generated through foundation construction would be

limited through the use of Best Management Practices (erosion and sediment controls) and would be removed from the wetland.

The majority of potential direct impacts on wetlands due to Project construction would be temporary in nature. 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 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. When siting transmission lines, perpendicular crossings of wetland systems are prioritized to minimize direct impacts to these sensitive areas and reduce overall impacts to the watershed.

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. Where tree clearing is required within the new right-of-way, PFO and PSS wetlands would be permanently converted to PSS or PEM wetland types. Forested wetlands and riparian buffers provide functions such as peak flood flow reduction, nutrient and sediment capture, filtration of pollutants to adjacent waterbodies, and habitat diversity. The conversion of forested wetlands would reduce or eliminate some of these functions.

Required tree removal adjacent to waterbodies would reduce riparian buffer functions such as stream bank stabilization and erosion control, nutrient and sediment filtration, floodwater storage and peak flow reduction, and water temperature modification from shading. Vegetation within the right-of-way would be allowed to return to maintained grasses and shrubs after construction, which would provide some filtration stabilization to help protect waterbodies from pollutants. Within the stream buffers (100 feet), all trees will be hand felled with stumps left in place to reduce the potential for erosion. Shrubs and trees with a diameter at breast height of less than three inches will be left in place unless it impedes temporary access where they would be clipped, leaving roots in place which will be able to naturally regenerate.

SUMMARY

This Wetland and Waterbody Summary report was prepared in accordance with the Memorandum of Agreement between the DEQ and the SCC for the purpose of initiating a Wetlands Impact Consultation. Please note that a formal onsite wetland delineation was not conducted as part of this review.

In addition, there is 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: www.dominionenergy.com/NOVA.

If you have any questions regarding this wetland assessment, please contact me at 612-347-7178 or by email at mariah.weitzenkamp@erm.com.

Sincerely,

Mariah Weitzenkamp
Environmental Resources Management

cc: Heather Kennedy, Dominion Energy Virginia

Enclosures: Attachments 1 and 2

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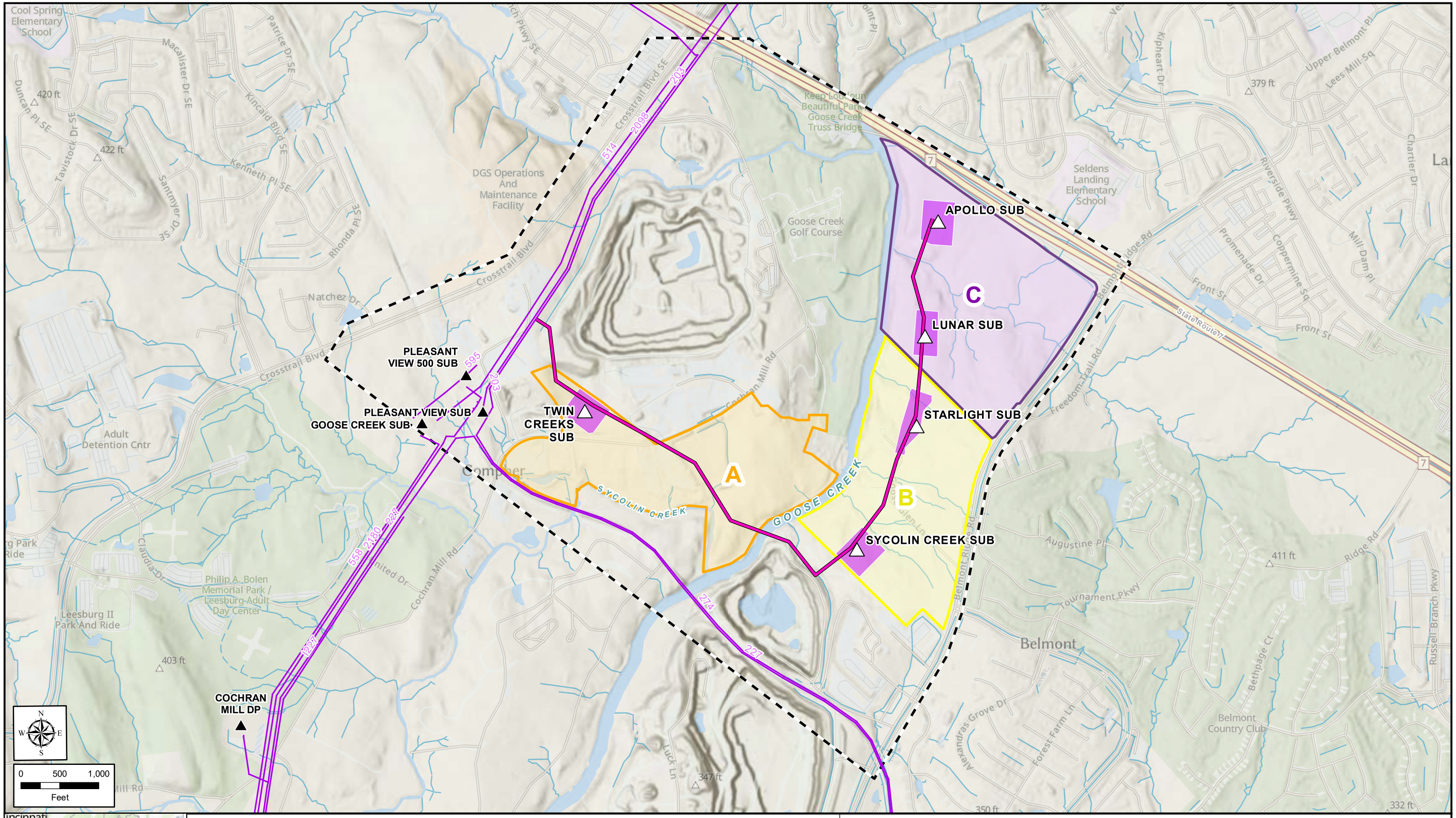
ATTACHMENT 1

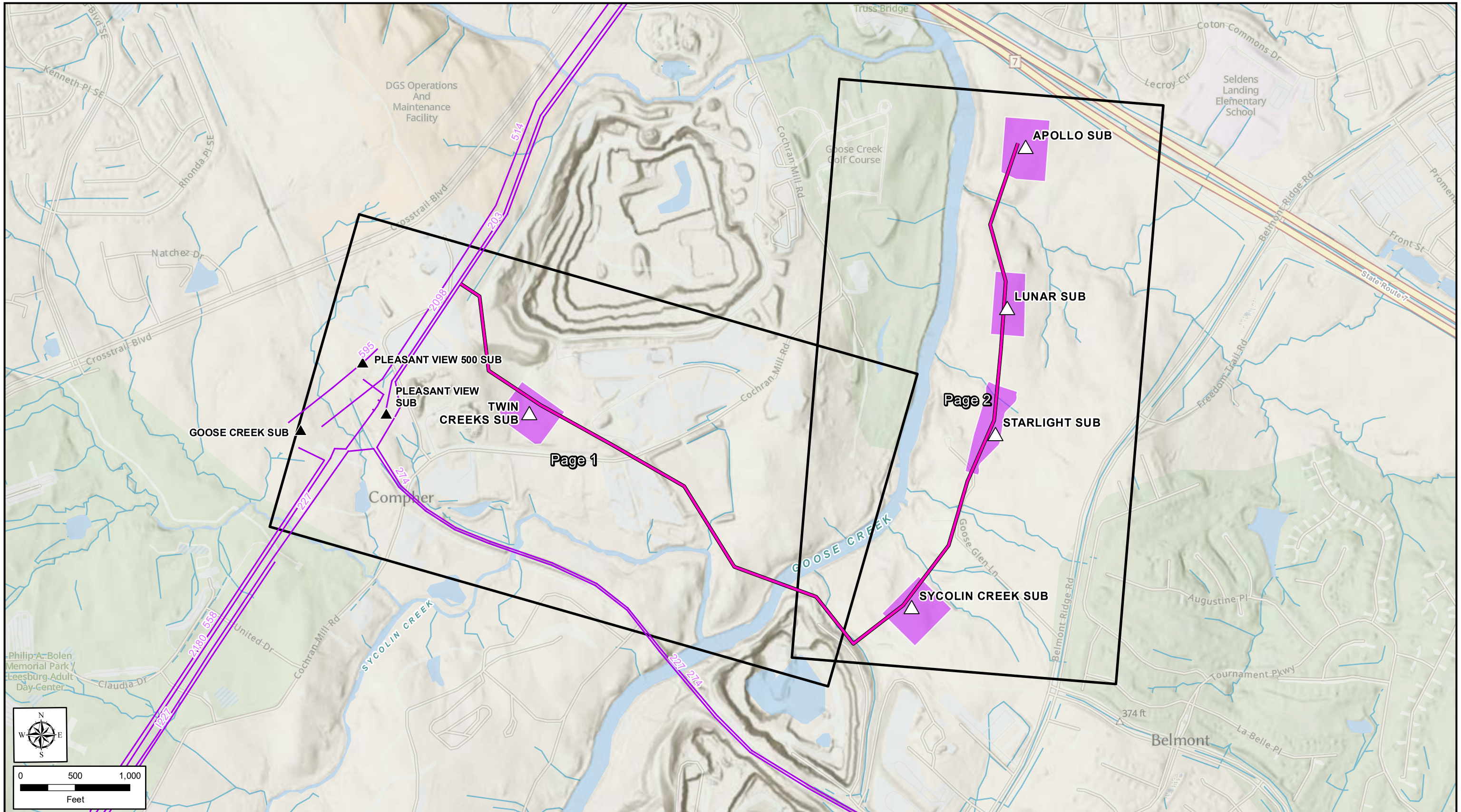


Attachment 1
Project Overview Map
230 kV Apollo-Twin Creeks Lines, Twin Creeks, Sycolin Creek, Starlight, Lunar, and Apollo Substations
Dominion Energy Virginia
Loudoun County, Virginia

ERM

Dominion Energy

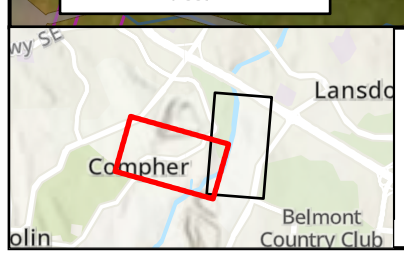
ATTACHMENT 2



Attachment 2
Overview Map Index
230 kV Apollo-Twin Creeks Lines, Twin Creeks, Sycolin Creek, Starlight, Lunar, and Apollo Substations
Dominion Energy Virginia
Loudoun County, Virginia

ERM

Dominion Energy



- Mileposts
- Existing Substation
- Proposed Substation
- Proposed Apollo-Twin Creeks Lines (Route 1)
- Proposed Substation Footprint

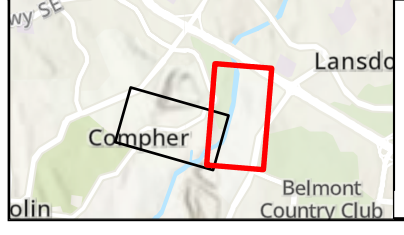
Wetland Probability
- Medium
- Medium/High

SSURGO Hydric Soil Rating
- Not Hydric Soil
- Partially Hydric Soil
- Hydric Soil
- NWI Wetland

Attachment 2
Wetland Probability Map Set-Probability
230 kV Apollo-Twin Creeks Lines, Twin Creeks, Sycolin Creek, Starlight, Lunar, and Apollo Substations
Dominion Energy Virginia
Loudoun County, Virginia

ERM

Dominion Energy



- Mileposts
- Proposed Substation
- Proposed Apollo-Twin Creeks Lines (Route 1)
- Proposed Substation Footprint

Wetland Probability
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- Medium/High

SSURGO Hydric Soil Rating
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- Partially Hydric Soil
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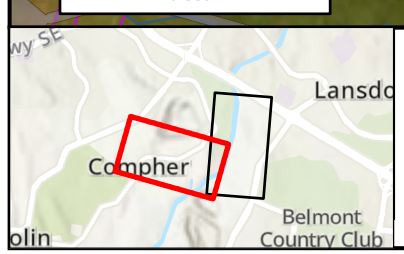
- NWI Wetland

Attachment 2
Wetland Probability Map Set-Probability
230 kV Apollo-Twin Creeks Lines, Twin Creeks, Sycolin Creek, Starlight, Lunar, and Apollo Substations
Dominion Energy Virginia
Loudoun County, Virginia

ERM

Dominion Energy



- Mileposts
- Existing Substation
- Proposed Substation
- Proposed Apollo-Twin Creeks Lines (Route 1)
- Proposed Substation Footprint

Cowardin
- PEM
- PUB
- Riverine

SSURGO Hydric Soil Rating
- Not Hydric Soil
- Partially Hydric Soil
- Hydric Soil
- NWI Wetland

Attachment 2
Wetland Probability Map Set-Cowardin Classification
230 kV Apollo-Twin Creeks Lines, Twin Creeks, Sycolin Creek, Starlight, Lunar, and Apollo Substations
Dominion Energy Virginia
Loudoun County, Virginia

ERM

Dominion Energy

- Mileposts
- Proposed Substation
- Proposed Apollo-Twin Creeks Lines (Route 1)
- Proposed Substation Footprint

Cowardin
- PSS
- PUB
- Riverine

SSURGO Hydric Soil Rating
- Not Hydric Soil
- Partially Hydric Soil
- Hydric Soil
- NWI Wetland

Attachment 2
Wetland Probability Map Set-Cowardin Classification
230 kV Apollo-Twin Creeks Lines, Twin Creeks, Sycolin Creek, Starlight, Lunar, and Apollo Substations
Dominion Energy Virginia
Loudoun County, Virginia

ERM

Dominion Energy

APPENDIX E AGENCY AND STAKEHOLDER CORRESPONDENCE

From: Whitten, Kathleen <KWhitten@loudounwater.org>
Sent: Wednesday, August 16, 2023 7:11 AM
To: Jared Brandell-Douglas <jared.brandell-douglas@erm.com>; Jake Rosenberg <jake.rosenberg@erm.com>; Clayton Tock <CTock@urban-ltd.com>; matthew.b.vinson@dominionenergy.com
Cc: Osiecki, Matthew <MOsiecki@loudounwater.org>; Flores, Samuel <seflores@loudounwater.org>
Subject: Loudoun Water Criteria for Overhead Electric Alignments

EXTERNAL MESSAGE

Good Afternoon,
In our meeting last week Loudoun Water committed to a list of criteria for placing overhead transmission power lines adjacent to Loudoun Water facilities. These criteria are listed below. Please let me know if you have any comments or questions.
Thanks,

- Loudoun Water requires a minimum of 25' from the outside edge of any existing or proposed water main to the outside edge of an electric tower structure. This is to ensure that maintenance and possible replacement of the watermain can be completed without impacting Dominion's facilities.
- All electric tower structures loading planes are outside of any existing and proposed sanitary sewer mains. This will remove any additional structural loading to our sewer lines and ensure that maintenance and possible replacement can be completed without impacting Dominion's facilities.
- Loudoun Water requires that adequate cathodic protection be provided on all metallic utilities within 100' of the electric transmission line. Loudoun Water needs to protect its assets from stray currents as well as protect its employees from shocks.
- Loudoun Water has plans for an additional pump station on the Two Creeks parcel. This would require heavy construction equipment to use the access roads from Cochran Mill Road to the site. Therefore, the minimum height of electric power lines needs to be at least 35' over Loudoun Water access roads.
- Similarly, a minimum height of line over the Loudoun Water access bridge from the J/K parcel to the Two Creeks parcel is necessary in consideration of a future replacement of the bridge. We are still working on a reasonable height to meet this criterion.
- All crossings of Loudoun Water utilities will also need to have a minimum electric height of 35' in order to facilitate their possible replacement in the future without impacting Dominion's facilities.
- Loudoun Water has plans to build a permanent sewer pump station at the existing Goose Creek Industrial Park (GCIP) wastewater treatment facility (WWTP). Therefore, no Dominion easement over the GCIP permanent pump station site will be allowed. An overlap of the GCIP WWTP easement may be allowed if it is outside of the permanent pump station area and an allowance for buffer landscaping and fencing within the Dominion easement is granted.
- Due to Loudoun Water's plans to install another pump station on the Two Creeks property, the replacement of pumps at the Milestone Reservoir pump station, and the construction of the permanent GCIP SPS, it is likely that

cranes will be in use around our sites. Due to the nature of arc flash and the height of the crane necessary, Loudoun Water will need to have a buffer from where a crane may sit to the nearest overhead power line. At this stage of planning, 100' from the proposed edge of pavement to the electric lines will provide an adequate buffer.

- In addition, Loudoun Water does not allow blasting within 25' of existing utilities. If blasting will occur within 100' of existing utilities, there is a form on the website to inform us of the blasting and additional restrictions may be imposed.

KATHLEEN WHITTEN, P.E.
ASSET MANAGEMENT PROGRAM MANAGER
LOUDOUN WATER
44771 LOUDOUN WATER WAY
ASHBURN, VA 20147
TEL 571.291.7933 | FAX 571.223.2912
WWW.LOUDOUNWATER.ORG

March 20, 2024

Stephen Hudson
Electric T&D Projects Manager
John Mulligan
Transmission Strategic Projects Advisor
5000 Dominion Boulevard
Glen Allen, VA 23060

RE: Support for Dominion Energy Virginia's Applications for the Aspen to Golden 500/230 kV and Twin Creeks to Apollo 230 kV Transmission Line Projects

Dear Mr. Hudson and Mr. Mulligan:

On behalf of SDC Capital Partners LLC ("SDC"), I write in support of Dominion's application to the Virginia State Corporation Commission for approval of the above referenced projects (together "Projects"; separately, "Aspen Project" and "Twin Project").

The Projects are important for the continued economic growth in Loudoun County in connection with the data center industry. This growth supports state and local revenue needs, as well as providing substantial construction and operational employment in the region. Specifically, the Twin Project will support our and other data center developers' delivery point requests to serve planned data centers located south of Route 7 and west of Belmont Ridge Road in Loudoun.

SDC's delivery point request is documented in Load Letters submitted to Dominion on October 3, 2023. The requested load and ramp schedule remain unchanged as SDC plans to develop its 111-acre, by-right campus with power-dense facilities capable of supporting AI compute workloads.

SDC is pleased with Dominion's efforts to develop the Projects cooperatively with the many stakeholders in the project area. Specifically, SDC appreciates Dominion's regular outreach and coordination with it, the other data center developers to be served by this Twin Project, the County, and other stakeholders to develop a route that minimizes impacts to important resources in the area, and efficiently provides necessary service to it and others. Through these discussions, SDC also learned about the Aspen Project, and the need to route a portion of that project through the same areas that the Twins Project will traverse. SDC understands that the Aspen Project will support needed reliability and capacity to the larger Loudoun County data center cluster.

Of particular note, Dominion worked with SDC to coordinate with Goose Creek advocates such as the Goose Creek Association and Goose Creek Scenic River Advisory Committee to limit visual and physical impacts to the Creek and its buffers by the Projects. Dominion also worked with SDC to coordinate with the Belmont Community Association, which is a significant

neighborhood near SDC's campus. Ultimately, the preferred route through SDC's property for the Projects gained broad consensus from the stakeholders and SDC.

Dominion has shared with SDC its review of potential impacts and the routing alternatives Dominion has evaluated for the Projects. With respect to the Twin Project, SDC agrees with Dominion that its proposed Route is the best solution when all facts and circumstances are considered, including the portions of the route that cross SDC's property. SDC also agrees with Dominion that the portion of its proposed Route for the Aspen Project in the area of the Twin Project is the best solution when all facts and circumstances are considered, including the portions of the Aspen Project that cross its property.

SDC supports Dominion's proposed routings for the Projects and, if approved by the State Corporation Commission, will work cooperatively with Dominion to permit those Projects to be located on its land as needed.

SDC looks forward to continuing to work with Dominion and its neighbors to ensure these Projects are permitted and timely completed.

Please feel free to contact us with any questions, and we look forward to our continued cooperation.

Sincerely,

SDC Capital Partners, LLC

Todd Aaron

_____

Name: Todd Aaron
Title: Managing Partner

APPENDIX F VISUAL SIMULATIONS

Apollo - Twin Creeks 230 kV
Transmission Project

Dominion Energy

KOP 1

Community Parking Lot off Cochran Mill Rd

Date: 03/30/2023
Time: 11:22 am
Viewing Direction: Northeast
Distance to closest feature: 0.2 mi

EXISTING CONDITIONS

PROPOSED CONDITIONS

LEGEND

- KOP and View Direction
- Proposed Apollo-Twin Creeks Lines (Route 1)
- Proposed Substation

Note: Project components illustrated are based on proposed preliminary designs The images contained on this page show the proposed project within a wider land-scape context and are not representative of scale and distance when viewed from the actual view point.

Apollo - Twin Creeks 230 kV
Transmission Project

Dominion Energy

KOP 2

Belmont Ridge Road

Date: 08/28/23
Time: 2:42 pm
Viewing Direction: West
Distance to closest feature: 0.2 mi

LEGEND

- KOP and View Direction
- Proposed Apollo-Twin Creeks Lines (Route 1)
- Proposed Substation

Note: Project components illustrated are based on proposed preliminary designs The images contained on this page show the proposed project within a wider land-scape context and are not representative of scale and distance when viewed from the actual view point.

Apollo - Twin Creeks 230 kV
Transmission Project

Dominion Energy

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- Proposed Apollo-Twin Creeks Lines (Route 1)
- Proposed Substation

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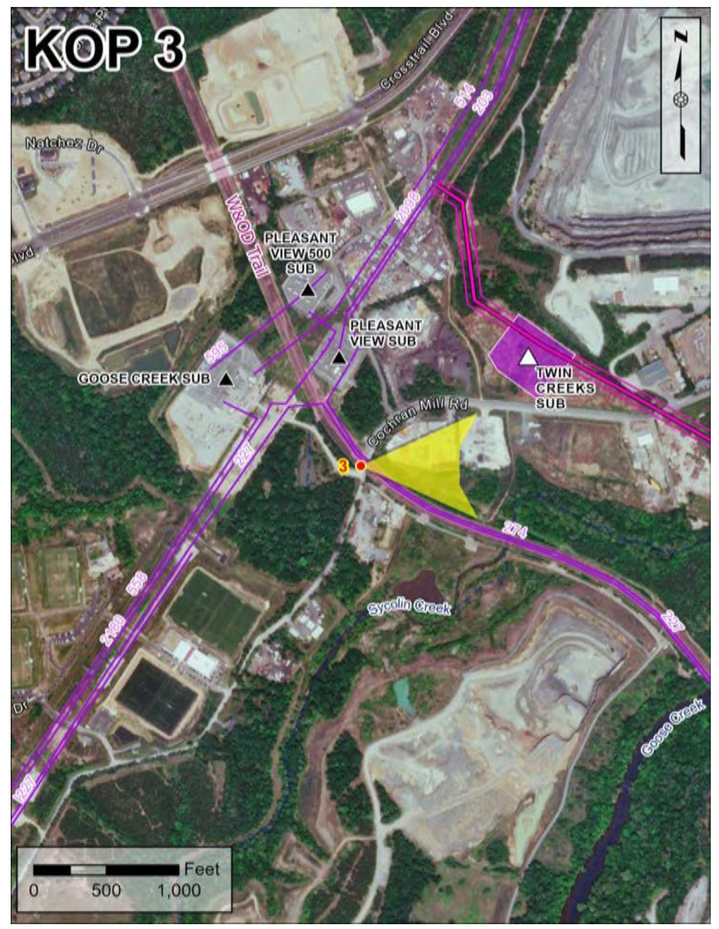
Apollo - Twin Creeks 230 kV
Transmission Project

Dominion Energy

KOP 3

Washington & Old Dominion Trail
and Cochran Mill Road Intersection

Date: 03/30/2023
Time: 10:12 am
Viewing Direction: East
Distance to closest feature: 0.2 mi



LEGEND

- KOP and View Direction
- Proposed Apollo-Twin Creeks Lines (Route 1)
- Proposed Substation

Note: Project components illustrated are based on proposed preliminary designs The images contained on this page show the proposed project within a wider landscape context and are not representative of scale and distance when viewed from the actual view point.

Apollo - Twin Creeks 230 kV
Transmission Project

Dominion Energy

KOP 4

Washington & Old Dominion Trail

Date: 03/22/22
Time: 12:04 pm
Viewing Direction: Northeast
Distance to closest feature: 0.3 mi

LEGEND

- KOP and View Direction
- Proposed Apollo-Twin Creeks Lines (Route 1)
- Proposed Substation

Note: Project components illustrated are based on proposed preliminary designs The images contained on this page show the proposed project within a wider land-scape context and are not representative of scale and distance when viewed from the actual view point.

Apollo - Twin Creeks 230 kV
Transmission Project

Dominion Energy

KOP 4

Washington & Old Dominion Trail

Date: 03/22/22
Time: 12:04 pm
Viewing Direction: Northeast
Distance to closest feature: 0.3 mi

EXISTING CONDITIONS

PROPOSED CONDITIONS - INFRASTRUCTURE HIGHLIGHTED

- Proposed Apollo-Twin Creeks

LEGEND

- KOP and View Direction

- Proposed Apollo-Twin Creeks Lines (Route 1)

- Proposed Substation

Note: Project components illustrated are based on proposed preliminary designs The images contained on this page show the proposed project within a wider landscape context and are not representative of scale and distance when viewed from the actual view point.

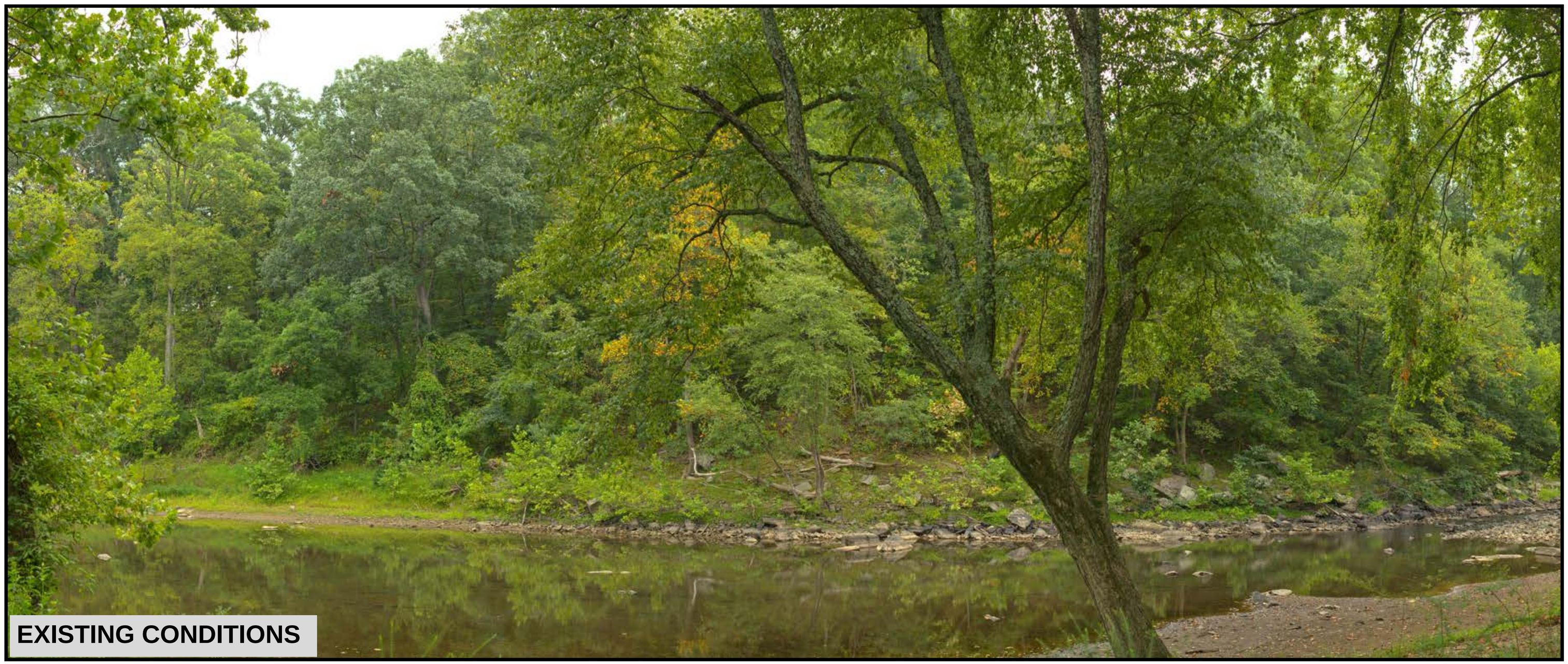
Apollo - Twin Creeks 230 kV Transmission Project

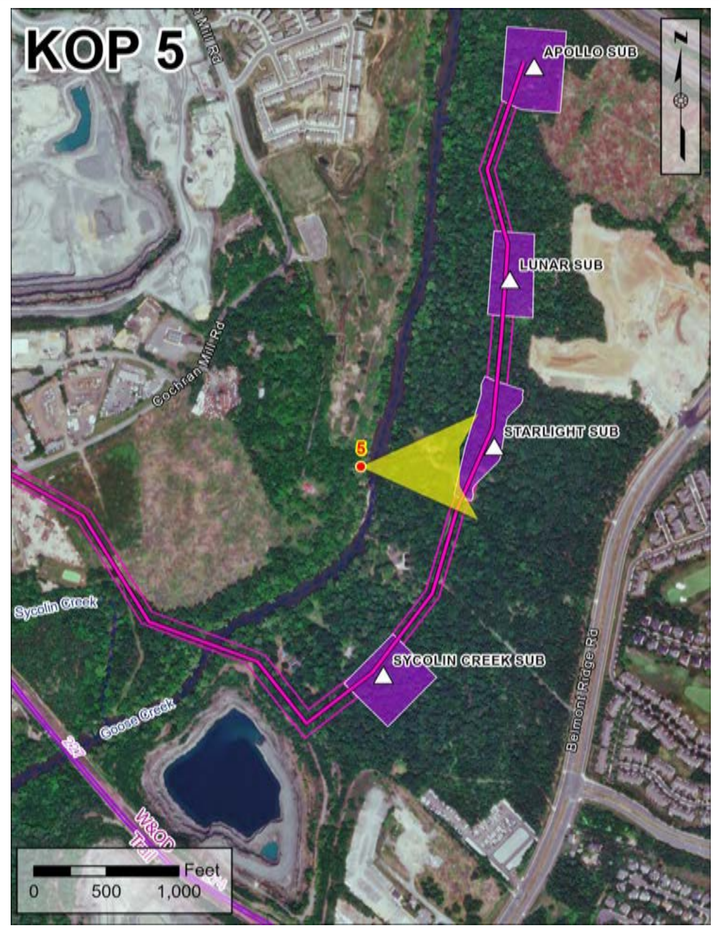
Dominion Energy

KOP 5

Cooke's Mill Ruins along Goose Creek

Date: 08/29/23
Time: 12:05 pm
Viewing Direction: East
Distance to closest feature: 0.1 mi





LEGEND

- KOP and View Direction
- Proposed Apollo-Twin Creeks Lines (Route 1)
- Proposed Substation

Note: Project components illustrated are based on proposed preliminary designs The images contained on this page show the proposed project within a wider landscape context and are not representative of scale and distance when viewed from the actual view point.

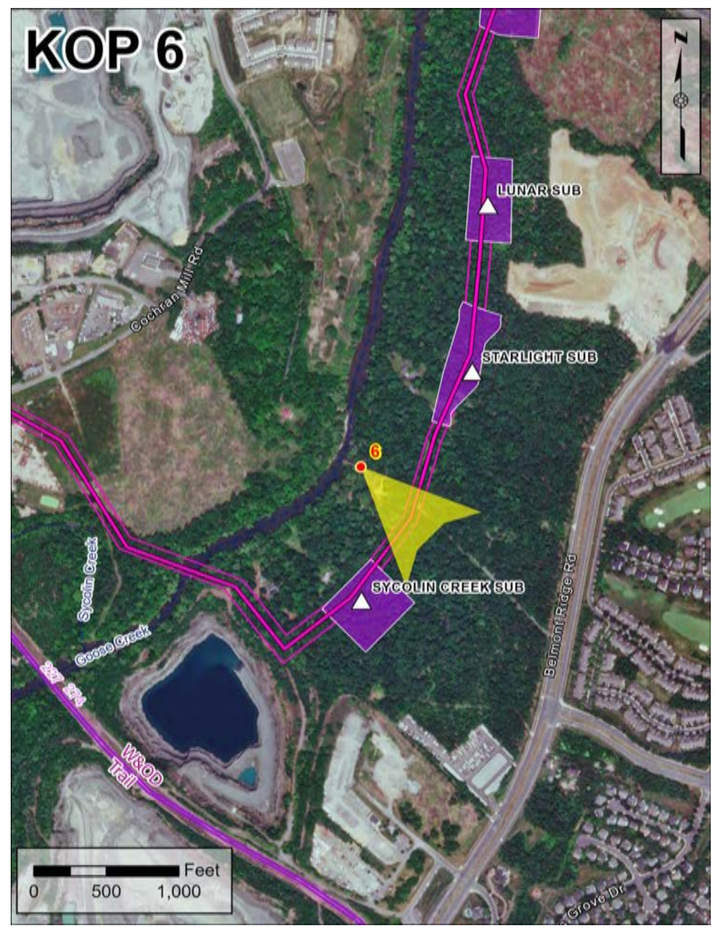
Apollo - Twin Creeks 230 kV
Transmission Project

Dominion Energy

KOP 6

East Bank of Goose Creek

Date: 08/29/23
Time: 2:51 pm
Viewing Direction: Southeast
Distance to closest feature: 0.1 mi



LEGEND

- KOP and View Direction
- Proposed Apollo-Twin Creeks Lines (Route 1)
- Proposed Substation

Note: Project components illustrated are based on proposed preliminary designs The images contained on this page show the proposed project within a wider landscape context and are not representative of scale and distance when viewed from the actual view point.

Apollo - Twin Creeks 230 kV
Transmission Project

Dominion Energy

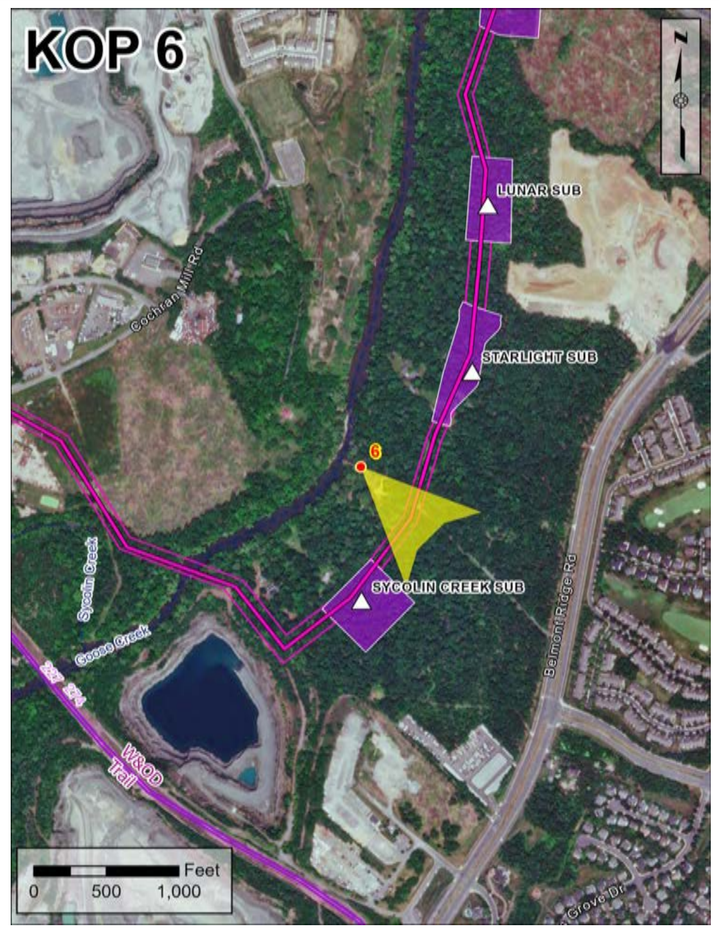
KOP 6

East Bank of Goose Creek

Date: 08/29/23
Time: 2:51 pm
Viewing Direction: Southeast
Distance to closest feature: 0.1 mi

EXISTING CONDITIONS

PROPOSED CONDITIONS - INFRASTRUCTURE HIGHLIGHTED



LEGEND

- KOP and View Direction
- Proposed Apollo-Twin Creeks Lines (Route 1)
- Proposed Substation

Note: Project components illustrated are based on proposed preliminary designs The images contained on this page show the proposed project within a wider landscape context and are not representative of scale and distance when viewed from the actual view point.

Apollo - Twin Creeks 230 kV
Transmission Project

Dominion Energy

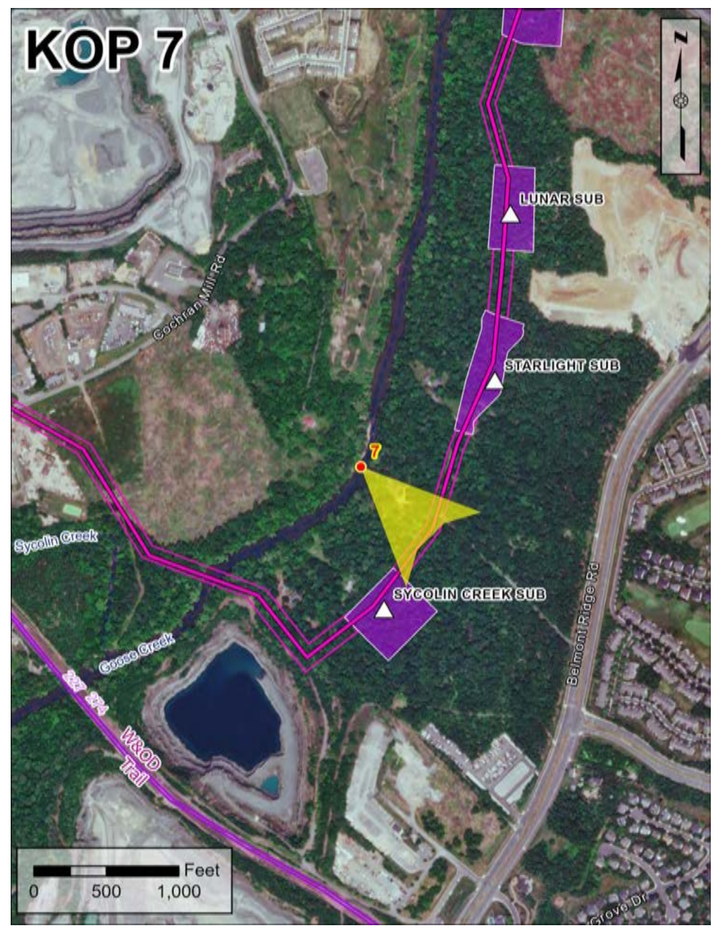
KOP 7

West Bank of Goose Creek

Date: 08/29/23
Time: 12:58 pm
Viewing Direction: Southeast
Distance to closest feature: 0.1 mi

EXISTING CONDITIONS

PROPOSED CONDITIONS



LEGEND

- KOP and View Direction
- Proposed Apollo-Twin Creeks Lines (Route 1)
- Proposed Substation

Note: Project components illustrated are based on proposed preliminary designs The images contained on this page show the proposed project within a wider landscape context and are not representative of scale and distance when viewed from the actual view point.

Apollo - Twin Creeks 230 kV
Transmission Project

Dominion Energy

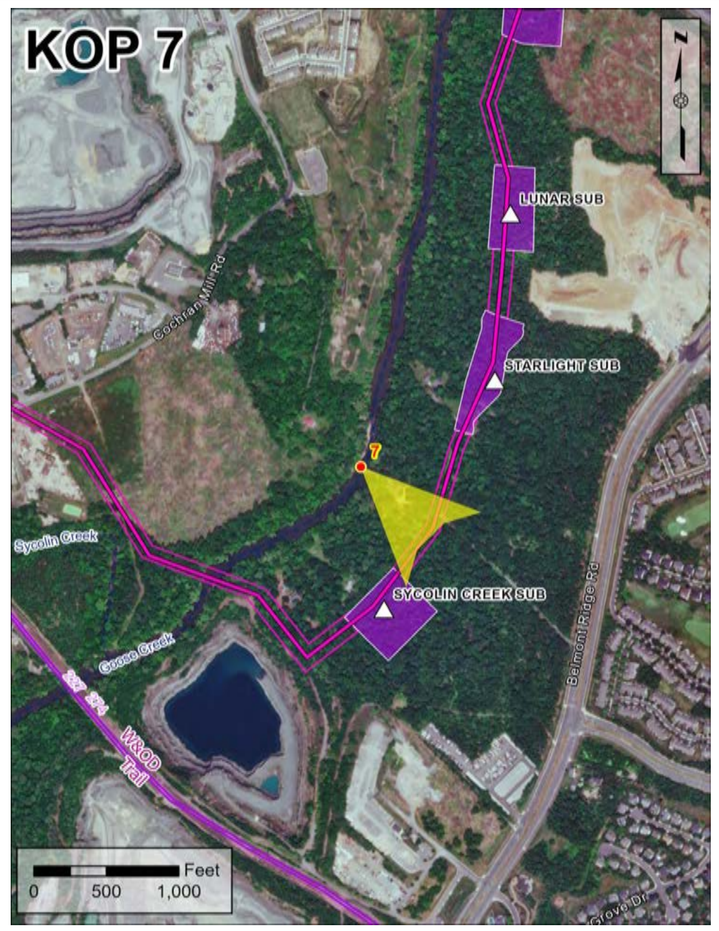
KOP 7

West Bank of Goose Creek

Date: 08/29/23
Time: 12:58 pm
Viewing Direction: Southeast
Distance to closest feature: 0.1 mi

EXISTING CONDITIONS

PROPOSED CONDITIONS - INFRASTRUCTURE HIGHLIGHTED



LEGEND

- KOP and View Direction
- Proposed Apollo-Twin Creeks Lines (Route 1)
- Proposed Substation

Note: Project components illustrated are based on proposed preliminary designs The images contained on this page show the proposed project within a wider landscape context and are not representative of scale and distance when viewed from the actual view point.

Apollo - Twin Creeks 230 kV
Transmission Project

Dominion Energy

KOP 8

Belmont Ridge Road and Freedom Trail Road

Date: 07/12/23
Time: 11:46 am
Viewing Direction: West
Distance to closest feature: 0.4 mi

LEGEND

- KOP and View Direction
- Proposed Apollo-Twin Creeks Lines (Route 1)
- Proposed Substation

Note: Project components illustrated are based on proposed preliminary designs The images contained on this page show the proposed project within a wider land-scape context and are not representative of scale and distance when viewed from the actual view point.

Apollo - Twin Creeks 230 kV
Transmission Project

Dominion Energy

KOP 8

Belmont Ridge Road and Freedom Trail Road

Date: 07/12/23
Time: 11:46 am
Viewing Direction: West
Distance to closest feature: 0.4 mi

LEGEND

- KOP and View Direction
- Proposed Apollo-Twin Creeks Lines (Route 1)
- Proposed Substation

Note: Project components illustrated are based on proposed preliminary designs The images contained on this page show the proposed project within a wider landscape context and are not representative of scale and distance when viewed from the actual view point.

APPENDIX G STAGE 1 PRE-APPLICATION ANALYSIS

Pre-Application Analysis

Apollo-Twin Creeks 230 kV Electric Transmission Project

PREPARED FOR

Dominion Energy

DATE
26 March 2024

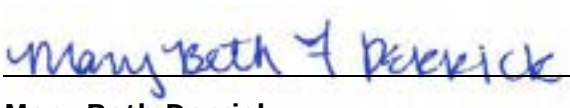
REFERENCE
0655669

SIGNATURE PAGE

Pre-Application Analysis

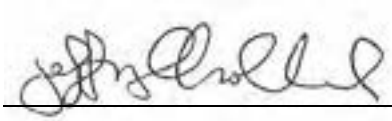
Apollo-Twin Creeks 230 kV Electric Transmission Project

0655669



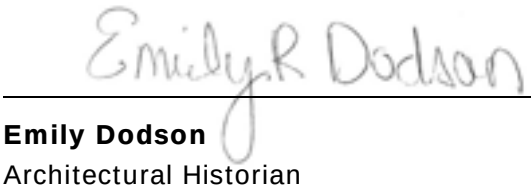
Mary Beth Derrick
Senior Architectural Historian

Megan Wiginton
Senior Architectural Historian

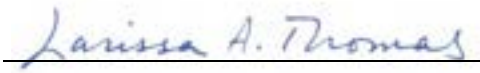


Jeffrey L. Holland
Senior Historian

Jeremy Mastroianni
Data Analytics and Visualization Specialist



Emily Dodson
Architectural Historian



Larissa A. Thomas, Ph.D.
Senior Archaeologist/Reviewer

ERM
3300 Breckenridge Boulevard
Suite 300
Duluth, GA 30096

CONTENTS

LIST OF TABLES

LIST OF FIGURES

ACRONYMS AND ABBREVIATIONS

Acronyms	Description
3D	Three dimensional
ABPP	American Battlefield Protection Program
CMOS	Complementary Metal–Oxide–Semiconductor
ERM	Environmental Resources Management
ESRI	Environmental Systems Research Institute
GNSS	Global Navigation Satellite System
HABS	Historic American Buildings Survey
IBM	International Business Machines Corporation
ISO	International Organization for Standardization
JPEG	Joint Photographic Experts Group format
kV	kilovolt
MVA	Megavolt-amperes
NHL	National Historic Landmark
NPS	National Park Service
NRHP	National Register of Historic Places
PBR	Physically Based Rendering
PDF	Portable Document Format
Project	Apollo-Twin Creeks 230 kV Electric Transmission Project
RAW	an unprocessed image
ROW	Right-Of-Way
SCC	State Corporation Commission
SLR	Single-Lens Reflex
SP	Simulation Point
USGS	United States Geological Survey
UTM	Universal Transverse Mercator
VCRIS	Virginia Cultural Resource Information System
VDHR	Virginia Department of Historic Resources
VHLC	Virginia Historic Landmarks Commission
VLR	Virginia Landmarks Register
W&OD	Washington & Old Dominion

EXECUTIVE SUMMARY

This report presents the findings of the pre-application analysis prepared by Environmental Resources Management (ERM) for Virginia Electric and Power Company's (herein referred to as Dominion Energy Virginia, Dominion, or the Company) proposed overhead 230 kilovolt (kV) double circuit Apollo-Twin Creeks Lines, Twin Creeks Substation, Sycolin Creek Substation, Starlight Substation, Lunar Substation, and Apollo Substation (Apollo-Twin Creeks 230 kV Electric Transmission Project, or Project) in Loudoun County, Virginia. For this Project, the Company) is proposing to construct and operate:

- A new approximately 1.9 mile double circuit overhead 230 kV transmission line in entirely new right-of-way[1] by cutting the Company's existing 230 kV Edwards Ferry-Pleasant View Line #203 at Structure #203/2 and extending the lines to the proposed Apollo Substation (collectively, the Apollo-Twin Creeks Lines); and
- Five new 230-34.5 kV substations for service requested by three data center customers (individually, Customers A, B and C; collectively, the Customers) within planned data center developments on property to be obtained by the Company (i.e., the Twin Creeks, Sycolin Creek, Starlight, Lunar, and Apollo Substation).

From the cut-in location within the existing right-of-way, the Apollo-Twin Creeks Lines will extend approximately 1.9 miles within a predominantly 100-foot-wide right-of-way, interconnecting the proposed Twin Creeks, Sycolin Creek, Starlight, and Lunar Substations and terminating at the proposed Apollo Substation. The new transmission lines would be supported primarily by double-circuit dulled galvanized steel monopoles and utilize three-phase twin-bundled 768.2 Aluminum Conductor Steel Supported/Trapezoidal Wire/High Strength (ACSS/TW/HS) type conductor with a summer transfer capability of 1,573 megavolt-amperes (MVA).

[1] On March 7, 2024, the Company filed an application for State Corporation Commission (SCC) approval of new single circuit 500 kV and 230 kV electric transmission lines located in a new right-of-way varying between 100 and 150 feet in width and extending for approximately 9.4 miles (the future Aspen-Golden Lines) between a new 500-230 kV Aspen Substation and a new 500-230 kV Golden Substation, as well as an approximately 0.2-mile line between the new 500-230 kV Aspen Substation and the existing 500 kV Goose Creek Substation, all located in Loudoun County, Virginia (collectively, the Aspen-Golden Project). *See Application of Virginia Electric and Power Company for approval and certification of electric transmission facilities: 500-230 kV Aspen Substation, 500 kV Aspen-Goose Creek Line #5002, 500 kV and 230 kV Aspen-Golden Lines #5001 and #2333, 500-230 kV Golden Substation and Lines# 2081/#2150 Loop*, Case No. PUR-2024-00032 (filed March 7, 2024) (referred to herein as the Aspen-Golden Application). For approximately 0.9 mile of the 9.4-mile proposed route of the future Aspen-Golden Lines, the Company noted as part of the Aspen-Golden Application that it would need additional right-of-way with varying widths between 100 and 140 feet to accommodate construction of two new 230 kV double circuit lines—namely, the Apollo-Twin Creeks Lines (as defined herein but referred to in the Aspen-Golden Application as the future Twin Creeks Lines). As noted in the Aspen-Golden Application, the Company understood that it could not condemn for more than what was needed for the Aspen-Golden Project until such time as the Company sought approval of this instant Project, as defined herein, consistent with the Commission's approach in recent proceedings. *See* the Aspen-Golden Application, Appendix at n. 6. The Company is now seeking such approval in this Application. A map depicting the total right-of-way where the Apollo-Twin Creeks Lines are proposed for collocation with the future Aspen-Golden Lines, which ranges from a total of 200 to 260 feet, is provided in Attachment II.A.6 to the Appendix. As clarification, the Company notes that the use of "collocation" in this context indicates where the rights-of-way are adjacent to and/or overlap one another as depicted in Attachment II.A.2 to the Appendix.

Dominion Energy Virginia determined that building a portion of the proposed Apollo-Twin Creeks Lines adjacent to a future Aspen-Golden Lines is preferred given that the facilities proposed for each project traverse the same area. Collocation of the future rights-of-way for proposed Apollo-Twin Creeks Lines and the future Aspen-Golden Lines minimizes the impacts of each project on communities and sensitive resources.

This pre-application analysis assesses and compares potential impacts on previously recorded historic and archaeological resources in relation to the proposed Apollo-Twin Creeks Lines (Route 1) and the proposed Twin Creeks, Sycolin Creek, Starlight, Lunar, and Apollo Substations. ERM conducted the analysis on behalf of Dominion Energy Virginia to assist in the development of a feasible Project design that minimizes impacts to historic resources. The analysis is a required study for transmission line projects regulated by the SCC. The study was completed in accordance with the Virginia Department of Historic Resources' (VDHR's) *Guidelines for Assessing Impacts of Proposed Electric Transmission Lines and Associated Facilities on Historic Resources in the Commonwealth of Virginia* (VDHR 2008) (Guidelines).

Four known archaeological sites were located within what would be the right-of-way of Route 1 and/or substation boundaries. Of these, three are considered not eligible for listing in the National Register of Historic Places (NRHP) and one has not been evaluated for listing in the NRHP. [redacted] The archaeological sites and their current NRHP status are summarized in Table 1 below. The sites could be impacted by construction traffic or clearing within the right-of-way. A confident evaluation of the nature of archaeological deposits at each site and impacts on the sites from prior land use activities would require a field survey.

Six previously recorded historic architectural resources meeting criteria specified in the Guidelines fall within study tiers defined by the VDHR for identifying aboveground historic sites along and near Route 1. The likely impacts on individual historic resources associated with the proposed route and its associated substations are presented in Table 2 below. Among the six considered resources included in this analysis, ERM recommends that Route 1 would have no impact on three historic resources and a minimal impact on three resources.

TABLE 1 EXECUTIVE SUMMARY OF NATIONAL REGISTER STATUS OF CONSIDERED ARCHAEOLOGICAL RESOURCES IN THE STUDY AREA OF THE PROJECT

Considered Resource	Project Component	Proposed Project
44LD1999	[redacted]	Not Eligible
44LD2001	[redacted]	Not Eligible
44LD2002	[redacted]	Not Eligible
44LD2012	[redacted]	Unevaluated

TABLE 2 EXECUTIVE SUMMARY PROJECT IMPACTS TO CONSIDERED ABOVEGROUND RESOURCES IN THE STUDY AREA OF THE PROJECT

Considered Resource	Project Component	Recommended Impact
053-0106	Route 1, Sycolin Creek Substation, Starlight Substation, Lunar Substation, Apollo Substation	None
053-0276	Route 1, Twin Creeks Substation, Sycolin Creek Substation	Minimal
053-0336	Route 1, Twin Creeks Substation, Sycolin Creek Substation, Starlight Substation, Lunar Substation	Minimal
053-5058	Route 1, Apollo Substation	None
053-6238	Route 1, Sycolin Creek Substation, Starlight Substation, Lunar Substation, Apollo Substation	Minimal
253-5182	Route 1, Apollo Substation	None

1. INTRODUCTION

This report presents the findings of the pre-application analysis conducted for Dominion Energy Virginia's Apollo-Twin Creeks Lines, Twin Creeks Substation, Sycolin Creek Substation, Starlight Substation, Lunar Substation, and Apollo Substation (Apollo-Twin Creeks 230 kV Electric Transmission Project, or Project) in Loudoun County, Virginia. For this Project, the Company is proposing to construct and operate:

- A new approximately 1.9 mile double circuit overhead 230 kV transmission line in entirely new right-of-way by cutting the Company's existing 230 kV Edwards Ferry-Pleasant View Line #203 at Structure #203/2 and extending the line to the proposed Apollo Substation (collectively, the Apollo-Twin Creeks Lines); and
- Five new 230-34.5 kV substations for service requested by three data center customers (individually, Customers A, B and C; collectively, the Customers) within planned data center developments on property to be obtained by the Company (i.e., the Twin Creeks, Sycolin Creek, Starlight, Lunar, and Apollo Substation).

From the cut-in location within the existing right-of-way, the Apollo-Twin Creeks Lines will extend approximately 1.9 miles within a predominantly 100-foot-wide right-of-way, interconnecting the proposed Twin Creeks, Sycolin Creek, Starlight, and Lunar Substations and terminating at the proposed Apollo Substation. The new transmission lines would be supported primarily by double-circuit dulled galvanized steel monopoles and utilize three-phase twin-bundled 768.2 ACSS/TW/HS type conductor with a summer transfer capability of 1,573 MVA.

Dominion Energy Virginia determined that building a portion of the proposed Apollo-Twin Creeks Lines adjacent to a future Aspen-Golden Lines is preferred given that the facilities proposed for each project traverse the same area. Collocation of the future rights-of-way for proposed Apollo-Twin Creeks Lines and the future Aspen-Golden Lines minimizes the impacts of each project on communities and sensitive resources.

The pre-application analysis assesses potential impacts on previously recorded historic and archeological resources relative to the proposed route and five proposed substations. ERM conducted the pre-application analysis on behalf of Dominion Energy Virginia to assist in the development of a feasible Project design that minimizes impacts on historic resources. The study was completed in accordance with VDHR's Guidelines.

1.1 OVERVIEW

Only one route option (Route 1) is under consideration for the new overhead transmission lines. A map depicting the proposed Project is provided as Figure 1.

1.1.1 PROPOSED APOLLO-TWIN CREEKS LINES (ROUTE 1)

From the cut-in location, the Proposed Route (Route 1) initially heads south for about 0.2 mile generally following the property line of an existing Luck Stone quarry and existing Loudoun Water utility lines to connect with the first substation, the proposed Twin Creeks Substation associated with Campus A. The site for the substation is within a parcel on the north side of Cochran Mill

Road and south of a Luck Stone quarry. Route 1 then continues southeast for about 0.2 mile along a property boundary to a point just north of Cochran Mill Road, where the route intersects and begins to parallel the Company's future Aspen-Golden Lines. From here, Route 1 crosses Cochran Mill Road and continues southeast across the Customer A parcels for about 0.4 mile. The route crosses Goose Creek collocated with the future Aspen-Golden Lines at a spot just north of a former quarry (now a reservoir), about 0.2 mile northeast of the Company's existing Lines #227 and #274. Still collocated with the future Aspen-Golden Lines, Route 1 continues south on the former quarry property for 0.1 mile then turns northeast. The route connects to the proposed Sycolin Creek Substation and continues northeast across Customer B's parcels for about 0.3 mile to the south side of the proposed Starlight Substation. From there, Route 1 of the Apollo-Twin Creeks Lines splits from the future Aspen-Golden-Lines for 0.2 mile before entering the proposed Starlight Substation, while the future Aspen-Golden Lines continue east along the north side of the substation. Route 1 then heads north for about 0.4 mile across the Customer C parcel connecting to the proposed Lunar Substation and terminating at the proposed Apollo Substation south of Rt. 7 and west of Belmont Ridge Road.

Route 1 measures 1.9 miles in length, including the portions of the line extending through the five proposed substation sites.

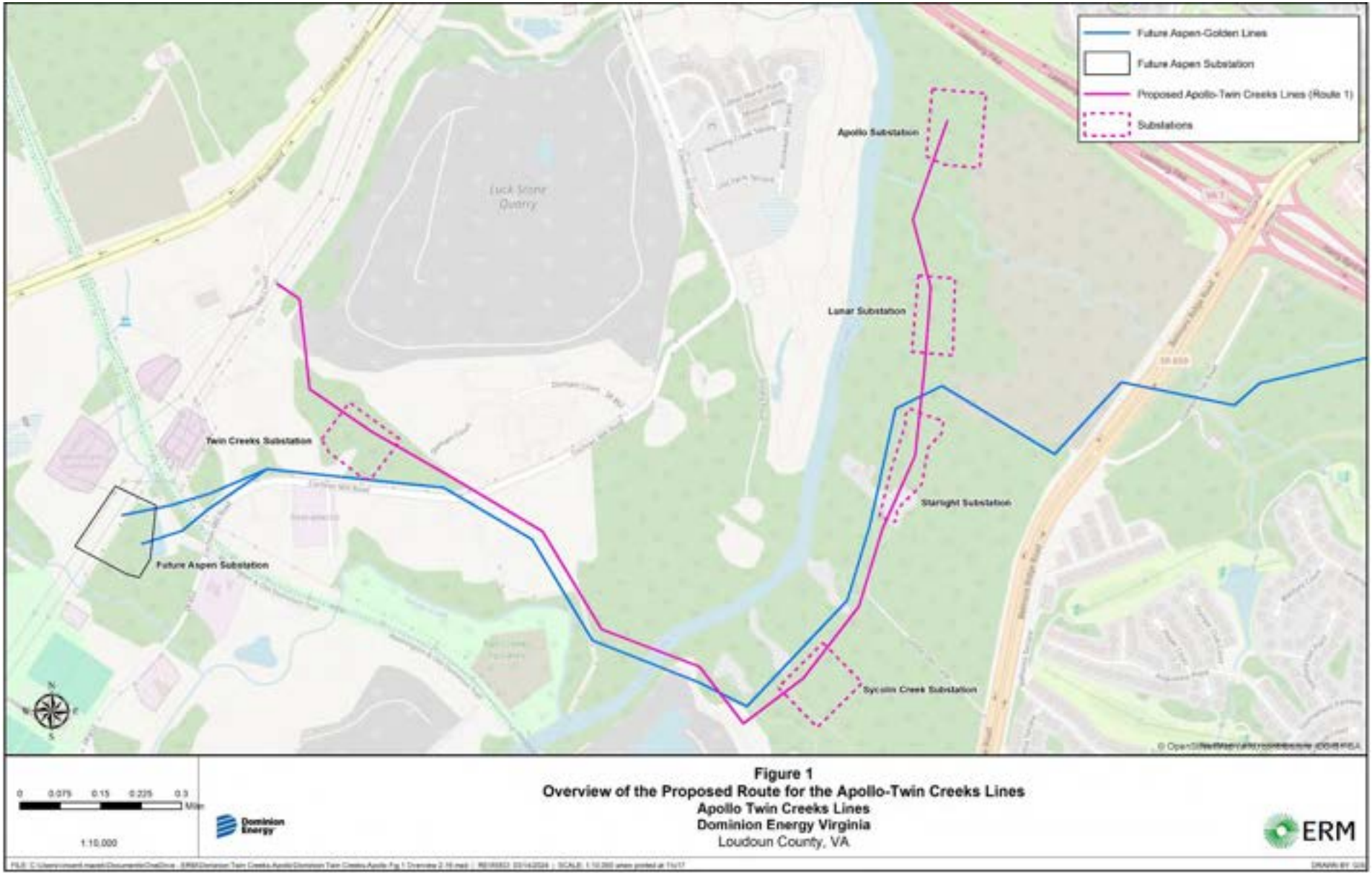
1.1.2 COLLOCATION WITH THE ASPEN-GOLDEN PROJECT

On March 7, 2024, the Company filed an application with the SCC in Case No. PUR-2024-00032 for approval of its Aspen-Golden 500-230kV Electric Transmission Project. In that case, Dominion sought SCC approval to construct the 500-230 kV Aspen Substation, the 500-230 kV Golden Substation, the 500 kV Aspen-Goose Creek Line #5002, the 500 kV Aspen-Golden Line #5001, the 230 kV Aspen-Golden Line #2333, and the Lines #2081/#2150 Loop in Loudoun County, Virginia (collectively, the Aspen-Golden Project).

Due to the proximity of the two Projects, Dominion determined that building a portion of the proposed Apollo-Twin Creeks Lines parallel and adjacent to the future Aspen-Golden Lines is preferred given that the facilities proposed for each project traverse the same area. Collocation of the future rights-of-way for the proposed Apollo-Twin Creeks Lines and the future Aspen-Golden Lines minimizes the impacts of each project on communities and sensitive resources, including Goose Creek, which is designated as a scenic river by the Commonwealth of Virginia.

Per VDHR guidance from a joint meeting on August 16, 2023, the simulations prepared for this study of proposed transmission infrastructure in the viewsheds from historic resources depict both Apollo-Twin Creeks 230 kV Electric Transmission Project and the Aspen-Golden Project to assess their cumulative effects. In the case of the resources addressed in this report, four resources in the proposed Project's study tiers would also have line of sight to the future Aspen-Golden Lines.

FIGURE 1 OVERVIEW OF THE PROPOSED ROUTE FOR THE APOLLO-TWIN CREEKS LINES



1.2 MANAGEMENT RECOMMENDATIONS

Four known archaeological sites were located within what would be the right-of-way of Route 1 and/or within substation boundaries. Of these, three are considered not eligible for listing in the NRHP and one has not been evaluated to determine its eligibility for listing in the NRHP. [redacted] The archaeological sites could be impacted by construction traffic or clearing within the right-of-way during Project construction. A confident evaluation of the nature of archaeological deposits at each site and impacts on the sites from prior land use activities would require a field survey.

Six previously recorded historic architectural resources meeting criteria specified in the Guidelines fall within study tiers defined by the VDHR for identifying aboveground historic sites along and near proposed transmission lines. Of these, ERM recommends Route 1 would have no impact on three historic resources and a minimal impact on three resources. More information about each resource and the nature of potential impacts from the proposed Project can be found in the sections that follow.

2. RECORDS REVIEW

2.1 DATA COLLECTION APPROACH

ERM conducted an analysis of potential cultural resource impacts for the alternative routes under consideration in accordance with the VDHR Guidelines. For each route, this analysis identified and considered the following previously recorded resources.

- National Historic Landmarks (NHLs) within a 1.5 mile-radius of the centerline;
- NRHP-listed properties, NHLs, battlefields, and historic landscapes within a 1.0-mile radius of the centerline;
- NRHP-eligible and NRHP-listed properties, NHLs, battlefields, and historic landscapes within a 0.5 mile radius of the centerline; and
- All of the above qualifying resources as well as archaeological sites within the right-of-way for the route.

These study tiers additionally encompassed the proposed Twin Creeks, Sycolin Creek, Starlight, Lunar, and Apollo Substation sites.

Information on the considered resources in each study tier was collected from the Virginia Cultural Resource Information System (VCRIS). ERM also collected information from the Loudoun County Preservation Society (2023), Loudoun County Heritage Commission (2023), Loudoun County Preservation and Conservation Commission (2023), and the Loudoun County African-American Historic Architectural Resources Survey (2004) to find locally significant resources within a 1.0-mile radius of the centerline.

Along with the records review, ERM conducted field assessments of the considered aboveground resources along the route in accordance with the Guidelines. Digital photographs of each historic architectural resource and views to the proposed transmission line were taken. Photo simulations were then prepared to assess the potential for visual impacts from the new transmission infrastructure on the resources. For previously recorded archaeological sites under consideration, aerial photographs were examined to assess the current land condition and the spatial relationship between the sites and any existing or planned transmission line infrastructure.

2.2 ARCHAEOLOGICAL RESOURCES

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 traffic within a site). The known archaeological sites in what would be the right-of-way for the proposed transmission line and within the associated substation sites are summarized in Table 3 and their locations are depicted in Figure 2.

Of the four previously recorded sites that could be impacted by the proposed Project, three are considered not eligible for listing in the NRHP and one has not been evaluated for listing on the NRHP. [redacted]

[redacted] A confident evaluation of the nature of the archaeological deposits at each site and impacts on the sites from prior land use activities would require a field survey.

FIGURE 2 LOCATIONS OF ARCHAEOLOGICAL RESOURCES WITHIN THE RIGHT-OF-WAY FOR THE PROJECT (REDACTED)

TABLE 3 ARCHAEOLOGICAL RESOURCES WITHIN THE RIGHT-OF-WAY FOR THE PROJECT

Project Component	Greenfield or Existing/Expanded Right-of-way?	Site Number	Description	NRHP Status
Route 1 Apollo Substation	Greenfield	44LD1999	Single dwelling (Reconstruction and Growth, World War I to World War II)	Not Eligible
Apollo Substation	Greenfield	44LD2001	Temporary camp (Pre-Contact) and Artifact scatter (Early National Period, Antebellum Period, Civil War, Reconstruction and Growth, World War I to World War II, The New Dominion, Post Cold War)	Not Eligible
Route 1	Greenfield	44LD2002	Temporary camp (Pre-Contact)	Not Eligible
Route 1 Starlight Substation	Greenfield	44LD2012	Artifact scatter (The New Dominion, Post Cold War)	Unevaluated

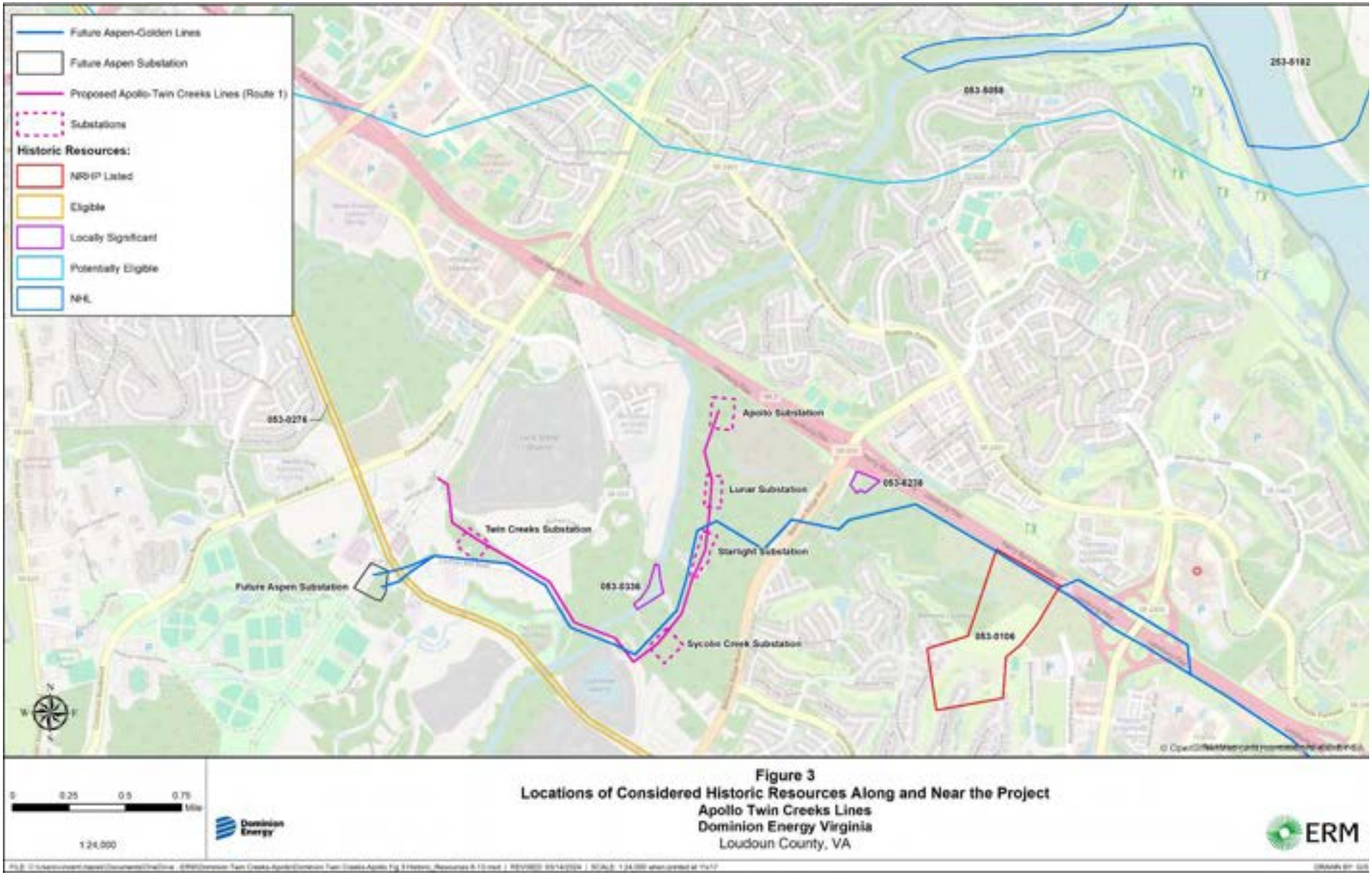
2.3 HISTORIC RESOURCES

The following discussion summarizes the known historic resources in the vicinity of the proposed Project based on the VDHR's tiered study model defined in the Guidelines. The locations of the considered historic architectural resources and the proposed Project are shown on Figure 3 as well as Attachment 1.

The resources located within the right-of-way of a proposed transmission line may be subject to both direct impacts from placement of the line across the property as well as visual impacts from changes to the viewshed introduced by the new transmission line structures and conductors. Resources in the 0.5-mile tier would not be directly impacted, but are likely to be visually impacted, unless topography, vegetation, or the built environment obscures the view to the transmission line. At a distance of over 0.5 mile, it becomes less likely that a resource would be within line-of-sight of the proposed transmission line. Beyond 1.0 mile, it becomes less likely that a given resource would be within line-of-sight of a transmission line.

The nature of the impacts to resources, while estimated in this study within the assistance of photo simulations, will depend on the final Project design in which the exact placement and height of transmission structures is determined. Moreover, a complete, identification-phase architectural survey would be completed along the route once the Project is approved by the SCC. The survey area for that investigation will be based on the height of the transmission line structures as well as topography, tree cover, and any other factors impacting the line-of-sight from historic resources to the route.

FIGURE 3 LOCATIONS OF CONSIDERED HISTORIC RESOURCES ALONG AND NEAR THE PROJECT



2.3.1 ROUTE 1

The considered resources that lie within the VDHR tiers for Route 1 are presented in Table 4 and depicted in the map provided as Attachment 1. ERM identified six aboveground historic resources within the VDHR tiers for Route 1. The considered resources were subjected to field reconnaissance and a preliminary assessment of impacts, discussed in the next chapter.

TABLE 4 HISTORIC RESOURCES IN VDHR TIERS FOR THE PROJECT

Buffer (miles)	Resource Category	Resource Number	Description
1.0 to 1.5	National Historic Landmark	253-5182 [5]	Ball's Bluff Battlefield & National Cemetery Historic District Boundary Increase
0.5 to 1.0	National Register Properties (Listed)	053-0106 [2, 3, 4, 5]	Belmont Manor
	Battlefields (Potentially Eligible)	053-5058 [5]	Ball's Bluff Battlefield
0.0 to 0.5	Locally Significant	053-0336 [2, 3, 4]	Cooke's Mill
		053-6238 [2, 3, 4, 5]	African American Burial Ground for the Enslaved at Belmont
	National Register – Eligible	053-0276 [1, 2]	Washington and Old Dominion Railroad Historic District

[1] Resource is also within the designated tiers for the proposed Twin Creeks Substation
[2] Resource is also within the designated tiers for the proposed Sycolin Creek Substation
[3] Resource is also within the designated tiers for the proposed Starlight Substation
[4] Resource is also within the designated tiers for the proposed Lunar Substation
[5] Resource is also within the designated tiers for the proposed Apollo Substation

3. PREVIOUS SURVEYS

Portions of Route 1 and the Sycolin Creek, Starlight, Lunar, and Apollo Substations have been previously surveyed for cultural resources. Eight previous cultural resource surveys intersect parts of the proposed Project. Information on these previous surveys—including VDHR survey number, report title, report authors, and report date—is provided in Table 5. The extent of the previous survey coverage is depicted in Attachment 2.

TABLE 5 CULTURAL RESOURCE SURVEYS COVERING PORTIONS OF THE PROPOSED PROJECT

VDHR Survey #	Title	Author(s)	Date
LD-065	Phase I Archaeological Survey of the Proposed Loudoun County Power Plant, Leesburg, Virginia	Jill Chappell	1991
LD-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	Douglas C. McLearen, Kimberly S. Zawacki, Matthew R. Laird, James G. Harrison III	1999
LD-140	Historical and Archaeological Survey of the Lansdowne Tract, Loudoun County, Virginia	Eugene M. Scheel	1991
LD-199	Archaeological Survey of Route 659, Belmont Ridge Road Improvements, Loudoun County, Virginia	Barbara Shaffer, Lily Richards, Richard White, Brenda Carr-Weller	2007
LD-290	Phase I Archeological Investigations of the Loudoun Water Proposed Pump Station and Water Transmission Line, Loudoun County, Virginia	Kimberly Snyder, David Carroll	2010
LD-320	Cultural Resources Survey of the Proposed Routes 7 and 659 Project, Loudoun County, Virginia	Elizabeth Monroe, Meg Malvasi	2010
LD-416	Phase IA and I Archeological Investigations of the +/- 106.56 Acre Goose Creek Golf Course Property, Loudoun County, Virginia	John Mullen, Edward Johnson, Kristen Deily	2008
LD-614	Phase I Cultural Resources Investigation, 19509 Belmont Ridge Road, Loudoun County, Virginia	David Carroll, Elizabeth Johnson, Daniel Baicy	2022

4. STAGE 1 PRE-APPLICATION ANALYSIS FINDINGS

4.1 METHODS OF ANALYSIS

Fieldwork for the pre-application analysis was conducted by Secretary of the Interior Qualified architectural historians Emily Dodson and Michael Langmyer between March 20–25, 2023, August 28–30, 2023, and December 6–7, 2023. The fieldwork involved photographing six resources requiring visual assessment according to the Guidelines and examining potential line-of-sight views from each resource toward the Project. For resources where property owner approval was granted for historic resource documentation, photographs were taken toward the proposed transmission line from the property at the most prominent view of the landscape. When such permission was not available, photographs were taken from the public right-of-way (typically a road) nearest to the resource facing toward the route and/or substation(s).

Panoramic photographs were taken from each resource, with an effort to capture the direction with the clearest, most unobstructed view toward the route. The precise location of the photograph was captured with a mobile tablet device connected to a sub-meter accurate Global Navigation Satellite System (GNSS) receiver, the Trimble R1. The locations where photographs were taken were noted as Simulation Points (SP). Site visits to the SPs were prioritized based on their location relative to the resource, so that viewpoints east of the resource were visited in the morning and viewpoints west of the resource were visited in the afternoon. This helped ensure, where possible, that the sun was behind the photographer at the time the viewpoint photography was captured. Additionally, minor adjustments to position were made to obtain as clear a view to the site center as possible, avoiding trees, landscaping, or built obstructions. Tablets recorded the center bearing, angle of view, altitude, and camera lens height. Upon receipt of the viewpoint location information, the viewpoints were plotted onto open source mapping from the Environmental Systems Research Institute (ESRI) using the Universal Transverse Mercator (UTM) 18N coordinate system.

The process of taking panoramas included setting up the tripod and camera. The camera was placed on the panoramic head in a landscape orientation where its lens height was confirmed and set at 1.5 meters (note: a portrait camera orientation was sometimes used in situations where the viewpoint is very close to a development so that the top of the development is not cut off by the image boundaries). The tripod head and camera combination were then leveled. With the camera's viewfinder centered on the perceived site center, exposure and focus settings were taken. These were then fixed manually on the camera so that they could not be inadvertently altered. The head was rotated 90 degrees to the left where the first frame of the 360-degree sequence was then taken. Each subsequent frame was taken using a 50 percent overlap of the previous frame until the full 360-degree sequence was captured. The camera was then removed from the tripod and a viewpoint location photograph was captured showing the tripod in its position.

The following camera and tripod configuration was used:

- Camera body: Nikon D800 professional specification digital SLR (full frame CMOS sensor)
- Camera lens: Nikkor AF 50mm f1.8 prime
- Tripod: Manfrotto 055MF4 with Manfrotto 438 ball leveller

- Panoramic head: Manfrotto 303SPH

The following camera settings were used for all photography:

- Camera mode: Manual Priority
- ISO: 100
- Aperture: f13
- Image format: RAW

After the photos were complete, they were uploaded to a server to begin the simulation/ visualization process. The single-frame photographs were opened in Adobe Photoshop CC 2022 where they were checked, and any camera sensor dust spots were removed before being saved as high-resolution JPEG images. If required, discrete color and tonal adjustments were made to each frame before they were saved. The single-frame photographs were stitched together in PTGui Pro version 12.11 professional photographic stitching software using cylindrical projection settings. The camera locations were plotted in Global Mapper version 23.1. Digital models of the transmission line structures were provided by Dominion, then cleaned up and textured in Autodesk 3DS Max 2021. The transmission structures along each route were rendered in Vray version 5.2 from each SP camera location. 3D imagery was produced at the field of view using camera matching. Renderings for each route and each tower combination were then exported for use as an overlay.

Detailed, correctly dimensioned 3D computer models of the transmission structures were generated using Autodesk 3DS Max 2021 and iToo RailClone. The virtual 3D model of the structures was created using real-world measurements and elevation drawings provided by the Company (see Attachment 3). These were textured using Vray PBR materials to simulate the weathering steel texture. The detailed, textured models were rendered to a digital image using a simulated physical camera and a sun and sky simulation lighting model in the computer software consistent with conditions within the original viewpoint photography.

Photomontages were produced by overlaying the rendered image on the photograph, using known control points and the wireline imagery showing the tower columns at the correct height and distance. Final adjustments were then made to the brightness and contrast of the rendered images to match them to the photograph. Final photomontages were prepared from each viewpoint for the route. These were then opened in Adobe Photoshop CC 2022 where minor changes were made such as placing relevant tree/building/hedge screening or telegraph wires over the proposed development renders where necessary. Finally, the final images were cropped to the proportions required for the visual simulation figures, and the visualization figures were prepared in Adobe InDesign CC2022 and exported in a PDF format.

4.2 ASSESSMENT OF POTENTIAL IMPACTS

The assessment of potential Project impacts on individual resources made use of the visual assessment findings and categorized the severity level of impacts according to the following scale devised by VDHR:

- **None**–Project is not visible from the resource.

- **Minimal**–Viewsheds have existing transmission lines, there would be only a minor change in height, and/or other views are partially obscured by topography or vegetation.
- **Moderate**–Viewsheds have more expansive views of the transmission line, more dramatic changes in height are proposed, and/or the overall visibility of the Project would be greater.
- **Severe**–Existing viewshed contains no transmission line, the view to the Project would be relatively unobstructed, the new transmission line would introduce a significant change to the setting of historic properties, and/or a dramatic change in the height of an existing transmission line would take place in close proximity to historic properties.

4.3 HISTORIC RESOURCE DESCRIPTIONS

4.3.1 053-0106, BELMONT MANOR

Belmont Manor (053-0106) is located at 19661 Belmont Manor Lane on 218 acres within the gated community called the Belmont Country Club and Golf Course. The property includes the main dwelling house, which was converted to a community club house and a golf course. Individual suburban-style lots with residences are located to the south, southeast, and west of the main dwelling. The gated community is accessed via the Russell Branch Parkway in Ashburn. The main dwelling is accessed by a paved curved drive and is flanked by two large parking lots to the east and west and the golf course to the south. Clusters of trees are scattered across the grassy lawn (Google Earth Pro 2023; Attachment 4, Figure 1).

The property was originally surveyed in 1937 by Elizabeth Morgan and recorded as the Belmont of Indian Plantation for the Works Progress Administration Virginia Historical Inventory Survey for the Historic American Buildings Survey (HABS). A second HABS Inventory was conducted in 1959 by George Worthington. A Phase II intensive survey in 1974 carried out by John G. Lewis for VDHR also covered the resource, followed by a NRHP nomination in 1976 prepared by Calder C. Loth, a staff member of the Virginia Historic Landmarks Commission (VHLC).

The 1976 survey, prepared by Loth, noted a main dwelling, a smoke/meat house, and a cemetery (Loth 1976a, 1976b). Loth described the main dwelling as a sophisticated five-part Federal mansion built circa 1799 for Ludwell Lee, the son of Richard Lee, who was a signer of the Declaration of Independence. The dwelling consisted of a central two-story five-bay section capped by a gable roof with modillion cornices and interior end chimneys. The dwelling was constructed of brick laid in a Flemish bond pattern with narrow tooled joints. The roof was described as sheathed in slate, though historic photographs showed a standing seam metal roof and it was noted that the original roof was clad with wood shingles. The central bay was a pedimented pavilion featuring a lunette underneath the pediment. This central bay included a Palladian window on the second story and a double door on the first floor flanked by side lights and topped by a fanlight. Sheltering the main entrance was a refined tetra-style portico with fluted Doric columns, a modillion cornice, and a frieze ornamented with alternating geometric patterns. Flanking this center section were three-bay hyphens with round-arch windows containing intersecting tracery. These hyphens originally had flat roofs but were converted to gable roofs during a 1907 renovation. During this same renovation, wings measuring three bays wide and capped by gable roofs were connected to the hyphens. The wings were also modified in the 1907 renovation to be the single-bay pavilion topped by an open-tympanum pediment

observed in 1976. Originally, the dwelling had a T-shaped floorplan, but in 1907, the rear wing was removed and replaced with an addition as wide as the original dwelling, featuring a hipped roof with dormers and a shallow pavilion topped by an open-tympanum pediment. Loth noted the windows consisted of six-over-six double-hung wood sash, as well as other types of wood sash double-hung windows. Details were not provided on the smokehouse. The survey noted a cemetery was enclosed by a wall and contained the grave of Ludwell Lee, who was born in 1760 and died in 1836 (Loth 1976a, 1976b). 053-0106 was surveyed again in 2009 by Meg Greene Malvasi, but due to limited access to the property, the surveyor was not able to assess the parcel containing the site (Malvasi 2009a).

The property had various owners throughout its history. Most recently, George Clarke sold the property to International Business Machines Corporation (IBM) in 1969, but it was never used. Clarke's widow vacated the dwelling in 1974 (Loth 1976b). In 1995, Toll Brothers, Inc. purchased and restored the property, and by 2001, the Belmont Country Club and Golf Course opened. The main dwelling was converted into an event space for the club (Belmont Country Club 2023). According to maps, the cemetery is located northwest of the dwelling (Google Earth Pro 2023).

053-0106 was listed in the VLR in 1976 and in the NRHP in 1980 (Loth 1976a). Belmont, a Northern Virginia estate established by the Lee family, is listed under Criteria A and C. The estate symbolizes the late eighteenth century resettlement of many of Virginia's prominent Tidewater families to the more fertile northern and western areas of the state (Criterion A) and it is a significant example of a Federal style dwelling (Criterion C; Loth 1976b). Resource 053-0106 lies within the one-mile study tier for Route 1 as well as the Sycolin, Starlight, Lunar, and Apollo Substations.

4.3.2 053-0276, WASHINGTON AND OLD DOMINION RAILROAD HISTORIC DISTRICT

The Washington & Old Dominion (W&OD) Railroad Historic District (053-0276) encompasses 547.45 acres in Arlington County, Fairfax County, the City of Falls Church, and Loudoun County, though this report only addresses the portion of the resource within the study tiers for this Project (Attachment 4, Figure 2). A trail, called the W&OD Trail, built on the former railroad bed, travels through the urban heartland and countryside of Northern Virginia, running from Shirlington in Arlington County to Purcellville in Loudoun County. This 45-mile long and 100-foot-wide corridor features a hard-surfaced pedestrian and bicycle trail as well as an adjacent 33-mile bluestone-surfaced bike path between Purcellville and Vienna. The park is owned by the Northern Virginia Regional Park Authority.

In 1999, Helen P. Ross surveyed the W&OD Railroad and its features, noting that the alignment, grading, bridges, culverts, six stone arches, and six depots and freight stations remained intact. The surveyor noted many of the original features such as the rolling stock, rails, ballast, fencing, repair shops, station houses, water stations, and woodsheds were no longer extant (Ross 1999). In 2000, Ashley M. Neville prepared an NRHP nomination form for the historic district (Neville 2000). Subsequent surveys of portions of the historic district occurred in 2006, 2008, 2010, 2012, 2013, 2014, 2016, 2018, and 2022 (Andre 2008; CCR, Inc. 2006; DeChard 2022; Derrick 2018; Dovetail CRG 2008, 2010; Hanbury 2012, 2013; Jacobe 2014; Schlupp 2016; Shiflett 2022;

Traum 2014). For the current Project in 2023, ERM observed portions of the trail and alignment near Cochran Mill Road in Leesburg, and it appeared in good condition.

Built as the Alexandria, Loudoun, and Hampshire Railroad in 1855, the resource was one of the region's major commercial and transportation arteries during the mid to late nineteenth century. The founders hoped to recapture Alexandria's past glory as a world trade center by constructing a rail line from the west over the Allegheny mountains to Alexandria's fading seaport. In 1858, a portion of the line was completed to Leesburg, 38 miles away from Alexandria, with passenger cars arriving in 1860. The Southern Railway purchased the line in 1900, merging it with its own rail network. By 1911, the line transitioned from steam to electric, making it Virginia's largest interurban system to date. As one of the nation's largest steam to electric conversion projects, it included 72 route miles, 17 of which were double tracked. Passenger and freight traffic declined with the advent of the automobile in the 1940s and 1950s (Ross 1999). The railroad was abandoned in 1968, and the right-of-way was purchased by Virginia Electric and Power Company to construct transmission lines. The tracks were removed in the 1970s. In 1982, the Northern Virginia Regional Park Authority, purchased 45 miles of the rail bed for use as a public park (Shiflett 2022).

VDHR determined 053-0276 eligible for the NRHP under Criterion A for its contribution to the broad patterns of Northern Virginia history in the areas of transportation and commerce. The railroad is historically significant as one of the major commercial and transportation arteries of the Northern Virginia area from the mid-nineteenth century through the mid-twentieth century. Although it never reached its goal as a trunk line from the Shenandoah Valley to Alexandria, it served as a local carrier facilitating local development. The line was crucial during the Civil War and Spanish American War, and it also enabled the development of the early Washington D.C. suburbs of Falls Church and Dunn Loring. The railroad carried vacationers to the Blue Ridge Mountains and hauled agricultural products from the surrounding countryside to Washington D.C. In its final years, it transported construction materials used in the construction of Dulles Airport and the Capital Beltway before its demise in 1968 (Neville 2000; Shiflett 2022). The historic district includes six contributing resources (053-0276-0001, 0002, 0003, 0004, 0005, and 0006); however, only 053-0276-001 (Washington & Old Dominion Railroad) is within the boundaries of the current Project.

The VDHR determined 053-0276-0001 as eligible for the NRHP in 1999. 053-0276 lies within the half-mile study tier for Route 1 as well as the Twin Creeks and Sycolin Creek Substation sites.

4.3.3 053-0336, COOKE'S MILL

Cooke's Mill (053-0336), also known as Marvin's Mill and Houghs Mill, is located at 42485 Cochran Mill Road/Route 653 in Leesburg Parkway (Attachment 4, Figure 3). This resource spans Goose Creek with the mill ruins located on the western banks (VDHR 053-0336). The immediate surrounding area is heavily wooded with mature trees. Residential parcels are located to the east and west, a former golf course is to the north, and a quarry lies farther to the southwest.

First surveyed in 1974 by John Lewis on behalf of VDHR (Lewis 1973), the resource was recorded as a circa 1763 mill ruin and lock and dam with datestone reading 'HI 1763'. It was surveyed again in 2022 by Daniel Baicy for Thunderbird Archaeology, a division of Wetland Studies and

Solutions, Inc. This survey was confined to the eastern bank of the resource's mill pond, which featured a stone wall associated with the dam of the mill. Baicy noted a similar wall appeared on the western bank.

In 2023, ERM observed the eastern and western bank walls, which appear to be unchanged since the 2022 survey. They consist of various sized stone blocks in a ruinous state. A reinforced concrete structure lies near Goose Creek. It features a stone block foundation, which has been skimmed in concrete. The upper portion of the structure had a clay brick wall. The roof has collapsed, and all further details have been lost. Vegetation has heavily overgrown a majority of the mill and lock and dam causing further deterioration.

053-0336 has not been given a formal NRHP determination. However, Loudoun County Archaeologist, Stephen Thompson, categorized the resource as locally significant, so it is included as a considered resource for this Project. 053-0336 lies within the half-mile study tier for Route 1 as well as the Sycolin Creek, Starlight, and Lunar Substation sites.

4.3.4 053-5058, BALL'S BLUFF BATTLEFIELD

Ball's Bluff Battlefield (053-5058) is located in Virginia and Maryland on both sides of the Potomac River near Leesburg, Virginia. The portion in Virginia is in northern Loudoun County between the Potomac River and U.S. Highway 15 to the north of the Project (Appendix 4, Figure 4). The resource represents the site of the Battle of Ball's Bluff, an early battle in the Civil War that took place on October 21, 1861. The boundaries of the resource are defined by the American Battlefield Protection Program (ABPP) Study Area and encompass approximately 5,783 acres, including a 2,621-acre Core Area where the principal action took place. Of the total study area acreage, 1,072 acres were believed to retain sufficient integrity for NRHP listing (Potential National Register Boundary).

The Battle of Ball's Bluff took place on October 21, 1861, during the beginning of the American Civil War. The battle was the result of Union exploratory efforts crossing the Potomac River from Maryland into Virginia. Union officer General Charles P. Stone received orders from General George B. McClellan on October 20, 1861, to send a scouting party across the Potomac River to identify the position of the Confederates under the command of Colonel Nathan B. Evans. A scouting party was sent and reported that they identified an unguarded Confederate campsite, which turned out to be a natural phenomenon. On the morning of October 21, 1861, General Stone decided to send an attacking party with the information provided to him from the night before. This enlarged operation was under the command of Colonel Charles Devens along with approximately 400 troops, who crossed the river at first light. After crossing the river, it was easy to see that what was thought of as an unprotected campsite was a cluster of trees. While the confusion was addressed between Colonel Devens and General Stone on what to do next, a force of Confederate infantry found the Union force and the two sides began to skirmish (American Battlefield Trust 2023; Morgan 2012).

Colonel Edward Baker, a United States Senator, decided to move his forces across the river to help Colonel Devens and take command of the situation. Confederate forces were allowed to organize in full while Union troops slowly crossed the river, resulting in the Confederates overpowering the Federal forces. Colonel Baker was killed in the action and the scattered Union troops retreated

across the Potomac River or surrendered. A total of 3,429 soldiers were engaged in the actions at Balls Bluff, with about equal numbers on both sides. The battle was a disaster for the Union, with about 1,000 men (nearly 60 percent of the total engaged) being killed, wounded, missing, or captured, compared to just 155 casualties for the Confederates (American Battlefield Trust 2023). The Confederate victory at Ball's Bluff was the third in the war's eastern campaign thus far, after First Manassas and Wilsons Creek. The Union defeat at Ball's Bluff, in combination with previous failures, resulted in the creation of the Joint Committee on the Conduct of the War and an increased level of involvement from the Federal Government in the progress of the war. General Stone was later arrested in early 1862, and his military career was ended (Morgan 2012).

Ball's Bluff Battlefield (053-5058) was determined potentially eligible for listing in the NRHP in 2007. A small portion of the resource boundary (VCRIS boundary) is located within the 1.0-mile study tier for Route 1 and the Apollo Substation. However, neither the ABPP Core Area or the Potential National Register Boundary are within the 1.0-mile study tier for the Project.

In 2016, a portion of 053-5058, the Ball's Bluff Battlefield and National Cemetery Historic District Boundary Increase (253-5182), was designated a National Historic Landmark. It lies within the 1.5-mile study tier for the Project and is discussed below.

4.3.5 053-6238, AFRICAN AMERICAN BURIAL GROUND FOR THE ENSLAVED AT BELMONT

The African American Burial Ground for the Enslaved at Belmont (053-6238) is located approximately 0.1 mile from the southeast corner of the intersection of Belmont Ridge Road/Route 659 and Harry Byrd Highway Route 7 (Attachment 4, Figure 5). The burial ground is on a slight rise above the road within a small, wooded area. Freedom Trail Road leads from Belmont Ridge Road/Route 659 to a paved parking area. A gravel pathway leads to the cemetery.

In 2009, the cemetery was surveyed by Meg Greene Malvasi who noted the mid-to-late-nineteenth century cemetery was previously recorded as archaeological site 44LD0578 (Malvasi 2009b). The surveyor identified approximately 24 gravesites, some of which were marked with fieldstone headstones and footstones. The headstones faced east. There was one small, dressed granite stone, but it was not engraved. The site measured approximately 37 meters north to south by 15 meters east to west. It was identified as possibly representing a burial ground for the enslaved at Belmont (053-0106), located approximately 0.5 mile to the northwest. At that time, the cemetery was considered abandoned. A subsequent survey in 2020 noted no changes to the architectural description of the aboveground components; however, the archaeological site and architectural borders of this resource were enlarged to encompass its complete known extent (Baicy 2020). In 2023, ERM surveyed the cemetery and noted recent improvements including signage, pathways, and an interment from 2020.

053-6238 has not been formally evaluated by VDHR, but ERM has categorized it as locally significant for the purposes of this Project due to its ties to the African American community. 053-6238 lies within the half-mile study tier for Route 1 as well as the Sycolin Creek, Starlight, Lunar, and Apollo Substation sites.

4.3.6 253-5182, BALL'S BLUFF BATTLEFIELD & NATIONAL CEMETERY HISTORIC DISTRICT BOUNDARY INCREASE

Ball's Bluff Battlefield & National Cemetery Historic District (the District) represents the site of the Battle of Ball's Bluff, an early battle in the Civil War. The battlefield is located in eastern Loudoun County, Virginia, and western Mongomery County, Maryland on either side of the Potomac River east of Leesburg, Virginia. The boundaries of the resource are roughly defined by the ABPP Core Area and encompass approximately 3,301 acres in two noncontiguous parcels. The southern end of the District is located around Edward's Ferry, the Virginia side of which is at the mouth of Goose Creek. The resource lies well north of the Project, with only a small portion of the District on Goose Creek located within the 1.5-mile study tier for the Project (Appendix 4, Figure 6).

The Battle of Ball's Bluff took place on October 21, 1861. The District encompasses places associated with events both preceding, during, and following the battle between October 20 and October 24, 1861. The battle was the result of Union exploratory efforts crossing the Potomac River into Virginia from Maryland. Union General Charles P. Stone received orders from General George B. McClellan on October 20, 1861, to send a scouting party across the Potomac River to identify the position of the Confederates under the command of Colonel Nathan B. Evans. A scouting party was sent and reported that they identified an unguarded Confederate campsite, which turned out to be a cluster of trees. Based on the information provided to him from the night before, General Stone decided to send an attacking party against the camp on the morning of October 21, 1861. A party of approximately 400 troops under the command of Colonel Charles Devens crossed the river at first light, only to discover the error of the reconnaissance report. While the confusion was addressed between Colonel Devens and General Stone on what to do next, a force of Confederate infantry found the Union force and the two sides began to skirmish (American Battlefield Trust 2023; Morgan 2012).

Colonel Edward Baker, a United States Senator, decided to move his forces across the river to help Colonel Devens and take command of the situation. Confederate forces were allowed to organize in full while Union troops slowly crossed the river, resulting in the Confederates overpowering the Federal forces. Colonel Baker was killed in the action and the scattered Union troops retreated across the Potomac River or surrendered. A total of 3,429 soldiers were engaged in the actions at Balls Bluff, with about equal numbers on both sides. The battle was a disaster for the Union, with about 1,000 men (nearly 60 percent of the total engaged) being killed, wounded, missing, or captured, compared to just 155 casualties for the Confederates (American Battlefield Trust 2023). The Confederate victory at Ball's Bluff was the third in the war's eastern campaign thus far, after First Manassas and Wilsons Creek. The Union defeat at Ball's Bluff, in combination with previous failures, resulted in the creation of the Joint Committee on the Conduct of the War and an increased level of involvement from the Federal Government in the progress of the war. General Stone was later arrested in early 1862, and his military career ended (Morgan 2012).

The portion of the District within the 1.5-mile study tier for NHL properties is at the western end of an extension up Goose Creek that includes the site of Kephart's Bridge, which marked the southwestern limits of the military engagement of October 20–24, 1861. Brigadier General Gorman's Federal troops crossed the Potomac River at Edwards Ferry on October 20, 1861, and camped at the Goose Creek Landing while attacking the Confederate line from entrenchments

along the bluffs to the west of Edwards Ferry. However, the Union advance was stymied by the position of the Richmond Howitzers astride the Edwards Ferry road at what is now Battlefield Parkway, and Gorman was unable to assist the troops engaged at Ball's Bluff to the northwest. He retreated across the river at Edwards Ferry on the night of October 23 (Ford and Thompson 2015).

The Ball's Bluff Battlefield & National Cemetery Historic District Boundary Increase (253-5182) is an expansion of the 85-acre Ball's Bluff Battlefield and National Cemetery (253-5021) located northeast of Leesburg, which was listed on the NRHP and NHL in 1984. The boundary increase was listed as a NHL and on the NRHP in 2016. It is located within the 1.5-mile study tier for Route 1 and the Apollo Substation.

4.4 HISTORIC RESOURCE FINDINGS

4.4.1 053-0106, BELMONT MANOR

Belmont Manor is located approximately 0.8 mile to the southeast of Route 1 in an area where the route uses a greenfield alignment. The resource is also 0.8 mile southeast of the proposed Starlight Substation site, 0.9 mile east of the proposed Sycolin Creek Substation site, 1.0 mile to the southeast of the proposed Lunar Substation site, and 1.0 mile southeast of the proposed Apollo Substation site (Attachment 5, Figure 1). The area between the resource and the new transmission line consists of a dense residential development and forest. 053-0106 would have no view to Route 1 nor any of the proposed substations due to distance, as shown by the simulation from SP 3, where Route 1 (indicated in yellow) is hidden from the view (Attachment 5, Figure 2). Because the view towards the Project from Belmont Manor would be entirely screened, there would be **No Impact** on this resource from Route 1.

As indicated in the simulation, the future Aspen-Golden Lines would be visible from this resource (shown in gray). Infrastructure from thus project is moderately visible from SP 3 as discussed in another report (Derrick et al. 2024). As depicted in the simulation (Attachment 5, Figure 2), even with the removal of vegetation for construction of the Aspen-Golden Lines, transmission infrastructure installed along Route 1 for the Apollo-Twin Creeks Lines would not be visible from vantage points at Belmont Manor.

4.4.2 053-0276, WASHINGTON AND OLD DOMINION RAILROAD HISTORIC DISTRICT

The W&OD Railroad Historic District is approximately 0.2 mile to the southwest of Route 1 and the proposed Twin Creeks and Sycolin Creek Substation sites, in an area where the route uses a greenfield alignment (Attachment 5, Figure 3). The area between the resource and the new transmission line consists of existing substations and Dominion's existing Lines #203 and #2098. The historic district itself shares a right-of-way with Dominion's existing Lines #227 and #274. Two simulations were prepared from the resource, both from the historic district's right-of-way. As shown by SP 7, four transmission structures associated with Route 1 would be minimally visible where the route connects to Dominion's existing Lines #203 and #2098 (Attachment 5, Figure 4), but the Project would not be visible from other vantage points, as shown by SP 5 (Attachment 5,

Figure 5). Although Route 1 is closer to the resource from SP 5, transmission infrastructure installed along this alignment would not be visible due to dense vegetation.

It is important to note that Dominion's existing lines are already a conspicuous element in the district's viewshed, as they share the district's right-of-way. In addition, multiple existing Dominion substations are visible and directly adjacent to the district. Although the district's historic landscape has been severely by comparable infrastructure, because the installation of new transmission infrastructure installed along Route 1 would be visible, it constitutes a change. Thus, ERM recommends that Route 1 would have a **Minimal Impact** on 053-0276.

The Aspen-Golden Lines, once built, also would be minimally visible from various locations in the district, including from SP 7, when looking to the west (Attachment 5, Figure 6). The impact from the Aspen-Golden Project is discussed in a separate report (Derrick et al. 2024), but in terms of its relevance for assessing impacts from Apollo-Twin Creeks Route 1, the Aspen-Golden Lines would not alter the viewshed of 053-0276 in a way that would increase the visibility of infrastructure installed along Route 1.

4.4.3 053-0336, COOKE'S MILL

Cooke's Mill is approximately 0.1 mile northwest of Route 1, 0.1 mile west of the proposed Starlight Substation, 0.1 mile north of the proposed Sycolin Creek Substation, 0.3 mile southwest of the proposed Lunar Substation, and 0.6 mile southeast of the proposed Twin Creeks Substation (Attachment 5, Figure 7). The resource is located in an area where the route is collocated with the future Aspen-Golden Lines. The area between the resource and the proposed new transmission line includes one residential property surrounded by dense vegetation consisting of mature trees.

Four simulations (SP 27, SP 28, SP 29, and SP 30) were prepared from various potential vantage points within the resource boundary towards Route 1. SP 27 was taken from the northernmost edge of the resource boundary, approximately 0.1 mile west of the route, while SP 29 was taken from the southwestern boundary of the resource, approximately 0.1 mile to the northwest of the route (Attachment 5, Figures 8 and 9). Route 1 would not be visible from SP 27 or SP 29 due to the dense intervening vegetation. The two other SPs (SP 28 and SP 30) would have a view of transmission infrastructure installed the route (highlighted in purple in the simulations). SP 28 was taken at the easternmost resource boundary, closest to the route, approximately 0.1 mile west of what would be the right-of-way, and SP 30 was taken on the west bank of Goose Creek, closest to the mill (Attachment 5, Figures 10 and 11). From SP 28, one transmission line structure and associated conductors would be visible through a clearing in the trees. SP 30 was taken approximately 180 feet to the southwest of SP 28 and also shows that conductors would be visible through another clearing in the trees.

Because discrete locations within the resource would have limited views of transmission infrastructure installed along Route 1, the Project would add modern elements to the historic viewshed. The majority of the resource would have no view of the new transmission line, however, and no view to any of the proposed substations. Thus, ERM recommends there would be a **Minimal Impact** to the resource from Route 1.

The future Aspen-Golden Lines (shown in pink in the simulations) would also be minimally visible from vantage points at SPs 28 and 30. Only three of the Aspen-Golden Lines transmission structures and associated conductors would be visible. As illustrated in the simulations, the combined view of the Aspen-Golden Lines and Apollo-Twin Creeks Route 1 would not appreciably increase the impact to the viewshed.

4.4.4 053-5058, BALL'S BLUFF BATTLEFIELD

Ball's Bluff Battlefield is located approximately 0.8 mile to the north of the proposed Apollo Substation and 0.9 mile to the north of Route 1, in an area where the route uses a greenfield alignment (Attachment 5, Figure 12). The area between the resource and the proposed new transmission line consists of a large residential development. Due to distance from the route, the change in elevation, and the presence of intervening densely-packed residential development, 053-5058 would have no view to infrastructure installed along Route 1 or equipment installed at the proposed Apollo Substation, as shown by the viewpoint from SP 10 (Attachment 5, Figure 13). Because the view towards the Project from Ball's Bluff Battlefield would be entirely screened, there would be **No Impact** on this resource from Route 1.

4.4.5 053-6238, AFRICAN AMERICAN BURIAL GROUND FOR THE ENSLAVED AT BELMONT

The African American Burial Ground for the Enslaved at Belmont is approximately 0.5 mile to the east of Route 1. It is also 0.4 mile southeast of the proposed Apollo Substation site, 0.4 mile to the east of the proposed Lunar Substation site, 0.5 mile northeast of the proposed Starlight Substation site, and 0.8 mile to the northeast of the proposed Sycolin Creek Substation site (Attachment 5, Figure 14). The area between the resource and the proposed new transmission line and substations consists of dense forest and Belmont Ridge Road.

Three simulations were prepared from the resource: SP 41, located inside of the cemetery; SP 37, located at the entrance of the cemetery (about 235 feet outside of the VDHR boundary); and SP 308, located on Freedom Trail Road (about 100 feet outside of the VDHR boundary). SP 41 shows that no structures would be visible from inside of the resource boundary due to dense vegetation (Attachment 5, Figure 15). All other areas within the cemetery trail and inside the forested area would have no view of Route 1. The simulation from SP 37 shows that only the tip of one transmission structure would be visible from the entrance of the cemetery where it is closest to the route (Attachment 5, Figure 16). The simulation from SP 308 shows both the future Aspen-Golden Lines (pink) and Route 1 (purple) would be visible, with an unobstructed sight line to the Aspen-Golden Lines due to its location outside the forested area (Attachment 5, Figure 17), though the proposed Starlight Substation and the tips of two of transmission structures along Route 1 would also be visible. The proposed Starlight Substation appears in the distance. These views from outside of the resource boundary would quickly be screened upon entering the wooded interior of the resource.

The area surrounding the resource has already lost its historic feeling as a result of the construction of divided highways to the north and west. The new transmission line would constitute one more element of modern infrastructure within an altered landscape. The Aspen-Golden Project, discussed in a separate report (Derrick et al 2024), would be more prominent in

the landscape. Although the historic section of the cemetery has no view to the route, the cemetery entrance and areas outside of the tree line would have some visibility to the transmission infrastructure installed along the route and the proposed substation. Thus, ERM recommends that there would be a **Minimal Impact** on this resource from Route 1 and the proposed Starlight Substation.

4.4.6 253-5182, BALL'S BLUFF BATTLEFIELD & NATIONAL CEMETERY HISTORIC DISTRICT BOUNDARY INCREASE

Ball's Bluff Battlefield and National Cemetery Historic District Boundary Increase is approximately 1.3 miles to the north-northeast of the proposed Apollo Substation site and 1.4 miles to the north-northeast of Route 1 in an area where the route uses a greenfield alignment (Attachment 5, Figure 18). The area between the resource and the new transmission line consists of a large residential development. Due to distance from the route and the densely-packed residential development, 253-5182 would have no view to transmission infrastructure installed along Route 1 or to the proposed Apollo Substation, as shown by the viewpoint from SP 12 (Attachment 5, Figure 19). Because the view towards the Project from Ball's Bluff Battlefield and National Cemetery Historic District Boundary Increase would be entirely screened, there would be **No Impact** on this resource from Route 1.

4.5 ARCHAEOLOGY FINDINGS

Four known archaeological sites are located in the right-of-way of Route 1 and/or the proposed substations (Table 6). Of these:

- 44LD1999 is within what would be the right-of-way of Route 1 and within the boundary of the proposed [redacted].
- 44LD2001 is within the boundary of the proposed [redacted].
- 44LD2002 is within what would be the right-of-way of Route 1.
- 44LD2012 is within what would be the right-of-way of Route 1 and within the boundary of the proposed [redacted].

The archaeological sites crossed by Route 1 and/or within the proposed substation sites are described below. The descriptions include information on the eligibility of each site for listing in the NRHP as well as an assessment of each site's condition based on desktop review. A confident evaluation of the nature of archaeological deposits at each site and impacts from prior land use activities would require a field survey to verify the desktop analysis.

TABLE 6 ARCHAEOLOGICAL RESOURCES WITHIN THE RIGHT-OF-WAY FOR THE PROJECT

Considered Resource	Project Component					
	Route 1	Twin Creeks Substation	Sycolin Creek Substation	Starlight Substation	Lunar Substation	Apollo Substation
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

"X" indicates that the resource is within the right-of-way of the route and/or proposed substation footprint.

44LD1999 is a domestic artifact scatter associated with a single dwelling dating from the Reconstruction and Growth to World War II periods. The site was originally identified in 2022 by Thunderbird Archeology during a Phase I survey. Based on this work, the site was determined not eligible for listing on the NRHP. [redacted] The current site setting appears to be undisturbed based on a review of recent aerial photographs.

44LD2001 is a multicomponent site consisting of a Pre-Contact temporary encampment and a historic artifact scatter from an undetermined cultural period. The site was originally identified in 2022 by Thunderbird Archeology. Portions of the site have been disturbed by historic-era plowing, likely affecting the integrity of the site. The site was determined not eligible for listing on the NRHP. [redacted]

44LD2002 is interpreted as small lithic scatter representing a short-term temporary camp during an unknown period prior to European contact. The site was originally identified in a 2022 during a Phase I survey conducted by Thunderbird Archeology. It was assessed as not eligible for listing on the NRHP. [redacted] The current site setting appears to be undisturbed based on a review of recent aerial photographs.

44LD2012 consists of a historic artifact scatter dating from the Post Cold War to the New Dominion cultural periods. The site is interpreted as a refuse area associated with a nearby mid-twentieth century dwelling [redacted]. In their 2022 survey, Thunderbird Archaeology determined that up to a quarter of the site had been destroyed, though the site was not evaluated for listing on the NRHP. [redacted]

5. CONCLUSION AND RECOMMENDATIONS

The pre-application analysis gathered information on archaeological and historic architectural resources that qualify for consideration according to the VDHR Guidelines for transmission line projects.

Four known archaeological sites are located in the right-of-way of the proposed transmission line and/or associated substations. An assessment of the condition and research potential of those sites is contingent upon archaeological field investigations, which will be conducted at relevant sites once the Project is certificated by the SCC. Potential impacts to sites along the preferred route will be assessed as part of the field survey.

Six previously recorded aboveground resources meeting criteria established under the Guidelines fall within the VDHR study tiers associated with the proposed Project. A summary of the number of resources impacted and the degree of impact is presented in Table 7.

TABLE 7 COMPARISON OF PROJECT IMPACTS ON HISTORIC RESOURCES IN THE STUDY AREAS OF THE PROJECT

Route Alternative	Number of Considered Resources in Each Impact Category				
	None	Minimal	Moderate	Severe	Totals
Route 1	3	3	0	0	6

Final assessments of Project impacts will be dependent on the completion of identification-phase archaeological and historic structure surveys to be completed after the Project is certificated by the SCC and subsequent review of survey results by VDHR and other consulting parties. For any resources where the agencies concur in a finding of moderate or severe impact, the Company will propose treatments to avoid, minimize, or mitigate those impacts. Treatment options for archaeological sites could include selective structure placement to avoid direct impacts on sites, minor route adjustments to avoid crossing sites, or archaeological data recovery. Treatment options for aboveground historic resources could include detailed site documentation, historic research, and historic preservation studies; preparation of digital media or museum-type exhibits on sites for public interpretation; installation of historic markers of signs; installation of vegetative screening; or contributions to historical preservation organizations or specific preservation projects. Additional mitigations could be identified through consultation with VDHR and other consulting parties.

5.1 ROUTE 1 AND PROPOSED SUBSTATIONS

Six previously recorded historic architectural resources meet the criteria specified in the Guidelines within the VDHR study tiers for Route 1 and/or the five proposed substation sites (Table 8). The Project would have no impact on three resources and a minimal impact on three resources.

TABLE 8 IMPACTS TO HISTORIC RESOURCES IN THE VDHR STUDY TIERS FOR THE PROJECT

Buffer (miles)	Resource Category	Resource Number	Description	Impact
1.0 to 1.5	National Historic Landmark	253-5182 [5]	Ball's Bluff Battlefield & National Cemetery Historic District Boundary Increase	None
0.5 to 1.0	National Register Properties (Listed)	053-0106 [2, 3, 4, 5]	Belmont Manor	None
	Battlefields (Potentially Eligible)	053-5058 [5]	Ball's Bluff Battlefield	None
0.0 to 0.5	Locally Significant	053-0336 [2, 3, 4]	Cooke's Mill	Minimal
		053-6238 [2, 3, 4, 5]	African American Burial Ground for the Enslaved at Belmont	Minimal
	National Register – Eligible	053-0276 [1, 2]	Washington and Old Dominion Railroad Historic District	Minimal
0.0 (Within ROW)	National Register – Eligible	-	-	-

ROW= right-of-way
[1] Resource is within the designated tiers for the proposed Twin Creeks Substation
[2] Resource is within the designated tiers for the proposed Sycolin Creek Substation
[3] Resource is within the designated tiers for the proposed Starlight Substation
[4] Resource is within the designated tiers for the proposed Lunar Substation
[5] Resource is within the designated tiers for the proposed Apollo Substation

5.2 FUTURE INVESTIGATIONS

The next stage of assessing impacts on historic resources will be to conduct an identification-phase field survey to identify and assess resources after the Project is certificated by the SCC. Survey will be conducted in accordance with the Guidelines as well as:

- Guidelines for Conducting Historic Resources Survey in Virginia (VDHR 2017);
- National Register Bulletin 15: How to Apply the National Register Criteria for Evaluation (NPS 1995).

The survey teams will be led by individuals meeting the Secretary of the Interior's professional qualifications standards for archaeology and architectural history, respectively. Teams will traverse the length of the Project corridor, revisiting previously recorded archaeological and historic architectural resources and documenting as-of-yet unrecorded resources, if present, in the survey area as defined in the Guidelines and based on the final Project design. The archaeological survey will adhere to VDHR survey standards (VDHR 2017) and will entail systematic coverage of the approved route. All material culture, including artifacts and features, that could be 50 years old or older will be recorded. Sites will be delineated within the proposed right-of-way and/or substation

sites, and investigations will include subsurface testing sufficient to inform recommendations of potential eligibility for the NRHP under Criterion D. Each site will be fully documented with appropriate mapping, digital photography, and artifact collection/analysis. Site forms will be prepared for VCRIS submittal along with full site descriptions provided in a technical report.

During the course of the historic architectural survey, all structures determined to be of age will be photographed and marked on the applicable U.S. Geological Survey (USGS) quadrangle map. While the NPS Bulletin 15 (NPS 1995) defines a historic property as a resource that is 50 years or older, for the purposes of this Project, survey will include those 45 years or older to accommodate the length of time needed to complete the permitting phase for the Project. Furthermore, the survey will also record those resources that may have reached significance prior to the 50 (45) year age threshold, in accordance with NPS guidance, if they are integral parts of districts, or have sufficient merit to be considered eligible for the NRHP on their own.

Digital photographs will be taken to record the historic resources' overall appearance and details. Sketch maps will be drawn depicting the relationship of dwellings to outbuildings and associated landscape features. Additional information on the structures' appearance and integrity will be recorded to assist in making recommendations of NRHP eligibility. Historic maps, aerial photographs, and tax assessor data will be consulted to assist in dating the resources. Resources identified in the field effort will be reported to the VDHR, VCRIS numbers will be obtained, and shapefiles and database information will be provided. Sufficient information will be collected to make recommendations for each identified historic resource regarding eligibility for listing on the NRHP and to assess Project impacts.

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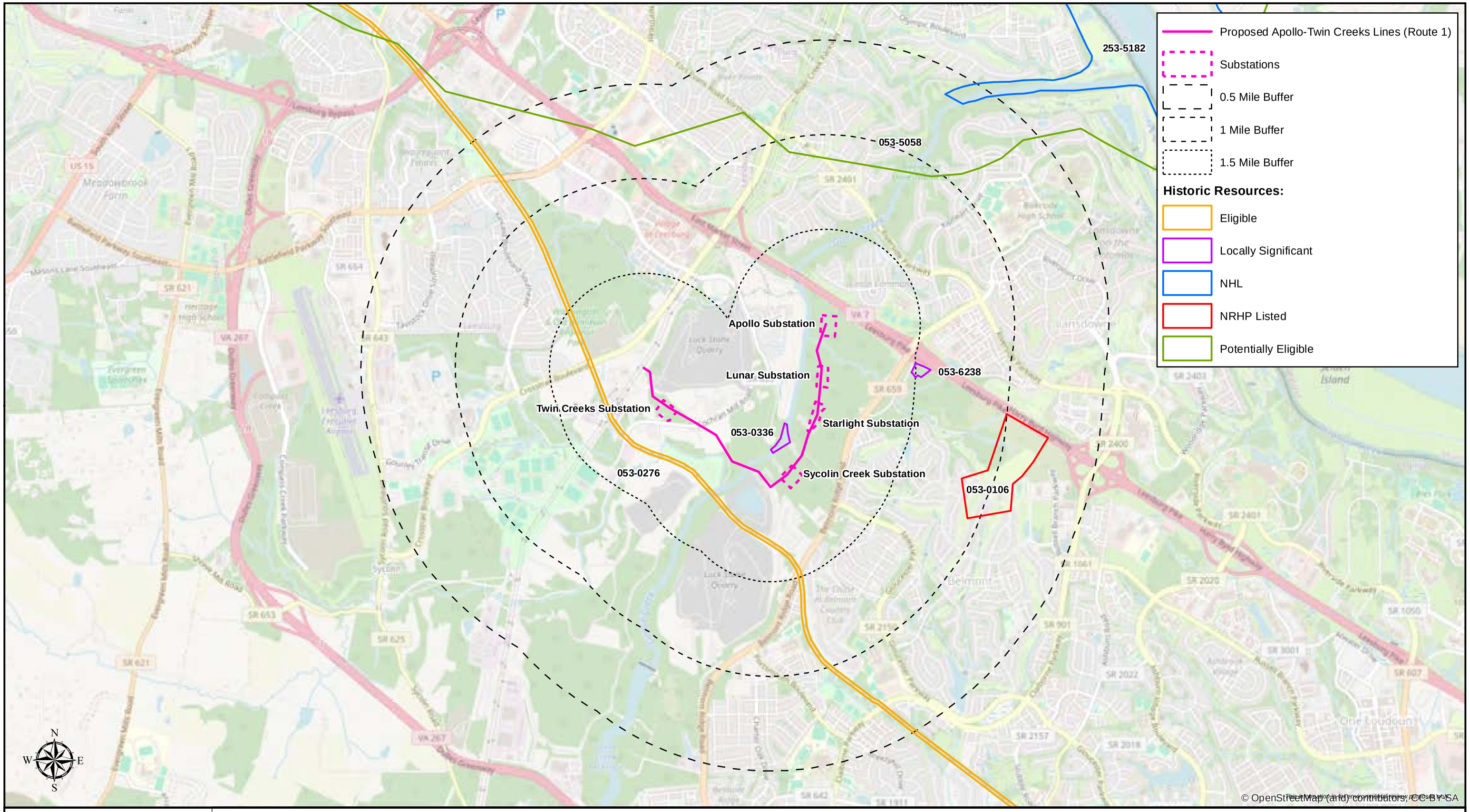
ATTACHMENT 1 LOCATIONS OF CONSIDERED HISTORIC RESOURCES ASSOCIATED WITH PROJECT



0 0.25 0.5 0.75 1 Miles

1:39,457

Attachment 1
Locations of Considered Resources Associated with the Project
Apollo-Twin Creeks 230 kV Electric Transmission Project
Dominion Energy Virginia
Loudoun County, VA

FILE: C:\Users\vincent.macek\Documents\OneDrive - ERM\Dominion Twin Creeks-Apollo\Dominion Twin Creeks-Apollo Attachment 1 HS.mxd | REVISED: 02/21/2024 | SCALE: 1:39,457 when printed at 11x17

DRAWN BY: GIS

ATTACHMENT 2 PREVIOUS CULTURAL RESOURCES SURVEYS COVERING PORTIONS OF PROJECT

Proposed Apollo-Twin Creeks Lines (Route 1)

Substations

Phase I Surveys

Apollo Substation

LD-416

Lunar Substation

Twin Creeks Substation

LD-614

Starlight Substation

LD-140

LD-320

LD-108

LD-199

LD-290

Sycolin Creek Substation

Luck Stone Quarry

Crosstrail Boulevard

Durham Court

Colonial Mill Road

Two Creeks Trail Area

0 0.05 0.1 0.15 0.2 0.25 Miles

1:10,000

Attachment 2
Cultural Resource Surveys Covering Portions of the Project
Apollo-Twin Creeks 230 kV Electric Transmission Project
Dominion Energy Virginia
Loudoun County, VA

FILE: C:\Users\vincent.macek\Documents\OneDrive - ERM\Dominion Twin Creeks-Apollo\Dominion Twin Creeks-Apollo Attachment 2 PH 1.mxd | REVISED: 02/21/2024 | SCALE: 1:10,000 when printed at 11x17

DRAWN BY: GIS

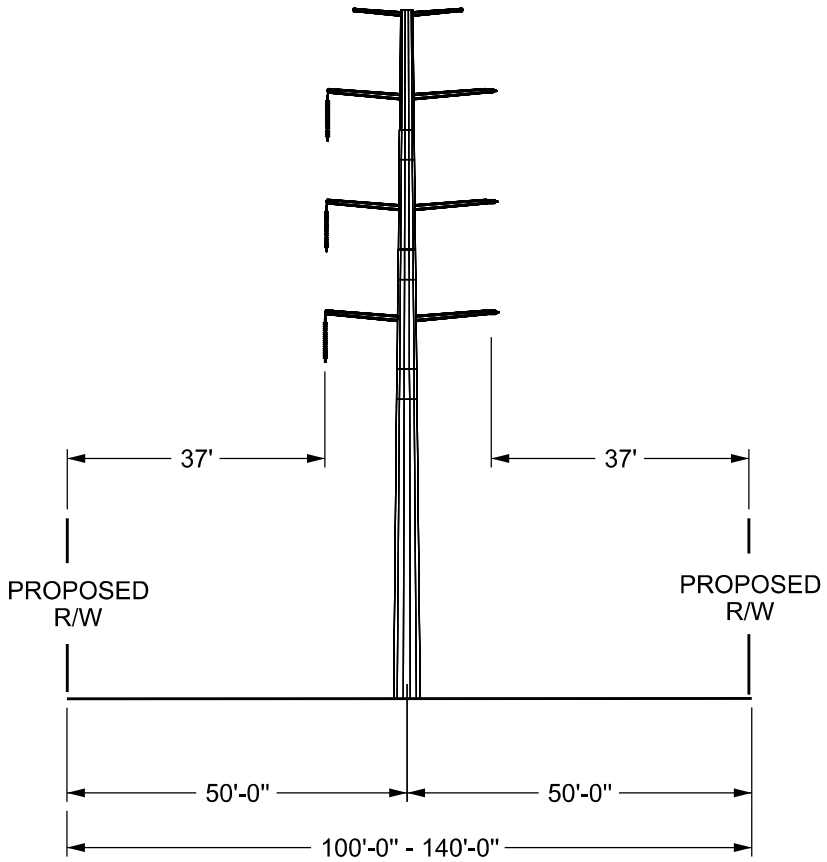
ATTACHMENT 3 TYPICAL DESIGN AND LAYOUT

ATTACHMENT 3 TYPICAL DESIGN AND LAYOUT - Apollo-Twin Creeks Lines

PRELIMINARY PROPOSED
APOLLO - TWIN CREEKS

STRUCTURES #203/2, 2320/5 - #203/1A, 2320/2
STRUCTURE #2340/2, 2341/2
STRUCTURE #2342/2, 2343/2

PROPOSED
230KV CIRCUIT



PROPOSED CONFIGURATION

TYPICAL RIGHT OF WAY LOOKING TOWARD APOLLO

NOTE:

1. PROPOSED STRUCTURE SHOWN WITH APPROXIMATE AVERAGE HEIGHT OF 112' FOR THE 230 KV STRUCTURES. THIS DOES NOT INCLUDE FOUNDATION REVEAL.

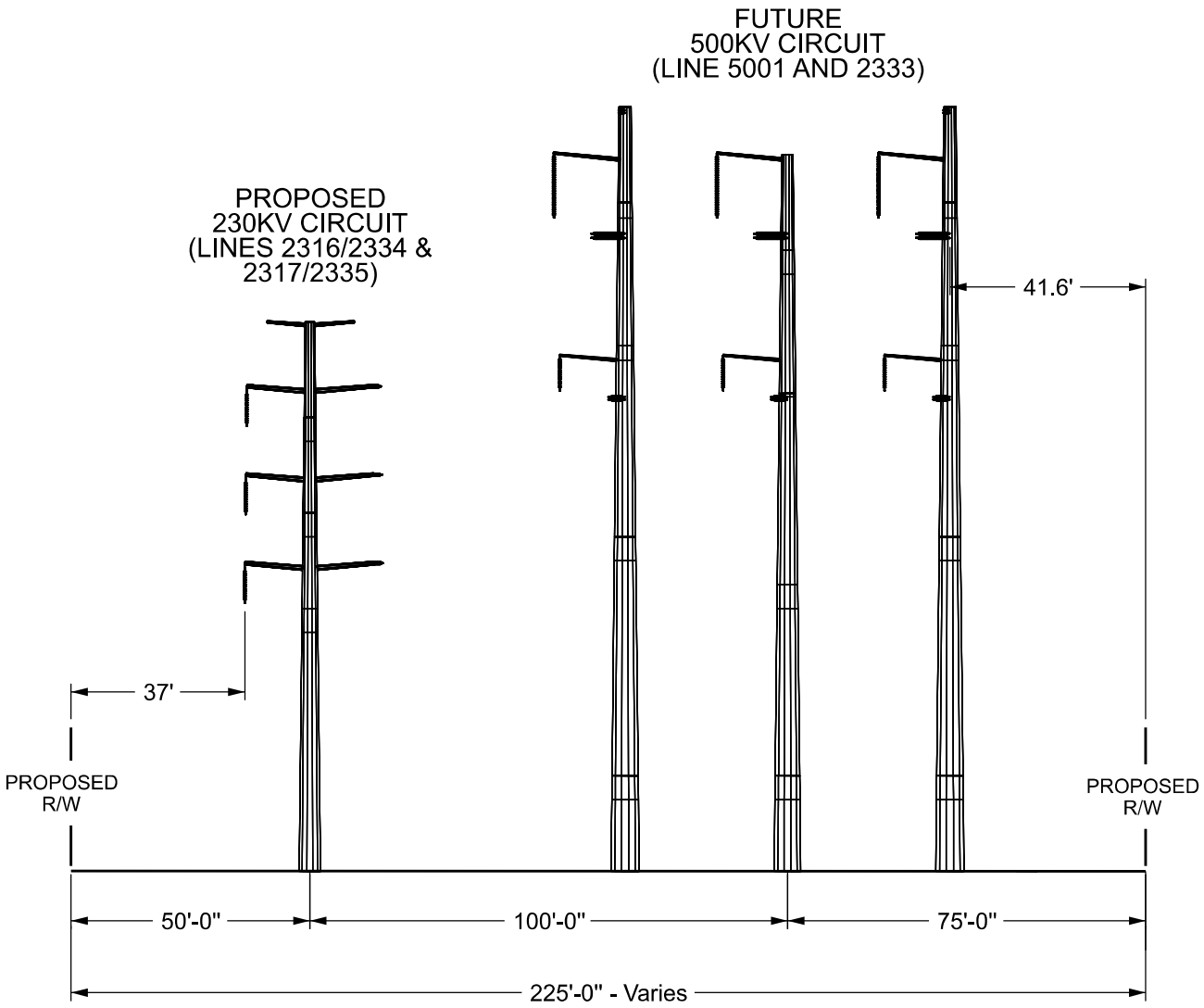
2. APPROXIMATE AVERAGE HEIGHT IS MEASURED FROM GROUNDLINE AT STRUCTURE CENTERLINE.

3. INFORMATION CONTAINED ON DRAWING IS TO BE CONSIDERED PRELIMINARY IN NATURE AND SUBJECT TO CHANGE BASED ON FINAL DESIGN.

$SYTIME$
$DATE$
$DGNSPEC$
TDBDIAG

PRELIMINARY PROPOSED
APOLLO - TWIN CREEKS

STRUCTURES #2316/2, 2317/2 - #2334/3, 2335/3



PROPOSED CONFIGURATION

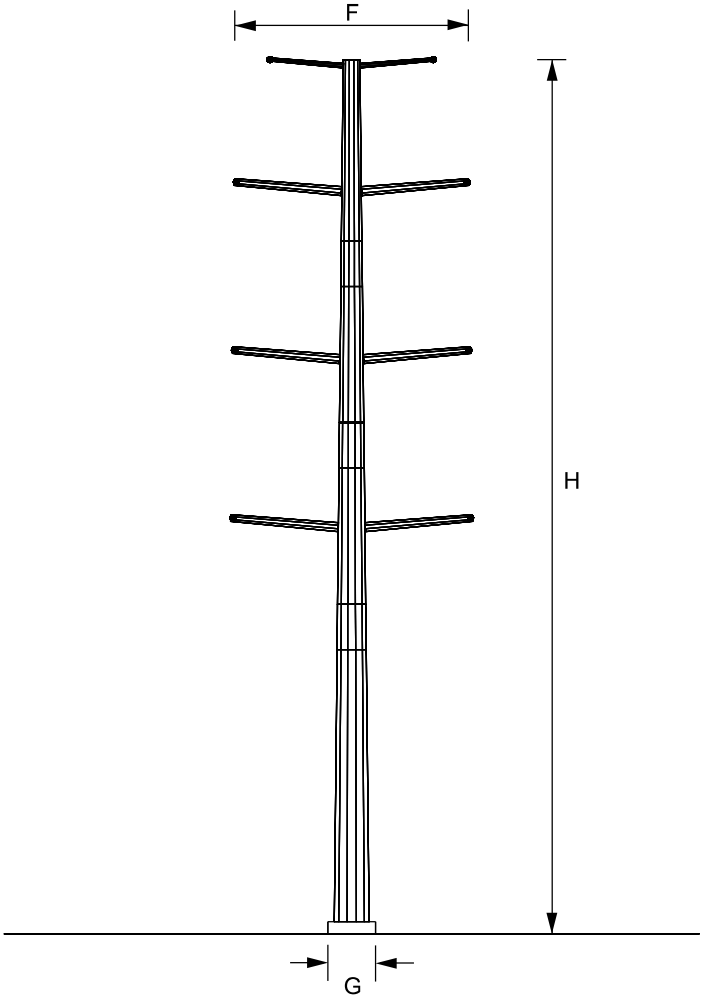
TYPICAL RIGHT OF WAY LOOKING TOWARD APOLLO

NOTE:

1. PROPOSED STRUCTURE SHOWN WITH APPROXIMATE AVERAGE HEIGHT OF 158' FOR THE 5-2 STRUCTURES AND 113' FOR THE 230 KV STRUCTURES. THIS DOES NOT INCLUDE FOUNDATION REVEAL.

2. APPROXIMATE AVERAGE HEIGHT IS MEASURED FROM GROUNDLINE AT STRUCTURECENTERLINE.

3. INFORMATION CONTAINED ON DRAWING IS TO BE CONSIDERED PRELIMINARYIN NATURE AND SUBJECT TO CHANGE BASED ON FINAL DESIGN.



TYPICAL DC ENGINEERED MONOPOLE DOUBLE DEADEND STRUCTURE

A. STRUCTURE MAPPING	SEE ATTACHMENT II.B.3.d
B. RATIONALE FOR STRUCTURE TYPE:	MORE COMPACT STRUCTURES FOR DOUBLE CIRCUIT CONFIGURATION
C. LENGTH OF R/W (STRUCTURE QTY):	1.9 MILES (9)
D. STRUCTURE MATERIAL:	DULLED GALVANIZED STEEL
RATIONALE FOR STRUCTURE MATERIAL:	DULLED GALVANIZED STEEL TO MINIMIZE VISUAL IMPACT BY REDUCING THE GLARE ON THE NEW STRUCTURES
E. FOUNDATION MATERIAL: AVERAGE FOUNDATION REVEAL:	CONCRETE SEE NOTE 1
F. AVERAGE WIDTH AT CROSSARM:	26'
G. AVERAGE WIDTH AT BASE:	9' DIAMETER FOUNDATION - SEE NOTE 2
H. MINIMUM STRUCTURE HEIGHT: MAXIMUM STRUCTURE HEIGHT: AVERAGE STRUCTURE HEIGHT:	110' 135' 121'
I. AVERAGE SPAN LENGTH:	*630' - SEE NOTE 3*
J. MINIMUM CONDUCTOR-TO-GROUND:	22.5' (AT MAXIMUM OPERATING TEMPERATURE)

NOTES:
1. MINIMUM FOUNDATION REVEAL SHALL BE 1.5', MAX REVEAL IS SUBJECT TO FINAL DESIGN
2. FINAL FOUNDATION DIAMETER SHALL BE BASED ON GEOTECHNICAL FINDINGS DURING FINAL DESIGN
3. SPAN LENGTHS ARE INCLUSIVE OF THE ROW LENGTH LISTED IN LINE (C)
4. INFORMATION ON DRAWING IS PRELIMINARY AND SUBJECT TO CHANGE DURING FINAL ENGINEERING

THE INFORMATION CONTAINED ON THIS DRAWING IS CONSIDERED PRELIMINARY IN NATURE AND IS SUBJECT TO CHANGE BASED ON FINAL DESIGN

Dominion Energy
10900 Nuckols Road
Glen Allen, VA 23060

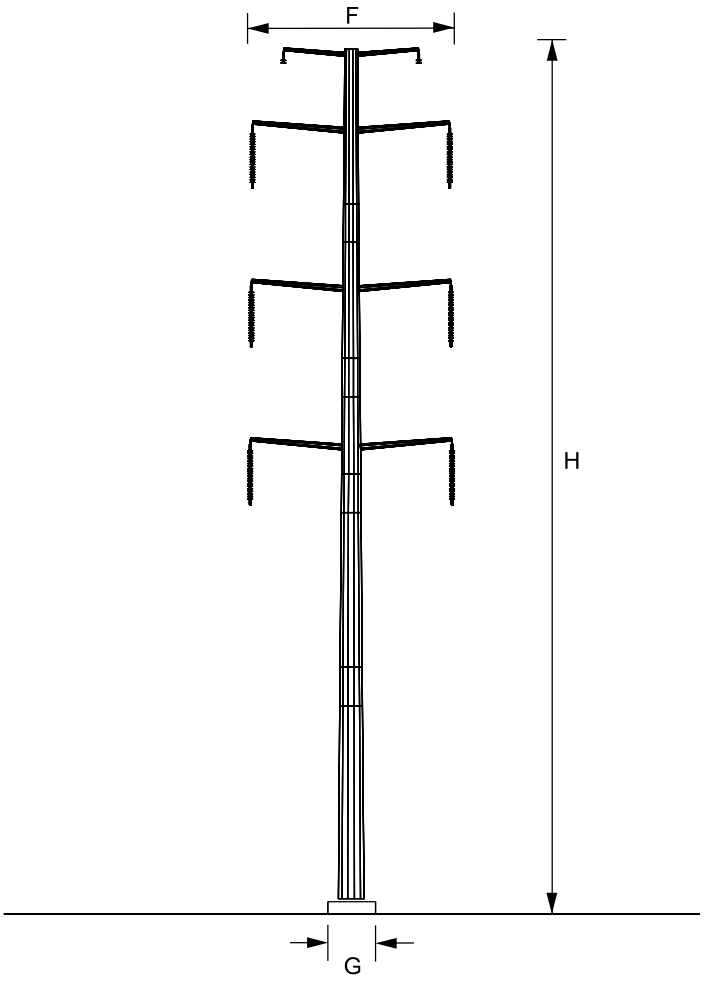
STRUCTURE: 203/2 (2320/5), 203/1C (2320/4), 203/1A (2320/2), 2316/2 (2317/2), 2316/3 (2317/3), 2316/4 (2317/4), 2334/2 (2335/2), 2334/3 (2335/3), 2342/2 (2343/2)

TYPICAL DC ENGINEERED MONOPOLE DOUBLE DEADEND STRUCTURE

ATTACHMENT NO.

II.B.3.a

DRAWN BY: SLS



TYPICAL DC ENGINEERED MONOPOLE SUSPENSION STRUCTURE

A. STRUCTURE MAPPING	SEE ATTACHMENT II.B.3.d
B. RATIONALE FOR STRUCTURE TYPE:	MORE COMPACT STRUCTURES FOR DOUBLE CIRCUIT CONFIGURATION
C. LENGTH OF R/W (STRUCTURE QTY):	1.9 MILES (1)
D. STRUCTURE MATERIAL:	DULLED GALVANIZED STEEL
RATIONALE FOR STRUCTURE MATERIAL:	DULLED GALVANIZED STEEL TO MINIMIZE VISUAL IMPACT BY REDUCING THE GLARE ON THE NEW STRUCTURES
E. FOUNDATION MATERIAL: AVERAGE FOUNDATION REVEAL:	CONCRETE SEE NOTE 1
F. AVERAGE WIDTH AT CROSSARM:	26'
G. AVERAGE WIDTH AT BASE:	6' DIAMETER FOUNDATION - SEE NOTE 2
H. MINIMUM STRUCTURE HEIGHT : MAXIMUM STRUCTURE HEIGHT : AVERAGE STRUCTURE HEIGHT :	110' 110' 110'
I. AVERAGE SPAN LENGTH:	*630' - SEE NOTE 3*
J. MINIMUM CONDUCTOR-TO-GROUND:	22.5' (AT MAXIMUM OPERATING TEMPERATURE)

NOTES:
1. MINIMUM FOUNDATION REVEAL SHALL BE 1.5', MAX REVEAL IS SUBJECT TO FINAL DESIGN
2. FINAL FOUNDATION DIAMETER SHALL BE BASED ON GEOTECHNICAL FINDINGS DURING FINAL DESIGN
3. SPAN LENGTHS ARE INCLUSIVE OF THE ROW LENGTH LISTED IN LINE (C)
4. INFORMATION ON DRAWING IS PRELIMINARY AND SUBJECT TO CHANGE DURING FINAL ENGINEERING

THE INFORMATION CONTAINED ON THIS DRAWING IS CONSIDERED PRELIMINARY IN NATURE AND IS SUBJECT TO CHANGE BASED ON FINAL DESIGN

Dominion Energy
Dominion Energy
10900 Nuckols Road
Glen Allen, VA 23060

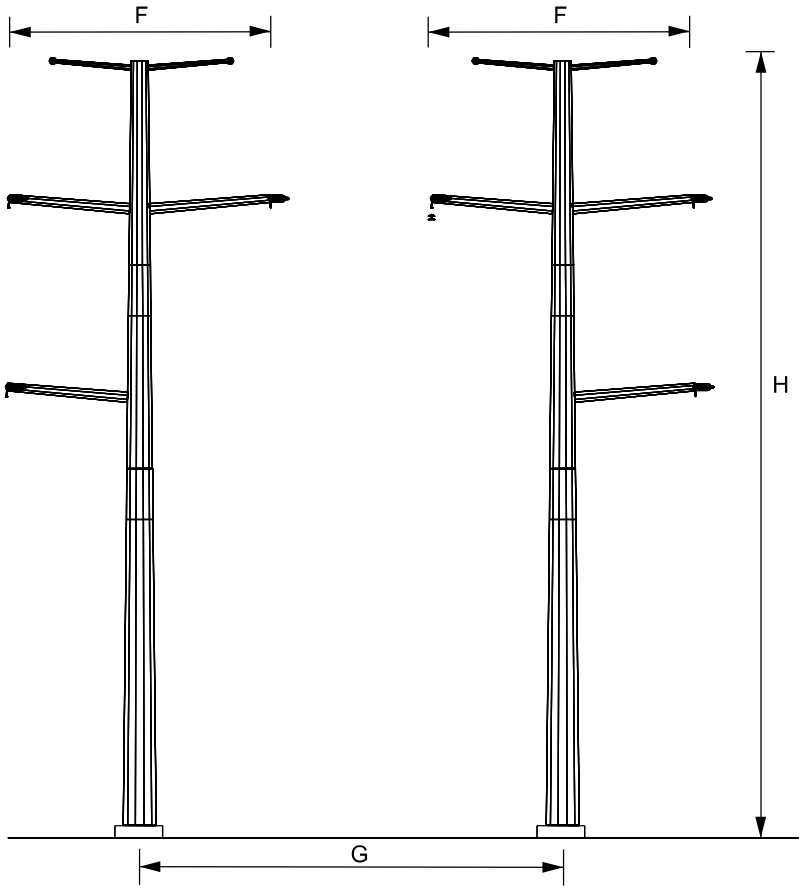
STRUCTURE: 203/1B (2320/3)

TYPICAL DC ENGINEERED MONOPOLE SUSPENSION STRUCTURE

ATTACHMENT NO.

II.B.3.b

DRAWN BY: SLS



TYPICAL DC ENGINEERED 2-POLE DOUBLE DEADEND STRUCTURE

A. STRUCTURE MAPPING	SEE ATTACHMENT II.B.3.d
B. RATIONALE FOR STRUCTURE TYPE:	SHORTER STRUCTURES FOR DOUBLE CIRCUIT CONFIGURATION NEEDED FOR CROSSING UNDER TRANSMISSION LINE.
C. LENGTH OF R/W (STRUCTURE QTY):	1.9 MILES (3)
D. STRUCTURE MATERIAL:	DULLED GALVANIZED STEEL
RATIONALE FOR STRUCTURE MATERIAL:	DULLED GALVANIZED STEEL TO MINIMIZE VISUAL IMPACT BY REDUCING THE GLARE ON THE NEW STRUCTURES
E. FOUNDATION MATERIAL: AVERAGE FOUNDATION REVEAL:	CONCRETE SEE NOTE 1
F. AVERAGE WIDTH AT CROSSARM:	26'
G. AVERAGE WIDTH AT BASE:	41.5' POLE SPACING, 7' DIAMETER FOUNDATION - SEE NOTE 2
H. MINIMUM STRUCTURE HEIGHT : MAXIMUM STRUCTURE HEIGHT : AVERAGE STRUCTURE HEIGHT :	85' 90' 88'
I. AVERAGE SPAN LENGTH:	*630' - SEE NOTE 3*
J. MINIMUM CONDUCTOR-TO-GROUND:	22.5' (AT MAXIMUM OPERATING TEMPERATURE)

NOTES:
1. MINIMUM FOUNDATION REVEAL SHALL BE 1.5', MAX REVEAL IS SUBJECT TO FINAL DESIGN
2. FINAL FOUNDATION DIAMETER SHALL BE BASED ON GEOTECHNICAL FINDINGS DURING FINAL DESIGN
3. SPAN LENGTHS ARE INCLUSIVE OF THE ROW LENGTH LISTED IN LINE (C)
4. INFORMATION ON DRAWING IS PRELIMINARY AND SUBJECT TO CHANGE DURING FINAL ENGINEERING

THE INFORMATION CONTAINED ON THIS DRAWING IS CONSIDERED PRELIMINARY IN NATURE AND IS SUBJECT TO CHANGE BASED ON FINAL DESIGN

Dominion Energy
Dominion Energy
10900 Nuckols Road
Glen Allen, VA 23060

STRUCTURE: 2316/5 (2317/5), 2316/6 (2317/6), 2340/2 (2341/2)

TYPICAL DC ENGINEERED 2-POLE DOUBLE DEADEND STRUCTURE

ATTACHMENT NO.

II.B.3.c

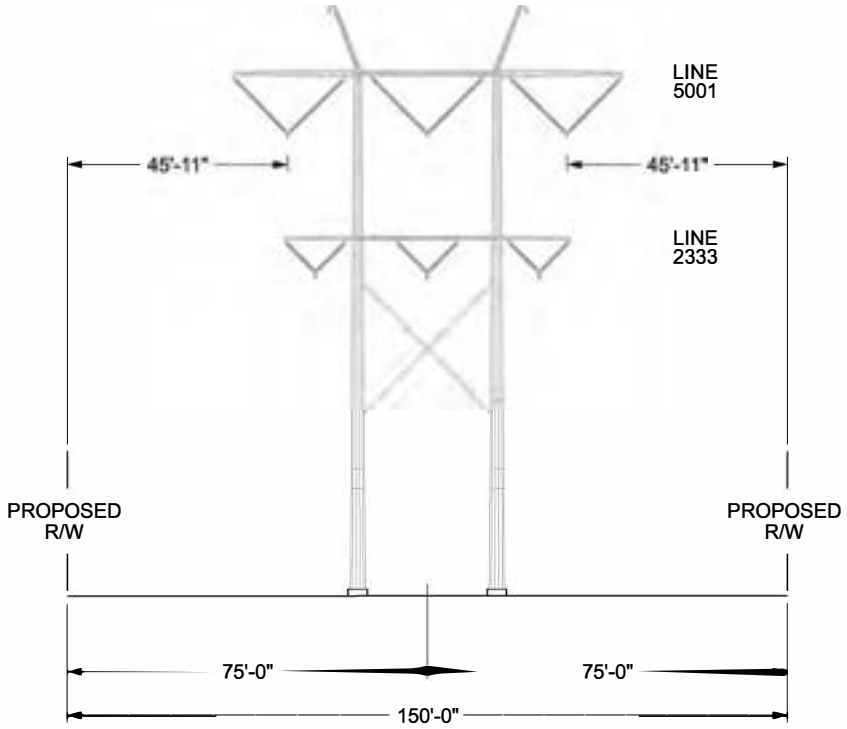
DRAWN BY: SLS

ATTACHMENT 3 TYPICAL DESIGN AND LAYOUT - Aspen-Golden Lines

PRELIMINARY PROPOSED
ASPEN - GOLDEN

STRUCTURES: *5001/2,*5001/3, 5001/4, 2333/4, 5001/13, 2333/13 - 5001/16, 2333/16, 5001/63, 2333/63 - 5001/68, 2333/68

PROPOSED
500 KV & 230 KV CIRCUITS



PROPOSED CONFIGURATION

TYPICAL RIGHT OF WAY LOOKING TOWARD GOLDEN

NOTE:

1. PROPOSED STRUCTURE SHOWN WITH APPROXIMATE AVERAGE HEIGHT OF 170' FOR THE 5-2 STRUCTURES. THIS DOES NOT INCLUDE FOUNDATION REVEAL.

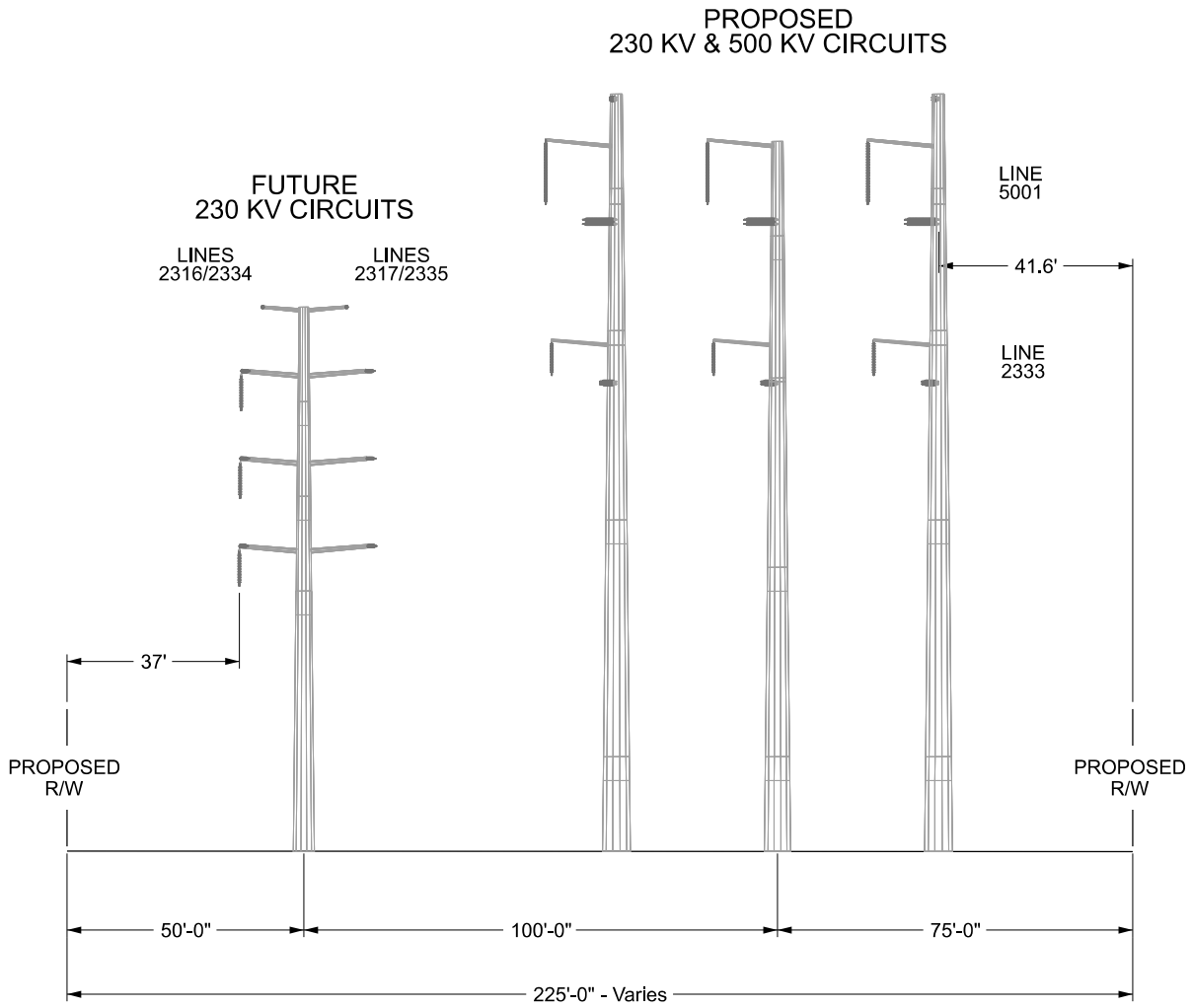
2. APPROXIMATE AVERAGE HEIGHT IS MEASURED FROM GROUNDLINE AT STRUCTURE CENTERLINE.

3. INFORMATION CONTAINED ON DRAWING IS TO BE CONSIDERED PRELIMINARY IN NATURE AND SUBJECT TO CHANGE BASED ON FINAL DESIGN.

* STRUCTURES 5001/2 AND 5001/3 ARE SINGLE CIRCUIT 500KV H-FRAME STRUCTURES WITH SIMILAR HEIGHT SAME ROW WIDTH.

PRELIMINARY PROPOSED
ASPEN - GOLDEN

STRUCTURES: 5001/6, 2333/6 - 5001/12, 2333/12



PROPOSED CONFIGURATION

TYPICAL RIGHT OF WAY LOOKING TOWARD GOLDEN

NOTE:

1. PROPOSED STRUCTURE SHOWN WITH APPROXIMATE AVERAGE HEIGHT OF 158' FOR THE 5-2 STRUCTURES AND 113' FOR THE 230 KV STRUCTURES. THIS DOES NOT INCLUDE FOUNDATION REVEAL.

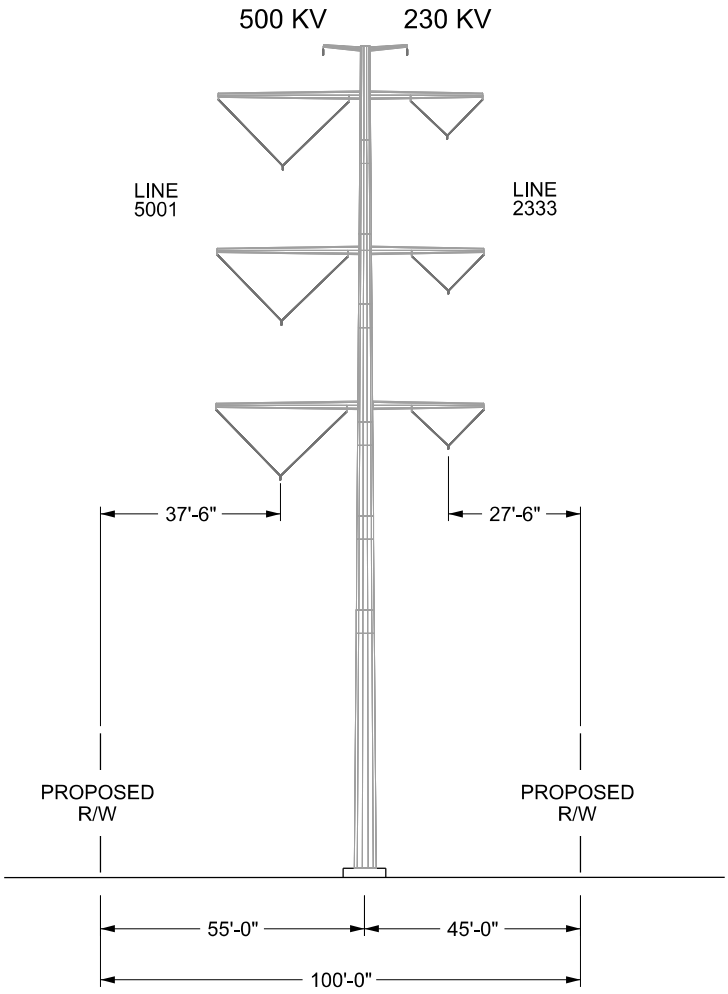
2. APPROXIMATE AVERAGE HEIGHT IS MEASURED FROM GROUNDLINE AT STRUCTURE CENTERLINE.

3. INFORMATION CONTAINED ON DRAWING IS TO BE CONSIDERED PRELIMINARY IN NATURE AND SUBJECT TO CHANGE BASED ON FINAL DESIGN.

PRELIMINARY PROPOSED
ASPEN - GOLDEN

STRUCTURES: 5001/5, 2333/5, 5001/17, 2333/17 - 5001/62, 2333/62, 5001/69, 2333/69 - 5001/71, 2333/71

PROPOSED CIRCUITS



PROPOSED CONFIGURATION

TYPICAL RIGHT OF WAY LOOKING TOWARD GOLDEN

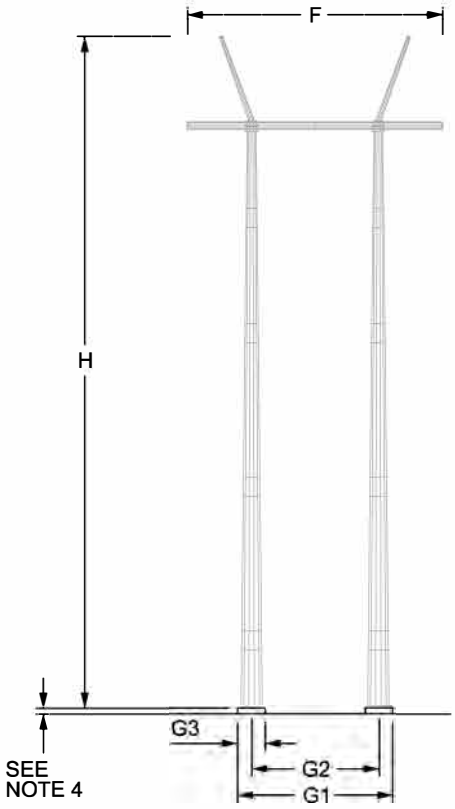
NOTE:

1. PROPOSED STRUCTURE SHOWN WITH APPROXIMATE AVERAGE HEIGHT OF 176' FOR THE 5-2 STRUCTURES. THIS DOES NOT INCLUDE FOUNDATION REVEAL.

2. APPROXIMATE AVERAGE HEIGHT IS MEASURED FROM GROUNDLINE AT STRUCTURE CENTERLINE.

3. INFORMATION CONTAINED ON DRAWING IS TO BE CONSIDERED PRELIMINARY IN NATURE AND SUBJECT TO CHANGE BASED ON FINAL DESIGN.

STRUCTURE: 5001/2, 5001/3



SC 500 KV H-FRAME STRUCTURE

B. RATIONALE FOR STRUCTURE TYPE:	HORIZONTAL CONFIGURATION TO REDUCE HEIGHT FOR LINE CROSSING, PREFERRED BY PUBLIC OVER LATTICE
C. LENGTH OF R/W (STRUCTURE QUANTITY):	9.4 MILES (2 STRUCTURES)
D. STRUCTURE MATERIAL:	DULLED GALVANIZED STEEL
RATIONALE FOR STRUCTURE MATERIAL:	DULLED GALVANIZED STEEL TO MINIMIZE VISUAL IMPACT BY REDUCING THE GLARE ON THE NEW STRUCTURES
E. FOUNDATION MATERIAL: AVERAGE FOUNDATION REVEAL:	CONCRETE SEE NOTE 4
F. AVERAGE WIDTH AT CROSSARM:	66.5'
G1:AVERAGE WIDTH AT BASE\G2: POLE SPACING G3: BASE WIDTH:	G1: 41'\G2: 33'\G3: 8' (SEE NOTE 2)
H. MINIMUM STRUCTURE HEIGHT: MAXIMUM STRUCTURE HEIGHT: AVERAGE STRUCTURE HEIGHT:	160' 170' 165'
I. AVERAGE SPAN LENGTH:	670' (257'-1108')
J. MINIMUM CONDUCTOR-TO-GROUND AT MAXIMUM OPERATING TEMPERATURE:	27.5' (500 KV) PER THE NATIONAL ELECTRICAL SAFETY CODE

NOTES
1. INFORMATION ON DRAWING IS PRELIMINARY AND SUBJECT TO CHANGE DURING FINAL ENGINEERING
2. FINAL FOUNDATION DIAMETER SHALL BE BASED UPON FINAL ENGINEERING
3. STRUCTURE HEIGHTS ARE MEASURED FROM STRUCTURE CENTERLINE
4. MINIMUM FOUNDATION REVEAL SHALL BE 1.5', MAX REVEAL SUBJECT TO FINAL LOCATION AND TERRAIN

Electric Transmission

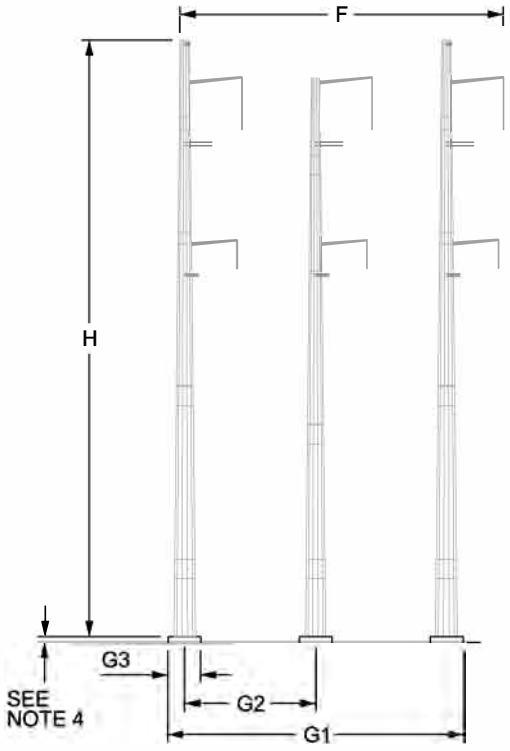
Dominion Energy
Dominion Energy
5000 Dominion Blvd
Glen Allen, VA 23060

STRUCTURE: 5001/2, 5001/3

DRAWING NO.
ATTACHMENT II.B.3.i

DRAWN: MBV

STRUCTURE: 5001/4, 2333/4, 5001/8, 2333/8, 5001/10, 2333/10, 5001/11, 2333/11, 5001/13, 2333/13 - 5001/15, 2333/15, 5001/64, 2333/64, 5001/67, 2333/67



DOUBLE CIRCUIT 3-POLE STRUCTURE

B. RATIONALE FOR STRUCTURE TYPE:	SHORTER STRUCTURES FOR DOUBLE CIRCUIT CONFIGURATION, PREFERRED BY PUBLIC OVER LATTICE
C. LENGTH OF R/W (STRUCTURE QUANTITY):	9.4 MILES (9 STRUCTURES)
D. STRUCTURE MATERIAL:	DULLED GALVANIZED STEEL
RATIONALE FOR STRUCTURE MATERIAL:	DULLED GALVANIZED STEEL TO MINIMIZE VISUAL IMPACT BY REDUCING THE GLARE ON THE NEW STRUCTURES
E. FOUNDATION MATERIAL: AVERAGE FOUNDATION REVEAL:	CONCRETE SEE NOTE 4
F. AVERAGE WIDTH AT CROSSARM:	84.3'
G1:AVERAGE WIDTH AT BASE\G2: POLE SPACING G3: BASE WIDTH:	G1: 77'\G2: 34'\G3: 8' (SEE NOTE 2)
H. MINIMUM STRUCTURE HEIGHT: MAXIMUM STRUCTURE HEIGHT: AVERAGE STRUCTURE HEIGHT:	130' 180' 153'
I. AVERAGE SPAN LENGTH:	670' (257'-1108')
J. MINIMUM CONDUCTOR-TO-GROUND AT MAXIMUM OPERATING TEMPERATURE:	22.5'/27.5' (230/500 KV) PER THE NATIONAL ELECTRICAL SAFETY CODE

NOTES
1. INFORMATION ON DRAWING IS PRELIMINARY AND SUBJECT TO CHANGE DURING FINAL ENGINEERING
2. FINAL FOUNDATION DIAMETER SHALL BE BASED UPON FINAL ENGINEERING
3. STRUCTURE HEIGHTS ARE MEASURED FROM STRUCTURE CENTERLINE
4. MINIMUM FOUNDATION REVEAL SHALL BE 1.5', MAX REVEAL SUBJECT TO FINAL LOCATION AND TERRAIN

Electric Transmission

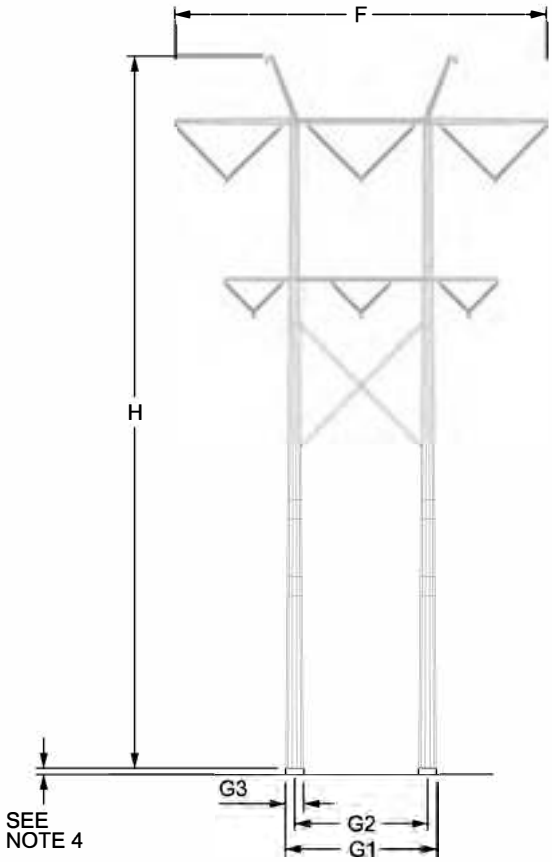
Dominion Energy
Dominion Energy
5000 Dominion Blvd
Glen Allen, VA 23060

STRUCTURE:
5001/4, 2333/4, 5001/8, 2333/8, 5001/10, 2333/10, 5001/11, 2333/11,
5001/13, 2333/13 - 5001/15, 2333/15, 5001/64, 2333/64, 5001/67, 2333/67

DRAWING NO.
ATTACHMENT II.B.3.ii

DRAWN: MBV

STRUCTURE: 5001/9, 2333/9, 5001/65, 2333/65, 5001/66, 2333/66



DOUBLE CIRCUIT H-FRAME SUSPENSION

B. RATIONALE FOR STRUCTURE TYPE:	SHORTER STRUCTURES FOR DOUBLE CIRCUIT CONFIGURATION, PREFERRED BY PUBLIC OVER LATTICE
C. LENGTH OF R/W (STRUCTURE QUANTITY):	9.4 MILES (3 STRUCTURE)
D. STRUCTURE MATERIAL:	DULLED GALVANIZED STEEL
RATIONALE FOR STRUCTURE MATERIAL:	DULLED GALVANIZED STEEL TO MINIMIZE VISUAL IMPACT BY REDUCING THE GLARE ON THE NEW STRUCTURES
E. FOUNDATION MATERIAL: AVERAGE FOUNDATION REVEAL:	CONCRETE SEE NOTE 4
F. AVERAGE WIDTH AT CROSSARM:	96.9'
G1:AVERAGE WIDTH AT BASE\G2: POLE SPACING G3: BASE WIDTH:	G1: 40.2'\G2: 34.7'\G3: 5.5' (SEE NOTE 2)
H. MINIMUM STRUCTURE HEIGHT: MAXIMUM STRUCTURE HEIGHT: AVERAGE STRUCTURE HEIGHT:	161' 196' 184'
I. AVERAGE SPAN LENGTH:	670' (257'-1108')
J. MINIMUM CONDUCTOR-TO-GROUND AT MAXIMUM OPERATING TEMPERATURE:	22.5'/27.5' (230/500 KV) PER THE NATIONAL ELECTRICAL SAFETY CODE

NOTES
1. INFORMATION ON DRAWING IS PRELIMINARY AND SUBJECT TO CHANGE DURING FINAL ENGINEERING
2. FINAL FOUNDATION DIAMETER SHALL BE BASED UPON FINAL ENGINEERING
3. STRUCTURE HEIGHTS ARE MEASURED FROM STRUCTURE CENTERLINE
4. MINIMUM FOUNDATION REVEAL SHALL BE 1.5', MAX REVEAL SUBJECT TO FINAL LOCATION AND TERRAIN

Electric Transmission

Dominion Energy®

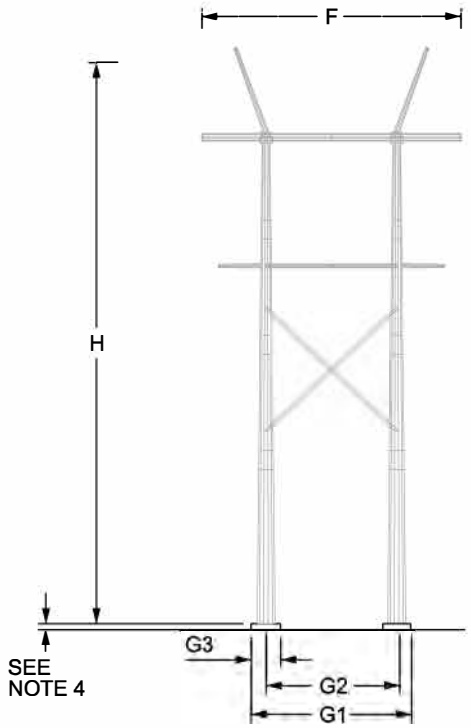
Dominion Energy
5000 Dominion Blvd
Glen Allen, VA 23060

STRUCTURE: 5001/9, 2333/9, 5001/65, 2333/65, 5001/66, 2333/66

DRAWING NO.
ATTACHMENT II.B.3.iii

DRAWN: MBV

STRUCTURE: 5001/12, 2333/12



DOUBLE CIRCUIT H-FRAME DDE STRUCTURE

B. RATIONALE FOR STRUCTURE TYPE:	SHORTER STRUCTURES FOR DOUBLE CIRCUIT CONFIGURATION, PREFERRED BY PUBLIC OVER LATTICE
C. LENGTH OF R/W (STRUCTURE QUANTITY):	9.4 MILES (1 STRUCTURE)
D. STRUCTURE MATERIAL:	DULLED GALVANIZED STEEL
RATIONALE FOR STRUCTURE MATERIAL:	DULLED GALVANIZED STEEL TO MINIMIZE VISUAL IMPACT BY REDUCING THE GLARE ON THE NEW STRUCTURES
E. FOUNDATION MATERIAL: AVERAGE FOUNDATION REVEAL:	CONCRETE SEE NOTE 4
F. AVERAGE WIDTH AT CROSSARM:	67.5'
G1:AVERAGE WIDTH AT BASE\G2: POLE SPACING G3: BASE WIDTH:	G1: 43'\G2: 34'\G3: 9' (SEE NOTE 2)
H. MINIMUM STRUCTURE HEIGHT: MAXIMUM STRUCTURE HEIGHT: AVERAGE STRUCTURE HEIGHT:	145' 145' 145'
I. AVERAGE SPAN LENGTH:	670' (257'-1108')
J. MINIMUM CONDUCTOR-TO-GROUND AT MAXIMUM OPERATING TEMPERATURE:	22.5'/27.5' (230/500 KV) PER THE NATIONAL ELECTRICAL SAFETY CODE

NOTES
1. INFORMATION ON DRAWING IS PRELIMINARY AND SUBJECT TO CHANGE DURING FINAL ENGINEERING
2. FINAL FOUNDATION DIAMETER SHALL BE BASED UPON FINAL ENGINEERING
3. STRUCTURE HEIGHTS ARE MEASURED FROM STRUCTURE CENTERLINE
4. MINIMUM FOUNDATION REVEAL SHALL BE 1.5', MAX REVEAL SUBJECT TO FINAL LOCATION AND TERRAIN

Electric Transmission

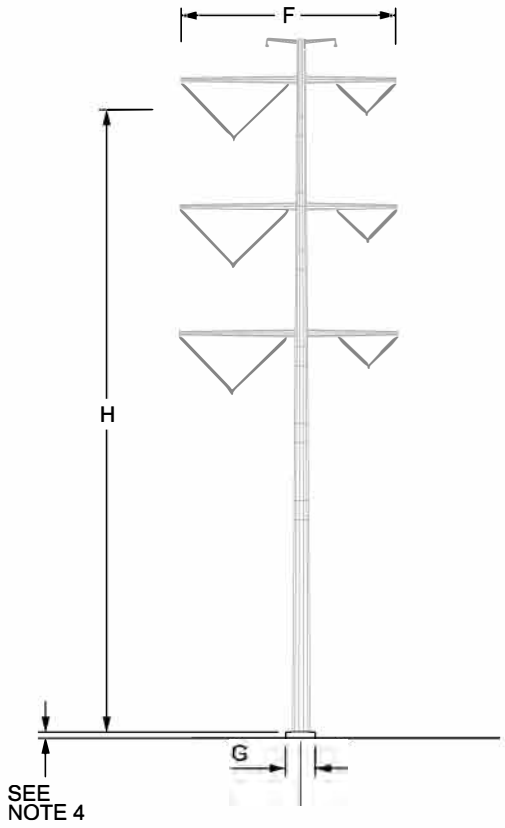
Dominion Energy
Dominion Energy
5000 Dominion Blvd
Glen Allen, VA 23060

STRUCTURE: 5001/12, 2333/12

DRAWING NO.
ATTACHMENT II.B.3.iv

DRAWN: MBV

STRUCTURE: 5001/19, 2333/19, 5001/21, 2333/21 - 5001/24, 2333/24, 5001/26, 2333/26, 5001/28, 2333/28, 5001/29, 2333/29, 5001/31, 2333/31, 5001/34, 2333/34 - 5001/39, 2333/39, 5001/41, 2333/41, 5001/43, 2333/43, 5001/52, 2333/52, 5001/60, 2333/60, 5001/62, 2333/62



DOUBLE CIRCUIT 1-POLE SUS STRUCTURE

B. RATIONALE FOR STRUCTURE TYPE:	500KV AND 230KV VERTICALLY ARRANGED TO REDUCE ROW REQUIREMENTS
C. LENGTH OF R/W (STRUCTURE QUANTITY):	9.4 MILES (20 STRUCTURES)
D. STRUCTURE MATERIAL:	DULLED GALVANIZED STEEL
RATIONALE FOR STRUCTURE MATERIAL:	DULLED GALVANIZED STEEL TO MINIMIZE VISUAL IMPACT BY REDUCING THE GLARE ON THE NEW STRUCTURES
E. FOUNDATION MATERIAL: AVERAGE FOUNDATION REVEAL:	CONCRETE SEE NOTE 4
F. AVERAGE WIDTH AT CROSSARM:	56.3'
G. AVERAGE WIDTH AT BASE:	8' (SEE NOTE 2)
H. MINIMUM STRUCTURE HEIGHT: MAXIMUM STRUCTURE HEIGHT: AVERAGE STRUCTURE HEIGHT:	160' 195' 178'
I. AVERAGE SPAN LENGTH:	670' (257'-1108')
J. MINIMUM CONDUCTOR-TO-GROUND AT MAXIMUM OPERATING TEMPERATURE:	22.5'/27.5' (230/500 KV) PER THE NATIONAL ELECTRICAL SAFETY CODE

NOTES
1. INFORMATION ON DRAWING IS PRELIMINARY AND SUBJECT TO CHANGE DURING FINAL ENGINEERING
2. FINAL FOUNDATION DIAMETER SHALL BE BASED UPON FINAL ENGINEERING
3. STRUCTURE HEIGHTS ARE MEASURED FROM STRUCTURE CENTERLINE
4. MINIMUM FOUNDATION REVEAL SHALL BE 1.5', MAX REVEAL SUBJECT TO FINAL LOCATION AND TERRAIN

Electric Transmission

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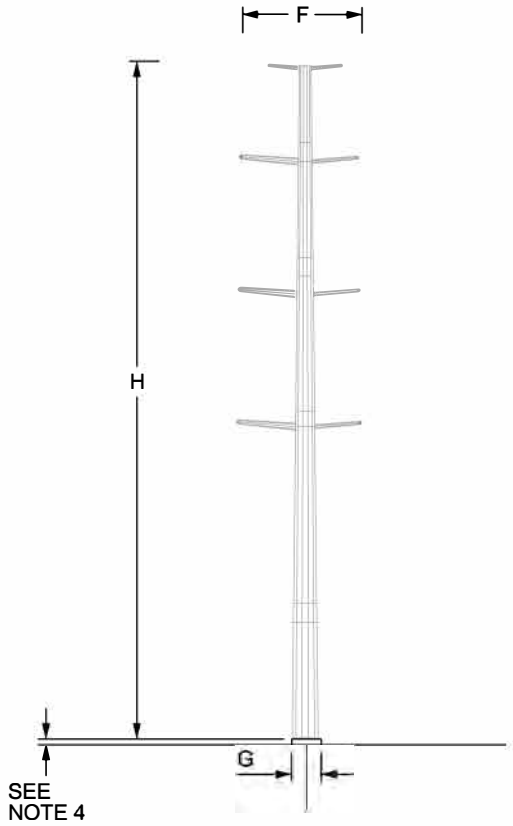
Dominion Energy
5000 Dominion Blvd
Glen Allen, VA 23060

STRUCTURE: 5001/19, 2333/19, 5001/21, 2333/21 - 5001/24, 2333/24, 5001/26, 2333/26, 5001/28, 2333/28, 5001/29, 2333/29, 5001/31, 2333/31, 5001/34, 2333/34 - 5001/39, 2333/39, 5001/41, 2333/41, 5001/43, 2333/43, 5001/52, 2333/52, 5001/60, 2333/60, 5001/62, 2333/62

DRAWING NO.
ATTACHMENT II.B.3.v

DRAWN: MBV

STRUCTURE: 5001/5, 2333/5, 5001/18, 2333/18, 5001/25, 2333/25, 5001/27, 2333/27, 5001/30, 2333/30, 5001/33, 2333/33, 5001/40, 2333/40, 5001/42, 2333/42, 5001/44, 2333/44, 5001/46, 2333/46, 5001/51, 2333/51, 5001/53, 2333/53, 5001/55, 2333/55 - 5001/59, 2333/59, 5001/61, 2333/61



DOUBLE CIRCUIT 1-POLE DDE STRUCTURE

B. RATIONALE FOR STRUCTURE TYPE:	500KV AND 230KV VERTICALLY ARRANGED TO REDUCE ROW REQUIREMENTS
C. LENGTH OF R/W (STRUCTURE QUANTITY):	9.4 MILES (18 STRUCTURES)
D. STRUCTURE MATERIAL:	DULLED GALVANIZED STEEL
RATIONALE FOR STRUCTURE MATERIAL:	DULLED GALVANIZED STEEL TO MINIMIZE VISUAL IMPACT BY REDUCING THE GLARE ON THE NEW STRUCTURES
E. FOUNDATION MATERIAL: AVERAGE FOUNDATION REVEAL:	CONCRETE SEE NOTE 4
F. AVERAGE WIDTH AT CROSSARM:	31.1'
G. AVERAGE WIDTH AT BASE:	10' (SEE NOTE 2)
H. MINIMUM STRUCTURE HEIGHT: MAXIMUM STRUCTURE HEIGHT: AVERAGE STRUCTURE HEIGHT:	160' 195' 174'
I. AVERAGE SPAN LENGTH:	670' (257'-1108')
J. MINIMUM CONDUCTOR-TO-GROUND AT MAXIMUM OPERATING TEMPERATURE:	22.5'/27.5' (230/500 KV) PER THE NATIONAL ELECTRICAL SAFETY CODE

NOTES
1. INFORMATION ON DRAWING IS PRELIMINARY AND SUBJECT TO CHANGE DURING FINAL ENGINEERING
2. FINAL FOUNDATION DIAMETER SHALL BE BASED UPON FINAL ENGINEERING
3. STRUCTURE HEIGHTS ARE MEASURED FROM STRUCTURE CENTERLINE
4. MINIMUM FOUNDATION REVEAL SHALL BE 1.5', MAX REVEAL SUBJECT TO FINAL LOCATION AND TERRAIN

Electric Transmission

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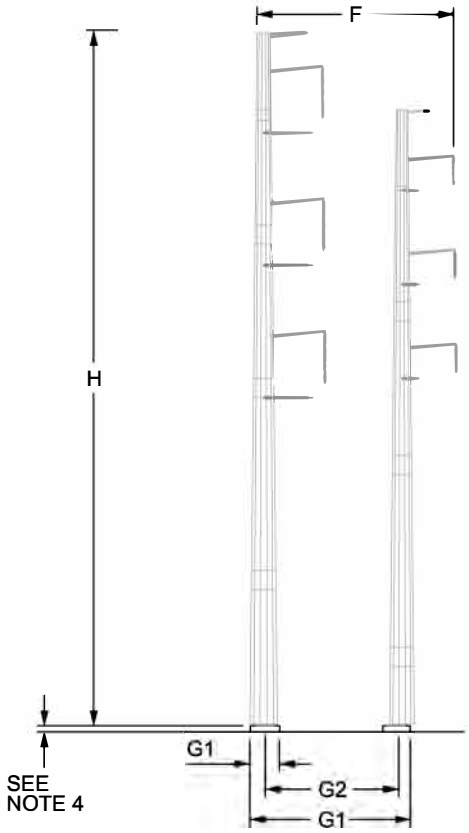
STRUCTURE: 5001/5, 2333/5, 5001/18, 2333/18, 5001/25, 2333/25, 5001/27, 2333/27, 5001/30, 2333/30 5001/33, 2333/33, 5001/40, 2333/40, 5001/42, 2333/42, 5001/44, 2333/44, 5001/46, 2333/46, 5001/51, 2333/51, 5001/53, 2333/53, 5001/55, 2333/55 - 5001/59, 2333/59, 5001/61, 2333/61

DRAWING NO.
ATTACHMENT II.B.3.vi

DRAWN: MBV

STRUCTURE: 5001/6, 2333/6, 5001/7, 2333/7, 5001/16, 2333/16, 5001/17, 2333/17, 5001/20, 2333/20, 5001/32, 2333/32, 5001/45, 2333/45, 5001/47, 2333/47 - 5001/50, 2333/50, 5001/54, 2333/54, 5001/63, 2333/63, 5001/68, 2333/68 - 5001/71, 2333/71



DOUBLE CIRCUIT 2-POLE STRUCTURE

B. RATIONALE FOR STRUCTURE TYPE:	500KV AND 230KV VERTICALLY ARRANGED TO REDUCE ROW REQUIREMENTS. TWO SEPARATE POLES TO REDUCE LOADING FOR FOUNDATIONS.
C. LENGTH OF R/W (STRUCTURE QUANTITY):	9.4 MILES (17 STRUCTURES)
D. STRUCTURE MATERIAL:	DULLED GALVANIZED STEEL
RATIONALE FOR STRUCTURE MATERIAL:	DULLED GALVANIZED STEEL TO MINIMIZE VISUAL IMPACT BY REDUCING THE GLARE ON THE NEW STRUCTURES
E. FOUNDATION MATERIAL: AVERAGE FOUNDATION REVEAL:	CONCRETE SEE NOTE 4
F. AVERAGE WIDTH AT CROSSARM:	52.1'
G1:AVERAGE WIDTH AT BASE\G2: POLE SPACING G3: BASE WIDTH:	G1: 43'\G2: 34'\G3: 9' (SEE NOTE 2)
H. MINIMUM STRUCTURE HEIGHT: MAXIMUM STRUCTURE HEIGHT: AVERAGE STRUCTURE HEIGHT:	160' 190' 179'
I. AVERAGE SPAN LENGTH:	670' (257'-1108')
J. MINIMUM CONDUCTOR-TO-GROUND AT MAXIMUM OPERATING TEMPERATURE:	22.5'/27.5' (230/500 KV) PER THE NATIONAL ELECTRICAL SAFETY CODE

NOTES
1. INFORMATION ON DRAWING IS PRELIMINARY AND SUBJECT TO CHANGE DURING FINAL ENGINEERING
2. FINAL FOUNDATION DIAMETER SHALL BE BASED UPON FINAL ENGINEERING
3. STRUCTURE HEIGHTS ARE MEASURED FROM STRUCTURE CENTERLINE
4. MINIMUM FOUNDATION REVEAL SHALL BE 1.5', MAX REVEAL SUBJECT TO FINAL LOCATION AND TERRAIN

Electric Transmission

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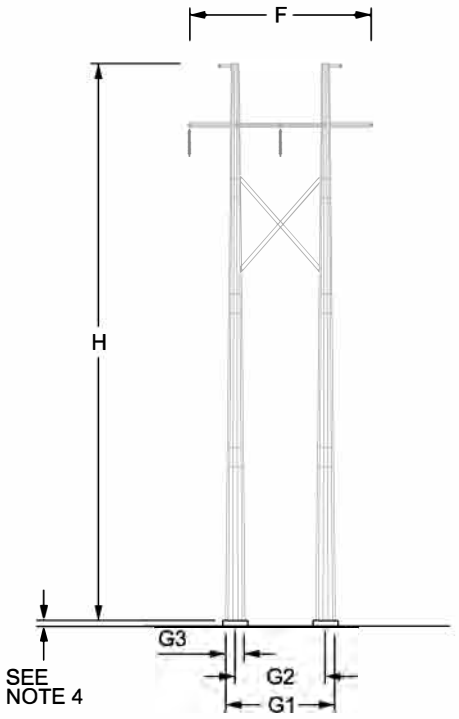
STRUCTURE: 5001/6, 2333/6, 5001/7, 2333/7, 5001/16, 2333/16, 5001/17, 2333/17, 5001/20, 2333/20, 5001/32, 2333/32, 5001/45, 2333/45, 5001/47, 2333/47 - 5001/50, 2333/50, 5001/54, 2333/54, 5001/63, 2333/63, 5001/68, 2333/68 - 5001/71, 2333/71

DRAWING NO.
ATTACHMENT II.B.3.vii

DRAWN: MBV

STRUCTURE: 2333/2, 2333/3



SC 230 KV H-FRAME STRUCTURE

B. RATIONALE FOR STRUCTURE TYPE:	HORIZONTAL CONFIGURATION TO REDUCE HEIGHT FOR LINE CROSSING. STRUCTURES FOR SINGLE CIRCUIT 230KV CONFIGURATION
C. LENGTH OF R/W (STRUCTURE QUANTITY):	9.4 MILES (2 STRUCTURE)
D. STRUCTURE MATERIAL:	DULLED GALVANIZED STEEL
RATIONALE FOR STRUCTURE MATERIAL:	DULLED GALVANIZED STEEL TO MINIMIZE VISUAL IMPACT BY REDUCING THE GLARE ON THE NEW STRUCTURES
E. FOUNDATION MATERIAL: AVERAGE FOUNDATION REVEAL:	CONCRETE SEE NOTE 4
F. AVERAGE WIDTH AT CROSSARM:	47.4'
G1:AVERAGE WIDTH AT BASE\G2: POLE SPACING G3: BASE WIDTH:	G1: 29'\G2: 23.5'\G3: 5.5' (SEE NOTE 2)
H. MINIMUM STRUCTURE HEIGHT: MAXIMUM STRUCTURE HEIGHT: AVERAGE STRUCTURE HEIGHT:	140' 145' 143'
I. AVERAGE SPAN LENGTH:	670' (257'-1108')
J. MINIMUM CONDUCTOR-TO-GROUND AT MAXIMUM OPERATING TEMPERATURE:	22.5' (230 KV) PER THE NATIONAL ELECTRICAL SAFETY CODE

NOTES
1. INFORMATION ON DRAWING IS PRELIMINARY AND SUBJECT TO CHANGE DURING FINAL ENGINEERING
2. FINAL FOUNDATION DIAMETER SHALL BE BASED UPON FINAL ENGINEERING
3. STRUCTURE HEIGHTS ARE MEASURED FROM STRUCTURE CENTERLINE
4. MINIMUM FOUNDATION REVEAL SHALL BE 1.5', MAX REVEAL SUBJECT TO FINAL LOCATION AND TERRAIN

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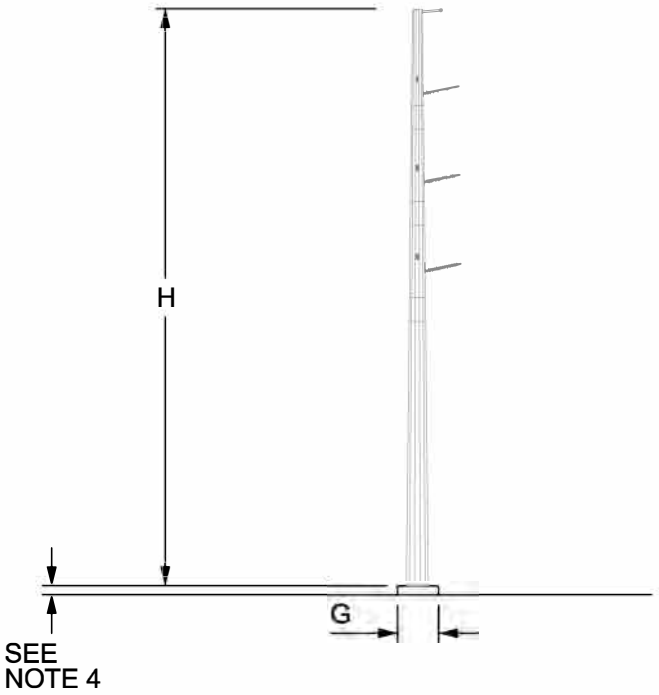
STRUCTURE: 2333/2, 2333/3

DRAWING NO.
ATTACHMENT II.B.3.viii

DRAWN: MBV

STRUCTURE: 2333/72, 2333/73, 2351/183A, 2150/182A, 2348/123A, 2081/122A



SC 230 KV 1-POLE STRUCTURE

B. RATIONALE FOR STRUCTURE TYPE:	MORE COMPACT STRUCTURES FOR SINGLE CIRCUIT 230KV CONFIGURATION
C. LENGTH OF R/W (STRUCTURE QUANTITY):	9.4 MILES (6 STRUCTURES)
D. STRUCTURE MATERIAL:	DULLED GALVANIZED STEEL
RATIONALE FOR STRUCTURE MATERIAL:	DULLED GALVANIZED STEEL TO MINIMIZE VISUAL IMPACT BY REDUCING THE GLARE ON THE NEW STRUCTURES
E. FOUNDATION MATERIAL: AVERAGE FOUNDATION REVEAL:	CONCRETE SEE NOTE 4
F. AVERAGE WIDTH AT CROSSARM:	3'
G. AVERAGE WIDTH AT BASE:	8.5' (SEE NOTE 2)
H. MINIMUM STRUCTURE HEIGHT: MAXIMUM STRUCTURE HEIGHT: AVERAGE STRUCTURE HEIGHT:	105' 120' 113'
I. AVERAGE SPAN LENGTH:	670' (257'-1108')
J. MINIMUM CONDUCTOR-TO-GROUND AT MAXIMUM OPERATING TEMPERATURE:	22.5' (230 KV) PER THE NATIONAL ELECTRICAL SAFETY CODE

NOTES
1. INFORMATION ON DRAWING IS PRELIMINARY AND SUBJECT TO CHANGE DURING FINAL ENGINEERING
2. FINAL FOUNDATION DIAMETER SHALL BE BASED UPON FINAL ENGINEERING
3. STRUCTURE HEIGHTS ARE MEASURED FROM STRUCTURE CENTERLINE
4. MINIMUM FOUNDATION REVEAL SHALL BE 1.5', MAX REVEAL SUBJECT TO FINAL LOCATION AND TERRAIN

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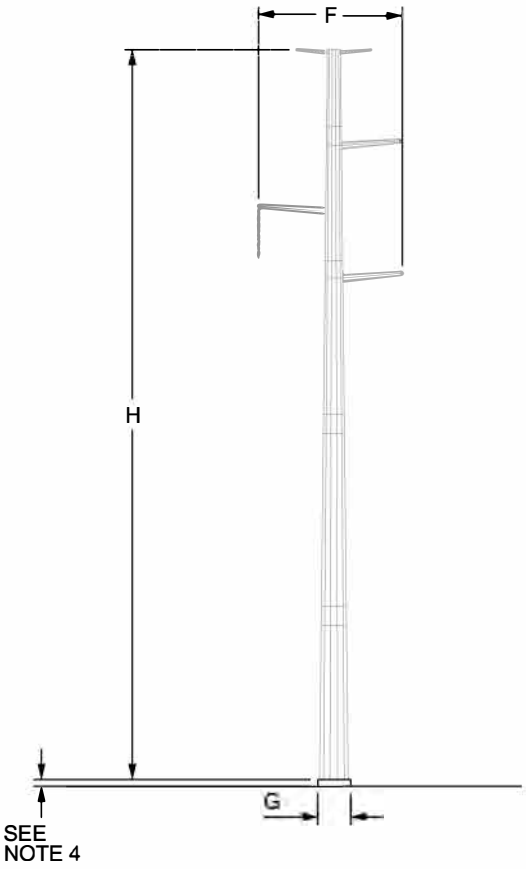
STRUCTURE: 2333/72, 2333/73, 2150/183A, 2150X/182A, 2081/123A, 2081X/122A

DRAWING NO.
ATTACHMENT II.B.3.ix

DRAWN: MBV

STRUCTURE: 5002/2



SC 500 KV 1-POLE DDE STRUCTURE

B. RATIONALE FOR STRUCTURE TYPE:	COMPACT SINGLE CIRCUIT 500KV DESIGN FOR MINIMAL FOOTPRINT
C. LENGTH OF R/W (STRUCTURE QUANTITY):	0.2 MILES (1 STRUCTURE)
D. STRUCTURE MATERIAL:	GALVANIZED STEEL
RATIONALE FOR STRUCTURE MATERIAL:	GALVANIZED STEEL TO MATCH SUBSTATION STRUCTURES, SINCE INSIDE SUBSTATION FENCE
E. FOUNDATION MATERIAL:	CONCRETE
AVERAGE FOUNDATION REVEAL:	SEE NOTE 4
F. AVERAGE WIDTH AT CROSSARM:	37.4'
G. AVERAGE WIDTH AT BASE:	10' (SEE NOTE 2)
H. MINIMUM STRUCTURE HEIGHT:	190'
MAXIMUM STRUCTURE HEIGHT:	190'
AVERAGE STRUCTURE HEIGHT:	190'
I. AVERAGE SPAN LENGTH:	432' (405'-460')
J. MINIMUM CONDUCTOR-TO-GROUND AT MAXIMUM OPERATING TEMPERATURE:	27.5' (500 KV) PER THE NATIONAL ELECTRICAL SAFETY CODE

NOTES
1. INFORMATION ON DRAWING IS PRELIMINARY AND SUBJECT TO CHANGE DURING FINAL ENGINEERING
2. FINAL FOUNDATION DIAMETER SHALL BE BASED UPON FINAL ENGINEERING
3. STRUCTURE HEIGHTS ARE MEASURED FROM STRUCTURE CENTERLINE
4. MINIMUM FOUNDATION REVEAL SHALL BE 1.5', MAX REVEAL SUBJECT TO FINAL LOCATION AND TERRAIN

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STRUCTURE: 5002/2

DRAWING NO.
ATTACHMENT II.B.3.x

DRAWN: MBV

ATTACHMENT 4 HISTORIC RESOURCE PHOTOS

Figure 1. 053-0106, Belmont Manor, dwelling, North and East Elevations, View to the Southwest.

Figure 2. 053-0276, Washington & Old Dominion Railroad Historic District, Intersection at Cochran Mill Rd, View to the Southeast.

Figure 3. 053-0336, Cooke's Mill, View to the Southwest.

Figure 4. 053-5058, Ball's Bluff Battlefield, View to the Northwest.

Figure 5. 053-6238, African American Burial Ground for the Enslaved at Belmont, View to the North.

Figure 6. 253-5182, Ball's Bluff Battlefield & National Cemetery Historic District Boundary Increase, View to the Northeast.

ATTACHMENT 5 PHOTO SIMULATIONS

Figure 1. Aerial photograph depicting land use and photo view for 053-0106.

Existing View

Proposed view showing Route 1's hidden transmission line structures (highlighted in yellow) and Aspen-Golden

Dominion Energy

ERM

Viewpoint Location UTM Zone 18N:	284552E 4328128N
View Direction:	269 degrees
Viewpoint Elevation:	244 feet
Distance to Development:	5259 feet
Horizontal Field of View:	90 degrees

Date of Photography:	22nd March 2023 15:05
Camera:	Nikon D800
Lens:	Nikkor 50mm 1.4
Camera Height:	62 inches

VIEWPOINT CONTEXT

Figure 2
Viewpoint SP 03
Leesburg Pike NW of Ridge Rd
053-0106

Pre-Application Analysis
Apollo-Twin Creeks 230 kV Electric Transmission Project

Figure 3. Aerial photograph depicting land use and photo view for 053-0276.

Existing View

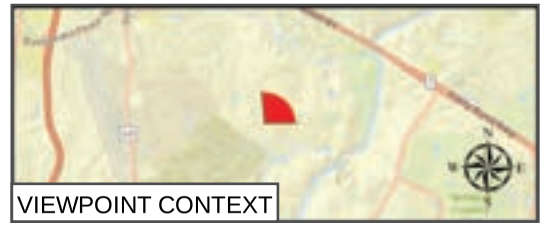
Proposed view showing location of transmission line structures

Dominion Energy

ERM

Viewpoint Location UTM Zone 18N:	281156E 4328250N
View Direction:	70 degrees
Viewpoint Elevation:	185 feet
Distance to Development:	1292 feet
Horizontal Field of View:	92 degrees

Date of Photography:	22nd March 2023 12:04
Camera:	Nikon D800
Lens:	Nikkor 50mm 1.4
Camera Height:	64 inches



VIEWPOINT CONTEXT

Figure 4
Viewpoint SP 07 East
Trail NW of Cochran Mill Rd
053-0276

Pre-Application Analysis
Apollo-Twin Creeks 230 kV Electric Transmission Project

Existing View

Proposed view showing hidden transmission line structures

Dominion Energy

ERM

Viewpoint Location UTM Zone 18N:	282204E 4327293N
View Direction:	45 degrees
Viewpoint Elevation:	185 feet
Distance to Development:	1340 feet
Horizontal Field of View:	91 degrees

Date of Photography:	22nd March 2023 13:26
Camera:	Nikon D800
Lens:	Nikkor 50mm 1.4
Camera Height:	63 inches

VIEWPOINT CONTEXT

Figure 5
Viewpoint SP 05
Trail NW of Belmont Ridge Rd
053-0276

Pre-Application Analysis
Apollo-Twin Creeks 230 kV Electric Transmission Project

Existing View

Proposed view showing location of transmission line structures associated with Aspen-Golden (no view to Apollo-Twin Creeks Route 1)

Dominion Energy

ERM

Viewpoint Location UTM Zone 18N:	281156E 4328250N
View Direction:	179 degrees
Viewpoint Elevation:	185 feet
Distance to Development:	728 feet
Horizontal Field of View:	84 degrees

Date of Photography:	22nd March 2023 12:04
Camera:	Nikon D800
Lens:	Nikkor 50mm 1.4
Camera Height:	64 inches

VIEWPOINT CONTEXT

Figure 6
Viewpoint SP 07
Trail NW of Cochran Mill Rd & Samuels Mill Ct
053-0276

Pre-Application Analysis
Apollo-Twin Creeks 230 kV Electric Transmission Project

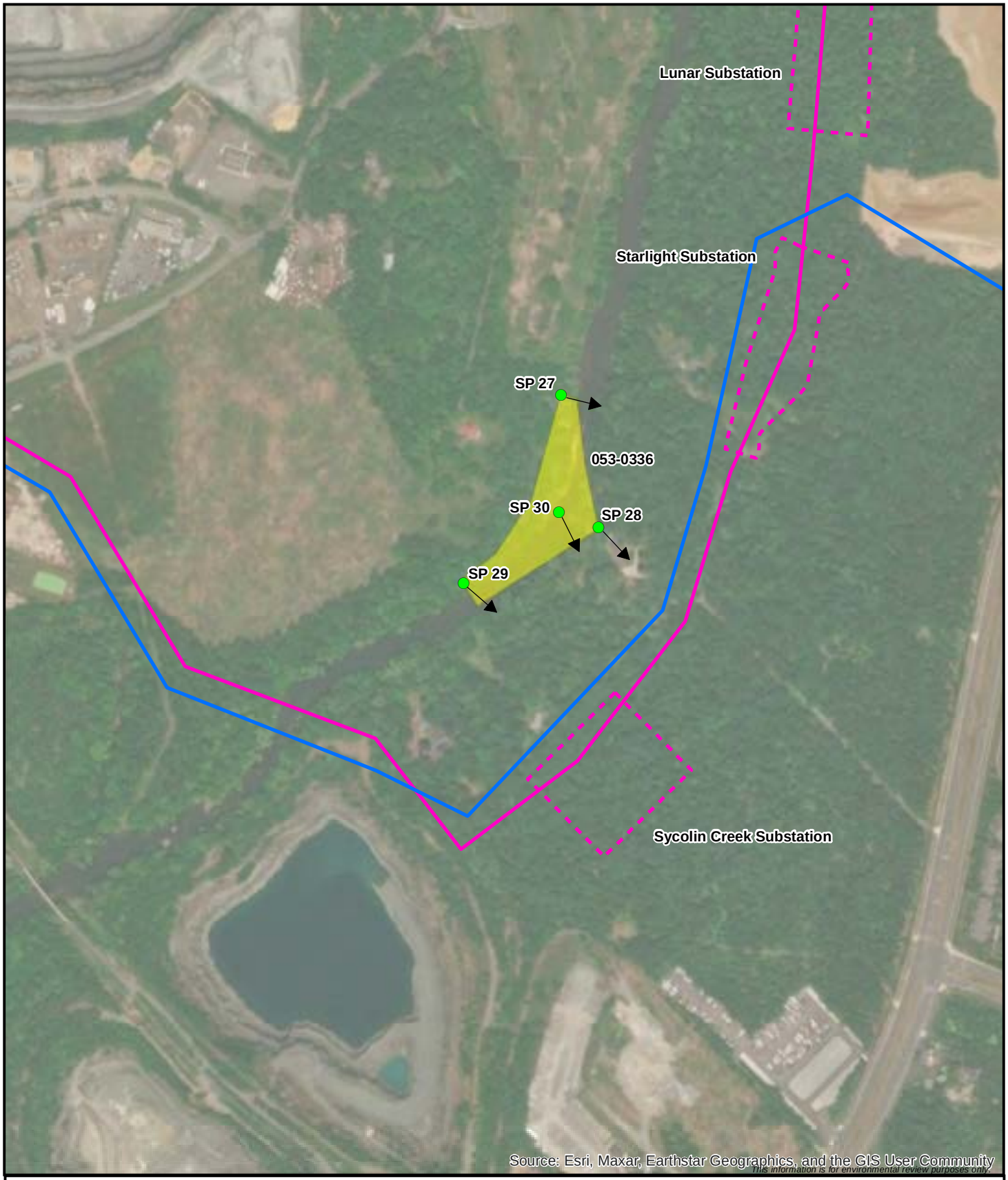


Figure 7. Aerial photograph depicting land use and photo view for 053-0336.

Existing View

Proposed view showing hidden transmission line structures

Dominion Energy

ERM

Viewpoint Location UTM Zone 18N:	282661E 4328083N
View Direction:	100 degrees
Viewpoint Elevation:	120 feet
Distance to Development:	715 feet
Horizontal Field of View:	90 degrees

Date of Photography:	29th August 2023 12:05
Camera:	Nikon D800
Lens:	Nikkor 50mm 1.4
Camera Height:	59 inches

VIEWPOINT CONTEXT

Figure 8
Viewpoint SP 27
W Bank of Goose Creek W of Goose Glen Ln
053-0336

Pre-Application Analysis
Apollo-Twin Creeks 230 kV Electric Transmission Project

Existing View

Proposed view showing hidden transmission line structures

Dominion Energy

ERM

Viewpoint Location UTM Zone 18N:	282530E 4327865N
View Direction:	126 degrees
Viewpoint Elevation:	215 feet
Distance to Development:	648 feet
Horizontal Field of View:	90 degrees

Date of Photography:	29th August 2023 13:29
Camera:	Nikon D800
Lens:	Nikkor 50mm 1.4
Camera Height:	61 inches

VIEWPOINT CONTEXT

Figure 9
Viewpoint SP 29
W Bank of Goose Creek W of Goose Glen Ln
053-0336

Pre-Application Analysis
Apollo-Twin Creeks 230 kV Electric Transmission Project

Existing View

Proposed view showing location of transmission line structures for Route 1 (highlighted in purple) and Aspen-Golden Lines (highlighted in pink)

Dominion Energy

ERM

Viewpoint Location UTM Zone 18N:	282686E 4327920N
View Direction:	133 degrees
Viewpoint Elevation:	210 feet
Distance to Development:	5432 feet
Horizontal Field of View:	90 degrees

Date of Photography:	29th August 2023 14:51
Camera:	Nikon D800
Lens:	Nikkor 50mm 1.4
Camera Height:	61 inches

VIEWPOINT CONTEXT

Figure 10
Viewpoint SP 28
E Bank of Goose Creek W of Goose Glen Ln
053-0336

Pre-Application Analysis
Apollo-Twin Creeks 230 kV Electric Transmission Project

Existing View

Proposed view showing location of transmission line structures for Route 1 (highlighted in purple) and Aspen-Golden Lines (highlighted in pink)

Dominion Energy

ERM

Viewpoint Location UTM Zone 18N:	282646E 4327956N
View Direction:	153 degrees
Viewpoint Elevation:	202 feet
Distance to Development:	524 feet
Horizontal Field of View:	94 degrees

Date of Photography:	29th August 2023 12:58
Camera:	Nikon D800
Lens:	Nikkor 50mm 1.4
Camera Height:	58 inches

VIEWPOINT CONTEXT

Figure 11
Viewpoint SP 30
W Bank of Goose Creek W of Goose Glen Ln
053-0336

Pre-Application Analysis
Apollo-Twin Creeks 230 kV Electric Transmission Project

Figure 12. Aerial photograph depicting land use and photo view for 053-5058.

Existing View

Proposed view showing hidden transmission line structures

Dominion Energy

ERM

Viewpoint Location UTM Zone 18N:	282611E 4330524N
View Direction:	191 degrees
Viewpoint Elevation:	209 feet
Distance to Development:	5433 feet
Horizontal Field of View:	90 degrees

Date of Photography:	22nd March 2023 11:20
Camera:	Nikon D800
Lens:	Nikkor 50mm 1.4
Camera Height:	63 inches

VIEWPOINT CONTEXT

Figure 13
Viewpoint SP 10
River Creek Pkwy S of Riverside Pkwy
053-5058

Pre-Application Analysis
Apollo-Twin Creeks 230 kV Electric Transmission Project

Figure 14. Aerial photograph depicting land use and photo view for 053-6238.

Existing View

Proposed view showing hidden transmission line structures

Viewpoint Location UTM Zone 18N:	283793E 4328527N
View Direction:	272 degrees
Viewpoint Elevation:	216 feet
Distance to Development:	2808 feet
Horizontal Field of View:	83 degrees

Date of Photography:	30th August 2023 09:59
Camera:	Nikon D800
Lens:	Nikkor 50mm 1.4
Camera Height:	63 inches

VIEWPOINT CONTEXT

Figure 15
Viewpoint SP 41
Cemetery Trail E of Freedom Trail Rd.
053-6238

Pre-Application Analysis
Apollo-Twin Creeks 230 kV Electric Transmission Project

Existing View

Proposed view showing location of transmission line structures

Dominion Energy

ERM

Viewpoint Location UTM Zone 18N:	283701E 4328556N
View Direction:	293 degrees
Viewpoint Elevation:	199 feet
Distance to Development:	2350 feet
Horizontal Field of View:	85 degrees

Date of Photography:	28th August 2023 14:42
Camera:	Nikon D800
Lens:	Nikkor 50mm 1.4
Camera Height:	59 inches

VIEWPOINT CONTEXT

Figure 16
Viewpoint SP 37
Belmont Ridge Rd at Leesburg Pike
053-6238

Pre-Application Analysis
Apollo-Twin Creeks 230 kV Electric Transmission Project

Existing View

Proposed view showing location of Route 1 transmission line structures (highlighted in purple) and Aspen-Golden Lines (highlighted in pink)

Dominion Energy

ERM

Viewpoint Location UTM Zone 18N:	283730E 4328468N
View Direction:	257 degrees
Viewpoint Elevation:	281 feet
Distance to Development:	2456 feet
Horizontal Field of View:	91 degrees

Date of Photography:	7th December 2023 12:04
Camera:	Nikon D800
Lens:	Nikkor 50mm 1.4
Camera Height:	65 inches

VIEWPOINT CONTEXT

Figure 17
Viewpoint SP 308
Freedom Trail Rd SW of Leesburg Pike
053-6238

Pre-Application Analysis
Apollo-Twin Creeks 230 kV Electric Transmission Project

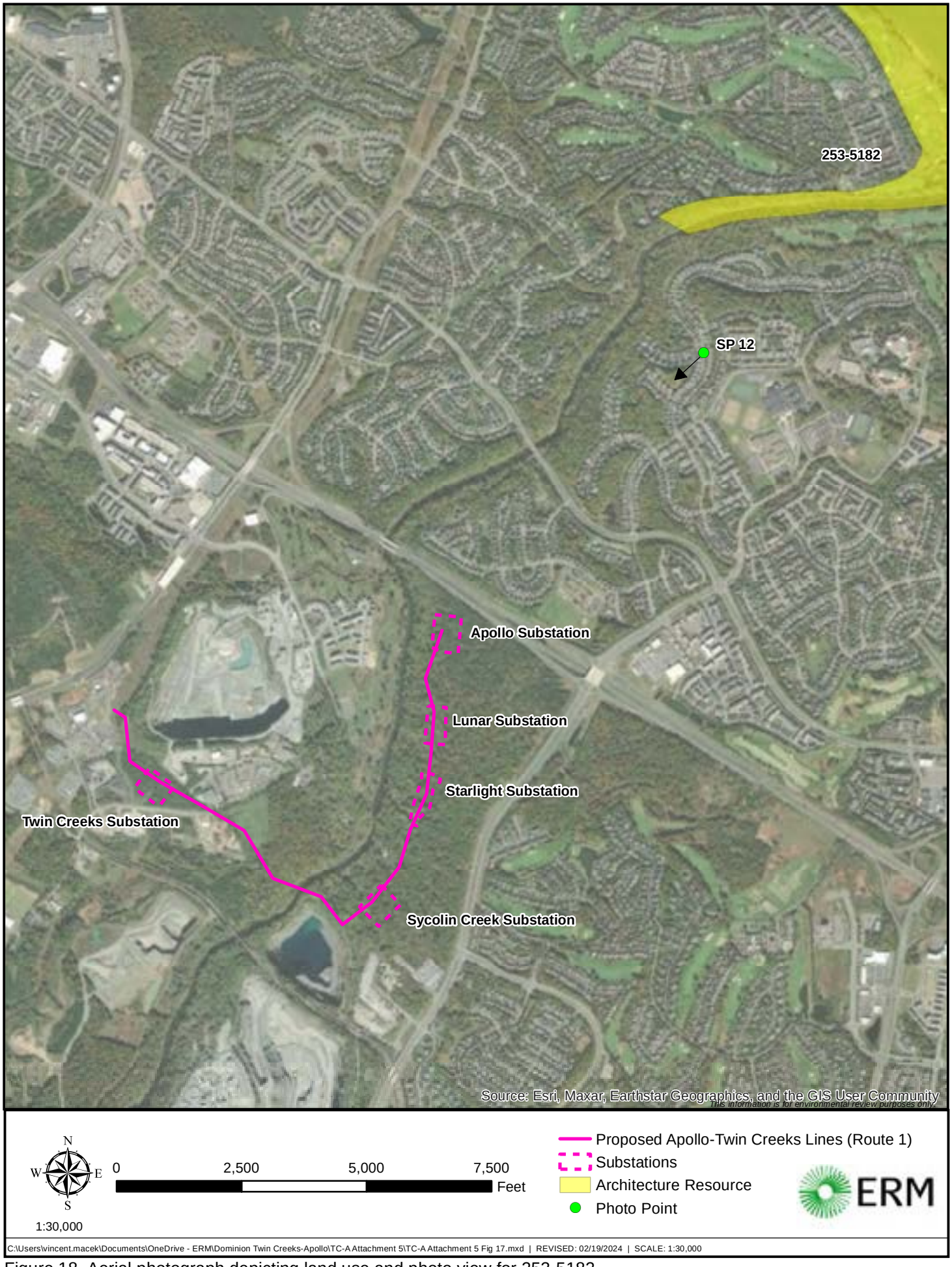


Figure 18. Aerial photograph depicting land use and photo view for 253-5182.

Existing View

Proposed view showing hidden transmission line structures

Dominion Energy

ERM

Viewpoint Location UTM Zone 18N:	284305E 4330199N
View Direction:	217 degrees
Viewpoint Elevation:	216 feet
Distance to Development:	5908 feet
Horizontal Field of View:	90 degrees

Date of Photography:	22nd March 2023 10:46
Camera:	Nikon D800
Lens:	Nikkor 50mm 1.4
Camera Height:	62 inches

VIEWPOINT CONTEXT

Figure 19
Viewpoint SP 12
Calphams Mill Ct at Riverpoint Dr
053-5058

Pre-Application Analysis
Apollo-Twin Creeks 230 kV Electric Transmission Project

APPENDIX H FEATURES TABLE

Appendix H: Features Crossings Table for the Project [a, b]

Environmental Feature	Unit	Apollo-Twin Creeks Line Route 1 [c]
Route Overview		
Route Length	miles	1.9
Construction Footprint	acres	41.6
Routing Opportunities		
Collocation with Future Aspen–Golden Lines	miles percentage	0.9 48%
Parallel to Existing Roads	miles	0
Parallel to Existing Railroad	miles	0
Parallel to Existing Sewer and Water Lines	miles	0.2
Parallel to Proposed Sewer and Water Lines [d]	miles	0.4
LAND USE		
Land Ownership		
Parcels Crossed (total)	number	14
Private	number	14
Public	number	0
Landowners	number	13
Forested	acres	36.8
Open Space	acres	2.3
Developed	acres	1.6
Open water	acres	0.3
Dwellings within ROW	number	0
Dwellings within 60 feet of ROW	number	0
Dwellings within 100 feet of centerline	number	0
Dwellings within 250 feet of centerline	number	1
Dwellings within 500 feet of centerline	number	1
Non-residential Buildings within ROW	number	1 [e]
Non-residential buildings within 100 feet of centerline	number	2
Non-residential buildings within 250 feet of centerline	number	6
Non-residential Buildings within 500 feet of centerline	number	13
Cemeteries, Schools, and Places of Worship		
Cemeteries within 500 feet of centerline	number	0
Schools within 500 feet of centerline	number	0

Environmental Feature	Unit	Apollo-Twin Creeks Line Route 1 [c]
Places of Worship within 500 feet of centerline	number	0
Zoning Districts		
Agricultural/Residential District (A-3)	acres miles	23.7 0.9
General Industry District (GI)	acres miles	4.6 0.3
Joint Land Management Area (JLMA)-3	acres miles	0.2 0.02
Mineral Resource – Heavy Industry (MRHI)	acres miles	12.5 0.7
Transportation and Utilities		
Local Roads	number	1
State Highways	number	0
Railroad crossings	number	0
Natural Gas Pipeline crossings	number	1
VDOT ROW Crossing	acres miles	0.2 0.1
Structures in VDOT ROW	number	0
NATURAL RESOURCES		
Wetlands		
Wetlands Affected–total [f]	acres	1.0
Palustrine Forested	acres	0
Palustrine Emergent	acres	0.3
Palustrine Scrub Shrub	acres	0
Palustrine Unconsolidated Bottom	acres	0.1
Riverine	acres	0.6
Waterbodies		
Waterbodies–total	number	7
NHD-Mapped Perennial	number	1
NHD-Mapped Intermittent	number	2
Not Mapped by NHD (identified via 2023 aerial imagery)	number	4
Forest Conservation Value		
Average	acres	32.7
Moderate	acres	1.0
High	acres	0
Very High	acres	0

Environmental Feature	Unit	Apollo-Twin Creeks Line Route 1 [c]
Outstanding	acres	0
NRCS Soil Classification (SSURGO)		
Prime farmland	acres	0
Farmland of Statewide Importance	acres miles	31.2 1.5
Ecological Cores		
Outstanding	acres	0
Very High	acres	0
High	acres	0
Moderate	acres	16.4
General	acres	3.7
Protected Species		
Bald eagle nests within 330 feet	number	0
Bald eagle nests within 660 feet	number	0
Conservation Easements and Lands		
Virginia Outdoors Foundation	acres miles	0 0
Scenic Creek Valley Buffer	acres miles	2.6 0.2
Proffered Transitional Open Space Buffer	acres miles	0.9 0.1
CULTURAL RESOURCES		
Archaeological sites within ROW	number	4
NRHP eligible and NRHP-listed Properties, NHLs, Battlefields, and Historic Landscapes within ROW	number	0
NRHP potentially eligible Properties, NHLs, Battlefields, and Historic Landscapes within ROW	number	0
NRHP eligible and NRHP-listed Properties, NHLs, Battlefields, and Historic Landscapes within 0.5 mile	number	1
NRHP potentially eligible Properties, NHLs, Battlefields, and Historic Landscapes within 0.5 mile	number	0
NRHP-eligible and NRHP-listed Properties, NHLs, Battlefields, Historic Landscapes, and NHLs between 0.5 and 1.0 mile	number	2

ABPP = American Battlefield Protection Program; NA = not applicable; NHL = National Historic Landmark; NRCS = National Resources Conservation Service; NRHP = National Register of Historic Places; SSURGO = Soil Survey Geographic Database; ROW = right-of-way; VDCR = Virginia Department of Conservation and Recreation; VDHR = Virginia Department of Historic Resources

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

[b] *The crossing lengths presented in this table for all feature categories were calculated using the centerline of each route.*

[c] *Totals for the Apollo-Twin Creeks Route 1 include the footprints of the five proposed substations (Twin Creeks, Sycolin Creek, Starlight, Lunar, and Apollo).*

[d] *The locations of planned sewer and water lines are based on information provided by Loudoun Water and Customers as it pertains to their planned data center campus developments. These locations are subject to change.*

[e] *As noted in the Company's Apollo-Twin Creeks Application, there is a 31-foot by 19-foot steel picnic structure on a Luck Stone property that will have to be either demolished or relocated to construct the future Aspen-Golden Lines. The Company is conducting ongoing conversations with Luck Stone pertaining to the relocation of the steel picnic structure.*

[f] *This is based on results of the desktop waterbody and wetlands study (see Appendix D, Wetland and Waterbody Desktop Summary).*